Contents: Jan 2023 Issue 118

Cover:

Autumn Durald Arkapaw, ASC filming Dominique Thorne as Riri on Marvel Studios' *Black Panther: Wakanda Forever.*

Autumn cradles a Sony VENICE—with Panavision 60mm T2.6 detuned anamorphic prime, Preston Cinema LR2, Teradek Bolt, Anton/Bauer Titon G90—suspended from an Easyrig.

Photo by Eli Adé. © 2022 MARVEL.

Introduction

by Jon Fauer. New York, Jan 4, 2023. 1.5 hours to deadline.

VENICE cameras apparently were named after Venice Beach because of the proximity to Sony Studios in Culver City. I gravitate to the alternate backstory, that VENICE was named after Venice of the Medicis, Grand Canal, Canaletto and the Rialto. After all, it was Henry III who declared, "If I were not King of France, I would choose to be a citizen of Venice."

In Venice, 360 years later, director Akira Kurosawa won the 1951 Golden Lion at the Venice Film Festival for *Rashomon.* Starring Toshiro Mifune, it is about an incident witnessed by three different people who tell the same story from three perspectives, with three different points of view.

That Rashomon effect is at play in this January edition of FDTimes. Twenty cinematographers, assistants, operators, colorists, color scientists, executives and users discuss the same VENICE camera from twenty points of view. Tanya Lyon of Sony was the indefatigable instigator and DP wrangler, a task perhaps even tougher than wrangling data on the biggest multi-camera magic hour stunt sequence. To paraphrase an apocryphal Fellini story, just when you have one DP lined up for a discussion, two others disappear to places unknown.

Two types of user stories usually cross this desk: random or Rashomon. Random user stories might go like this: "Kazuo Miyagawa (Kurosawa's cinematographer) just used a fine Chirimen Silk fabric to clean his lens. There's a story there, don't you think?" That is when the prevaricating begins and every excuse is made to do a technical article instead, perhaps on how that fine Chirimen Silk is made. Fear not, there are 16 pages of technical firmware update details.

And then there's the Rashomon type of user story. It all began with murmuring mid-year about the imminent firmware update 2.00 for VENICE 2 cameras. And then, just a month ago, there was a definite date. January 5 at 3 pm Japan Time. Meanwhile, all kinds of colleagues were working on films with the original VENICE and VENICE 2, and wouldn't it be nice to find out, Rashomon style, how those cameras were being used, what lenses they had, how LUTs were developed, who was using the original Rialto besides *Top Gun* and *Avatar*, how the color science was developed, and more.

Essentially this is not only a story about Sony VENICE cameras and the latest firmware update 2.00. It is a broad discussion of technique and technology, art and tools—our favorite themes—by the people who use them.

Great thanks to all the cinematographers, assistants, operators, and everyone else who endured deep debriefs. Thanks to all the studios, publicity departments and photographers who provided production stills and framegrabs. And thanks to all the equipment companies who sent lenses and accessories to try with the pre-release VENICE 2 Version 2.00 Firmware Update.

But, as the great William A. Fraker, ASC, BSC once said, "You could keep on lighting a set, but at a certain point, you just have to say, OK, let's do this." There were many more pages of wonderful interviews and stories about shooting stories on VENICE cameras, and people we missed. But at a certain point, deadline closing, you just have to say, "OK let's do this."

VENICE 2 Version 2.00 Firmware Update

VENICE 2 8K

VENICE 2 6K

January 5, 2023. Happy New Year and new, new year's resolutions. Some of these new resolutions are in Sony's VENICE 2 Version 2.00 Firmware Update.

VENICE 2 Version 2.00 adds many things requested by users. Some of these were announced at IBC in September and at Camerimage in November. Now the release is official. Here is a summary of what's new.

VENICE 2 Version 2.00 Firmware Update

New imager modes, higher frame rates

- Full Frame 8.6K, 17:9, up to 48 fps (full sensor width)
- Full Frame 8.2K, 2.39:1, up to 72 fps
- Full Frame 8.1K, 16:9, up to 48 fps
- Super35 5.8K, Anamorphic 4:3, up to 60 fps
- Super35 5.5K, 2.39:1, up to 120 fps
    Please see pages 6-7 about licenses

Rialto 2

- Support for new VENICE Extension System 2 (Rialto 2).

LUTs and CDLs

LUT (Look Up Table) and CDL (Color Decision List) metadata are now embedded in the recorded clips, in-camera.

EVF and Monitors

- Zoom to fit monitoring output for anamorphic lenses.
- Change brightness and transparency of frame lines.
- Change brightness of info displayed by EVF and monitors.
- 8 positions for recording and playback status indicator.
- Output the same image as the viewfinder via monitor-out, including zebra and peaking settings.

Focus

- 9 positions for magnification of the image in the EVF—to check focus.

Playback

- EI (Exposure Index) metadata is applied during playback.
- Playback position in the clip is displayed and allows frame-by-frame playback.
- Frame-by-frame playback is enabled.

Genlock / Sync

- Phase shifting of Genlock to sync with LED backgrounds, volumes and monitors.
- Phase shifting of Genlock lets you shift visible artifacts on screens until they disappear. These might include, for example, pulsing of LEDs or the dreaded horizontal bar seen on an analog TV or monitor screen.
- Locked frequency is displayed when Genlocked.
- Genlock is also available when shooting at high frame rates. The frame rate must be an even multiple of 2 or greater.

Power-On Display of Firmware

- When the camera is powered on, the sensor type (8K or 6K) and firmware version are displayed on the camera right display screen.
- All camera functions can be controlled via Ethernet or Wi-Fi.

Files

- ProRes 4444XQ recording is enabled.
- Camera ID can consist of 1 or 2 letters, e.g. A123 or AA123 where 123 is an example of the "reel (roll)" number.

All VENICE 2 8K Imager Modes (v2.00)

New VENICE 2 Version 2.00 Imager Modes

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

New Imager Modes are shown with red box around description. Not drawn to scale and overlaps are exaggerated.

Full Frame   *Super35*

8.6K 3:2 FF

8.6K 17:9 FF

8.1K 16:9 FF

7.6K 16:9 FF

8.2K 17:9 FF

8.2K 2.39:1 FF

5.8K 6:5 U35 anamorphic

5.8K 4:3 S35 anamorphic

5.5K 2.39:1 S35

5.4K 16:9 S35

5.8K 17:9 S35
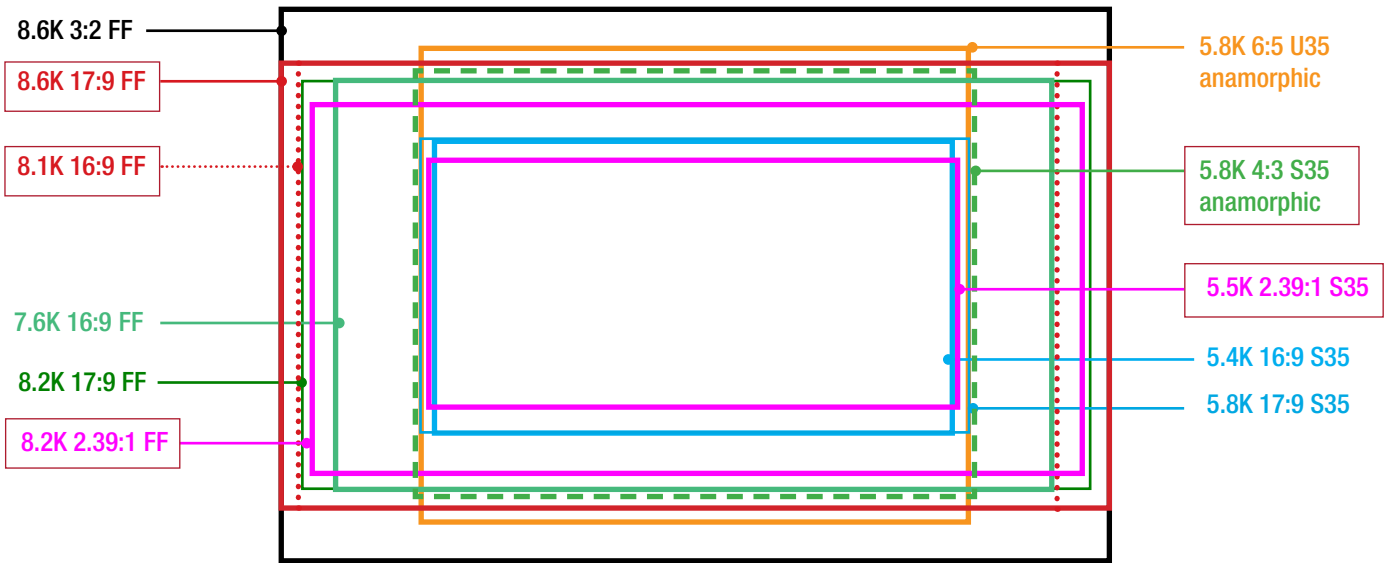
Previous VENICE 2 8K Imager Modes (v1.00)

Full Frame   *Super35*

8.6K 3:2 FF

7.6K 16:9 FF

8.2K 17:9 FF

5.8K 6:5 U35

5.4K 16:9 S35

5.8K 17:9 S35
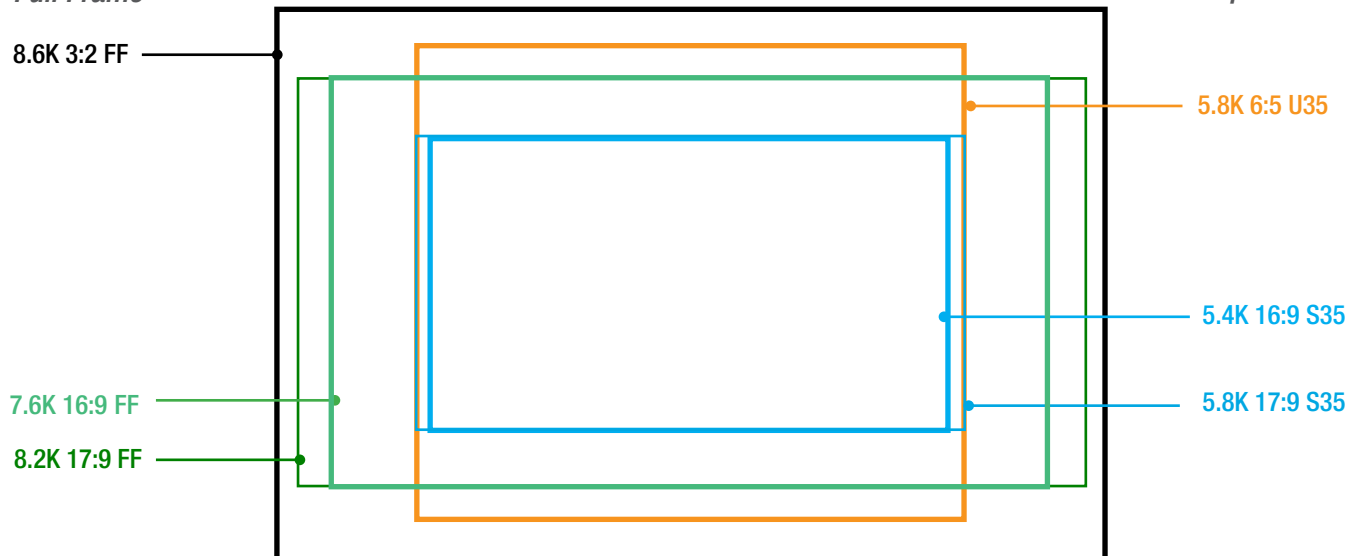
VENICE 2 Version 2.00 Imager Modes

Full Frame   *Super35*
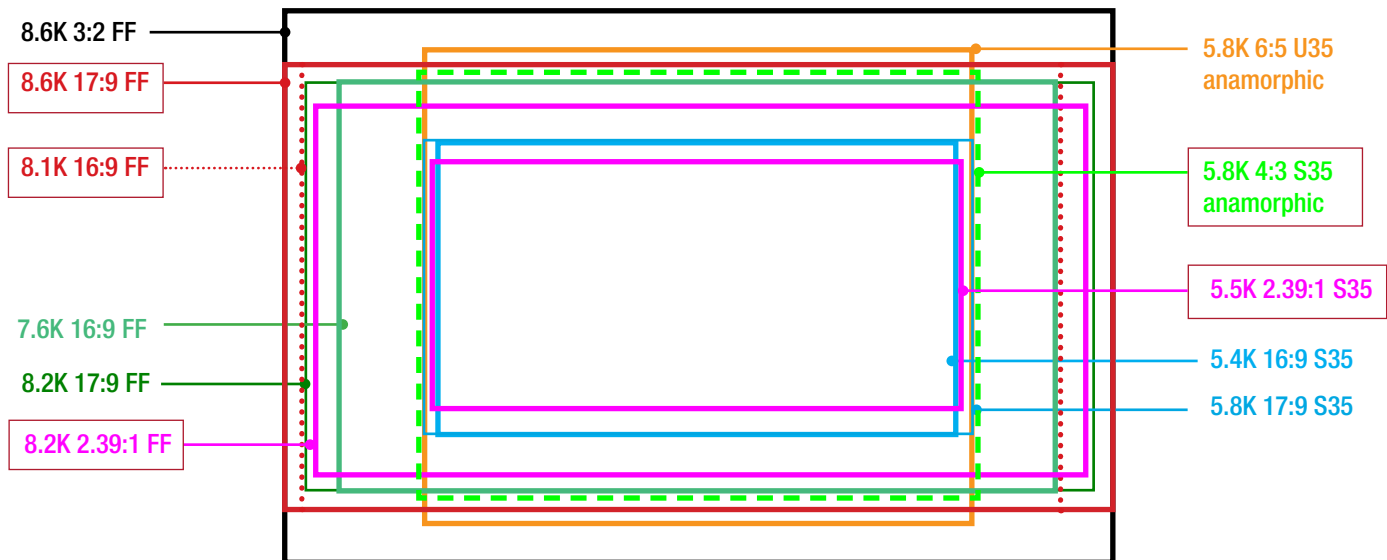
Red Rows indicate new Imager Modes in V2.00

Imager Mode	Format [2]	Resolution	W x H (mm)	Project Frame Rate [3]	fps [4]	License [5]
5.4K 16:9	S35	5434 x 3056	22.6 x 12.7	23, 24, 25, 29, 47, 50, 59	1-60, 66, 72, 75, 88, 90	-
5.5K 2.39:1	S35	5480x2296	22.8 x 9.55	23, 24, 25, 29, 47, 50, 59	1-60, 66, 72, 75, 88, 90, 96, 100, 110, 120	-
5.8K 17:9	S35	5792 x 3056	24.1 x 12.7	23, 24, 25, 29, 47, 50, 59	1-60, 66, 72, 75, 88, 90	-
5.8K 6:5	U35	5792 x 4854	24.1 x 20.2	23, 24, 25, 29, 47	1-48	Anamorphic
5.8K 4:3	S35	5792 x 4276	24.1 x 17.8	23, 24, 25, 29, 47, 50, 59	1-60	Anamorphic
7.6K 16:9	FF	7680 x 4320	32.0 x 18.0	23, 24, 25, 29, 47, 50, 59	1-60	Full Frame
8.1K 16:9	FF	8100x4556	33.8 x 19.0	23, 24, 25, 29	1-48	Full Frame
8.2K 17:9	FF	8192 x 4320	34.1 x 18.0	23, 24, 25, 29, 47, 50, 59	1-60	Full Frame
8.2K 2.39:1	FF	8192x3432	34.1 x 14.3	23, 24, 25, 29, 47, 50, 59	1-60, 66, 72	Full Frame
8.6K 17:9	FF	8640x4556	35.9 x 19.0	23, 24, 25, 29, 47	1-48	Full Frame
8.6K 3:2	FF	8640 x 5760	35.9 x 24.0	23, 24, 25, 29	1-30	Full Frame

If an imager mode is not shown in the chart above, you can still choose any aspect ratio you desire with user-defined frame lines.
Then, simply pick the closest sensor mode that fits, and crop the remainder in post.

2: FF=Full Frame. S35 = Super35. U35 is Angenieux's good designation of formats larger than Super35, with image heights greater than 18 mm and usually around 20 mm. It can also be called S35+ but neither designation is official to Sony.

3: For simplicity, Project Frame Rate numbers are abbreviated. 23=23.98; 24=24; 25=25; 29=29.97; 47=47.95; 50=50; 59=59.94

4: These frames rates are for standard base ISO 800.
In high base ISO 3200, 1-7 fps is not available.

5: You only need the Anamorphic License if you want to desqueeze the image on the EVF or monitors. If you are shooting with spherical lenses and would like this sensor mode, then you can select it without a license.

VENICE 2 6K Imager Modes (same as original VENICE, v6.0)

Full-Frame   **35 & Super35**
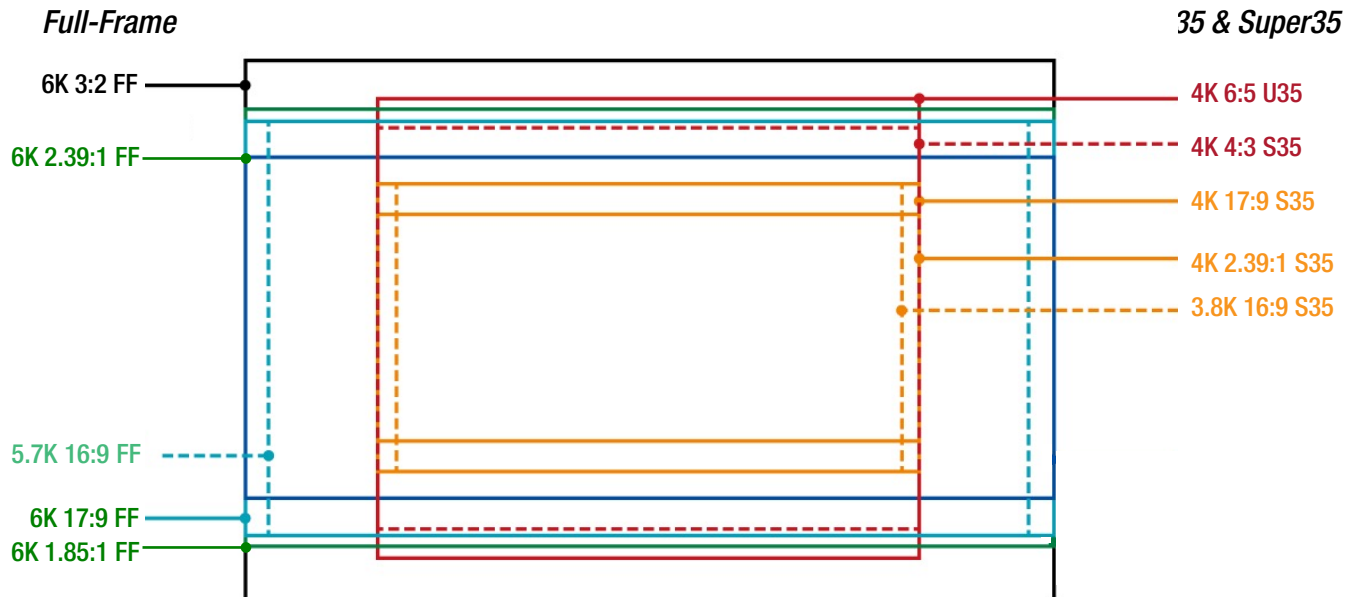
Imager Mode [6]	Format [7]	Resolution	W x H (mm)	Project Frame Rate [8]	fps	License [9]
3.8K 16:9	S35	3840 x 2160	22.8 x 12.8	23, 24, 25, 29, 47, 50, 59	1-60, 66, 72, 75, 88, 90, 96, 100, 110	-
3.8K 16:9 Surround View	S35	3840 x 2160	22.8 x 12.8	23, 24, 25, 29, 47	1-48	-
4K 2.39:1	S35	4096 x 1716	24.3 x 10.3	23, 24, 25, 29, 47, 50, 59	1-60, 66, 72, 75, 88, 90, 96, 100, 110, 120	-
4K 17:9	S35	4096 x 2160	24.3 x 12.8	23, 24, 25, 29, 47, 50, 59	1-60, 66, 72, 75, 88, 90, 96, 100, 110	-
4K 17:9 Surround View	S35	4096 x 2160	24.3 x 12.8	23, 24, 25, 29, 47	1-48	-
4K 4:3	S35	4096 x 3024	24.3 x 18.0	23, 24, 25, 29, 47, 50, 59	1-48, 49-60, 66, 72, 75	Anamorphic
4K 4:3 Surround View	S35	4096 x 3024	24.3 x 18.0	23, 24, 25, 29, 47	1-30	Anamorphic
4K 6:5	U35	4096 x 3432	24.3 x 20.4	23, 24, 25, 29, 47	1-30, 31-60, 66, 72	Anamorphic
5.7K 16:9	FF	5674 x 3192	33.7 x 19.0	23, 24, 25, 29, 47	1-30, 31-60, 66, 72	Full Frame
6K 2.39:1	FF	6048 x 2534	35.9 x 15.0	23, 24, 25, 29, 47, 50, 59	1-60, 66, 72, 75, 88, 90	Full Frame
6K 17:9	FF	6054 x 3192	36.0 x 19.0	23, 24, 25, 29, 47, 50, 59	1-60, 66, 72	Full Frame
6K 1.85:1	FF	6054 x 3272	36.0 x 19.4	23, 24, 25, 29, 47, 50, 59	1-60, 66, 72	Full Frame
6K 3:2	FF	6048 x 4032	35.9 x 24.0	23, 24, 25, 29, 47, 50, 59	1-60	Full Frame

6: These details are mostly the same as for the original VENICE, firmware v6.0.

7: U35 is Angenieux's good designation of formats larger than Super35, usually with an image height of around 20 mm. FF=Full Frame

8: For simplicity, Project Frame Rate numbers are abbreviated. 23=23.98; 24=24; 25=25; 29=29.97; 47=47.95; 50=50; 59=59.94

9: You only need the Anamorphic License if you want to desqueeze the image on the EVF or monitors.
If you are shooting with spherical lenses and would like this sensor mode, then you can select it without a license.

FDTimes has consolidated and modified these table from several Sony charts.

Specifications may change.

Quick Review: VENICE, VENICE 2 6K, VENICE 2 8K

VENICE 6K	VENICE 2 6K	VENICE 2 8K

VENICE 6K	**VENICE 2 6K**	**VENICE 2 8K**
Sensor: 24 MP	Sensor: 24 MP	Sensor: 50 MP
Sensor size: 35.9 x 24 mm	Sensor size: 35.9 x 24 mm	Sensor size: 35.9 x 24 mm
Internal ND: Clear, ND.3 - ND2.4	Internal ND: Clear, ND.3 - ND2.4	Internal ND: Clear, ND.3 - ND2.4
Dual base ISO: 500 and 2500	Dual base ISO: 500 and 2500	Dual base ISO: 800 and 3200
Max Res: 6048 x 4032 X-OCN 16-Bit	Max Res: 6048 x 4032 X-OCN 16-Bit	Max Res: 8640 x 5760 X-OCN 16-Bit
Internal RAW: 6048 x 4032 16-Bit	Internal RAW: 6048 x 4032 16-Bit	Internal X-OCN RAW: 8640 x 5760 16-Bit
PL Mount & Lever Lock E-mount—FF & S35	PL Mount & Lever Lock E-mount—FF & S35	PL Mount & Lever Lock E-mount—FF & S35
Weight (body only): kg / lb	Weight (body only): 4.2 kg / 9 lb 4.2 oz	Weight (body only): 4.3 kg / 9 lb 7.7 oz
Size (body only): 147 mm / 5 7/8" wide 158 mm / 6.25"" high 235 mm / 9 3/8" long	Size (body only): 152 mm / 5.98" wide 158 mm / 6.25" high 250 mm / 9.84" long	Size (body only): 152 mm / 5.98" wide 158 mm / 6.25" high 250 mm / 9.84" long
Battery: 14.8v V-Mount rear plate	Battery: 14.8v V-Mount rear plate	Battery: 14.8v V-Mount rear plate
Camera Introduced September 2017	Camera Introduced November 2021	Camera Introduced November 2021

Original VENICE (6K) with AXS-R7 X-OCN Recorder

VENICE 2 8K with internal X-OCN Recording

Sony VENICE 2 8K – Front

VENICE 8K with PL Mount

Tape measure hook,
image sensor plane

VENICE 2 8K identifier
(VENICE 2 6K does not have
any lettering here.)

One of 6 captive screws
securing PL mount (2.5mm
hex head)

3-pin RS Fischer connector:
24 V DC OUT and
Remote Start/Stop Record

LENS connector for remote
focus, iris, zoom control, 12-pin

EVF Viewfinder cable connector,
26-pin
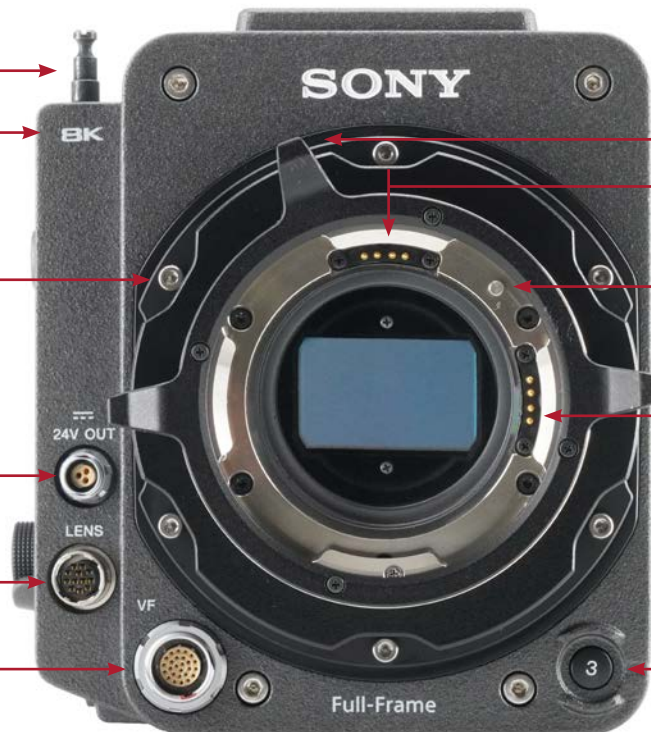
PL mount has a 52 mm
flange focal depth

PL lens breech lock: rotate
clockwise to lock.

/i and eXtended lens data pogo pins
in standard 12 o'clock position

PL Lens Mount
locating pin

/i data pins for lenses with
contacts in the 3 o'clock
position.
And no, it does not read LDS
lens metadata.

Assignable Button 1

VENICE 8K with PL Mount Removed, Revealing E-mount

Sony E-mount has an 18
mm flange focal depth

Push safety tab up and then
rotate E-mount lever-lock
clockwise to unlock.

Sony lever-lock E-mount
breech lock: rotate
counter-clockwise to lock

E-mount lens contacts

Pass-through lens contacts
for PL mount

Sony VENICE 2 Exploded View

Top Handle

DVF-EL200 Viewfinder

Viewfinder Bracket

Battery Plate

VENICE 2 Camera Body

8K Sensor Block

PL Mount

6K and 8K Sensor Blocks

VENICE is basically divided into 2 parts: a camera body and a sensor block—for original VENICE 6K and VENICE 6K or 8K.

- The 8K Sensor Block only fits a VENICE 2 camera body.
- The 8K Sensor Block will fit on VENICE 2 6K. (Swap Sensor Blocks.)
- The 6K Sensor Block of VENICE 2 6K fits VENICE 2 8K. (Swap Sensor Blocks.)
- The 6K Sensor Block of original VENICE fits VENICE 2. (Swap Sensor Blocks.)
- The 6K Sensor Block of original VENICE is the same as the 6K Sensor Block of VENICE 2 6K.

VENICE 2 8K or 6K
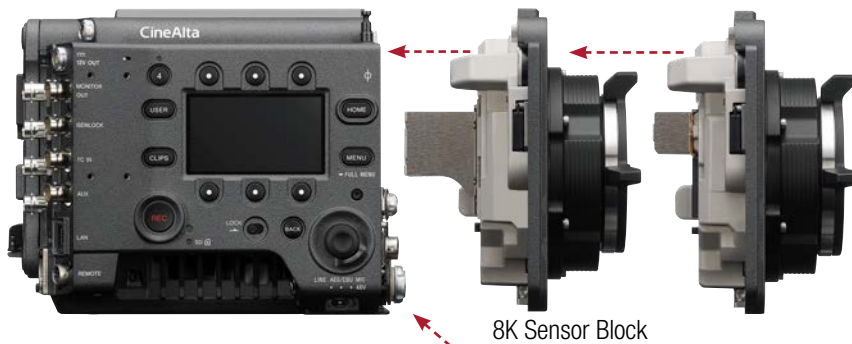
6K Sensor Block is the same as in original VENICE and also fits VENICE 2 (making it a VENICE 6K).

8K Sensor Block

Original VENICE (6K) with AXS-R7 Recorder

6K Sensor Block of original VENICE also fits VENICE 2

Zoom to Fit anamorphic monitoring

In the example above, we're shooting with a Cooke 1.8x Anamorphic/i FF 100mm lens. You're in 8.6K 3:2 sensor mode. Desqueezed, the image is 2.70:1. So, if you are delivering typical 2.39:1 widescreen, the sides have to be cropped in post, and masked with camera tape on your monitor most likely. (See the comments by Autumn Durald Arkapaw, ASC about this.)

Above: The VENICE 2.00 update has a Zoom to Fit monitoring output function for anamorphic lenses. At the moment, it only assumes you're shooting anamorphic for 16:9 or 17:9 release.

Below: Zoom to Fit enlarges up your puny anamorphically squeezed image area to fill the frame—shown here on a CINEPADS 7HS monitor.

How to update VENICE Firmware

Firmware Update 2.00 for VENICE 2

1. Select Maintenance > Firmware in the menu to display the current firmware version.

2. To update, always connect an AC adaptor with power supply rating of 120 W or higher because the process takes a while. Attach an onboard battery in case someone kicks out the power cable.

3. Insert an SD memory card into the SD slot at the lower right side of the camera. Use an SDHC (Speed Class 4 to 10, non-UHS, Capacity: 2 GB to 32 GB) or an or an SD memory card (FAT16, Capacity: up to 2 GB).

4. Format the SD card in the camera. MENU>Project>Scene File

5. Remove the SD card from the camera and connect it to your computer. Check that it is Read/Write capable. (e.g. File Info on Mac). If it's read-only, jiggle the write protect tab down a little ways from the top.

6. Download the Firmware Update file from Sony.

7. Unzip the file, and copy only the .bin file to the SD card.

8. Insert the SD card back into the VENICE.

9. MENU > Maintenance > Firmware > FW Update > Run.

10. A "Connect DC Power to DC IN Upgrade Version?" message appears. Select RUN.

11. Among many other things, VENICE 2 Firmware Update 2.00 will let you work with the new RIALTO 2, below.

Rialto 2

Sony VENICE Extension System 2 (Rialto 2)

VENICE 2 sensor block
and lens mount

VENICE 2 camera body

Tether cable

VENICE Extension System 2 (Rialto 2)

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

VENICE Rialto 2 works with both the original VENICE (6K) and VENICE 2 (6K and 8K).

Cable length has been extended—you can connect body to head with a 3m or 12m cable and you do not need a repeater for the longer run.

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

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

Setting up Rialto 2

1. VENICE Extension System 2 (Rialto 2) comes as two complete units: one for 3m (9.8') and the other for 12m (39.4') cable extensions. (The 12m Rialto 2 at right that I had was a prototype.) The two ends of Rialto nest together when not being used. Careful: the connectors are delicate.

2. Unscrew the 4x 3mm silver hex screws on the front of the Rialto.

3. Gently separate the two halves.

4. Next, unscrew 6x 3mm silver hex screws on the VENICE camera itself The 2 screws at bottom front are shorter. Keep the cavity cap on to avoid dropping a screw onto the delicate sensor cover glass.

5. Gently separate the sensor block and lens mount / camera head from the camera body.

6. Attach the Rialto end with the SONY logo to the VENICE camera body using the 4 long 3mm screws you removed earlier. Don't lose the 2 shorter screws.

7. Attach the other end of the tether cable +housing to the sensor block / lens mount assembly with 4x 3mm screws.

8. It takes about 10 minutes to complete, which is why many productions have the Rialto as a second VENICE camera ready to go.

Joshua Pines & Picture Shop Family of VENICE LUTs

LOG

Sony's native s709 LUT

Sony's new Lo Con Base LUT

Developed from Lo Con Base LUT
Look 1
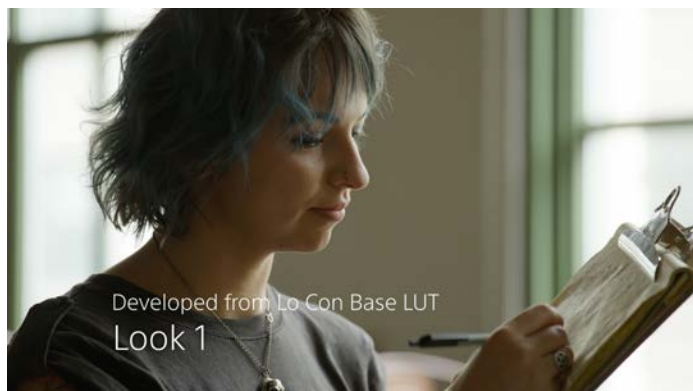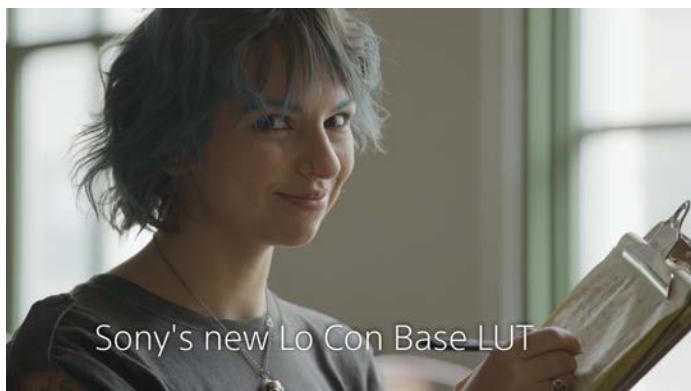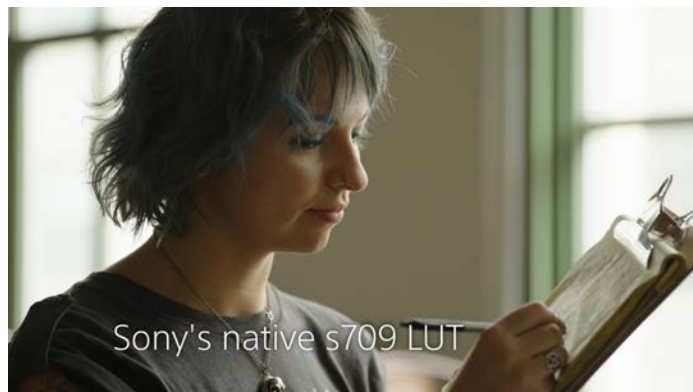
Sony partnered with Picture Shop color scientists Joshua Pines and Chris Kutcka, and senior colorists Jason Fabbro and Tony D'Amore, to release a family of LUTs designed with the VENICE 2.

These new LUTs can be used with any Sony camera that supports S-Log3/S-Gamut3.Cine. The entire collections offer a "kinder, gentler" alternative to the stylized LUTs that Sony and Picture Shop have released in the past. To download the LUTs, available on the Sony Cine website at no cost, go to *sonycine.com/resources/luts/*

Pines Low Contrast Base LUT

Lo-Con Base LUT: sv2_base_locon_r709_g24.cube
This low-contrast base LUT is intended to be modified and graded. It offers a low-contrast starting point and has the S-curve built in. Pines explained, "It has a kinder, gentler viewing transform that has knowledge of the camera's codec and color space and its low contrast and doesn't severely limit the color gamut." It is designed for DITs and DPs who want to create their own LUT or look development with a colorist for each project.

Pines "more finished" VENICE LUTs

Joshua Pines also developed two other versions of the base LUT for users asking for a finished look. These LUTs offer more contrast and saturation while remaining color accurate.

Hi-Con LUT: sv2_look_7525_r709_g24.cube
This is a higher contrast version of the Lo-Con Base LUT. It's a good example of how you can advance from the starting point.

50-50 LUT: slgv4_locon_050-050.cube
50-50 is the Goldilocks version of the LUT trio with more contrast and saturation than the Lo Con Base LUT.

Fabbro LUTS

Picture Shop senior colorist Jason Fabbro provided two additional LUTs for VENICE.

Look 1: sv2_look_1_r709_g24.cube
Created using the Lo-Con Base LUT, offers slightly more contrast and saturation; reds and highlights have been pulled down.

Look 2: sv2_look_2_r709_g24.cube
Also created using the Lo-Con Base LUT, adds more warmth to skin tones, more contrast and saturation. Like Look 1, reds and highlights have been pulled down to look more film-like.

D'Amore LUTS

Picture Shop Senior Colorist and Director of Creative Workflow Tony D'Amore developed these LUTs for Sony VENICE cameras.

D'Amore Daylight: slog3_td_daylight_base.cube
Cools off the blacks and warms up the highlights for better color separation so the image is a little closer to what the DP might see on-set. During the grade, this base LUT provides a good starting point to save time and open creative possibilities.

D'Amore Style: slog3_td_style.cube
Pushes the color separation a bit further than the daylight LUT by adding a warm shift to the highlights and midtones for rich skin tones. Offsets the warm shift by cooling off the blacks.

D'Amore Tungsten: slog3_td_tungsten_base.cube
A tungsten (3200°K) version of the D'Amore Daylight LUT.

HDR LUTS

The Joshua Pines Lo-Con Base and Hi-Con LUTs, and Jason Fabbro Look 1 and Look 2 LUTs also come in HDR versions for the Rec.2020 PQ color space.

Joshua Pines & Picture Shop Family of VENICE LUTs

Sony's new 50-50 LUT

Sony's new Hi Con LUT

D'Amore Daylight

D'Amore Style

LOG

Sony's native s709 LUT

Sony's new Lo Con Base LUT

Developed from Lo Con Base LUT
Look 2

Joshua Pines on LUTS, CDLs, Looks, Transforms, VENICE 2
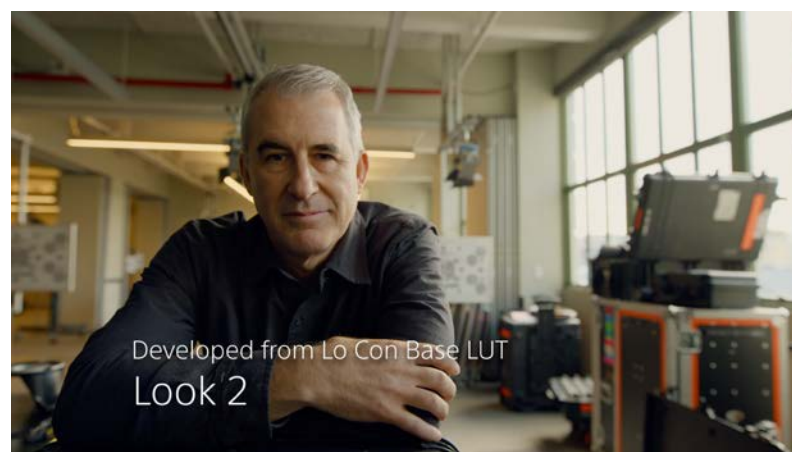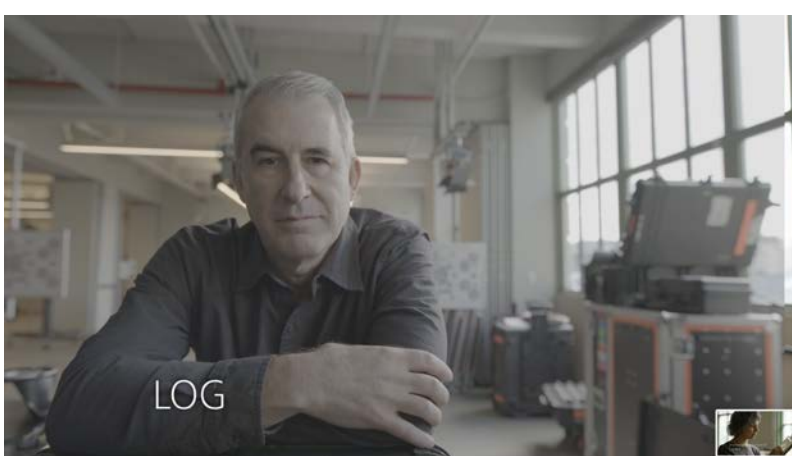
Joshua Pines grew up in New York. He attended Cooper Union, studied math, physics, electrical engineering, graphic design and filmmaking, and played keyboard and synthesizers in bands. He taught film technique while enrolled in the engineering school's master's degree program. He worked at R/Greenberg Associates, Industrial Light and Magic, and Technicolor (now Picture Shop), where he is the color scientist. Credits include Titanic, Saving Private Ryan, The Aviator, The Revenant.

Jon: Leading question—don't cameras come with LUTs? Then why did you create new LUTs for the Sony VENICE 2?

Joshua: Because we were asked to.

Seriously, every LUT, every look, every viewing transform that's worth its salt imposes a look. In order to impose a look that "looks good", it actually has to do something destructive. This may sound strange, but we are imposing a look to make it a space opera, a romcom or a period piece. "Oh, I want this to really feel like it's the court of Louis the XIV." Or "I want this to feel like it's Wall Street in the '80s."

And so, with the advent of the VENICE 2, Sony reached out and asked, "Rather than having all these different looks, how about some sort of a generic look?" We said, "Once you have a LUT that looks good, it's already driven in a particular direction." It's very difficult to come up with a one-size-fits-all." Colorists know this. When we're doing look development for a show, we begin with starting point LUTs. Oh, by the way, you should just tell me if my run-on sentences go on too long.

I'll add some punctuation here and there.

I don't add commas when I speak, as you've noticed. Our starting points do something that all viewing transforms really have to do. There are a number of color science-y reasons for

this. You always want to have a contrast increase, but you don't want to clip highlights and shadows, so you roll off them off. That is what we refer to as an S-curve. One of the things about these starting point LUTs is they don't impose a look until you drive them to look like the examples I gave earlier. So the good news in this strategy is having a starting point that you can drive.

It does a lot of the basic work for you so you don't have to start from scratch with drawing custom curves. The good news is it can be graded anyway you want. The bad news is it has to be graded. No one's going to look at one of these starting point LUTs and go, "That's it. That's perfect. I want my movie to look like that." And that's a very difficult thing to sell to people when they're saying, "Give me a LUT that looks good. I need a LUT for this camera."

An analogy I like to give is, if you ever have written a document in a modern word processor, you have a choice of fonts. There's a pull-down menu and maybe you say, "Oh, I like this font." The idea of our starting point LUT is akin to, "Let's actually design a custom font that works for the type of document I want to make." Now, it may be overkill for some productions, but for the caliber of projects we work on, the directors and the DPs, especially the DPs, usually have a very strong idea of how they want certain sequences or the whole project to look. They'll come in with reference pictures. And rather than just go through the usual suspects of 20 or 30 LUTs, we design it from scratch.

In talking about this with Tanya Lyon at Sony, it evolved into a really interesting idea to make a LUT for this camera. Chris Kutcka and I work together in the color science department at Picture Shop. This is what we do; we eat this stuff for breakfast. We got all the technical information about the camera, its log encoding, its color space.

Another analogy I like to give is sculpting. If you are going to be sculpting something out of marble or clay, you don't want to start with a piece that already looks like a human figure and then you go from there. You want to start with a block of clay or marble and then shape or sculpt it. The other thing I like about that analogy is when you have a block of clay or marble and you start sculpting it, everything you do is basically destructive. You are taking things away in order to form what you want this final work of art to look like. At the level of really analyzing what's happening to the color spaces, as you do this look development, most of it is destructive. You limit the color gamut, you impose a certain contrast curve and things like that. All of which are basically taking the raw camera data and sculpting it into the desired goal. So there, that's my speech.

In the realm of color correction for motion pictures and episod-

ics, actually doing the look development for what you want your finished images to look like, these days it's something that pretty much anyone can do. And that's a good thing. The hope is that our Lo Con LUT (sv2_base_locon_r709_g24.cube), that we developed for Sony, is a starting point. We also provided a higher contrast version—it'll fall off the truck looking better. Maybe it's a good starting point if you don't want to do too much heavy lifting for look development.

Where do CDLs come into play with your LUT?

The CDL, Color Decision List, was done by the digital intermediate working group under the auspices of the American Society of Cinematographers Technology Committee. I was co-chair or vice chair. It allows DPs on set to do minor color correction, baby color correction, essentially to make the scene a little darker or a little redder or more desaturated. Very minor things, so the DPs retained or regained the control of the look of their dailies. They can be looking at something on set and say, "If my dailies look like that, I'm happy." Because, for the final grade, they may not be available, they may be on the next show, and dailies set the tone.

CDLs set the tone for dailies. That's what the editors look at, the producers look at. But, when it comes to the final color correction, for the most part, the colorist may use the same base LUT, but they're not going to be married to the CDLs. They're there for visual reference. This may come as a shock to people, but the CDL that a DP and a DIT came up with on set, when they're rushing to get eight more setups on that day and they have to do all this other work, is not the final grade. The actual final grade is left to the colorist.

So the CDLs are there for reference. In terms of the actual base LUT, if the colorist and the DP were involved in pre-production and we or the colorist provided the LUT for the show to be used on set and dailies, then they will use the starting point LUT for the final DI.

Sometimes we haven't been hired yet. The final colorist may not have been involved in the initial setup. In which case there's a conversation between the creatives, whether it's the DP and/or director and the colorist, about how they want to proceed. Did you like your dailies? And normally the colorist will look at the dailies and say, "I know what they used. I know how to do this." And then they will pick the best viewing transform and grading pipeline that's going to fit in with what the creative goals of the show are.

Since you've good at this, please give us a refresher course on the difference or similarity between Look, LUT and color space?

Right now? With plausible deniability?

Look

The Look of a show is the result of applying various transforms. I'm using the word "transforms" as the way to achieve a desired look. And that is a very generic thing. It can involve color, brighter, darker, contrast, saturation, isolating certain colors and changing them, isolating certain areas and changing them, as with power windows. Even things like sharpness or softness.

Anything you can do on a color correction platform is a grade. That is the generic overall umbrella for Look.

LUT — Look Up Table

Now, when we talk about this thing called the LUT, the Look Up Table, a lot of those transforms that went into the look are math. They're actually running mathematical equations, mathematical formulae, in real time, GPU accelerated, so they can do very sophisticated things.

When you're on set, you probably don't have a full-blown color corrector there. You're only going to be doing CDLs and things. What we supply is sort of a base look, a look for the show, that we've characterized and sampled and provided to you in the form of a Look Up Table, a LUT. A Look Up Table is a very good approximation of the underlying mathematical formulae that go into the Look. It is not the mathematical formulae, it is a characterization of the mathematical. It is not perfect because it is sparse and it is interpolated.

But a Look Up Table can't do everything. For example, a Look Up Table can't handle power windows. It can't sharpen, can't blur, can't do any of the spatial things. It can only do things in terms of the overall color palette. So that's another limitation of Look Up Tables.

So we have the Look, which really can encompass everything. And then there are these Look Up Tables, which are like snapshots or approximations that you can reuse and that characterize the full grade and can be applied.

Color Space

There are three ways that color spaces come into play. First, what is the camera signal? The camera's capturing something and it's spitting out three numbers at every pixel for red, green, and blue. Well, one camera's red, green, and blue—pointing at the same stimulus—may not give you the same three numbers as another camera. Each camera has its own encoding, and its own filters on the actual sensor, and different spectral sensitivities. Remember how various camera negative film stocks had different strengths and weaknesses, and a DP would choose a film stock based on how its palette aligned with the overall story and style?

The second color space is the grading color space. ACES is an example.

And the third one is the output color space, and that's what you're looking at on a display, whether it's a projector in a theater or a monitor while you're doing your grading. That display has an encoding in a color space. The screen you're looking at right now as we're doing this Zoom meeting probably has close to a gamma 2.2 encoding and an sRGB color space.

And for the grading, the idea is that we have a show LUT, or we have a look for the show, that lives in a very generic space, and then we would have a transform to convert that to specific displays. So we do a grade, and it goes through a transform for a theatrical release, because projectors in movie theaters have their own color space. We would have a different output transform or conversion to Rec.709, which is the color space that's used for episodic streaming, home video and broadcast. So, we as color scientists have to be aware of the color space and encoding of the camera, the color space and encoding of the working space, and the color space and encoding of the viewing display and the ancillary deliverables. Wow.

Jason Fabbro on Grading VENICE 2

Color Mangement

Lookup Tables

Open LUT Folder

DaVinci Resolve LUT Folder

Your Folder of new LUTs
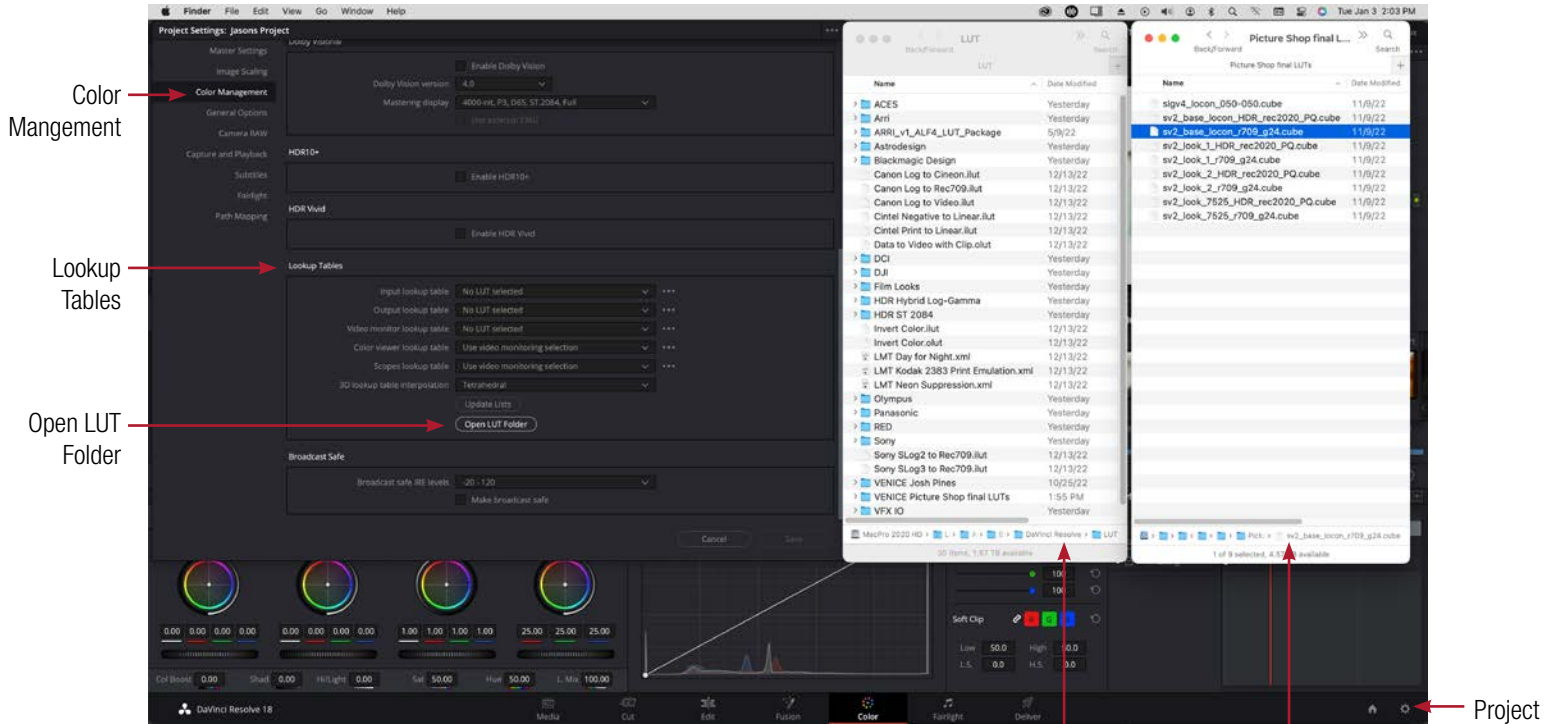
Project Settings

To import LUTs into DaVinci Resolve: Project Settings (gear at lower right)> Color Mangement>Lookup Tables>Open LUT Folde (where Resolve's LUTs are stored). Open the folder containing your new LUTs and drag them into the Resolve LUT folder. Click Save.
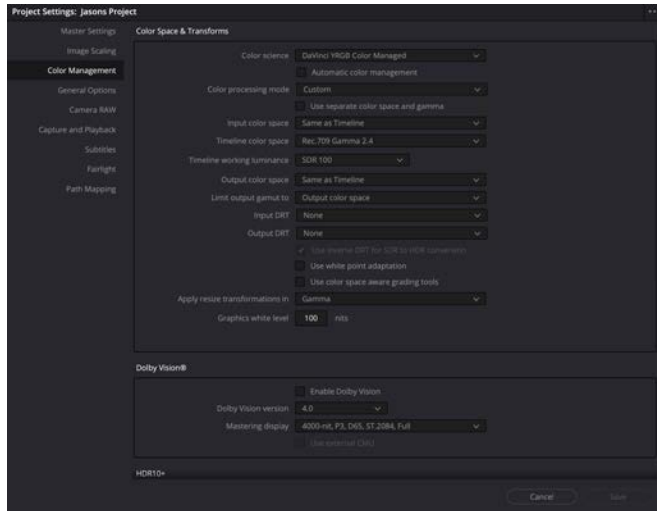
Above: Color Management. Below: DPX files Input Color Space
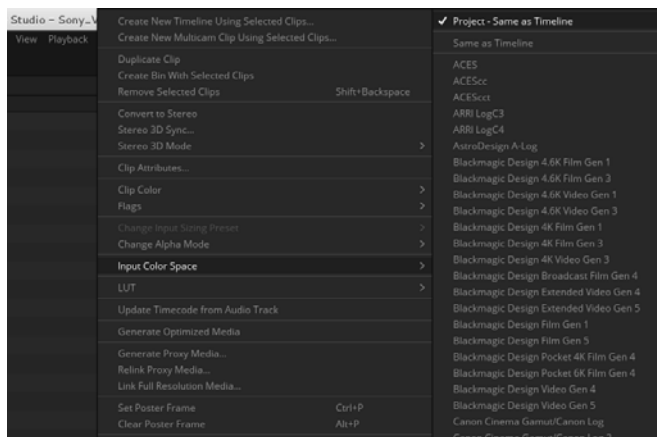
I asked Jason Fabbro, Picture Shop Senior Colorist, if he would teach us a basic DaVinci for DPs tutorial and go through the process of how these new VENICE 2 LUTs actually work. Jason explains:

We have the benefit of Josh Pines's color science. Working with VENICE 2 material, we are in S-Log3/S-Gamut3.Cine. Josh's Lo-Con LUT takes the material and puts it in a nice place. It isn't meant to be an end-all LUT. In some cases, maybe. But it's meant to be put at the end of the chain. For the LUTs I worked on, they went to Rec.709 Gamut 2.4. All I had to do was bring in the camera footage. With DaVinci Resolve, depending on what material comes in, I like to set it up in a way that is sort of idiot-proof.

- Go to: Project Settings>Color Management. Then: Color science>DaVinci YRGB Color Managed.
- Uncheck Automatic color management.
- Color processing mode>Custom.
- Input color space>Same as Timeline.
- Output color space>Same as Timeline.
- Timeline color space>Rec.709 Gamma 2.4.
- Input DRT>None
- Output DRT>None
- Uncheck: Use white point adaptation
- Uncheck: Use color space aware grading tools.
- Click: Save

Essentially, this basically says, "Don't do anything. Just bring the footage in." And then let it hit the output LUT.

(If you're working with non-RAW files, (DPX example at left), go to the media page. Right click on a clip and set input color space to "Project—same as timeline". This ensures no colorspace conversion is being done to your footage. X-OCN files do not show this option.)

Jason Fabbro on Grading VENICE 2

Picture Shop LUTs   Thumbnails of LUTs   Right click and add a node.

Add as many nodes as you want
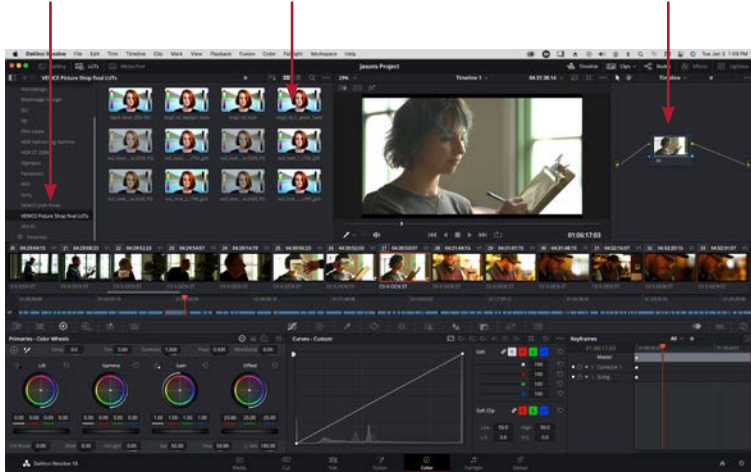
Now, go to the Color Page. Click on LUTs at the very top left. I see you have already imported ours and have named the folder VENICE Picture Shop LUTs Final. Select the thumbnail option. As you mouse over the thumbnails, you can see the effect these LUTs have on the clip.

Next, add a node. Then drag Joshua's Lo-Con Base LUT (sv2_base_locon_r709_g24.cube) onto the node. Since that's the "starting off point," it is the output node because anything we grade is done on a node before his.

Then, we'll add another node, and this is where we add our adjustments, our grading, onto Mr. Pines's kinder, gentler LUT. Obviously you're not going to drag another LUT into this new, first node. This is where we'll do our grading.

Exporting the LUT

OK, picture this. The DP is working with me on a show LUT. We've done all the steps discussed above. We're happy with how it looks. Let's export it as a .cube file so you can load it into your VENICE 2 camera. Right click on the shot you like. Select Generate LUT>65 Point>Cube. Give it a name, save, copy it onto an SD card pre-formatted in VENICE 2— in the folder \PRIVATE\SONY\PRO\LUT.

Generate LUT

Add a node for grading   Lo-Con Base LUT

You can add as many nodes as you want to make it bright or dark, add saturation, add a warm tone, etc. And then that's the look for your show. The advantage is that the Lo-Con LUT got you maybe 80% of the way there. And then you do the work to go the rest of the way to a hundred percent.
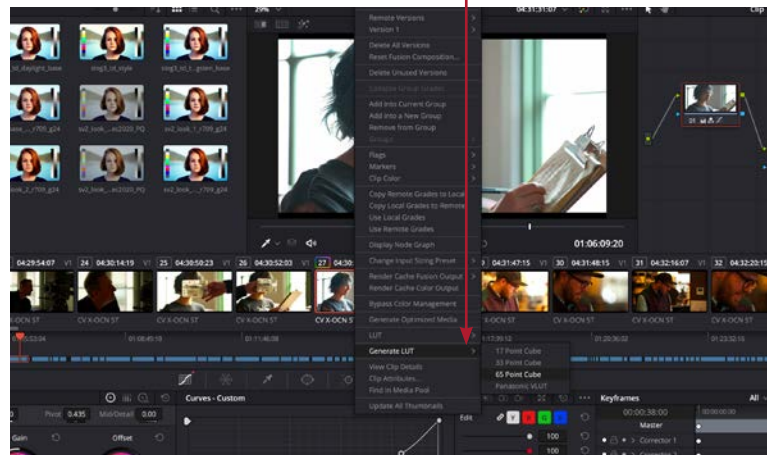
Jason Fabbro, Senior Colorist at Picture Shop

Nobutatsu Takahashi, General Manager of Sony Cinema Line

Since its introduction, the Sony VENICE camera system has been used on hundreds of productions—including some of the top-grossing movies of 2022. On January 5, 2023, Sony releases a firmware update for VENICE 2. We spoke with Nobutatsu (Nobu) Takahashi, General Manager, Camera System Business Div. 2 (Cinema Line), Imaging Products & Solutions Business Group, Sony Corporation, to discuss Sony's ideas for the future of the VENICE line and high-end cinematography.

Jon Fauer: It has been just over a year since the introduction of VENICE 2 and your interview in December 2021. Please give us an update about VENICE 2.

Nobu Takahashi: When we launched the VENICE 2, we were pleased with the response. We really owe that success to the cinematographers who helped contribute feedback to the design of the original camera. For those who aren't familiar, we have two models of VENICE 2. One has a newly developed 8.6K sensor and the other has the 6K sensor familiar from the original VENICE. The 8.6K VENICE 2 has 16 stops of dynamic range, and Dual Base ISO of 800 and 3200. And of course, both VENICE 2 models have 8-stops of built-in ND filters.

We developed this camera with the aim of being a reliable partner for cinematographers, directors, camera assistants, colorists and other members of the production team. Feedback from the production community has been great. The VENICE 2 has been used on a number of commercials and series, like *American Gigolo, Purple Hearts*, and many more that we can't talk about yet. We are even seeing the camera being used in new ways. For example, the new sensor in the VENICE 2 8K is so sensitive in low light situations that we have seen it adopted many cinematic multicam productions, including a 30-camera Lady Gaga concert and a 22-camera concert with The Weeknd that will air on HBO Max next month.

Please tell us what you have been working on since we spoke last year.

We heard the voices of users, and we are honored to introduce Software Update 2.0 for VENICE 2 with added imager modes and intuitive functions. The Version 2.0 software update also addresses many suggestions provided by cinematographers and users.

The big news is Rialto 2, the tether extension system officially named CBK-3620XS Extension System 2. It has passed final testing at the factory, ready to ship and should be in customers' hands at the beginning of the year. We improved upon the original Rialto and designed the Rialto 2 with the option to use one of two cables: a 9-foot or a 36-foot cable without the need for a repeater. This gives DPs more flexibility, whether they prefer to shoot handheld or on a specialty rig.

Some of the industry's top cinematographers have used our prototype models on a number of productions and movies, including the Sony Pictures production *Gran Turismo*.

The two things that appealed to many users of VENICE cameras were the internal ND filters and the look.

We appreciate that cinematographers say they like the look. Having the ND filter system inside is very helpful so they can change filters quickly without keeping the actors waiting. I think it is very important for us to enable the cinematographer's vision as much as possible on set.

Creativity combined with technology enables good and innovative motion pictures. I'm always telling the engineers that we, at Sony, have the technology but we don't have the art of the creators, the cinematographers. Those two things combined—creativity and technology—will lead us to the next level of filmmaking in the motion picture revolutions to come.

What are the next stages of those creative revolutions?

Nobutatsu Takahashi, General Manager of Sony Cinema Line

Of course, the film look is very important to express the emotions of the storytelling. That's important, but at the same time, creators have a curiosity to challenge and try something new. I think one example is *Avatar*. I watched *Avatar* yesterday in an IMAX 3D theater at 48 frames per second—the latest technology. That was a mind blowing, eye-opening experience. I would like to see what new things creators and cinematographers would like to challenge next. The cinema industry is not just about recognizing its history, but when we look back, every cinematographer has always continued to challenge the technology and style at that time, attempting to try something new. We should keep challenging the motion picture experience.

And as a result, is market share of VENICE growing?

In 2019, VENICE cameras shot 6 major Hollywood feature films. In 2021, VENICE was on 28 big feature films. This past year, 2022, including *Top Gun, Avatar, Black Panther: Wakanda Forever* and other feature films, I think it's increasing. I really appreciate that a lot of cinematographers are using VENICE, VENICE 2, and also the unique Rialto.

I entered Sony in 1998, and my mentor was Morita-san, the founder of Sony. I remember his saying, "Be unique." Those words have encouraged me during my Sony career. I started as an engineer and now I'm a business manager, but I always think I have to be unique, that Sony has to be unique and VENICE has to be unique.

Therefore, we give cinematographers tools to be unique as well. On *Top Gun*, they put six VENICE cameras in the cockpit and sometimes there were up to 30 in total. That is very exciting. I watched *Top Gun* four times. Another example was *Avatar*, where they rigged two VENICE cameras with Rialto extensions to capture 3D cinematic images. We provide the tools and the cinematographers and directors come up with interesting ways to use them. That's how art, creativity and technology work together. I think that's very important. And that is how we have to be unique as Sony.

Some cinematographers who have used the new VENICE 2 in 8K said they hadn't expected such a smooth and natural look with beautiful skin tones.

I think the look of VENICE 2 is very important for cinematographers to enable their vision and to put emotion in every frame. That is one of the main reasons why VENICE and VENICE 2 have been used successfully by a lot of cinematographers. But at same time, the innovative technologies that we provide with the VENICE 2 cameras are making some revolutionary image capturing possible.

You have said that one of the reasons for the success of VENICE is that you maintain a close collaboration with cinematographers, crew and rental houses in addition to continuously updating the camera and letting it grow with them.

We go to trade shows, film festivals, rental houses, locations and sets to get closer to the cinematographers and users so that we can have insight into what they want. We take their suggestions back to our engineers, to try to match their needs. A good example is the original Rialto. We worked with Claudia Miranda, ASC and James Cameron to develop the Rialto and then we launched it as a product. Some DPs wanted a longer cable and additional assignable buttons. The result is Rialto 2. So we always try to listen to the customers, and then we will do everything we can.

When you say that you listen to customers, how do those customers get their ideas to you and the engineering team?

We go to events, engage in discussions and hear what they want us to do. We want to be closer to the customers. And we want to be the first people to hear their voices. They also call, email and chat with us.

Are there specific teams at Sony whose jobs involve asking, visiting and talking with DPs?

Actually, the attitude of getting closer to the customers has to be in every employee at Sony. Not just marketing, not just product planning, but we all have to have that same desire to get closer to the customers. I am including myself. I think that's very important. Attitude.

For VENICE software updates, I understand that many ideas come from DPs, camera assistants, DITs, and crew.

Product planners and engineers look at the requests and comments. They discuss what kind of technology is required. If the technology takes time to develop, then we have to prepare the appropriate schedule.

I guess many software and firmware engineers are involved?

Yes. They work so hard and love cinema. Everybody loves cinema.

For sure. How is the supply chain going for VENICE 2?

Supply chain. I have to apologize to the customers who, in the beginning of the year, had delayed deliveries. We experienced a very severe parts shortage.

Everybody did. We still have trouble finding the right paper to print this on.

And especially our Cinema Line cameras had a severe parts shortage. Customers had to wait for a long time. I do apologize. But now, the situation is getting much better and our production is almost at its usual capacity. Customers are getting their products delivered now, so we don't have to worry about next year. That is very good for this situation.

What's next?

We recently launched the Cinema Line FR7, a Pan-Tilt-Zoom remote head cinema camera that we see being used with the VENICE 2 on many multicam concerts and shows. And the other new camera is the FX30, for the new future filmmaking market.

We will be hosting the Sony Future Filmmaker Awards in February 2023. It is an annual awards program for short films, where we support independent filmmakers and creators from around the world. The judging panel will include leading figures from the cinema industries. And then the overall winner will win a trip to the Sony Pictures studio in Culver City. It will be an exciting and unique event for young filmmakers.

The other exciting news is our USC partnership. The University of South California and Sony are working together to create the future of entertainment by enhancing cinematic education with Sony Cinema Line equipment in their curriculum, including VENICE 2, FX9 and FX6.

Autumn Durald Arkapaw, ASC on *Black Panther: Wakanda Forever*
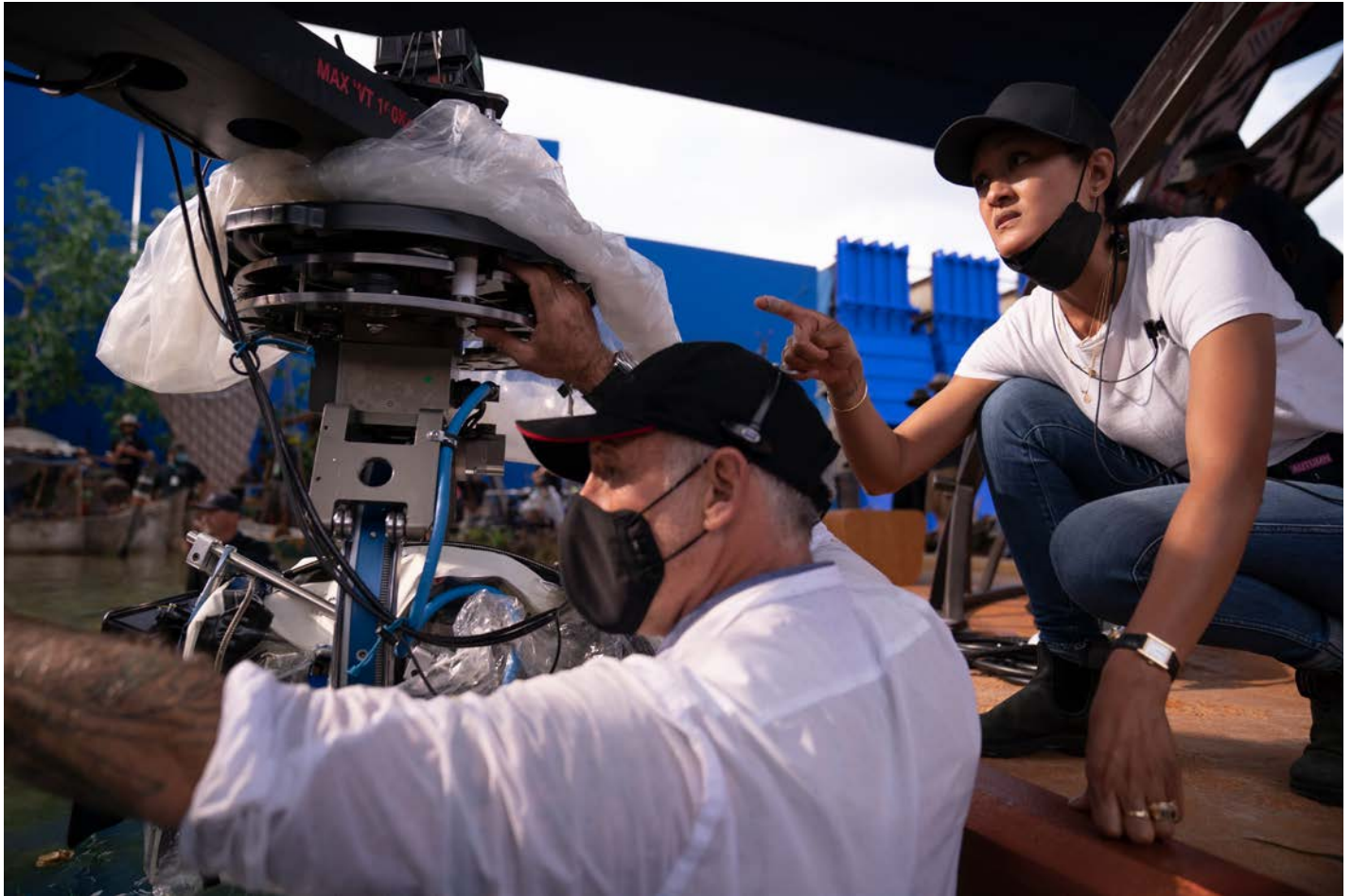
Autumn Durald Arkapaw, ASC at right on *Black Panther: Wakanda Forever*. Photo by Eli Adé. © 2022 MARVEL.

Autumn Durald Arkapaw, ASC grew up in the San Francisco Bay Area, studied art history at Loyola Marymount University, and received an M.A. from the AFI Conservatory. Credits include Loki, Palo Alto, Teen Spirit *and* Black Panther: Wakanda Forever.

Jon Fauer: What were your cameras and lenses on *Black Panther: Wakanda Forever*?

Autumn Durald Arkapaw, ASC: Our main package was the original Sony VENICE 6K shooting Full Frame, recording X-OCN XT, with mostly Panavision Anamorphic 2x squeeze T Series primes that were modified and expanded for the Sony VENICE. We shot Full Frame with a 2.39:1 aspect ratio. For select IMAX sequences, we used the same VENICE cameras with Ultra Panatar 1.3x squeeze anamorphic lenses to give us a 1.9:1 aspect ratio that you need for your IMAX deliverables.

You had two sets of frame lines and composed for both?

When I do IMAX, my approach is to frame for 2.39:1 and if you look at the sequences that we chose to shoot IMAX, we're just getting a little bit more headroom. As far as how we frame characters and the story we're trying to tell, it's all very much in the 2.39:1 format. There's a sequence at the beginning that takes place at night on a cargo ship that is IMAX. You just get more room on the top and bottom. There's another sequence in the third act that takes place on a big ship, Royal Sea Leopard, in the middle of the ocean. That was also composed for IMAX.

Because our main format was 2.39:1 with 2x anamorphic squeezed lenses, when we went to our IMAX sequences, we used the same Sony VENICE cameras, but we changed the lenses to 1.3x squeeze lenses and the frame lines to 1.9:1. That shift had to happen whenever we were shooting IMAX. Because most of the IMAX shots happened in sequence, we generally didn't have to go back and forth too much.

When you're watching in an IMAX theater, the projected image jumps between 2.39:1 and 1.9:1? And in a regular theater, it remains in 2.39:1 widescreen?

It does. For example, in the third act, there's a sequence that takes place in the Atacama Desert where Panther and Namor have their final standoff fight. We wanted it to be framed widescreen, like an old spaghetti western face-off. When we shot it, we didn't know how much exactly would cut back and forth, but we did know that that would occur because it does go back and forth in the script.

Please tell us more about the lenses.

Our main package of around 22 lenses for our A and B cameras were all T Series. We had a few special lenses in that package, for example, a B series 35mm. That's before expansion, but a 35mm in Full Frame is a 40mm. But Ryan and I loved that lens. It was our work horse as an emotional storytelling lens that we used for many of our closeups.

We also had a few other specialty lenses, like a 90mm portrait anamorphic lens and a 55MAP macro lens.

Autumn Durald Arkapaw, ASC on *Black Panther: Wakanda Forever*

Autumn handheld with VENICE in Rialto mode. Photo by Eli Adé. © 2022 MARVEL.

Would you care to specify focal lengths and series?

Our main set was the T Series. Dan Sasaki at Panavision, whom I adore and love working with, modified them for me to take on some of the qualities that I appreciate in the C Series. But it's nice to have the consistency and modern mechanics of the T set as far as production and focus pullers are concerned. And so, our modified T Series took on some of the more vintage characteristics that we're used to seeing on the C Series.

Dan Sasaki is like a genius wizard. A true artist when designing bespoke lenses.

Yes he is. I like his "Seven pillars of lens design." Your T Series are pretty fast lenses, opening to about T2.3?

In certain situations, if I want something a little creamier and softer, I may open up my longer focal length lenses all the way. They're beautiful wide open. But I generally will shoot at a T2.8

You shot VENICE Full Frame, 6K, 3:2 sensor mode. But with 2.39:1 2x anamorphic lenses, don't they desqueeze to 3:1?

Yes, we had the Sony VENICE 6K in the 3:2 (1.5:1) sensor mode and then we're extracting 2x anamorphic. Our final frame is 2.39:1, but obviously the math works out 1.5 x 2 = 3, so the actual image area desqueezes to 3:1 and we have to crop the left and right sides.

It would be so amazing if I could shoot a movie with that wider field. A 3:1 widescreen ratio would be gorgeous. But, that's why, when I'm looking at the monitor, I always have to shade the sides because otherwise I'd fall in love with that 3:1 widescreen a little bit too much.

Oh, you don't mind talking technical stuff then?

Not at all. Please ask.

Thanks for your amused indulgence. Doing a big Marvel action film with VENICE cameras and seriously detuned anamorphics must not have been a timid choice.

It was new for me on *Loki*. Marvel had only used the Sony VENICE on *Black Widow*, so it was a new camera for them and it was embraced on that show. When I came onto *Loki* and wanted to also shoot with VENICE, they only had done it once and they certainly had to embrace the color science and the post workflow. But they were great and appreciated it. It worked out well and they all liked the overall look.

Why did you decide on VENICE?

I had been using another camera for a while on my narrative films prior to *Loki* until I did a commercial with a director (Abteen Bagheri) who specified the camera. That rarely happens where the director asks for a camera I had not used.

I wanted to be open-minded. He's a great guy with an excellent sense of taste in film. Of course, I had heard about VENICE.

Autumn Durald Arkapaw, ASC on *Black Panther: Wakanda Forever*

Above: Letitia Wright as Shuri in *Black Panther: Wakanda Forever*. Frame courtesy of Marvel Studios. © 2022 MARVEL.
Below: Angela Bassett as Ramonda. Frame courtesy of Marvel Studios. © 2022 MARVEL.

It was a commercial, not a huge commitment where you're jumping into something much different. It worked out well and was great because I embraced the color science. I remember being so in love with the colors that I was getting with the combination of the LUT that we used. I work a lot with Tom Poole at Company 3 and he gave me a LUT for that job. It was beautiful. As far as the toe of the exposure and how much shadow detail I was getting in combination with this very filmic LUT, the images looked beautiful, very filmic and textured. And so I fell in love and kept using VENICE on commercials then on Loki. And so, when it came around time for Panther and we were deciding to go anamorphic, I asked Ryan if he was open to using VENICE, because that would be a camera change from the first Panther. He was aware of the VENICE already, had seen work from it, and was very open to using it. I sent him some references, and then we did our own testing: makeup, hair and wardrobe tests—and at that point he really loved it.

You mentioned color science.

As a DP, all of these choices are very personal—what lenses to use, how the lenses are modified, how I light a scene, what filtration I add or don't add, the LUT that I apply, the colorist I work with. We make the LUT prior to the film, work together on the show LUT and then we grade the film afterwards. All of those layers of choices affect the final image and the camera is one of those tools. These are the personal choices of a DP.

I was talking to other DPs at Camerimage who said they never used a Sony for various personal reasons. It's like a painter. You have your own tools and they are specific to your taste. I see the color space in one way, but another DP has a different eye and may see it in a different space.

I found that after I'd worked with VENICE, the way that I like to shoot, the way that I like to light and the LUT that I use, the images felt very filmic. I was getting to a place where I eventually

Autumn Durald Arkapaw, ASC on *Black Panther: Wakanda Forever*

Above: Lupita Nyong'O as Nakia. Frame courtesy of Marvel Studios. © 2022 MARVEL.
Below: Black Panther. Frame courtesy of Marvel Studios. © 2022 MARVEL.

ended up in a more filmic zone than I had previously seen before. So that's why I continued to use the VENICE camera.

Did you notice that the high resolution and characteristics of the VENICE seemed to make for smoother skin tones, which was contrary to what many people expected?

While testing, I was shooting various skin tones—darker, middle tones and lighter—and the shadow detail was beautiful. That's one of the things I was responding to. I like to push the camera, to be brave with the lighting, and I feel that camera responds well to the way in which I like to shoot and expose.

Talk about the LUT that you developed and how you dealt with that on set.

With the large number of visual effects and all the different deliverables—theatrical, EDR, HDR, Rec.709—it's imperative to build a LUT that will service this extensive workflow. Even on these bigger VFX shows, you still want to have your personality

in the LUT—you, the director and the colorist. We love having a more filmic LUT but we also want to make a friendly LUT so that the workflow is both pleasant and also one that works for VFX so that everyone's happy because it's a big collaborative team effort.

The way I like to work is to have a DIT on set and do as much of the grading onset as we can so that the director is constantly looking at as close to the final image as they can or as close to the skin tone that's appropriate, and as close to the overall look that we're trying to achieve. Obviously, we have bigger sequences that have huge blue screens and are action sequences, but we're still dealing with costumes and skin tones. Trying to get color accurate on the day is very important to me. The DIT and gaffer on Panther had worked with me on Loki, so we had a shorthand and it was very important for us to have great looking dailies.

Our show LUT was developed by Tom Poole and the Company 3 color science team in cooperation with Marvel.

Autumn Durald Arkapaw, ASC on *Black Panther: Wakanda Forever*

Interior set with blue VFX background. Photo by Brian Bartolini. © 2022 MARVEL.

Since you're shooting X-OCN (RAW), that LUT is not baked in. How do you get that look to the dailies and VFX teams and the colorist?

We're doing CDLs on top of the show LUT. Picture Shop, who did our dailies, had our LUT and our CDL information which they applied to the dailies.

The VFX team also got the CDL information and hopefully it's all consistent when they're applying it as well. It's a pretty extensive, well-oiled machine as far as pipeline goes, but you're always checking up on things. I feel like I'm a big nerd about that. I always get frame-grabs from dailies sent to me and I always want to make sure everything's color accurate and the CDLs are transferring correctly.

I look at dailies on a good monitor in the DIT tent. The idea is that our main LUT is doing all the heavy lifting and we're doing minimal CDL work and minor color adjustments. We're trying not to shift Gamma.

You don't have multiple LUTs for day, night and different setups?

No, I like treating the LUT like a film stock. That's the best approach if you want it to look like film.

And then how is the DIT grading?

The DIT has DaVinci Resolve. We're not trying to do heavy adjustments. And then, on set the DIT using Pomfort LiveGrade going out live to the monitors.

I always want to do as much as I can in lighting. I don't want to start doing a lot of shifts with the DIT and then have an aggressive CDL that's changing all over the place. With LiveGrade, if I want the DIT to add a point of brightness quickly, we can do that. But ideally it is done with lighting.

How are you watching dailies?

Everyone's watching dailies on PIX. Our dailies team, which is Picture Shop, have our LUT. They're applying the CDL and then they're exporting a 1920x1080 dailies file that is put up on PIX. Some people are watching dailies on an iPad, others are watching on a laptop. That's why I ask for framegrabs as stills because I think they are more of an accurate representation.

What kind of monitor are you viewing on set?

We had 3 Sony OLED PVM-A250 monitors for our main viewing in the DIT tent and 2 SmallHD 22" OLEDs on set.

Sometimes for action scenes we had up to six cameras running at the same time. Of course, there are many intimate, character driven scenes that were shot with two cameras but feel like one camera.

Did you have Steadicam?

Yes, my A-camera operator who's amazing, Jason Ellson, is also a Steadicam operator and we did use it from time to time, when appropriate. He has this custom slingshot rig he likes to use for handheld that Ryan and I appreciated. This rig was used in our opening handheld oner scene with Shuri in her lab.

Then what did you mostly use for camera moves?

It varied. I always feel that the consistency of camera movement is very important. It's not about what's convenient, it's not about what's faster, it's about what's appropriate because they all feel so different. We had some huge sets, which we did a lot of work with two cranes for those sequences, and incorporated Steadicam, handheld, and dolly shots as well.

Your focus pullers must have "loved" you: Full Frame, anamorphic, wide open.

My focus puller is one of the best in the business. His name is Serge Nafa. He's pulled focus on a lot of films that shot 35mm. He's a master at it and he's very zen about it all. Not once did we

Autumn Durald Arkapaw, ASC on *Black Panther: Wakanda Forever*

Actual frame in set shown on opposite page. (L-R): Dorothy Steel as Merchant Tribe Elder, Florence Kasumba as Ayo, Angela Bassett as Ramonda, Danai Gurira as Okoye. Frame courtesy of Marvel Studios. © 2022 MARVEL.

ever have to wait for him.

You had a lot of VFX, you're shooting anamorphic, and there's distortion in these lenses. Did you shoot grids or how did the VFX team manage things?

This is where I'm going to nerd out on you because it's a huge question. Whenever you're suggesting glass on these bigger films where they have so much VFX, it can be approached two ways. Either these lenses are going to be super friendly to the process or they can become the VFX's worst nightmare. If I say I'm shooting with detuned Panavision T series lenses that have heavy aberrations, everyone's going to freak out.

But because the team's so awesome and Ryan's such an amazing filmmaker, everyone is all in when they work with him. We made these choices because they told our story well and these lenses had a lot of aberrations and characteristics. For me, the biggest things are field curvature, distortion, astigmatism and flares. When you're pushing the boundaries with those four attributes, it does make it very difficult for VFX, especially if it's bespoke detuned glass.

Geoff Baumann, our VFX supervisor and his team, along with Michael Ralla, our VFX supervisor for second unit, took it on as a task that they were going to investigate fully. They shot terabytes and terabytes of grids and maps and charts in order to learn about our specific lenses. I think it ended up at 100 terabytes of grids and charts over several weeks of testing.

They worked with my team very closely. And obviously this is very tedious and annoying because normally they just shoot one checkerboard chart per lens. But they went out of their way to do all this extensive mapping and testing. That put a bigger workload on our camera department in prep. Whenever we would change lenses or introduce a new lens, they would have to do all of it again. It was great how they embraced it because they really wanted the VFX to have the same characteristics that we were getting in the photography. To tie in principal photography and CGI as close as they did, and to go to that effort on such a

big show like this was so beautiful to see and to be a part of. I was involved in the VFX reviews and I got to give comments about how the lensing, lighting, plates and extensions looked to match the foreground with background, and how they used flares and other visual elements.

It was a great learning process, and super fun. So much of what we do as DPs is to make sure that we collaborate well with the VFX team. Because after we finish shooting the movie, we are still making the movie.

You really have to check back in because they're doing virtual lighting and making so many extensions that ties into what you already shot.

We had many more vendors across the globe, but the heavy lifting was done by ILM, Digital Domain and WETA. We had many more vendors working on the project. All of these vendors had a camera and lens "bible" that was a book with all the lens profiles and characteristics that I mentioned in addition to notes on how I like to light and move the camera. We gave them as many notes as we could. Because the last thing you want is for them to just use the stock anamorphic look.

When compositing, did the VFX teams go the usual route of removing the distortion of your camera lenses, incorporating those shots with the undistorted VFX background, and then re-appling your initial distortion and look back to the composited images?

For technical processes, like 3D tracking/matchmoving, the distortion was removed, but for instance character animation is done WITH lens distortion—as the perception of where something is can dramatically change between an image with and without it. The mantra was to leave the plate untouched, and match to that. Every single lens attribute, not just the distortion. And boy, it was a process. The guys actually broke it down in three steps, which I thought was really interesting.

First they had to understand what the lenses actually do, and

Autumn Durald Arkapaw, ASC on *Black Panther: Wakanda Forever*
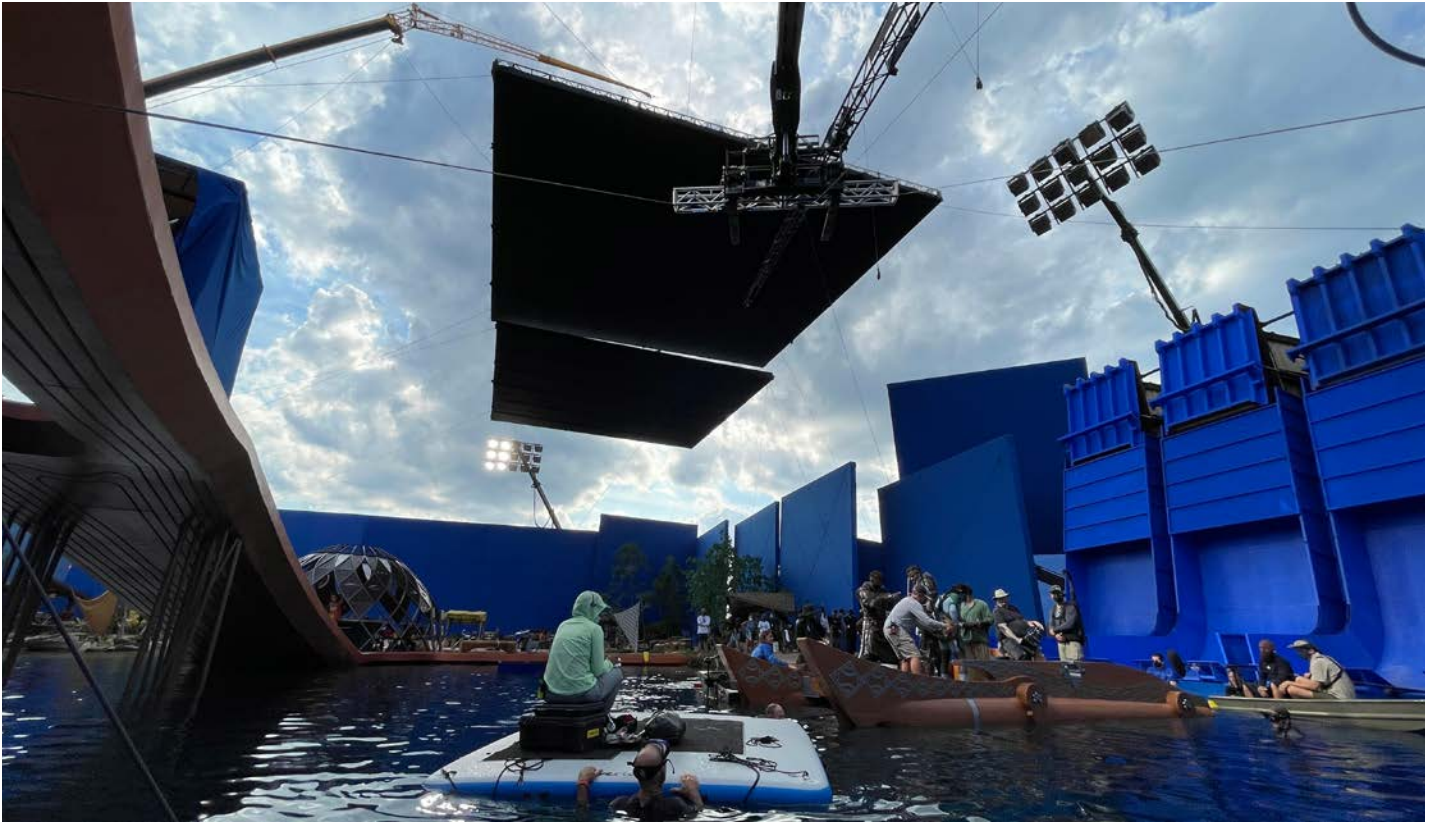
Exterior big blue VFX background set. Photo by Brian Bartolini. © 2022 MARVEL.

identify the different aberrations. The VFX team had a whole 50 page bible just for that.

The grids and charts they shot gave them a really good way of identifying those, as what they put in front of the lenses was what they called "a known per-lens ground truth per", in nerd lingo. It means they know exactly what the grid looks like, and that allows them to see what the lenses add to that or do with that. There was some back and forth with that, and they added several maps into the process as we went.

Then they had to put together a digital toolkit that allowed them to replicate all those characteristics in post. They worked very closely with WetaFX over the course of many months, as there was simply nothing out there yet that was capable of doing that. I looked at several of those iterations, and gave them a lot of feedback in regards to what I was looking for. The result was a pretty accurate profile for each lens, including flares, and they eventually got me, I couldn't tell the difference at some point.

The last step was education: Even though WetaFX licensed the toolkit to every VFX house on the show, it became clear that they had to also not only teach them how to use those tools, but also educate them on all the different characteristics that were important for the visual language. That went together with another 25 page bible that was sent out as a guide. We needed to establish a common terminology to describe the look of the lenses, and give feedback. It's not all just blur and distortion, or flares. There's different kinds. And different kinds of chromatic aberration. And falloff can mean very different things—

Illumination falloff, aka vignetting. Focus falloff towards the edges, aka field curvature. It was educational on a lot of levels, which was awesome.

Ultimately, it was pretty bold to have the detuned anamorphic lenses you wanted.

Normally, that's why they usually would prefer for you to shoot with spherical lenses, right? Everyone wants more control. But the approach that Ryan and I took with the visual style of *Panther* was to see all of that in front of us on set. Those detuned Panavision lenses created so much of the image and storytelling that it's not something you can do afterwards. So they had to embrace that and they didn't ever push back and make us shoot scenes spherically.

They did change the game. This was one of the biggest movies and we had the biggest VFX houses working on it. I think that now they're more aware of these lenses that have different characteristics, it's a process that will change how they work with DPs and directors.

Would they have preferred having lens metadata?

That was frustrating for them a bit. But unfortunately these were not smart lenses. That would've helped a lot. Panavision may be working on that from what I hear. Obviously there are other lens sets that are smart that they'd probably prefer more. But I'm a Panavision anamorphic lens shooter 99% of the time.

If you detune the lenses, will all the metadata still be accurate?

It's still important for them to have the basic information.

Autumn Durald Arkapaw, ASC on *Black Panther: Wakanda Forever*

Above and below: Exterior sets. Photos by Brian Bartolini. © 2022 MARVEL.

Regardless of any metadata, things like field curvature, mechanical vignetting and astigmatism needs charting and mapping. VFX had their own people that take notes and work with the camera department. Hopefully the VFX guys can work closely together with the lens manufacturers to slowly figure all of that out more and more, so those efforts could be a lot faster and put elsewhere.

Can we talk about lighting? What was your approach for in general for lighting?

I try to light everything so it looks as real as possible—beautifully realistic. But I also appreciate a stylized naturalism because I think you can be bold with lighting choices that don't necessarily look too stylized. I love the work of Conrad Hall, ASC who did that so beautifully, with affecting and bold lighting, but still helped tell the story and felt like a real space. I like that approach.

"I've been working with my gaffer Brian Bartolini for about nine years. That helps a lot—to have the same crew on these projects

Autumn Durald Arkapaw, ASC on *Black Panther: Wakanda Forever*

Airstar above and sources outside windows. Photo by Brian Bartolini. © 2022 MARVEL.

sharing similar taste in lighting, contrast ratios and approach. He is fantastic at his job and runs an amazing crew. We had many complex lighting rigs on this film and they were all executed beautifully by our lighting and grip teams. When we go in for closeups, we can shape a face, but the set in the wide shot should have a motivated source and feel realistic. We work with the production designer so we can have some of the lighting fixtures built into the set. When I use bigger, motivated sources, I discuss it with the production designer and try to have some of those lighting elements work with the set design as well.

That approach helps when the actor walks on set and it feels like a real space that has real sun coming in that they can play with in the blocking. For the director, it's also a better environment. People aren't tripping over a bunch of stands and lights and diffusions, that type of lighting tends to look fake. I don't like that.

I think my approach comes from having made indies. I started out in documentaries and small films where you had to figure out how to make something look amazing with no budget, and therefore you pay attention to what the sun's doing and how it moves and you use that to your advantage. And overall I just have a fantastic crew. We're very fast and do a lot in prep to have the sets built in a way to quickly turn off units to create contrast on different angles. I like to be fast because people usually think it takes longer to make things look great. But that's not true.

It allows you to have more options too. Because Ryan is such an emotional filmmaker and comes from a place of wanting things to feel and look real, to be textural, for the sun to feel real and things to be darker and to be more brave. When we have night exteriors, we definitely push the boundaries on this. The audience responds emotionally and that often comes from giving them light and then giving them darkness too.

What did you use for the sun?

Various things. For the tribal council set, we used a 50K Softsun and 20Ks. And then we build in a lot of ambient, bigger soft boxes above so that we can turn fixtures on and off. I always enjoy contrast on the dark side towards camera. We use SkyPanels in our larger soft boxes in addition to surrounding space lights. For our bigger day exterior Rivertown set outdoor we lit them but also worked with the sun, planing the day accordingly. We used 4x 18K Fresnels and 8x 18K ArriMax's on condors along with 2x Bebee light trucks each rigged with 15 6K BeBee lights.

But can you ever replicate the sun? It's 93 million miles away. You're trying to create a really hard source, but when it falls on your actor it should feel delicate and real and not like a stage light because obviously that unit is much closer than the sun. That's always the trick. As I said before, every decision you make with lensing and lighting is to help make that sun fixture look real, even though it's not.

How did you prepare with Ryan to establish the style, the look? Did you use references? Did your background in art history help?

I always love photographs. Whenever I start a conversation with a director, I tend to gravitate towards photographs, just whether it's portraiture or landscape photography. It's so emotive to me. I respond to single images where I can dissect them and feel something. Sometimes, referencing different movies can be too literal. But we did speak of references in a broader sense. Ryan spoke of *Terminator 2*, *Alien* and *The Abyss* and explained that

Autumn Durald Arkapaw, ASC on *Black Panther: Wakanda Forever*

Tenoch Huerta Mejía as Namor. Frames courtesy of Marvel Studios. © 2022 MARVEL.

these were very humanistic films that have CG but feel like real worlds and you relate to the characters that aren't human. *The Abyss* underwater world feels textured with a lot of tension and mystery.

Alien was a big part of what I told Dan Sasaki as far as detuning because I love the look of that film. It was shot with C Series anamorphics. As far as the nostalgia and the dreamy quality in that film, it was shot on 35mm film stock and obviously we were digital, but that was a reference I gave Dan.

I gave the photography book *GENESIS* by Sebastian Salgado to Ryan because, early on, he told me to protect the image and make sure it feels as real as possible because he is that type of filmmaker where he wants people to be able to relate. On this grand scale you have a highly VFX movie but there are so many intimate moments as well. I think everyone did such a good job to make the VFX feel grounded and real as well. So I felt like it was important to give Ryan that book, that included beautiful black and white images of various skies and landscapes. We knew we weren't going to get to go to all these parts of the world, but you always want to keep in mind what Ryan originally said - to try and help make this world feel relatable and real.

Please discuss grading and finishing.

Tom Poole at Company 3 and I have worked together for years. He is a good friend and we share the same appreciation for films, fashion and humor. Which I find very important in my collaborators. When *Panther* came up, I asked if we could work with him. Ryan's a fan of his work and I knew they would get along well. VFX supervisor Geoff Bauman was open to it as well because there's such a big collaboration between VFX and the colorist. I was there in the grade every day. We graded for about six or seven weeks. I didn't take any other jobs because I wanted to be there. VFX, Editorial and Ryan, of course, were there as well. It was really good to finish the film with the people you made it with. Tom came out to LA because he's based in New York and we graded at the Disney lot.

Did you do an HDR pass first?

No. For *Panther*, we did not monitor in HDR. It was just a deliverable that we had in the process. We graded for theatrical and then we did our HDR pass. And then there was an EDR (Extended Dynamic Range) pass because that's actually what the premier was shown in, at the Dolby Theater. It's more contrasty so it's very snappy in a beautiful way. Your highlights and lows have more density. You're seeing a more dense black. It was nice to see because you can be a bit more brave in the darker scenes because the black has so much depth. The highlights are a little more pingy with more range.

At what ISO did you rate your VENICE cameras?

I rated everything at 1600 ISO. After *Loki*, where I shot everything at 2,500 ISO, I did some tests and it was nice to have a little bit more juice in the shadow areas. So I rated *Panther* at 1600 with a 2500 base. We found in our camera testing during prep that when we rated the camera at a base 500 ISO for day exteriors, we got two more stops in the highlights. I wanted to continually rate it at 1600 across the board. But at the 500 base, obviously I'm just NDing down. The camera has two different base ISOs: either 500 or 2,500.

And less noise?

Well the noise thing is so interesting to me because I feel it's so relative to the varying areas of darkness in the frame, but also how you're lighting or not lighting your shadows. Clearly you can get noise if something goes too dark. But sometimes you have to take into consideration the reflective quality of the darker subject and if there are any highlights in the frame that your eye is also balancing.

Have you tried the VENICE 2 yet?

I have. Ryan asked me to direct a music video for the Rihanna song that's in the movie, and he wanted the video to look and feel like the movie. We just had a one day shoot. It was a beach scene at sunset. Some of the shots in that video are done with the

Autumn Durald Arkapaw, ASC on *Black Panther: Wakanda Forever*

Letitia Wright as Shuri. Frame courtesy of Marvel Studios. © 2022 MARVEL.

VENICE 2. I appreciate that camera and the fact that you can shoot at higher ISOs or if you want to be braver and go into an existing night exterior just using practicals, you can. It has a very sensitive sensor and you don't get noise in situations where you thought you might.

What's your feeling of Full Frame versus Super35? Because I guess you could have shot Panther in Super35?

After I started exploring the VENICE camera on commercials, and of course I love anamorphic lenses so much, when you shoot anamorphic on the larger sensor, it definitely changes your field of view. It's a different way of shooting, especially if you're shooting wider lens closeups. I love the longer lens look even on your wide lens closeups. I think it's project appropriate, sometimes you may not want such a shallow depth of field. But I tend to like to shoot at a wide open stop. I find that I enjoy shooting large format anamorphic. I gravitate towards it. It's why I gravitate towards the look of *Lawrence of Arabia*, for example.

That's the best movie ever made, right?

If I'm getting a larger "negative" and a larger field of view, it just feels more filmic to me. I always gravitate towards more scope. I feel like I'm watching cinema in this format, so I like it.

Please talk about grip work on *Panther*.

Our key grip, Guy Micheletti, is amazing. We had extensive sets. One of our largest exterior sets is the river town fight sequence and we had a big blue screen wall environment. It was at a place called OFS near Atlanta. It was one of our largest back lots, which we also built a 16 foot deep exterior tank on, by digging directly into the existing asphalt ground. It had a blue screen wall that was about 450 feet long by 200 feet wide on each end. We were flying two large 60 x 60 black wind solids on construction cranes as well as cranes for stunts. Talking about being fast and working with all departments— my team had to be prepared and organized for all our big stunt sequences and weather changes.

These big exterior sets took a lot of coordination. And then there

was the North Triangle flood sequence that takes place in the Golden City. There's a big rush of water that floods the whole street as you see Okoye save a little boy. It was another huge set for us. Hannah Beachler, the production designer, built a beautiful street with shops along it, two levels high, and on the bottom floor you were able to go into the shops. We shot some sequences in those spaces as we flooded them with our water tanks. These SFX water tanks were pumping hundreds of thousands of gallons per minute. Dan Sudick the head of our SFX department is amazing and there wasn't a huge gag he didn't do on this film.

There was a lot of grip work shooting huge day exteriors in Atlanta where the weather never behaves. We were moving our overhead diffusions and solids during this flood sequence to be able work with the sun and our lighting so we had to precisely map out the day with the AD, but when the sun went away we had to solely light it to keep things consistent. It always involves a lot of coordination when you shoot outside and the sun is in and out of the clouds, and light is bouncing off every surface. You're essentially creating a stage outside, or that's the goal. I like to approach day exteriors by taking as much light as you can away and then introducing your main light source, whether that's the sun or a light making the sun.

When did you shoot *Panther*?

I was on the ground for this film in Atlanta in April, 2021. We started shooting in mid June.

Is there anything I didn't ask you that I should have?

No. I would say this is probably the most technical, nerdiest interview I've done and that I enjoyed because normally not a lot of people ask me about all the tech stuff.

Thank you. I hope you didn't mind.

No. I love it. That's why I kept blabbing.

Dan Sasaki on Lenses for *Black Panther: Wakanda Forever*

Tenoch Huerta Mejía as Namor. Frames courtesy of Marvel Studios. © 2022 MARVEL.

Dan Sasaki, referenced by Autumn as "genius wizard" in her interview, is Senior Vice President of Optical Engineering and Lens Strategy, Panavision.

Jon: Can you illuminate about expanding the T Series lenses to cover the VENICE Full Frame sensor?

Dan Sasaki: You're correct that we used expanders to convert our lenses from a Super35 lens to a larger image-diagonal lens. The wrinkle here was that each lens had a unique pupil position, and we had to use various expander types and positions to maximize the image diagonal while preserving the most light and maintaining the image quality that Autumn wanted. It was not a "black-and-white" process.

The resulting expanded focal length was always longer than its original base lens, but the variation between each focal length was not consistently the same. As a result, we had to re-label the focal length and corrected T-stop for each lens, and from there we created a "cheat sheet" that would translate between the converted focal length and its Super 35 equivalent in both the spherical and anamorphic world.

What lenses besides T Series did Autumn use?

On the surface, it looked like the main lenses were T Series, but Autumn wanted them to look more like the C Series and B Series, so we modified the stock T Series by removing select elements from the cylindrical portion of the lens and replacing them with true vintage glass that slightly violated the original prescription enough to induce additional aberrations and a unique glare color.

In the case of Autumn's special B Series 35mm, it was a hybrid design that incorporated components from T Series and B Series lenses. This approach resulted in a lens that genuinely gave us a characteristic I had not seen before. It produced images that were neither too sharp nor too soft. It had an interesting way of going from a state of being in-focus to out-of-focus. We really saw this unique characteristic when we shot a Siemens star and observed an unusually wide band that separated the energy shift between being in and out of focus.

Additionally, we built Petzval anamorphic lenses for Autumn. This was a fun exercise because the dominant positive power of the Petzval lens played nicely against the net negative power of the cylindrical system, and it created a rotating astigmatism within the bokeh. There were special C Series that were developed and modified to go closer focus and expanded to cover the larger diagonal. Autumn's beloved MAP55 was expanded to cover the larger VENICE sensor. There were also few G Series lenses used within the package, mostly set to cover the larger sensor diagonal, and they were mostly used as backups.

Since there was a need for some spherical shots, we supplied Autumn with VA primes, including some of the newer focal lengths within the VA lineup. The challenging aspect was making the VA lenses match the look of the anamorphic lenses. In this case, we introduced nulled-out cylindrical elements to the front of the VA lenses to yield a more anamorphic feel. We left a minute amount of power to the system. That helped by creating a more anamorphic fall-off in the bokeh, and the shape of the cylinders helped with the anamorphic flare.

For the underwater sequences, Autumn tested our newer Ultra Panatar II 1.3x anamorphic concept lenses, which allowed her closer focus as well as a wider image diagonal. We created a couple of very close-focus anamorphic lenses that were built to offset the aberrations seen by an underwater rig. In the case of the 28mm lens, we induced an opposite amount of lateral color to offset the color we expected from the rig.

Additionally, we induced a degree of vertical astigmatism to offset the decomposition of digital anamorphic de-squeeze. This is something that's bothered me in the past, especially when the disproportionate amount of pixels horizontal to vertical is considered before and after the digital de-squeeze. This modification helped maintain an even balance between the top and bottom and the center axis without sacrificing the anamorphic look that Autumn loved.

Rob McLachlan, ASC, CSC on *American Gigolo*

Rob McLachlan, ASC, CSC. © 2022 Showtime Networks Inc. Photo: Warrick Page

The son of an artist and a photographer, Rob McLachlan, ASC, CSC has dual US/Canadian citizenship. He was a Canadian Cycling Champion and Canada Games Cycling Gold medalist. Credits include 1923, Game of Thrones, Westworld. *I had one question, "Tell us about* American Gigolo.*" Rob replied:*

When and where.

American Gigolo was shot in the spring of 2022 in Los Angeles. We had a couple of the smaller stages at Sony Pictures where we'd photographed *Ray Donovan* for several years. It was my first time working in LA since 2017. I saw it mainly as an opportunity to properly put the new VENICE 2 through the paces in a full studio and location production setting, and also to reunite my favorite LA based crew (including Key Grip Seth Greenwald, Gaffer Shawn Ducsherer, Operator Eric Schilling and DIT Tim Nagasawa.) Knowing I'd have a real team of familiar pros around can get you through even the bumpiest production….and this turned out to be one of those.

The "Look" had been sort of established on the pilot which was shot the previous year when I was in Chicago on *Shining Girls* and formatted in 2.35:1. The original show runner and pilot director David Hollander and I had a long track record on *Ray Donovan* of doing some pretty terrific oners (See episode 10 season 6) though we always covered ourselves too. So, he was at some point kind of in love with that idea but when I came on was much more concerned about getting adequate coverage to editorially work around performances and so on. In short, they wanted the show to have a unique cinematic look but also had to be very efficient going forward.

VENICE 2

I chose to shoot on a pre-release pair of Sony VENICE 2 cameras with very fast ZEISS Supreme Primes. I'd shot extensively with the prototype the previous October while making the release demo for Sony and I knew that its incredible, cinematic image, especially at the 3200 ISO base, terrific highlight roll off and game changing latitude along with the overall design and form factor, would make a really efficient package. We chose to shoot in full 8.6K and extracted 2.35:1 like the pilot.

ZEISS Supreme and Supreme Prime Radiance

The show included a lot of flashbacks so I employed ZEISS Supremes for present day and ZEISS Supreme Radiance for the flashbacks to provide subtle differentiation.

(I love the Supremes because they don't have the clinical sharpness and contrast of the old Superspeeds I used on *Millennium* for instance - back in the 90's.) One of the studio's big complaints about the pilot was the audience couldn't tell what was present day and what was flashback. We further helped that in post by applying differing amounts of Live Grain to the scenes in the two different periods which was very effective although in truth I think I prefer the clean unadulterated images we got straight out of the camera were there no need to differentiate them.

Early on I found myself falling in love with the pictures I was getting at the 3200 as opposed to 800 base ISO, even using it on many day scenes and generally on all the flashbacks.

800 and 3200 Dual Base ISO

Rob McLachlan, ASC, CSC on *American Gigolo*

Frames © 2022 Showtime Networks Inc.

I had worked a lot with VENICE 1 in 6K and liked it but found if we were using the 2500 Base that I would then rate the camera at 1250 to get cleaner deep shadow detail - that's totally unnecessary on V2 at 3200. Going to 6400 ISO was interesting since by eye it was pitch black out side and it was still pretty clean.

Full disclosure. On day 1 it did take an inordinate amount of time to get everything downloaded at 8.6K in X-OCN but our post producer Danny Rodriguez quickly solved that by replacing the drives with faster ones. After that it was smooth sailing.

What initially happened and then continued to delight us with the camera and format was how much better whatever you pointed it at looked than what we were accustomed to. Those Full Frame lenses and big sensor just ineffably enhance wherever the camera is looking. Often the B-camera might be sitting on the cart looking at the back of the set lit by work lights and it would strike everyone as beautiful.

The camera especially enhances the way I've always worked since I started in documentaries where I had limited lighting and grip packages. I was always looking for ways to make the most of available light, especially outdoors or whatever it was and then enhance it with a little edge light or a bit of negative fill on the camera side. That approach has served me well in working efficiently. Not to say that I don't make full use of the benefits of a great crew and truckloads of lighting and grip equipment to get the look we need. It's just nice to have a tool that elevates the pic-

ture right out of the gate. Where the fine resolution and latitude really helped and saved time were instances where normally you might be ND'ing a lot of windows to balance inside and out or adding fill to a very contrasty scene in order to hold detail in a beautiful sky that before you'd need to sacrifice for foreground detail.

Rialto, Grading and Otto-Con

We carried two VENICE 2 cameras and a VENICE 1 because the Rialto system was not yet available for V2 and I really love that feature and use it a lot. The gear was supplied by Otto Nemenz International (ONI) and as always the service we got from Fritz and everyone there was stellar.

Grading was done by Shane Harris at Picture Shop in Burbank. He was the perfect colorist for us because of his experience with and love of working with VENICE 1. He generally had about 3 days per episode I believe.

I will point out we used a new LED flashing system that ONI makes (we called it the Otto-Con) It works like my old ARRI Varicon that I used a lot back in the 90's but is much more light-weight. We used it to push blue into the shadows which the LUT was already designed to do. We kept mids and highlights warm and shadows cool. It made a nice contrasty image.

I should mention that having a full compliment of instantly changeable NDs probably saved us about 15+ minutes a day.

Rob McLachlan, ASC, CSC *American Gigolo* Frames

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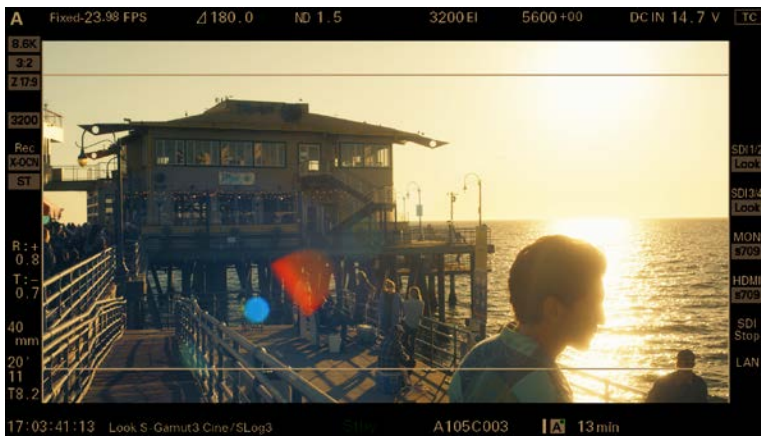
Tim Nagasawa, DIT on *American Gigolo*

Tim Nagasawa sitting on his Inovativ Echo 48 DIT cart with a Sony PVM-A170, two Sony PVM-A250 monitors, two Leader LV5333, Odyssey 7Q+, AJA Frame Synchronizer, Four Teradek COLR, Blackmagic Smartvideo Hub 20X20, Tangent Element Color Correction Panel, 13" Macbook Pro, Decimator Quad Splitter, two Blackmagic UltraStudio HD Minis, backup RAID array housed in a vintage Apple, and skateboard.

Tim Nagasawa is a Japanese American / Cherokee Nation Film-maker, born and raised in Southern California. He is a member of ICG (International Cinematographers Guild). He has held every positions in the Camera Department from camera PA to AC to DP. When the digital revolution hit, he was working as a DIT on some of the earliest features shot on digital cameras.

"Please discuss your work as DIT on *American Gigolo*.

American Gigolo was one of those projects that was both technically and creatively demanding day in and day out. The DP, Rob McLachlan, ASC, CSC, has always given me complete freedom to do my job and makes sure I have a voice when it comes to the look of the show, from pre-production to the final color grade.

Fortunately, I was heavily involved with two of the early VENICE 2 pre-release promo shoots, so I was very familiar with the data requirements and color science. Along with our excellent and very accommodating post production team we were able to put together a seamless media and color workflow. We really pushed to get our look in camera and on the day as much as possible, this required many moving parts, lots of detailed

notes and countless cappuccinos. I worked closely with Rob and the rest of our great camera team in managing the numerous looks we created for the show with a combination of different lenses, filters, camera settings, an LED matte box, and unique CDLs for every camera setup. We choose a neo-noir approach, borrowing visual cues from the original and adding color contrast with warm and cool hues. I also made sure we always had a proper viewing environment for Rob's monitors, and kept his tent as close to set as possible, usually just on the edge of frame, blocking the nearest emergency exit. I also help Rob with exposure and camera settings to maintain what we call a "fat negative," meaning we always try to retain as much information in the raw as possible, then bring the image back to our show look through CDLs. This has always given us a huge advantage in post and the final color timing.

How is your DIT cart set up?

I network everything through TB3 on my 13" Macbook Pro. I prefer using a Macbook over a desktop for speed and efficiency. There is minimal boot up time and zero shutdown time. My cart

Tim Nagasawa, DIT on *American Gigolo*

has one master power switch and as soon as I hit it I can move. I can also grab my MacBook and quickly jump to one of my satellite carts. My Macbook is the brain of my cart and it goes home with my every night. This allows me to make any further needed adjustments to any of the shots and send in new CDLs or if there are ever further questions about the day's work, I have it with me.

LiveGrade?

LiveGrade Studio. I make lots of decisions and corrections on the fly. LiveGrade gives me the flexibility to live color, manage camera metadata, organize looks, and quickly flip through references.

Monitors?

I have used them all and I currently like the Sony A250 OLED monitors. Very reliable and rock solid. I have taken them all over the world with me. It makes my job that much easier knowing for certain that what I'm looking at is what the dailies timer is looking at and what the final colorist is looking at.

Did you set up a LUT in advance.

Yes, after we took a look at what they did for the pilot we were able to put together a game plan of what worked and what we could improve on. Rob and I worked very closely with our final colorist and chose a fairly aggressive log transform as our base look that took advantage of the VENICE 2 dynamic range, color science and natural skin tones. This gave us a great place to start.

Comments about VENICE 2?

My favorite things were the dynamic range, color science, smooth skin tones, an impressive amount of detail without being overly sharp, sensitivity, amount of support applications from Sony and 3rd party vendors, and full complement of built in NDs. We had zero issues with the camera and found that the camera would see details that couldn't be seen with the naked eye. It was quite impressive. With the high and very clean 3200 ISO, there were times when we were able to take advantage of available light or existing practicals, but for the most part we still used traditional lighting practices but at much lower levels.

What were your main camera settings?

8.6K Full Frame, 3:2 full sensor, X-OCN XT, 800 ISO but 3200 ISO for night and stage work.

The LUTs you used on set?

We used one base LUT and created CDLs for every camera setup for every scene. I worked closely with our gaffer and key grip to make sure we were always on the same page and keeping to our *American Gigolo* look. Our goal was to get it to look as close as possible to the final product so that it would give our final colorist more time to fine tune.

CDLs: how do you get them from LiveGrade to post for dailies and the final grade? How does the colorist use them, or does your colorist start from scratch with your show LUT?"

As mentioned, I create a new CDL (.cdl file) for every camera setup for every scene, mostly so there is zero confusion about what is what (no guessing, no assumptions) and also I tend to fine tune every shot throughout the day. I export them as ASC CDLS along with framegrabs through LiveGrade. We send the .cdl files and frame grabs on the same shuttle drive as the day's

shot media to our Dailies Operator who uses the same base Show LUT as I use. They then apply the .CDL to the S-Log image and the base Show LUT transform. Then they check it against the frame grab to make sure it matches exactly.

When it comes time for the final grading, they start with the Show LUT that we all agreed upon during pre-production. I should mention that we shot camera tests specifically for *American Gigolo* to help pick the right lenses, filters, and base LUT. Typically the final colorist will work off of the CDLs we created on-set, but I believe for *American Gigolo* he used them as references and started fresh because we ended up changing a good amount of the looks toward the end of the season.

Grading?

We pushed blue into the blacks and mid-tone areas, and kept the top end clean to get truer looking skin tones. For the flashback scenes, we cooled everything down, pulled some color out, and added a slight vignette and defocus. We used various degrees of Live Grain, depending on flashback vs present day scenes.

Additional comments?

The one thing that I stress to my peers is that just because the file sizes are larger and more sophisticated doesn't mean you can't or shouldn't follow traditional on-set media management practices. Please embrace technology and make the necessary upgrades. We also used a matte box that had wirelessly controlled LED's built in. This allowed us to control a bit of color contrast. We ended up calling it the Otto-Con. Both cameras had them and were controlled from DIT station. We mostly pushed cyan into the bottom end. It worked beautifully and really added to the "secret sauce" we used to create the look for *American Gigolo*.

I have always been a second set of eyes for Rob, so when I was asked to shoot second units for *American Gigolo* it was a natural transition. I ended up shooting scenes for just about every episodes and was given credit for shooting Episode 4 *Nothing Is Real but the Girl* while Rob prepped with the episode 5 director. Rob and I are on the same wavelength at work so it was really great to be able to share notes about what was working and not working in our respective shooting units.

You mentioned countless cappuccinos. I assume there's a high tech machine on your cart or truck as well?

Ha, indeed. Typically we would have some fancy Ferrari of espresso machine on the camera truck but for *American Gigolo*, Rob was a big fan of a perfectly timed basic pour-over coffee. So, lots of single-origin beans were being delivered to our department.

I also forgot to mention, most of our schedule was all out on location battling the elements and always on the move. That's why I stressed how important it was for me as a DIT to move so fast. We rarely had any stage days. The VENICE 2 was great for the ever changing weather, especially for the super contrasty days in Malibu. So since we were always out and about a good coffee shop was always just around the corner to get an after lunch cappuccino. I have definitely become a bit of a coffee snob since joining the guild. No espresso machine on my cart quite yet but maybe a built-in pizza oven in the future?

Claudio Miranda, ASC on *Top Gun: Maverick*

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

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

Claudio Miranda, ASC: Initially, the Rialto was not about getting it into the jet. It was about getting it into the smaller F1 Shotover that goes on the front of the jet. It was devised so you could put the sensor block and lens in the Shotover, and then run the cable to the camera body and recorder inside the jet. Then I could attach any lens I wanted, like the the FUJINON 25-300 inside the small Shotover. And then we found it really handy to be able to use inside the jet.

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

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

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

I remember becoming frustrated because I was using SIGMA E-mount lenses that included Sony lens metadata. But when SIGMA Full Frame Cine primes came out, they didn't have lens data. And so, they were kind enough to add it back in for me

because I like to see focus distance and T-stop in the eyepiece or on the monitor.

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

We were looking at a bunch of lenses during tests for *Top Gun: Maverick* and we gravitated toward these SIGMA lenses based on some stills that we saw earlier on. But in truth, *Top Gun: Maverick* used a bunch of lenses and up to 30 cameras. The list is kind of crazy.

Danny Ming, Top Focus puller, sent the list: "At our max, we had up to 30 VENICE cameras going at the same time:
- *Main Unit: 4 bodies*
- *Interior jet rig 1: 6 cameras*
- *Interior jet rig 2: 6 cameras*
- *Exterior jet rig: 4 cameras*
- *Ground to Air unit: 4 cameras*
- *Air to Air: 3 cameras*
- *Sailing Test Unit: 2 cameras*
- *Publicity Unit: 1 camera*

"For lenses, we had:
- *SIGMA FF High Speed PL mount primes.*
- *Master Primes from 65mm and longer to cover Full Frame.*
- *Voigtlander and ZEISS Loxia E-mount primes in the cockpit.*
- *2x 28-100 FUJINON Premista FF zooms.*
- *FUJINON Premier 18-85, 24-180, 75-400 zooms with IB/E Optics Extenders.*
- *Canon 150-600 (FF modified still lens).*
- *The aerial and Shotover unit used 20-120, 85-300, and 25-300 FUJINON Cabrios."*

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

Claudio Miranda, ASC on *Top Gun: Maverick*

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

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

"It's one of life's mysteries." Seriously, Joe Kosinski, our Director, wanted to shoot Full Frame. SIGMA covered the wide end, and the Master Primes covered the long end. We were using the SIGMAs from 14mm to 50mm. The Master Primes in those focal lengths don't cover Full Frame. But the 50, 75, 100 and 150mm Master Primes do cover Full Frame. In terms of sharpness and resolution, they're pretty close. In grading, even if things are just a little bit off, you can kind of blend them all in.

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

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

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

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

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

To be as compact as we could, even SIGMA E-mount photo lenses would've been too big, believe it or not. We really had inches to work with, in very little space. The cameras had to allow clear ejection points for the pilot, and nothing could protrude in front of the control panel of the dash or beyond the glare shield. Not even by a quarter inch. We even had to shave off parts of the lenses just to make room.

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

How did you start and stop the cameras?

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

Did you lock the cockpit lenses off with tape?

Yes, the focus and iris barrels were all locked off. Also, if you remove its PL mount, VENICE has a native E-mount

Claudio Miranda, ASC on *Top Gun: Maverick*

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

underneath with a very secure lever locking mechanism that holds the lens in very tight. In fact, it has a safety locking detent, so E-mount may be even more secure than PL.

Who approved the safety of the cameras in the cockpits?

The Navy engineers determined whether it was flight worthy or not. Initially, they told me that I'd never get six cameras in there. "You'll barely get three inside," they said. I just said OK and started looking inside the jets every day. In the end, we did get six cameras inside. It had a lot to do with just being there every day and politely asking questions.

There was another time when I was on the aircraft carrier with a small crew and two cameras. I was struggling a bit, trying to get the light in the right place. Someone asked me how it was going. I said, "It's going okay but I really wish that I could ask the captain to head in a certain direction for better light. And they said, "No, you can't ask the captain to turn the boat. Are you crazy?" Well, that did sound pretty crazy to alter the heading of an aircraft carrier just for the film. A little later, someone else asked the same question—how I was doing. I said the same thing as before, that I was bummed out that I could not turn the ship to favor the light. He said, "Sure, that's not a problem. We can do anything you want." And he indicated they had something like 23 years of fuel on board.

He asked, "When do you want it? I said, "At four o'clock, it'd be great if the ship was heading 90 degrees. That would put the sun in a perfect place for us." I didn't think it would truly happen. But at four o'clock, the whole aircraft carrier turned and headed in the right direction, due east. I called our liaison officer the best gaffer we ever had. We were turning the ship all the time.

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

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

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

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

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

Was it similar with the aerials, finding the light?

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

Frames from *Top Gun: Maverick*

Frames © 2022 Paramount Pictures Corporation.

Russell Carpenter, ASC on *Avatar: The Way of Water*

Russell Carpenter, ASC at VENICE 3D rig. Photo: Mark Fellman. © 2022 20th Century Studios.

Russell Carpenter, ASC needs no introduction. Credits include Titanic, *for which he won the Academy Award for Best Cinematography in 1997,* Charlie's Angels, Charlie's Angels: Full Throttle, *and* Ant-Man.

Jon: Please go into some of the technical details of *Avatar: The Way of Water* (Avatar 2).

Russell: I came onto *Avatar 2* in 2018, shortly after the first version of VENICE was announced in September 2017. We were starting with something that was a beginning form of a camera and as we went along month by month, they released additional updates. There were various licenses: you'd license for this much of the sensor and then you got a license for that much more of the sensor.

In the Sony manual and your publication, various updates and intended dates were listed. It was a bit of a horse race to make sure the camera was ready to do what we needed. James Cameron, the director, had a relationship with Sony that went back to his first pictures on 2/3" cameras. But the idea now was to use a 4K sensor with a Super35 image circle of about 28mm.

The IMAX versions are released at 48 fps. The 2.39:1 versions will go out in 2.39:1. The image circle had to be wide enough to support 4K 2.39:1 aspect ratio but also service IMAX, because the premium venues were going to be all IMAX. That meant you probably needed much larger lenses than the first film needed. Jim, for a long time, wanted a handheld and a lighter 3D rig than they used on the first one. There were two people who were tasked with this. One was a brilliant guy named Patrick Campbell.

He worked out a lot of new designs to keep the frame stable enough for handheld but at a lighter weight. The next question was how to make the Sony as light as possible. Jim said to Sony, "We need to split your VENICE body from the sensor block." This is what eventually became the Rialto system.

That was one of the first things they worked on: how small and lightweight the two Sony VENICE sensor and lens blocks could be to put on our 3D rig. Two camera heads would be tethered to two VENICE bodies, distanced and carried by a grip who could move around with us all the time. The tether cable was about nine and a half feet long. That was a good start, but in

Russell Carpenter, ASC on *Avatar: The Way of Water*

Director James Cameron operating VENICE 3D rig. Photo: Mark Fellman. © 2022 20th Century Studios.

testing we realized that I was not really long enough to give anybody any reaction time. If somebody moved fairly quickly, the cable was just going to stress. Jim asked Sony for a 20 foot cable. It required an amplifier link in the system. Every time you do something like that, you want to make sure that that signal is never interrupted between the lens block and the processing system. Sony engineers worked very hard and it arrived about a month and a half before we started shooting.

When did you start shooting?

I was prepping about a year ahead of that. From early 2018 to when we started shooting, I had to jump into virtual lighting, which to me was a learning curve, but very enjoyable. The other thing was to test shutter angle because Jim wanted to commit to 48 fps and then decide in post when it was appropriate to use 24 fps. There was a certain clarity that he wanted, but he didn't want it to look like we're looking through a plate glass window and lose the charm of film. Instead of a 180 degree shutter angle, we experimented where to find the sweet spot. Sony VENICE doesn't have a global shutter, but they have an incredibly fast

refresh rate. After several motion tests, we wound up with the equivalent of a 270 degree shutter. That helped us with our 3D system. It took a lot of the curse off of 48 fps.

Was there more motion blur from the wide angle shutter?

Yes. You have some motion blur, which to us looked much easier to take than 180 degrees. There was no motion smoothing done. It all had to do with the 48 fps and the 270 degree shutter.

Aha. Because 48 fps with a 270 degree shutter (1/64 sec) is not far off from the exposure time of 24 fps with a 180 shutter (1/48 second)?

Yes. We also test the camera's ISO ratings. I really liked the 2500 base ISO of VENICE. My chief lighting technician and I thought this could be a game changer for us. For me, as a cinematographer, it was a very significant help in shooting this movie. We were watching Jim work on his virtual stage. He's out there with his little virtual camera rig that looks like an iPad, but is incredibly powerful. He can do all kinds of things with it. He can decide you have a 1:1 move or you have a 50:1 move. He could

Russell Carpenter, ASC on *Avatar: The Way of Water*

Jack Champion as Spider in 20th Century Studios' *Avatar: The Way of Water.* © 2022 20th Century Studios.

do anything. It's basic blocking, but he didn't have to commit to exactly where he put his cameras because all the performances are there, all the actors are where they're supposed to be, and now he can go in and really sweeten his camera angles. We're watching this and he's got a bank of three rows of computers behind him and he can just say, "For this shot, I want this thing in the background moved there. This Na'vi in the background isn't quite fitting. Let's just either lower him into the ground if we don't see his feet or just make a minor shift." There was all this fluidity, all this flexibility.

We thought, well, we're going to be in the same situation. Once we get past shooting the big people-populated things, we're going to drift slowly into the world of the scene, most of it being virtual. By the end of the film, we were working in large jungle sets. Even though the jungle wasn't there, there was a lot of territory to cover with the character Spider. We thought we could change our approach to this. Instead of having much bigger lights to deal with the fact that we're in very large stages, why don't we look at using moving lights? Basically what used to be rock 'n roll lighting. They're not nearly as powerful as instruments we used on film sets. But if you have, as we had, some very gifted lighting board operators, you can do a lot of things in a very quick amount of time and keep your lighting fixtures off the ground, which was what we did.

Given that, we went to Jim and said, "What about working at this high ISO?" He actually liked the look of the high base 2500 ISO better. The virtual production team at Wētā FX also tested

it and said, "This isn't the same clean information that we would be getting with an ASA 500 base ISO, but there's plenty to work with here. Once we had that go ahead, we were really free to work in a different lighting arena than we had before. It's not like we had a big stage where we had a zillion lights, but we had big stages where depending on the scene we were going to do the next day or the day after that, we would hang trusses of these moving lights in configurations that service that scene.

If you wanted a very beautiful bounce light coming from the side, we would just put up 20x20 frames above the blue screen area that the camera was going to capture. We'd take one, two, or even three Vari-Lites and bounce them to get a gorgeous, beautiful bounce light. These lights are terrific if you're using them as backlights in a jungle, or as three-quarter backlight. The issue, as we knew all along, is we're going to have Spider moving through this jungle next to Na'vis, and the jungles have very particular ways and splashes of light.

With our moving lights, we could be very specific, dial in the intensity and the color—for example to make it a little greener. All of that was possible because of just how good the Sony VENICE high base ISO was. For me, besides having a really great color space and great dynamic range, as the end user, that was the holy grail. It turned out just to be the perfect tool for the job.

Getting back to the Rialto stereo 3D rig—there were two Rialto camera heads and two VENICE bodies tethered somewhere else?

Russell Carpenter, ASC on *Avatar: The Way of Water*

Everything gets doubled. You have two lens blocks per rig. You have two tether cables running off them. You have a very strong grip with a super-duper high-tech backpack carrying two VENICE camera bodies. On our dollies and Scorpio crane, we could just place the VENICE bodies in convenient places.

What lenses did you have?

In fact, the final thing in terms of testing was finding two lenses that would track perfectly and were small and lightweight with great optical quality. We found that FUNINON MK 18-55mm T2.9 and MK 50-135mm T2.9 were excellent. Believe it or not, I would say that maybe 90% of the movie is shot on these affordable lenses, which I would label as prosumer. We were stunned. They were as good as some top of the line lenses. They really were not set up for what you would call a robust focus and wireless lens control system. In the secret lab, wherever they were building all kinds of custom things, the team retrofitted these MK lenses to withstand all the situations they would be in.

I guess you used the MK lenses in their native E-mount with the VENICE Rialto native E-mount?

Russell: Yes, native E-mount.

And, every once in a while we'd go to an even wider prime lens. The camera team worked very hard to make sure that they could make lens changes quickly. We thought this was just going to be a very time consuming task, actually. They started fire drills, basically, in terms of how fast they could change these lenses in

and out. They were quite proficient.

I guess you were shooting wide open with the 2-stop light loss of your 3D rig beamsplitter.

Most of the time we were at T2.9 and the lenses performed brilliantly there. The real workhorse lens was the 18-55 because in 3D you have diminishing returns the longer the lens gets.

Since MK lenses are Super35, I guess you were not shooting Sony VENICE in Full Frame?

Correct. Reason 1: Super35 seemed to be the sweet spot for 3D (depth of field, bokeh, etc.). Reason 2: Going with a larger sensor area means a larger image circle, which means larger and heavier lenses which was not good for our handheld 3D/Steadicam rigs.

And so, that the sweet spot was 4K 17:9 Imager Mode, 4096 x 2160, 24.3 mm wide by 12.8 mm high.

Was tethering with Rialto the main reason for choosing VENICE cameras?

Yes, and also, in terms of the type of filming we were doing, having this tremendous color depth and dynamic range really made it a great camera in terms of handing off the RAW X-OCN XT files to Wētā FX and now they're stuck with it until the end of the movie. And they were quite happy with what the Sony VENICE was delivering.

Did you work on a LUT in advance?

I decided to go with a basic LUT. I crush the blacks a little bit to

Russell Carpenter, ASC on *Avatar: The Way of Water*

know that if I fall off the end of the earth in terms of underexposure, I've got a little bit there. Most of what I was doing depended on the lighting ambience for the scene we were shooting. There was a blue color that Jim wanted that was the equivalent of what we used to know as Congo blue. It was really saturated. Even with our ARRI Sky Panels, there was a limit. In that case, I would just resort to just moving the camera's Kelvin setting around. I think I was way down at 2500° K. There's a lot of firelight where I wanted a warmth to that fire, but I still wanted the coolness of the Pandora night. I wasn't using a lot of LUTs; I was basically adjusting the VENICE white balance.

How was your live action footage composited with the virtual?

I knew these things were coming because I was doing about a year of virtual lighting. There was a point in the film where you hear a mandate. You have one job and one job only. That mandate was for Spider to be totally embedded in the frame. Jim was saying 99% is not going to be there. My nightmare was winding up with something that didn't quite make it. It takes people out of the movie.

We had a system called Simulcam which was a great help. Of course, everything I did in virtual lighting traveled into the information ecosystem. Two years later, if I lit something, I'd have some information to at least show what I was doing. The color temperature was a main key to this. But Simulcam was genius. They worked on it for a long time because this was a major thing. Jim says he's really just a provocateur. He'll go to his people and dump a problem on their doorstep and say, get back to me when you have solved this. He charged some of his main collaborators with coming up with something that eventually became Simulcam. He wanted a realtime system where he's on his performance capture rig and he can pan around and, in real time, see exactly what he should be seeing with no lag.

That was amazing. But what became even greater was that they developed a system that, just before we went into live action was perfected to use all the information, including focus and data from both cameras, that our focus pullers would use. The human component was in our virtual forest or our virtual anything, and instead of getting a really cruddy composite that you can barely tell what's what, they were actually embedded in the scene. Anything behind them was virtual. Anything around, left or right was virtual. Anything in front of them was virtual. In fact, virtual characters could walk in front of them and they would obscure that character. That was gold. That was also a key component in being able to say does this work or does this fail?

When you were shooting live action of the characters like Spider, was that against a green screen?

Actually against the blue screen and there was a lot going on there. Some of the shots don't move a lot. In other shots, he's running through 200 feet of forest, and there were some shots we had to do on a camera car because he was moving so fast inside the studio.

You mentioned focus. Did your focus pullers have traditional wireless lens controls?

Jim said, "Because it's 3D, let's not do anything crazy." Basically, we had a group of computers and people who are watching all

the 3D, but there's person tasked with running convergence and 99% of the time, he's following where focus is. Because why put it anywhere except the focus distance. So, with our two VENICE cameras in the rig with two MK zooms, we had traditional wireless focus. They tried to really keep the number of cables running off the camera down to a total minimum.

How long were you on this show?

I was on prep in early 2018 and we started shooting fairly early 2019. We took a break at a certain point near Christmas and everybody went home and said, okay, we'll be back in a couple months. COVID hit. It took the production a while to get back to New Zealand, but we were the first production back. We had to fly on a charter jet. Everybody had to be tested like a gazillion times. And when we left the jet, we were basically funneled into a hotel room. Here's your home for 10 days. We had to do that and then we were more or less free birds except that the production functioned under very strict COVID protocols. We didn't want to get kicked out and we didn't want to ruin it for other productions that wanted to get into New Zealand. That went very well.

Did you already start on the sequels?

Russell:

We shot most of *Avatar 3* because our Spider is growing pretty fast.

Are you shooting number four now?

No, it's going to take about two years to complete the virtual work, put film three together and complete some of things. The series is basically designed as playing the long game in terms of where this is going.

Maybe you will have VENICE 2, software update number four by then.

VENICE 2 has some definite advantages.

Have you tried VENICE 2 yet? 3200 high base ISO.

I did. I shot a commercial with it and it was lovely.

Did you use the internal NDs at all?

Definitely and I found them to be excellent. I didn't experience any diminishing of visual quality.

Where were you based in New Zealand?

We shot in Wellington at the Stone Street Studios. They're basically what you call the Lord of the Rings Studios and they have some gigantic stages. We shot in Wellington because we ran out of stages and we found a large space to shoot, but still in the Wellington area. And then for tank work and some other things, we moved up just outside of Auckland, a little town called Kumeu.

New Zealand is the most beautiful country I've ever been to.

Yes, it's just amazing. I've enjoyed this talk with you because you always take a deep dive.

Thank you. It's been a pleasure. I'm sorry to keep you so long. I promised 20 minutes and it's been an hour.
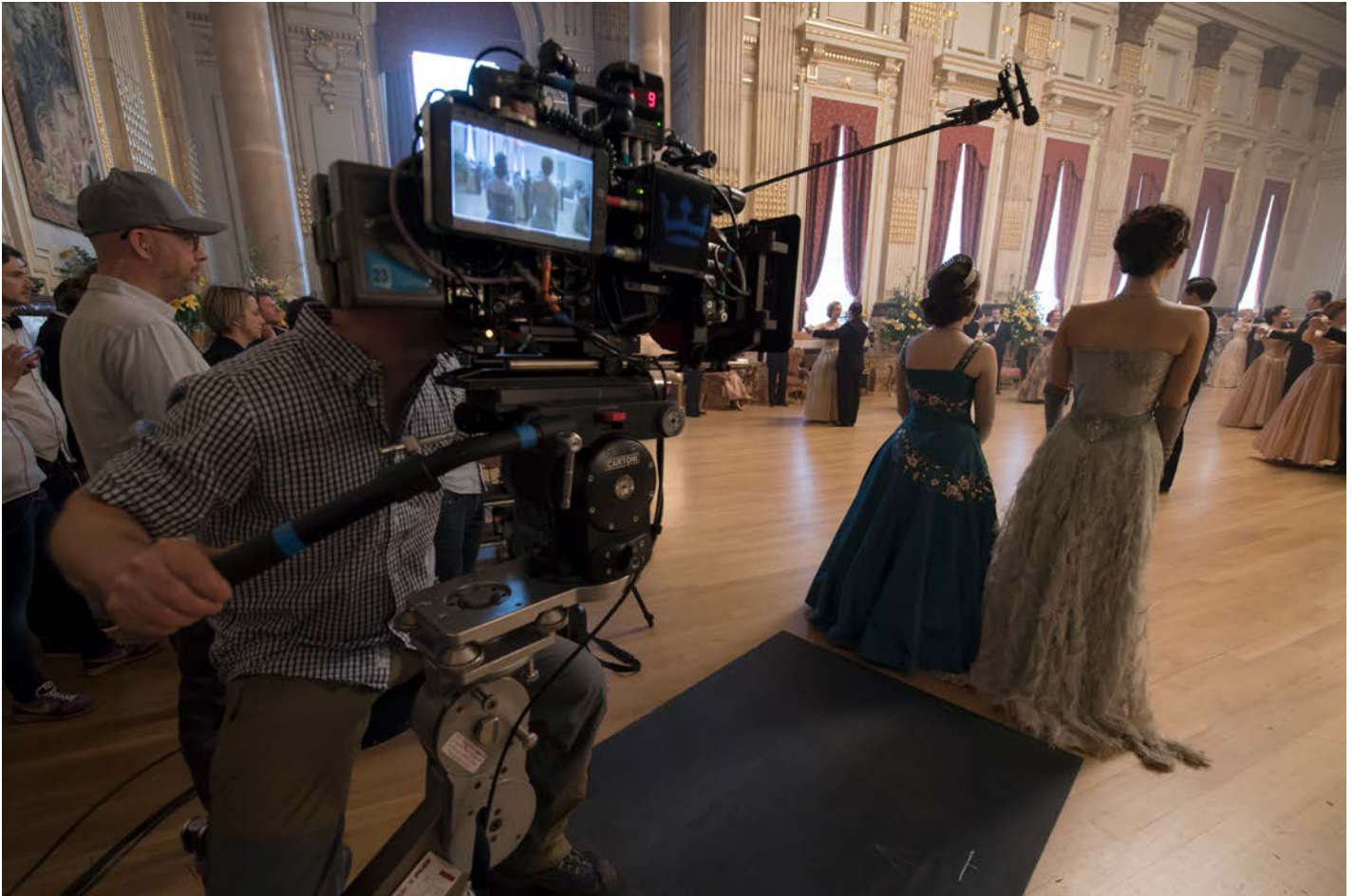
Adriano Goldman, ASC, BSC, ABC on *Andor* and *The Crown*

Adriano Goldman, ASC, BSC, ABC grew up in Sao Paulo, Brazil. He attended the Maine Workshops and then went on to shoot commercials, television series and many award-winning MTV music videos. He has shot 22 episodes of The Crown *from 2016-2022 and 6 episodes of* Andor.

Jon: *The Crown* and *Andor* were shot with Sony VENICE cameras?

Adriano: When I did my first tests for *The Crown* on season 1 in May 2015, I knew up-front that Netflix was keen on the 4K workflow. I liked the combination of vintage Cooke Panchro primes and the Sony F55, which was their top of the line camera at the time. I shot the first three seasons on the F55. I shot season 3 on the F55 cameras with ZEISS T1.3 Super Speeds (vintage 1975-2004) because every time the cast changed, something should change, mainly the glass. The glass would somehow follow the period.

Then on season 4, we upgraded to Sony VENICE cameras. I kept the ZEISS Super Speeds through season 4. I really felt VENICE was an amazing upgrade. Even knowing that the VENICE could give us 5K and 6K by season 5, we kept the workflow at 4K, Super35 format, as it's been since season 1. It felt like a proper upgrade in terms of the dynamic range, how sophisticated the sensor felt to me, the built-in ND filters that are amazing and really add speed to any production. The dual base ISO is also something that I use frequently. I remember being taught by one of the Sony representatives who came to

Panavision where we were testing the VENICE for season 4. He said, "Just think in terms of film stocks. It's as if you have one that is the 500 ASA and the other one is 2,500 ASA. Anything in between is just the way you used to rate your film stock above or below the recommended factory rating.

Just tell me if we are getting too technical.

Jon: The more technical the better.

Well, I'm going to really try hard, because I'm not a technical DOP, so I'll tell you some things that I learned from our tests, with my DIT and focus pullers, people who really know the equipment.

On *The Crown* and on *Andor* as well, I rated the VENICE 500 base ISO at 500 and the 2,500 base ISO at 1250. So basically, I am overexposing my material by a full stop when I shoot in the 2,500 environment. By doing so, my impression is you reduce the noise level and you can even easily intercut the two different files. You can jump from 500 to 1250. When we say, "Let's go to night mode," that means 1250.

I've used the 2,500 base ISO at 2,500 sometimes in incredibly low light situation. It was a really pleasant experience, but you get a little noise. It was appropriate for the scene. You can de-noise it a little bit in post, which is useful.

You have to get used to these high ISO ratings because your eyes never get used to it. I remember a night scene between the Queen and Prince Philip, all lit with practicals. I stepped out of

Adriano Goldman, ASC, BSC, ABC on *Andor* and *The Crown*

Stephen Daldry discusses a scene with Anton Lesser (Macmillan) and Claire Foy (Queen Elizabeth II). Photo: Robert Viglasky © 2022 Netflix Inc.

the set on a coffee break, and then coming back to the set it just felt almost impossible. Because basically the sensor sees much more than your eyes do. You have to get used to it.

There's been a massive change in terms of overall style since I started on *The Crown*. There was a very philosophical approach for the first two seasons that "less was more," that this was not TV. We wanted to deliver something filmic, with a different pace, where performances are really appreciated. It's not supposed to be quickly cut or fast-paced. Things have changed. There's no way I could be shooting season 6 now in the same way I shot seasons 1 and 2. It's more contemporary, it's more observational. We use more long lenses, we shoot closeups on longer lenses than we used to. With Claire Foy, Vanessa Kirby and the cast we had on seasons 1 and 2, there was a very clear intention of being physically close to the actors.

Closeups were done on a 40mm, maybe a 50mm. Now it's very frequent that we do closeups on the 65, the 75, even the 100mm. There is a different approach to the editing process as well.

One relevant thing to say about the VENICE is that I fell so much in love with it that I decided to use it on *Andor*. It is an action adventure. I knew we were going to have to move fast. I went to Panavision with my DIT and we tested the C series anamorphics on VENICE and found that we could get 4K images from it. So I went back to Pinewood that same day and spoke with Mohen Leo, the VFX guru magician. I said, "I think I have good news for you because I like the VENICE and I think

I can deliver 4K workflow from beginning to end. Is there any downside if I shoot Andor on anamorphic C-series with the VENICE?" He said, "Initially I don't think so, but let me talk to Disney." And then he came back saying, "They're okay with it."

Using VENICE was really a happy choice. My DIT, focus pullers and the post-production team were pleased with the results. The colorist, JC Clement, was very happy with the results, the range, the HDR and how flexible and interesting the footage is.

I'm back now on season 6 of *The Crown*, shooting on the VEN-ICE. Beginning season 5, with the new cast, we changed the glass to Cooke S4 lenses.

Cooke S4 again. We had a couple of night exteriors in New York and Paris where I had additional ZEISS T1.3 Super Speeds for extreme low light situations, and because I love the look. I will easily go back to that set on future projects. I really love how soft and fast they are and that it's just a small set of five—or six lenses if you get the 65mm.

I like how simple it is to shoot a project on the Super Speeds, but you probably need your director's commitment as well, because you're not going to have a 100mm. Of course you can augment the set as we did on *The Crown* seasons 3 and 4. I had ZEISS 100mm and 135mm T2.1 Standards (vintage 1964-1975). We also had an old 25-250 Angénieux zoom for the exteriors. It cut well with the Super Speeds. On a feature film, I think you can have these conversations with your director and say, "Are we all happy with a very restricted set of lenses?" It depends on the

nature of your show. If you're shooting mainly interiors, I think that's absolutely fine. If you're shooting mainly exteriors, you probably will miss some longer lenses. But I'm just talking about my love for the Super Speeds, but that's another conversation.

How would you compare the look of your Cooke S4, Cooke vintage Panchro, ZEISS Super Speeds and ZEISS Standards?

If you compare the Super Speeds and the Standards that are more or less the same age, they are almost the same size and they're both very lightweight lenses. The Standards are sharper and the color matches really well with the Super Speeds. It's very easy to match them. I was actually looking for soft glass when I did seasons 1 and 2, shooting on the Cooke vintage Panchros rehoused by TLS.

They are lovely and they have this very warm romantic tone, but it's crazy to work them in terms of workflow, because they don't match. Even if you have two 25mm or 50mm primes shooting side by side, they don't match [because the original coatings may have faded]. The 25mm and the 75mm, if I remember, are always warmer than all the other ones. The colorist on seasons 1 and 2, I had to spend a lot of time to make the lenses match so it wouldn't be so perceivable in the cutting room. We didn't really want to send a thousand messages a day saying, "Yes, we are aware this lens's a little bit warmer, please consider this, we'll grade it accordingly on the final grade." So there was always like an hour, an hour and a half in grading to make the 75mm a little bit less saturated, just basically to match them with the other ones. It was a little bit more complicated in terms of workflow.

And when you jump to the Super Speeds, although it's a limited lens set and it's vintage, they matched nicely. They're more modern in that sense. Now you can find rehoused Super Speeds sets. They are in high demand now.

Filters?

I must say, the combinations of the S4 primes and Tiffen Glimmerglass and Tiffen Smoque filters are very pleasing. We use very light Smoque filters when the locations don't allow us to use haze machines. Especially for wide shots, I think the Smoque filter is a very interesting achievement. They're not like the old fog filters. If you go heavy on them, you feel the strong diffusion, but if you keep them light, like ½ or even ¼ Smoque, it's beautiful. You get a beautiful glow on the highlights, but you don't perceive them on the low lights as much as we used to with the White Promists, the Fogs, and the Double Fogs. Remember the Double Fog filters? They was something else. So I carry those two filter sets, the Glimmerglass and the Smoque, that are, I'd say, more modern, more contemporary diffusion filters.

When do you use the Tiffen Glimmerglass?

We use them almost constantly. There's a rule that we apply. We we use the Full Glimmerglass up to 50mm or 65mm. And then, when we jump to 75mm onwards, we go to ½ Glimmerglass. I rarely use any diffusion filters on zoom lenses because I think it's a little too risky, because you're giving the camera operator and the director freedom to resize during a shot, and you don't want to suddenly find that now you're at 200mm and your number 1 Glimmerglass now turns into a diffusion filter that is too heavy. If I have full control on my atmosphere level, for example when I'm shooting on stage, and I like what I'm achieving in terms of

haze and atmos level, I just take the filters out, so I don't need them anymore. With a younger cast, I rarely use them. With a more senior cast, sometimes I do use the Glimmerglass 1, but I rarely use the Smoque filter to frame faces.

The Glimmerglass is to smooth the skin tones?

And to make some of the highlights glow a little bit more. It gives my practical lights and windows a more period sort of look.

Do you use a lot of smoke? Some quip that a BSC equipped toolkit includes a smoke machine and a bare lightbulb.

I do use atmos, or what you call smoke. But I've become less obsessive about it. I don't want to find myself frustrated because it's hard to keep the haze level super consistent. You achieve the right level, you shoot two takes, you like what you do, and then you realize, no, you're still carrying on, you're still going to need more takes. And then you have to break the flow to bring your SFX guys in. Sometimes I don't want to be the person who slows the flow down and if SFX is an issue, it does slow the rhythm.

On stage, I become a little bit more obsessive because I think that, in theory, the environment is where I should be able to control the drafts. I can close all the doors, I can keep it more consistent, resistant to the environment. But on locations I usually have conversations with my SFX guys, "Look, I like what I see, but there's no way to close all the doors on this location, so we're going to be fighting this level for the whole morning. So let's not do it. Or let's do it very, very lightly. So if something happens, there's not a continuity issue." Because it is about aesthetics, but it's also very much about the continuity.

And it's about not buying myself anxiety and frustration on the day by wishing to have something that is not realistic. Furthermore, I have the Smoque and the Glimmerglass filters to add a little bit of that texture if I need to.

Speaking of speed, you seem to favor primes, but wouldn't zoom lenses speed up your day?

It would and they do. When I shoot on the backlot, when I shoot day exteriors and have, let's say, a funeral scene with 400 extras or an intersection in Barcelona where you have from 7 to 10 am and then you have to free the road again, these are the types of sequences we might shoot entirely on zoom lenses. I like zooms.

I have two Angenieux Optimo Zooms now. I have the 12:1 24-290mm T2.8 and the 5:1 17-80mm T2.2.

I'll be able to grade them back onto a more Cooke-like look. Because they are very sharp, I don't use diffusion filters on these zoom lenses. Another thing that frightens me a little bit is that, once you have a zoom lens, you reframe naturally. If you're an experienced camera operator, you adjust your focal length because you know you already got that framing on the previous take and you know me well enough to change focal length a little.

But it's funny, because *The Crown* for season 6 takes place in the late nineties and early two thousands. Even if you send a message to the editor saying, "All the zoom moves are service zooms—they're not supposed to be used in the middle of a zoom move, so please treat my zoom lenses as prime lenses," they can-

Adriano Goldman, ASC, BSC, ABC on *Andor* and *The Crown*

Adriano Goldman, ASC, BSC, ABC, center left, on *Andor*. Photo Ed Miller © 2021 Lucasfilm Ltd™

not resist. They think it's incredibly exciting that something like this is now happening on *The Crown*, that you deliver this like a paparazzi approach to a character like Diana, for instance. When I see a scene cut where there are some zoom moves, I agree that specifically for the first four episodes on season 6 that covered the last days of Diana's life, the intensity and the wasps, as we call the paparazzi, are always around her. This is something we really wanted to deliver.

Take us through the process of shooting with anamorphic lenses and VFX work.

We were all very privileged to be able to shoot *Andor* on huge sets. I said to Mohen, our VFX supervisor, "If there's no atmos (smoke, dust, haze) in space, your virtual footage will be sharper than my C Series anamorphic footage when I'm shooting in a town like Ferrix with atmos, sunshine and real dust. How do we transfer this vintage anamorphic look to your VFX space scenes? It shouldn't be too technical, sharp and plastic. It should somehow contain the same sort of vintage look." He replied, "I don't have an answer for you before I actually have something to show to you, but I'm going to keep that in mind. I absolutely understand your optical approach. In VFX, we don't shoot with any lenses, but we can mimic your lenses and the lens flares of your C series anamorphic and we can build that into the VFX environment."

There's a very specific eye-shaped flare with soft edges when you aim a source at the C Series. They're not typical dark vignettes,

they're much lighter—they're white sometimes. That was the kind of optical distortion I had in mind when I asked Mohen about how this works in space.

Coming from shows like *The Crown* and the feature films I had done before, you prep, you go to places, go to locations, go to the costume department and you check the colors. When I started on *Andor*, nothing existed. There was nothing for me to see. I had to learn a lot about the previous environment, which was useful because you got to understand the dimensions and you could somehow start thinking about your pre-light. It's really interesting to be able to have the storyboard to help plan for some action sequences. But it's not that you are prepping visually, in terms of the textures that you will then achieve or encounter when you have an actual physical set.

We absolutely needed to rely on the built-in light sources in the sets and be able to control them individually. Especially in a white environment like that, it was really hard to add any sort of contrast, because even if you cut your sources, they were bouncing everywhere. I was not always able to bring an 8x8 or a 12x12 to be able to shape my lights a little bit for dialogue, over shoulder coverage. It was absolutely vital to be able to be in full control of every individual LED strip so I could cancel whatever source I was not interested in using, or to be able to create some shape and volume and contrast.

Did you have a lot of blue screen or green screen on *Andor*?

Adriano Goldman, ASC, BSC, ABC on *Andor* and *The Crown*

That's another amazing thing about *Andor*. Almost none. But there are many set extensions, for example the embassy set where you see Mon Mothma having all her meetings. That was the only set that we had a massive LED screen that was just outside the set and as Luke Hall, production designer, so cleverly said, it was basically in-camera VFX. It really prevents you from having the green or the blue bounce coming back to your set, especially with shiny floors, with shiny costumes and surfaces. That's always a nightmare. We manage those big windows of the dining room, and the bay window of the circular lounge, with big LED screens.

I still feel very privileged to be able to jump from *The Crown*, something that was period and realistic, to another project that was from an even earlier period and realistic. You learn, when you start on any *Star Wars* project, "This is not sci-fi, this is *Star Wars*." It is vintage. It is "A long time ago in a galaxy far, far away." It's not in the future. So everything on *Star Wars* is aged, everything is vintage. The doors are scratched; they all very much lived in.

It was really interesting to be able to light, more or less, the way I do, relying on real sources. Lights coming from the window when it's daytime, practicals playing a very strong part in my lighting setups. It's supposed to be believable. Tony Gilroy, executive producer, said it very clearly, "I want to be able to see the breathing, I want to be able to see the dust in the air."

What lighting units do you usually have coming through windows on *The Crown* and *Andor*?

Fewer HMIs, although we still use some HMIs, especially if I want to have a nice shaft of light, or if I want to bounce and create a powerful bounce source. Depending on the size of the window, it could be just an ARRI SkyPanel S360 as a powerful LED broad source. The use of LED sources are just really increasing over conventional tungsten and HMI sources. We still use those, we still carry them on the truck, but we use them less frequently.

If it's a big window, we'll probably have an ARRIMAX 18 (18 kW open face) or M90 (9 kW open face) not directly hitting the actors, or bounced. It's more about creating a shaft that kicks somewhere on the floor or somewhere. More and more, I try to place the actors away from the key light. The key light is often the window. It's very frequent now that the backlight actually turns into your key light and then there's just a little bit of a bounce board for fill.

The camera can see everything now. You can move your actors away from the key light and then realize that you still see the window in their eyes. The window is a few yards away, but you can still enjoy that as an interesting low-light look. This is something I say to myself, and to my gaffer all the time: it's not supposed to look lit. It's supposed to be there as an environment.

Actually, this is not a hundred percent true. Especially when I jump to a close-up with Claire Foy, Olivia Colman or Diego Luna, for example. I do appreciate taking care of my actors and characters. In that case, I would probably bring an additional diffusion layer, like an 8x8 or 12x12 by silk, or if they're too far away from the window, maybe I can bring a Hudson spider (octagon parabolic LED fixture) that would work at 20% just so I can see the eyes, to feel a shadow, but it's always the non-lit approach. And I'm very much obsessed about the eye line. Do we want to see the eyes? I absolutely love those conversations about how important the eyes can be, for drama, for emotions, even to deliver information. I always have this obsession about the stories that the eyes can tell.

How did you manage grading on *The Crown* when you're shooting all the time?

There are an incredible number of episodes. We only have about 20 hours of grading per episode on *The Crown*. But Asa Shoul, our unbelievable colorist, has been with me since season 1.

We now grade *The Crown* at the Warner Brothers facilities. Because Asa knows the show so well, he understands the workflow like no one else. He usually manages to cover the episode in one day, matching all the shots and somehow knowing what I usually like. And then, I would have 20 hours with him. When I get to grade my episodes, they have been pre-graded by Asa.

How do you view dailies?

We watch dailies on the Pix system. I get a link in an email where I can watch the footage from the day before. We also enjoy selecting still frames to distribute to other directors and DoPs working on the show. It's not every setup, just the ones we like the most, captured from the actual footage. This is not to establish a hard rule that everybody should follow, but just basically to show the kind of look that we are trying to achieve. *The Crown* is very generous with the directors and DoPs because it's episodic. Of course we want similarities. We want the look to be similar, within the same realm of *The Crown*. But you find similarities anyway, with costume, makeup and the cast. Although there are some rules to follow, there's also a lot of freedom as well for directors and DoPs.

How do you send your comments, notes or framegrabs to the dailies colorist?

On *The Crown*, I would say to the DIT, for example, "Because I'm shooting this at 4,300 Kelvin, it's a little warmer than it should be, but it is a good starting point. I like the color, I just don't like the level of saturation." Then he would just grade the scene and show me the result on a monitor. It's not live-grading in a sense that I'm physically there, working on him.

It was more of a proper live-grading process on *Andor*. John Paxton is my usual DIT, on both *The Crown* and *Andor*.

I should mention another characteristic of my work—I keep the iris control to myself. So there's no shouting anymore across the set to the camera assistant, "T5.6" or whatever. I keep the wireless iris controls (usually two of them, for two cameras) with me because I'm constantly adjusting exposure on camera moves—all the time. I see a few DoPs now are using an intercom with the team. But I don't work well with the radio. If I'm going to do something extreme, like shooting wide open, I would let the focus pullers know, "I'm sorry, but this has to be very shallow depth of focus. So let's do a couple rehearsals." I'll let them know that something more difficult is coming. But, on a daily basis, it's just me and my iris rings.

Geoffrey Haley, SOC, on *The Gray Man*

Geoff Haley received his degree in psychophysiology at Stanford University and worked on movies in LA during summers. He got into the union, bought a Steadicam, and has won SOC Operator of the Year twice. His credits include Joker, Cherry, Steve Jobs*, four of the* Fast and Furious*, and more.*

Jon: Credits in *The Gray Man* show you as an interesting hypenate—executive producer/camera operator. How is that?

Geoff Haley: I started working with the Russo Brothers on the Marvel movie *Avengers: Infinity Wars* and *Avengers: Endgame*. Since those projects, I've become increasingly involved in their day-to-day creative decisions in pre-production and on set, which allows me to do a lot of things that a camera operator wouldn't necessarily do on a project.

Such as?

I am very involved early on in the process with storyboarding and previz. Often, the shot design starts with the DP and the director working with me as camera operator. On *The Gray Man*, I had about 12 weeks of prep before we even started shooting, which is something that a camera operator wouldn't necessarily have. The studio doesn't blink too much when they see the other credit associated with it.

Do you get involved in the logistics of equipment as well?

I get fairly involved in the logistics of the equipment, but more so to the degree that a lot of the logistical challenges involved with achieving shots might have a bearing on what the equip-

ment is that we use. I try to leave logistical considerations having to do with cameras, formats and lenses to the DP.

Certainly, I'm involved in discussions early on about whether or not say we're going to go spherical or anamorphic. We'll have early discussions about what the nature of the project might be, and how aggressive a film it is from a camera movement standpoint. How much flexibility do we need to have on the day to make a decision on a shot that needs a very versatile camera? That might be more difficult if we have a camera that is very specific to a visual tone, but doesn't necessarily consider the fact that it's an action movie where we need to be able to do lots of different things on different platforms, sometimes very quickly, sometimes very adeptly.

To that degree, I get involved with the logistics of the equipment. Because I'm also the Steadicam operator, there are weight considerations and there are minimum focus considerations. On the lens side of things, you have to take a look at what the visual construct will be. But then you also have some logistical issues with lenses that have to do with how much of the frame is usable from a focus falloff or from a minimum focus standpoint. On a lot of the projects that we do, and *The Gray Man* was no exception, we are moving the camera very aggressively, and often we're moving the camera within inches of our actors.

So it might not help to have a beautiful anamorphic lens that has a minimum focus of 4'6", because then we're going to be constrained by what lenses allow us to get an extreme closeup

Geoffrey Haley, SOC, on *The Gray Man*

Frame from *The Gray Man* (2022) Ana de Armas as Dani Miranda. Courtesy of Netflix. © 2022 Netflix Inc.

moving to a big wide shot. Anamorphic lenses are notorious, especially the lighter weight ones, for not being able to do that. Which is why it's a consideration at the beginning of a show. There's no such thing as a free lunch. You're trading off something and I'm certainly involved in those discussions.

On *The Gray Man*, why were VENICE cameras chosen?

It had a great deal to do with the ergonomic sensibility of the camera. But you're talking about lenses as well and it's not just about what lens mount it has. In the case of the Sony VENICE, which I have to say I really like, it can shoot at these ungodly high ISOs, which can help especially at night and when we want to add a little extra bit of depth of field.

So that was one of the reasons—the low light ability. Also, it's not a super heavy camera, which is nice as well. I can do most of what I need to do with that camera. And its high speed, high frame rates are pretty impressive too. I think we went up to 60 fps in 6K and 120 fps in 4K 2.39:1.

There were a number of additional reasons why the VENICE body was the right choice. The color space looks good. It was pretty simple in the DI and grading.

How many cameras did you have on the show?

We had five VENICE bodies between the first and splinter units. Our splinter unit sort of became a fight unit as well. As you may remember from the movie, there are a lot of fight scenes. The average action movie maybe has an average of three and a half fights per movie. We had nine fights, which was a crazy amount.

In addition to the five bodies,we had a couple of RED KOMODO cameras for the fight unit. The first unit did not shoot multiple cameras very often. But, for the ability of moving quickly and making last minute decisions about how best to achieve a certain shot, we liked to have one camera dedicated in studio mode, one camera dedicated in Steadicam mode, one camera dedicated in crane mode, and one camera dedicated to handheld. That gave us the ability to quickly move back and forth between a lot of different camera modes.

Did you work as both the Steadicam and regular operator?

I was the A camera operator. We had a B camera operator, Maurice McGuire. I would bounce between dolly, crane, Steadicam, and handheld. The only thing I didn't do was the drone work, and that's because we had a speed drone and a great FPV operator, Johnny FPV (Johnny Schaer).

What lenses did you have?

Our main lenses were the ZEISS Supreme Primes and ZEISS Supreme Prime Radiance. Our camera and lens package came from Otto Nemenz International.

You were shooting Full Frame?

Yes, Full Frame spherical widescreeen 2.39:1.

Were you wide open a lot of the time?

Yes. But, that's another great thing about the VENICE—you could pump up the ISO with a limited amount of noise and not have to necessarily shoot at a T1.5. Because at the end of the day, if it's aggressive shot making, yes, you have tools like a Light Ranger or things that make it easier, but a lot of this is action. You don't want to do a take 2 or take 3 because of bad focus, or for that matter bad framing. On the one hand, shooting action is fun and it comes with its own adrenaline jolts, but it's super serious. I sometimes teach camera operating to various groups, and I always tell them to be careful when doing an action movie. It all seems fun, but you're one mistake away from sending somebody to the hospital. It's serious stuff. Actors and stunt players and stunt drivers and so on are doing stuff that should be safe, but it's risky.

So as a camera operator, my prime directive is like the Hippocratic Oath, "Do no harm." Then get the great shot. And so, if I need to figure out some way to do a shot that gives me a higher percentage of nailing it on take 1, I'll do it. That's not as important when you're doing comedies and dramas and other things

Geoffrey Haley, SOC, on *The Gray Man*

Frame from *The Gray Man* (2022). Ana de Armas as Dani Miranda. © 2022 Netflix Inc.

where you can easily do take 3, 4 and more.

I mean, the actors might not like it because they just gave you their best performance, but still it's not the same as if they had to jump off the roof again because we missed that take.

Tell us more about your Steadicam work.

I have the Steadicam M2 with its integral Volt stabilizer. At this point, it's really not acceptable to show up on any kind of a professional film set anymore with a Steadicam that does not have either a Volt or Wave. That is because the biggest complaint directors and DPs have with Steadicam is when the horizon goes off level.

The Steadicam is a fantastic piece of equipment. But the biggest problem was the fact that even the best Steadicam operators sometimes would struggle a tiny little bit with getting the horizon level. The Volt stabilizes two axes, the horizon and the tilt axis. The only thing it doesn't stabilize is the pan axis. Volt has enabled us to concentrate much more on the shot, and to be less concerned about the horizon.

What monitor do you have on your Steadicam?

I still have a Transvideo from about 10 years ago. It's interesting, there are some monitors out there that are lighter and theoretically have a higher nit count, but the coating on the front of the Transvideo handles glare better than any other monitor I've ever used. I also like the weight because as a Steadicam operator, remember I'm like the figure skater who wants to have as much weight at the extremes as possible and zero weight in front. So it's a light enough rig as it possibly can be, but that means the pan inertia is still nice and stable. I don't want to have to exert a lot of energy to pan or tilt because that means that it's going to look more like a camera on an OConnor head, on a dolly or a crane.

On the dolly, do you mostly use an OConnor or wheels?

I mostly use the OConnor. I really like the haptic feedback that comes with using a fluid head.

What do you have for remote head work?

I own an ARRI SRH-360 stabilized remote head. I use the ARRI DRW-1 Digital Remote Wheels with it most of the time. Sometimes I will use a joystick for working in a helicopter or inside a camera car with an arm.

It sounds as though you have been following the British style on *The Gray Man* as camera operator and executive producer, working closely with the director?

Essentially, I get involved with the camera and the DP takes care of the lighting and visually textured decisions.

I've had a long, fantastic working collaboration with Stephen F. Windon, ASC, ACS. I've done a bunch of the *Fast and Furious* movies with him as well as *GI Joe* and *Star Trek*. We have worked together a lot. It's a great relationship. I can't imagine working for a more talented and more collaborative DP. I'm very fortunate to get an opportunity to work with him whenever I can. With the Russos, it tends to be more of the British system, where I get to be more involved with camera and shot design and Steve is more involved with the lighting.

But when we are working with other directors, then it's a bit more of a traditional relationship, where he has more involvement in the camera shot design. I would say that my relationship with Steve varies depending on whom we're working with.

I can't say enough wonderful things about him. He's a bit of a unicorn in that he's a very talented lighter, but he's also extremely amenable, agreeable, he understands the filmmaking process. He's not too precious. He knows when to take his time and when not to. He's just a joy to be around, and he's also extremely creative. He's very inspired, with a lot of great creative ideas, and he loves to try new things on sets as well. He's not one of these DPs who is stuck in their system and sticks with it because that's what they've been doing for the last 30 years.

Steve is happy to try anything, whether it be new types of camera or lighting approaches. I'm always seeing him do new, fun, interesting things. I'll just say, "Wow, that's something that I've never seen you do." And he replies, "Yeah, I'm trying it on this show. Let's see what happens."

Geoffrey Haley, SOC, on *The Gray Man*

Frames from *The Gray Man* (2022). Ryan Gosling as Six. © 2022 Netflix Inc.

Otto Nemenz, Fritz Heinzle and Heinz Feldhaus have said the same things about him—that Steve is always interested in trying new equipment, cameras and lenses.

He's wonderful. I think you had trouble getting in touch with him to discuss *The Gray Man*. So basically you wound up with me.

It's a pleasure.

Steve has been working non-stop. He did the most recent *Fast and Furious*, which I wasn't able to do because of a schedule conflict. But then we twisted his arm to leave that a couple days early to come join us on *Electric State*. He's been working two years straight and I think he had to take a couple of days off.

Sounds like you should be taking some time off for a well-deserved break as well, sitting on a beach somewhere.

One of these days. When the phone stops ringing, that's when I'll go to the beach.

Taylor Matheson, 1st AC on *The Gray Man*

Taylor called in from far away with additional comments.

There were 4 VENICE cameras on the main unit and 1 VENICE on the splinter/second unit, in Full Frame 6K 3:2 imager mode for a 2.39:1 release and recording X-OCN XT.

The second unit also had a RED KOMODO with an RF to PL lens mount adapter. This was used as a lightweight, handheld action camera.

Lenses were ZEISS Supreme Primes and Supreme Prime Radiance in focal lengths from 18 to 200mm.

There was a 14mm SIGMA FF High Speed Cine Lens.

Steve's personal 7Artisans 50mm F1.1 stills lens with an E-mount adapter provided certain shots with soft edges when wide open.

Chris Teague on *Only Murders in the Building*

Cinematographer Chris Teague. Photo by Craig Blankenhorn © Hulu.

Chris Teague graduated with a BA from Northeastern University and an MFA in Film from Columbia University. Being technical and having a background in photography, he ended up as the de facto DP, shooting some short films that played at Sundance. Credits include Russian Doll, Mrs. America, GLOW, Only Murders in the Building…

Jon: What camera was on *Only Murders in the Building*?

Chris: *Only Murders* is VENICE and the show I'm doing in London now is with VENICE 2. We also have a prototype VENICE 2 Rialto (being introduced officially in the first week of January 2023.)

Why did you choose VENICE?

I shot tests. But earlier, I shot *Mrs. America* on VENICE. I wasn't the lead DP on that, so I inherited the choices that had been made. But I really liked how it performed. That show had a period look; the blacks were lifted. It had a rougher kind of natural look. I was impressed because I would've never thought before that a Sony camera could of deliver that kind of look.

That opened me up to the opportunity of using it. For subsequent projects, I did my own tests and for this new show now.

My takeaway from testing is that I would have been happy with almost any of the recent cameras. They all look amazing. In this day and age, it's hard to go wrong. The tech is so good.

It wasn't a night and day difference; it was just little nuanced differences. It was in certain shots and certain skin tones where you felt like you just saw a broader range of color than you might necessarily see on other cameras. I thought the highlights held up well. Honestly, it's the 8 consecutive stops of internal NDs that make a massive difference with VENICE. It's funny. It seems like not a major factor, but when it comes to location shooting, it makes such a big difference.

What was your base ISO and how were you rating it to retain those highlights?

I shot *Only Murders* at the 2,500 base ISO and rated it at 2,500. I'm shooting the current show at the VENICE 2 camera's high base ISO of 3,200 and rating it at 3,200. I think it looks great, and I'm usually going to add grain to the image afterwards. It's a very subtle amount.

Typically on *Murders* I shot at a T2.8 with an ND.3 or sometimes an ND.6 all the time, even if I was on stage. Because in large format, if you go tighter than a 75mm, which I would try not to do, you get in a situation where the background becomes indistinct. And so I'd like to have an opportunity to at least give focus pullers another stop if we're doing an insert or something that's really fussy. Or if you need to go to high speed for something, it's very easy to just open up and change the settings. It jut gives you flexibility. I like doing it that way.

With the VENICE 2, I think being 8K is helpful because its higher resolution means the noise isn't quite as noticeable to me.

Do you find that the skin tones, contrary to what we expected

Chris Teague on *Only Murders in the Building*

Photo by Craig Blankenhorn © Hulu.

and heard (high resolution would give us more of a video look), that in fact 8K actually gives you smoother skin tones?

I have found that in general. I first noticed that when I was testing RED cameras and I remember testing the HELIUM sensor and liking what it did. The kind of oversampling that you got from shooting in 8K and coming down to 4K reminded me of the early days of digital still photography where I felt there was a threshold that got crossed with resolution and still photos started to look good at a certain point where the resolution got high enough. It was counterintuitive and it's like you said, it started to feel more like a real photograph, all of a sudden, and not a digital image.

What lenses did you have on *Only Murders in the Building*?

We used the Leitz Prime and Zoom lenses. I love those lenses.

They are beautiful. It's nice that production agreed.

I don't know how I got away with that. The zooms were very new when we started the first season. It was great that we could do large format with those two zooms (25-75mm and 55-125mm), which look amazing. I like that they open to T2.8 so you can get a really nice fall off, shallow depth field, wide open.

I would live on the two Leitz Zoom lenses a lot on that show, and then go to primes for specific shots. I liked the flexibility of avoiding lens changes, which never takes very long, but at certain times they just kind of break the momentum of shooting. Also when you have two cameras, going in or out a couple of

millimeters always helps to try to make those frames as good as they can be.

You probably use them more as "adjustable primes" than to see a zoom move in the shot?

Exactly. I love a good zoom. I'm a big Altman fan. I love a live zoom, but you need the right director to get behind that idea.

Do you operate yourself?

I don't. It's comedy and I almost always have two cameras running. I like to be able to have an eye on both frames. I've been fortunate to have worked with so many great operators. They're always elevating things. I feel I'm a pretty good communicator, setting the boundaries of what I'm after and letting them improve upon it.

Do you have your own station with two monitors?

For *Only Murders*, I wanted to be as small and mobile as possible. I was on a Sony 25-inch OLED, and I would put two images side by side or easily click between each one and make it full screen if I needed to get a really close look at things.

On season 1, I had a Matthews Monitor stand which has a small footprint. For season 2, my A-camera focus puller, Tim Trotman, built a tiny cart because he convinced me it had the same footprint. And then he custom-built a switcher with video game style buttons where I could switch between A and B, or I could do four images and ones if I wanted to. The entire cart was the

Chris Teague on *Only Murders in the Building*

width of the 25-inch OLED, so we could tuck it in anywhere.

We did not have a DIT on *Only Murders*. I tried to get one, but they just wouldn't allow it for budget.

On a half hour show it is tough to get a DIT. It has gotten to the point where I've compiled a document of things that a DIT does that I don't think producers know. Because they'll often say something like, "Well, why don't we have them on for three days, and they can help you set the look of the show and then they'll go away." But there's just so much more that they're keeping an eye on that you don't want to have to be keeping an eye on.

All that is to say there was no question of being near a DIT. I just tried to be as close to the director as I could and have a good monitor to look at so that I could hear their responses to how a take or rehearsal was going, and just be on top of making it better.

Your Leitz lenses have a nice smooth quality, even though they're high resolution, high MTF?

They're high resolution. They are quite sharp. But it's one of those things that I can never put into words, and I wish I could. You notice it most when you're testing lenses together where you have the Leitz lenses and you direct cut against other lenses, and suddenly that other lens just feels like the elements are made out of plastic or something. It feels to me there's a thinness to certain lenses that I can't really put my finger on. Whereas the Leitz lenses have a real roundness and jus a kind of creaminess to them that is hard for me to identify specifically, but I just really like it.

You had both Leitz zooms, and the whole set of Leitz primes?

Yes. Often A-camera would be on the 25-75mm. B-camera

would be on 55-125mm. We did Steadicam work and used the 29mm Leitz Prime a lot. The 29mm was great for us. And rarely would we go wider than that unless we needed to.

If you didn't have a DIT, how did you deal with LUTs, look and data?

Well, on the first season I worked with a colorist, Nat Jencks who is at PostWorks, formerly Technicolor. He and I have worked together for over a decade. We built a LUT together, and it was sort of a blend of two film emulation LUTs. One was a Vision 2 stock. The other one was an older Kodak stock he had found. It was 5248 EXR Color Negative (Tungsten EI 100).

But the thing I've learned with the film emulation LUTs is that you have to take the stock name or number with a grain of salt. You're probably not going to turn a digital camera into a Kodak stock. In a very literal sense, sometimes I'm watching tests and I see certain colors popping away and I think it really feels like Kodak to me. I don't know how or why, but it just kind of jumps out at me.

And there were definitely moments where that happened, but there were also moments where it felt like skin tones just went in a strange direction if you used too heavy of a LUT. So we ended up doing a blend where we tried to get the best of both characteristics for the different film emulation LUTs, and then obviously graded it as necessary. But we built one LUT and shot the whole show on it. And then in season 2, we had to move everything to LA, so Tim Vincent did the show at Picture Shop. He worked off the LUT that we had from season 1.

Chris Teague on *Only Murders in the Building*

Photos: Craig Blankenhorn © Hulu.

Chayse Irvin, ASC, CSC on *Blonde*
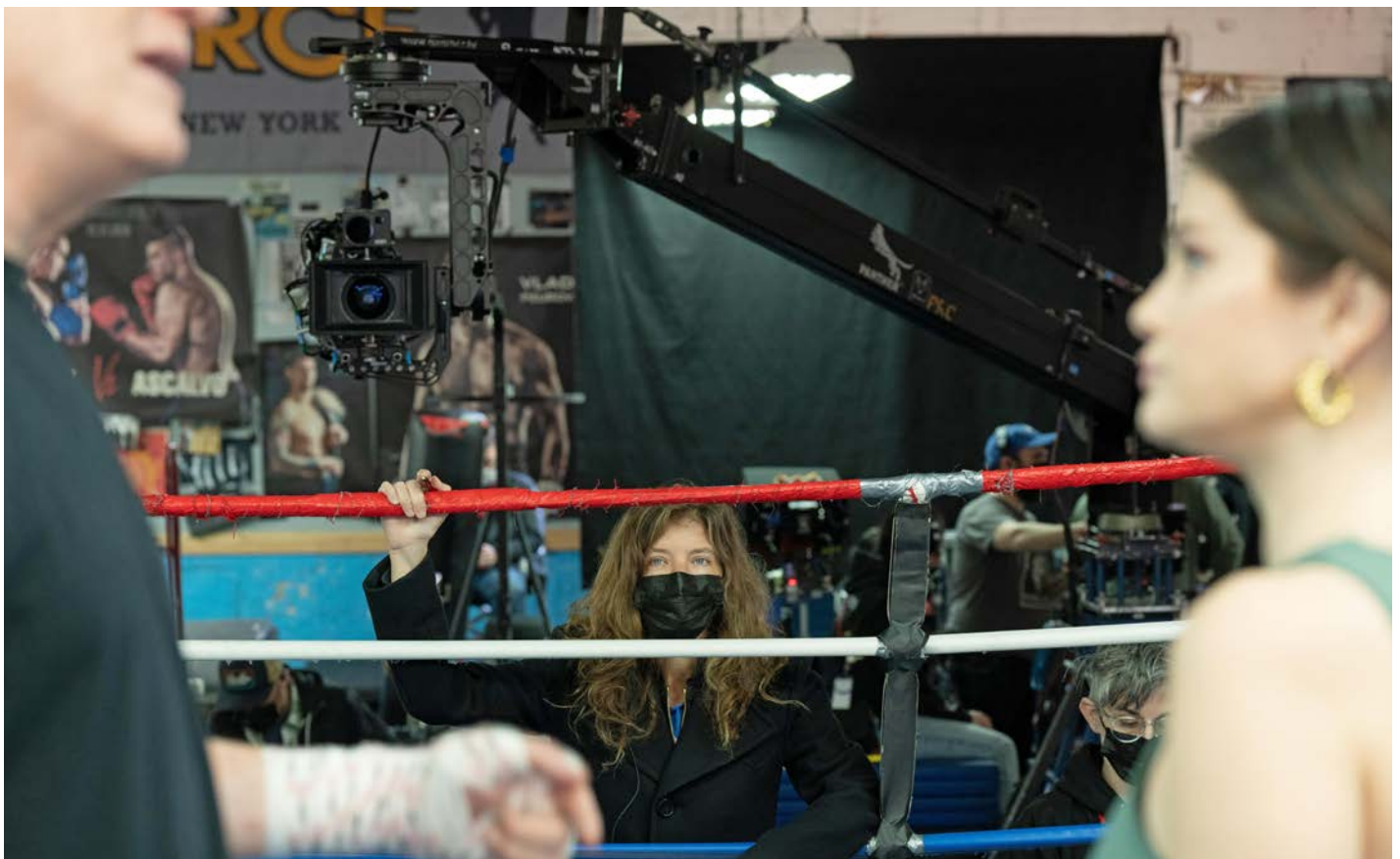
Cinematographer Chayse Irvin on Easyrig and Ana de Armas as Marilyn Monroe. Photo: Matt Kennedy. © 2022 Netflix Inc.

Chayse Irvin, ASC, CSC is a Canadian/American cinematographer. He shot commercials and shorts for Apple, Google, Gatorade, Heineken, Sephora, Samsung, Louis Vuitton and Ford. Feature credits include God's Creatures, Hannah, BlacKkKlansman.

Jon: On Blonde, you shot black & white and color. Please explain.

Chayse: We shot *Blonde* in 45 days, but it was actually done as a five or six-hour film. Andrew Dominik, the director, philosophically or as a device, tends to overload the schedule and creates a sense of chaos. In this way, he sees certain types of filmmaking, especially one where you're making a film that's relatively plotless, that really relies on acting. It's completely about character.

We shot two different systems. We shot the ARRI ALEXA XT (Super35) Monochrome and Sony VENICE.

Did you shoot VENICE in Super35 mode then?

Yes, originally we were in Super35 mode, but on some shots we were recreating images from Marilyn's life. Those shots were done in still photography 35mm format, which was the same as Full Frame 36 x 24 mm VENICE sensor mode. So when we were recreating those images, we went Full Frame.

We were recreating stills from her life and the VENICE in Full Frame emulated the image capture that would've been most likely at that time. We were shooting in almost entirely real locations that Marilyn had lived in. Fore example, there are shots in the film where she's at the top of a staircase waiting for Cass and Ed-

die and she's leaning against the wall. That's a photo from her life and I put the camera exactly where it was in that photo on the staircase and I was trying to find the right lens and the right tilt and so on. We captured the entire Full Frame but then indicated on the slate whether we were doing a Super 35 extraction and then EFILM would know that was what was being composed.

Interesting, different aspect ratios. What lenses did you use?

I had the Panavision PVintage Series because I had used them on *BlacKkKlansman* and other films. I augmented those with some specialty macros: a 90mm that I had for a lot of the portraits in the film, and a 50mm macro.

Dan Sasaki lent me an array of positive and negative elements from a zoom lens that Panavision had developed but did not release. I started taking these elements and put them in different angles in front of the macro lens. The image would distort vertically, and there are sequences in the film where I put the element on a fluid head and I tilted it in front of the macro and that's how you got these images of the father talking and his face would distort. It was motivated psychologically. Or when the mother, Gladys, drives her up the hill and there's ash falling in Hollywood.

The PVintage are Super35, but they covered Full Frame on the longer focal lengths?

Exactly. The widest lens we would use was 50mm on Full Frame, which was emulating a 32mm field of view in Super35. And then

L-R: Andrew Dominik (Director), Cody Jacobs (Gaffer), Ben Greaves (Boom Operator), Chayse Irvin (Cinematographer), Ana de Armas as Marilyn Monroe, Xavier Samuel as Cass Chaplin. Photo: Matt Kennedy. © 2022 Netflix Inc.

we did have some shots that were very, very wide angle, like the mounts that were on the limousine that she's driving while she's battling the demons of not really knowing her father. And that was an H-Series 12mm. Dan had given us a few wide angles that were H-Series Full Frame.

If the lenses were PVintage, I guess you had a Panavision mount on VENICE?

No, actually I requested PL mounts on all the lenses. So they PL-mounted all the PVintage lenses. Companies have been using all these different adapters to get all these different lenses to work. I find it a bit challenging having all these different mounts.

How did you choose the cameras?

I knew that the sense of spontaneity was going to be an element for Andrew. I saw that the internal NDs in the VENICE would help that. At the end of the day, it was difficult to perceive the differences in how the cameras looked, based off of the Pepsi Challenge of many cameras, and I chose to go with the VENICE because it fulfilled the needs that Netflix had. And then, I liked that it could do Super35 and Full Frame with the same camera.

Blonde reminded me of an experimental film.

Near the end of the shoot, Andrew and I were recreating an image from Marilyn's life and he just started laughing. I was standing next to him. I looked at him and asked, "What are you laughing at?" And he said, "Mate, we're making a $20 million art film."

Focus? Light Ranger?

Jimmy Ward, our focus puller, was using a Light Ranger 2. When we did *Blonde*, that was the first time I'd seen him using the LR2. By then he was an expert with it. It became quite useful in certain sequences because I was using the 90mm macro, which is a very difficult lens to pull focus on because it basically focuses to the very front element of the actual lens.

There's a graphic sequence with Marilyn and JFK, and I didn't really know how to shoot that scene because I had this need to protect Ana. We framed the scene and I set a slider with the 90mm macro and we just focused on her eyes as I was sliding back and forth on the slider. I think Jimmy was using the LR2 auto focus feature to support some of that, because I was panning around all over the place. Jimmy is not somebody who would rely on that often, but it would have been impossible to pull focus with the way I was moving the camera and how she was moving.

Jimmy knows how to use the Light Ranger like I've never seen before. It's really nice working with a focus puller whom you just trust completely. Any challenge that they come upon, they know exactly how to react to it intuitively. And in some scenes, I was shooting at T1. It was for this feeling that at any moment a catastrophe could happen.

What settings did you have on VENICE?

The VENICE was continuously set at 2,500, the high base ISO

rating. I also used the Cinefade as a variable ND filter. I purchased one and kept it on the camera for the whole film, pretty much. Even though VENICE has 8 stops of internal ND, I wanted something continuously variable so I could fade to black. The thing that excites me about that tool is basically to do Steadicam shots that were from a sun-lit room to a corridor and so on. I was able to continuously change exposure on the fly without adjusting the aperture, which I feel alters the point of view or the look of the "window" that the spectator's looking through.

I tried to keep it consistent and I used the variable ND to do that. Another reason why I like the Sony VENICE is because it's the combination of the Cinefade and the Sony together. Because of the high ISO, I could shoot it in that way and always have it on. Naturalism wasn't something that Andrew and I were attempting, so there are sequences where we wanted it to feel theatrical and have the lights dim out or dim up because they were motivated emotionally. And yet, we were using LiteGear LED technology. I have a very close relationship with the company and I've used them since they pretty much started. My mentor and gaffer, when I first moved to LA, was a gaffer named Jon Tower.

You had really beautiful, ivory skin tones.

That was the LUT that I've used kind of continuously throughout all my work. I have a little bit of background grading. I taught myself DaVinci Resolve and I also worked as a colorist for a while.

Were you operating? BTS stills show you with an Easyrig.

On this film, we had a Steadicam operator named Dana Morris. I operated almost everything else. We had two VENICE

cameras. It became an almost overwhelming amount of gear for how quickly we were moving.

Jimmy Ward said to us and the producers, "You should never be waiting on camera. If you're waiting on camera and if we want to work in a way that is right, we need another second." At the end of the first week we got a second second, Max. And Max was always responsible for rigging the cameras and having them ready. So if we changed to a Steadicam or this or that, or a mount, he already rigged it and had it ready. And then otherwise he was setting up the Cinefade to make sure that the lens was programmed correctly. The Cinefade was relatively new technology at the time and nobody else knew how to do it, so he became an expert.

The reason you had two cameras was not to shoot multiple cameras as much as to have them rigged and ready to go?

If it was a color scene, we would have a camera built for studio mode and another one built for Steadicam. But it became tricky in certain situations when we were doing color and black and white. It was very complicated. We joked about having T-shirts saying "I survived *Blonde*," because it was so crazy—we were changing aspect ratios, and cameras, not just by scene but by shots within the scene. And sometimes the aspect ratio is vertical. We were doing these things kind of at a whim and EFILM was trying to figure it all out. I have nothing but admiration for those guys, like Benny and Terry and Dave Grove. We were being cowboys and they were willing to ride with us. I don't think many others would have been so willing and I am really grateful for them. I'm trying to express how much more work went into this film.

Chayse Irvin, ASC, CSC on *Blonde*

Ana de Armas as
Marilyn Monroe in
Blonde.

Frames courtesy of
Netflix © 2022.

Arnau Valls Colomer, AEC on *The English*

Arnau Valls Colomer with Emily Blunt. © BBC Pictures. Photo: Diego López Calvín.

Arnau Valls Colomer, AEC attended ESCAC, the Barcelona Film School followed by a "stage" in Lodz, Poland which was basically a two year film program where you have a mentor and make your own program for the two years. It's a "stage" like a chef who goes to study in a restaurant.

Jon: Please tell me about *The English*.

Arnau: We had a meeting where we discussed how I might approach it. I suggested references to revisit, in a very classic way, the genre. I remember bringing up *Shane, True Grit, The Unforgiven*, and Sergio Leone. *Shane* was the film that really connected the director and me.

How would you describe that look of *Shane* and *The English*?

I thought of it as static, well-composed, waiting for the action, not looking for the action, an observational, distant look. You wait for the action to happen in your frame. I read the script and I didn't know if it was a classical homage to the Technicolor '50s films, or whether it was completely revisionist, because the script certainly takes a new approach to those stories in a completely different way. But, the director appreciated this very classical approach and we connected on that.

Did that influence your choice of camera and lenses?

For cameras, BBC and Amazon were recommending 4K. They never really pushed for it, but I could sense trouble if I didn't shoot 4K.

The best option was the Sony VENICE. I was skeptical at the beginning because I had thought of VENICE for more of an urban or night look, and this had a lot of day exteriors in the middle of the desert. But after the second week I was completely comfortable. That was my first big project with the VENICE and since then I've been using it a lot, actually.

Lenses—for sure I knew we wanted Panavision anamorphics. I wanted something solid, classic, where you don't see that much distortion at the edges and the lens is not too conspicuous. The Primo anamorphics were on my mind all the time. I was afraid of the size of the Primo anamorphics, but they were the only option available then, because we needed two full sets for three cameras. Basically the idea was "let's use the weight and size of the lens to establish even more our style." If there was any doubt in the beginning that the camera should be static, now it was a must. It was a way of forcing me to establish a dictionary or a grammar for the film. There were static shots, tripods, cranes or remote heads, but no Steadicam, no handheld, and no small rigs. We always had a 40mm lightweight prime, like a T Series or a G Series, for rig shots on horseback or the stagecoach, but the rest was done with two full sets of Primo anamorphics. And then we had like a 180mm E Series and the 42-42mm anamorphic zoom.

[Panavision notes: "Primo Anamorphic Prime lenses derive from a blend of Primo lenses matched to a modified version of the E series cylindrical lens layout. They have a maximum aperture of T2 and come in 35mm, 40mm, 50mm, 75mm, and 100mm. The Primo anamorphics are larger and heavier than any other series of Panavision anamorphic lenses and are not ideal for handheld or Steadicam applications. Used primarily as an 'A' lens for scenes with dollies and traditional studio set ups, the Primo Anamorphic Primes cut in well with the other Panavision anamorphic lenses."]

You were shooting in Super35 format on VENICE?

Super35 4K anamorphic 2x squeeze. We shot in Summer 2021.

Arnau Valls Colomer, AEC on *The English*

© BBC Pictures. Photos above: Diego López Calvín.

Why three cameras?

We had two VENICE cameras in regular mode and one VENICE in Rialto mode. We had two full camera crews, not three. But after the second week, we realized we wanted to shoot three cameras all the time. Since we decided that the camera was not moving, it was very easy to find different angles—all of them interesting. When I'm looking at the edit, it really makes a difference. There's a lot of dialogue and it has this dual feeling of a lot of angles of one same person that the director and the editor used very well as a style.

Did that make it more difficult for lighting for you?

I thought so, but at the end it didn't. It was challenging, but if the cameras are in the same area and facing the same direction, it's good. I never was crossing. So it was not that difficult and I enjoyed it. I was doing a lot of low, close angles. One camera would be over the shoulder and the other camera could be so close to the character that even this first over the shoulder was hitting the camera body.

Where did you shoot *The English*?

We shot in Spain. The story takes place as the main character arrives in Louisiana and travels to Nebraska. We were working from Castilla-La Mancha to Castilla-León. Castilla-La Mancha is the driest and represents the flat southern states. Castilla-León represents the more rocky, greener mountains. I never thought, when I read the script, that we would be in Spain. It's amazing how it works.

There a history of many westerns having been shot in Spain?

A lot of them. You tend to think of the famous Spaghetti West-erns. The Spaghettis and the Clint Eastwood movies were shot mainly in the south in Almería. But there are other regions around Madrid where westerns were shot as well; they were more B-movies. But a lot of films were shot there.

Did you have the houses and small towns built on location?

Yes. They were all built. It was not a huge set because this was at the end of 19th century, so the houses and villages were just starting to get built. We used that as a reason to make it simple. A lot of the cabin interiors were built in a studio in Madrid. Everything was in Spain.

Why did you shoot in Spain rather than the American West?

They did look at the US, but as a London based company, Spain was closer and logistically easier.

Who did the grading ?

Aidan Farrell at Picture Shop in London. I was lucky because I was shooting another film in London, so it was very easy for me to go in and out of the post facility do some tests, and go back. It was probably a two or three month period that we graded the series. Probably 10 or 15 sessions for me.

How many actual shooting days did you have?

We shot 90 days. It's six episodes, about three weeks for episode. Which is a little bit more than usual.

Please discuss LUTs and look.

On this show, we worked with ACES. I did some testing and at the end we chose the ACES workflow, just applying a small LUT in the viewfinder.

Arnau Valls Colomer, AEC on *The English*

Arnau: "Exteriors were backlit with Dino lights with Tungsten PAR 64 spotlights and bounce on her face. Sometimes, it was a 12K or 18K through diffusion. The exterior closeups were usually at a T2.8 ½. Wide shots were at T5.6 or T8." © BBC Pictures. Photos: Diego López Calvín.

Framegrab, above. Arnau: "We also had a set of wide spherical Primos—14, 17.5, 21 and 25 mm. This is probably a 14mm spherical Primo. We did that to go really wide and to to avoid distortion on the horizon line.

Arnau Valls Colomer, AEC on *The English*

I always work with the DIT on the monitoring. Normally, on every scene, I would do a small touch of contrast or color, but I always have this film mentality: only go either more blue or more yellow, or more magenta or green, or more cyan or red. Or you go a little bit darker or a little bit lighter, and I was trying not to adjust contrast. And then in grading, we worked hard to find the color of the skies and good skin colors. There's a classic grading that they use on many blockbusters where it's orange in the faces and blue in the background. Translated from Spanish, it's "Teal and orange."

There are a lot of moments where they are in the middle of the desert under the stars, and they're talking about the stars. I wanted to have the night feeling of the desert, of seeing everything to the very end of the horizon line. But I wanted to have the actors' faces under the starlight effect that makes it believable for the audience.

We decided to have a big set built in the studio where you have a 20 meters by 30 meters area of ground—earth and grass—and then have a large blue screen background for the night sky and stars. The background included plates and that we shot day-for-night, and the stars were added in post.

Carlos Caba, DIT:
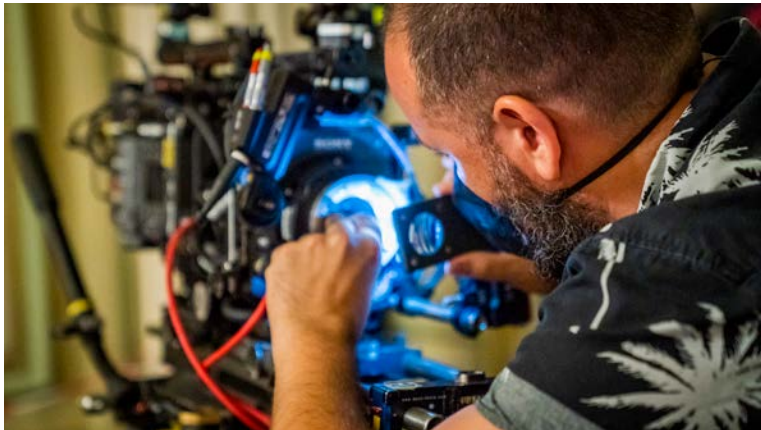
I work with *Why On Set,* a big Spanish on-set and near-set company and I configure my DIT Station depending of the project. On *The English*, we ran LiveGrain, so I chose a Mac Pro 12-core. We also used LiveGrade, distributing the signal with a Blackmagic 16x16 Videohub. There were two 24" OLED monitors on my cart. In addition, there was an Oddysey 7Q+ which used to see a 3rd camera, if we need to have all 3 in view, and to use its exposure tools. I have a Tangent element for grading color, and a RAID with 42 TB capacity.

For dailies, I did all color grading in DaVinci Resolve, using CDLs from LiveGrade, and gave DRX files to my data wrangler. So, she only had to apply the color corrections I did, and then sent the Davinci project to the Lab (Deluxe Madrid) and they rendered the footage and uploaded it to editorial.

On this project we had the great video operator, Igor Andrés. He and his team managed the Teradek Bolts and video. The signal went from cameras to video village via Teradek. Video went from his video assist station to me via BNC, and I sent back the image with the color grading and grain applied. In this way, we made sure that he could always have video even if my DIT station was not operational at that time.

The director wanted to be as close as possible to set, so he had two 13" monitors on a tripod and video was switched when we were using 3 cameras. Arnau was with me at my DIT Station.

Files from VENICE were X-OCN XT always. We set the cameras to 4K 6:5 2x anamorphic squeeze, with cropping between 5% and 15% to avoid vignetting in some situations. Aidan Farrell prepared LUTs for the show, and we mainly used 3 of them: Day EXT, Night, and Day for Night. LUTs were very useful for working on set. We had them both at my DIT station and loaded in camera. So, if the cameras had to be in a place where we couldn't move the DIT cart, or it was a splinter unit, they could see the same LUTS that we were working with.

Dolores Sáiz, my data wrangler, used a DIT station pretty similar to mine: 1 Mac Pro 12-core, 1 OLED 24" monitor, 2 RAIDs configured in RAID 5 and 1 SSD RAID, configured in RAID 0 as a shuttle. Both of them were encrypted. She made 3 copies directly from the card, MD5 checksum, and waited for the lab to email the next day confirming LTO backup before reusing those cards. One RAID 5 copy was sent to Postproduction after shooting.

Dolores prepared the Davinci Resolve project, ingested all the metadata from Silverstack, applied my color grade, and adjusted by shots if necessary. She did sound backup too. After that, she exported DIT, Camera and Sound Reports. At the end of the day, she sent the shuttle drive to lab. The shuttles contained all the footage, sound, Davinci Resolve project, and all the reports.

Aidan Farrell, Senior Colorist at Picture Shop:

What we were referencing essentially was more of an homage to the Technicolor cinematographers and directors. I did *Downton Abbey*, and especially from series 1, you're trying to create the look of the early 1900s. What they were trying to do on *The English* was to be faithful to the look of the 19th century, with costume, makeup, hair and design. However, I was trying to emulate films set in that 19th century era, but that were captured in the fifties and sixties by these Technicolor cameras. So, in a way, it's a look within a look. That was the fascinating thing.

The process of creating LUTs was done as Arnau would film locations and bits of sets that were in the process of being built. He wanted to make sure that the texture of the wood, for example, was looking real and old. He did tests for makeup, hair, costume. Incredible amounts of testing.

Evidently, it's shot on Sony VENICE. We knew we wanted lots of color, but we also had a stopping point. So, it never looked overly saturated. It just looked real, yet it looked like it just came out of the can, like a film print.

Then we decided how we could take these fantastic Sony VENICE images and make them less sharp, less modern. We used LiveGrain. The principle is that every time I tweak color, saturation, hue, brightness, or contrast, etc., that LiveGrain sits at the very end and changes. LiveGrain, in a way, is another level because every time I change something the grain structure changes. It's like my film days years ago where you had a negative and you're making a print. Depending on how dense that negative was, the grain structure on the print would change."

Jonny Mass, Director and Pete Konczal, DP on *Cowboy Currency*

L-R: Pete Konczal and Jonny Mass.

Jonny Mass is represented by RSA Films. He grew up in Arizona, started a successful YouTube channel, and has directed projects for BMW, Porsche, Toyota, Hyundai, Facebook, Kia and others. He writes, directs, shoots, edits and does post production.

Pete Konczal was in college and knew he wanted to be a cinematographer after watching Wild Strawberries. *His first camera was an Aaton LTR. Credits include* House of Cards, Art in the Twenty-First Century, *music videos, shorts and commercials.*

Jon: How did *Cowboy Currency* happen? You were one of the first to use a VENICE 2.

Jonny Mass: I figured it was just a cool time to do a Western, with a fresh take on it. I approached Pete with this idea, because I was just itching to do a personal project. I do maybe one every year, or one every other year, depending upon the scale of it. The scale of this project was pretty ridiculous. It was a 100 person crew.

To borrow a line from the movie, Pete, what kind of DP are you?

Pete Konczal: I'm not sure if anybody's ever asked me that specific question. I'd say, flexible. I like different projects. Johnny and I met doing a car commercial and we've always talked about doing more narrative work. When he brought this project up to me in the fall, I thought how fun it would be to just step into a different world. I saw that he was looking for an arc in the storyline of his commercials, and I saw how he always tried to apply narrative principles to that. It was great to walk into a different genre and do something completely different.

How did you choose the equipment?

Pete: I'd come off working on *Fargo* with another camera. *Fargo* was nominated for an ASC Award for one of the episodes. In that process, Jon Joffin had written to me and said how he liked the work. We were talking a week later and he mentioned that he was doing some shows with the VENICE and liked it. Then he was saying how excited he was about the VENICE 2.

Jonny had good experiences with the original VENICE and knew there weren't that many new VENICE 2 cameras available at the time we wanted to shoot. I was intrigued by the higher dual ISO ranges to 800 and 3,200 and that it's an 8K camera. The purpose was to really put the camera to the test.

I called Dennis McDonald at Keslow to ask if we could get a VENICE 2 along with the lens package. He got us in touch with Dan Perry at Sony, who responded immediately after he saw Jonny's treatment. The next thing we knew, we were off to the races.

You were lucky to get a VENICE 2. There were maybe only six of them in the entire country at that time.

Pete: We heard that Claudia Miranda had two of them on a movie he was doing about Diana Nyad.

Where were the locations?

Jonny: Santa Fe, New Mexico. We flew into Albuquerque and hauled all the gear to Santa Fe. We had some trucks and Sprinter vans bringing in stuff from LA. Then we shot in Lamy, New

Jonny Mass, Director and Pete Konczal, DP on *Cowboy Currency*

Mexico. It was Tom Ford's old ranch about 35 minutes outside of Santa Fe. I guess he had this crazy 30,000 acre property that he recently sold to a private buyer. The manager of the ranch, Clint, had been trying to inspire movie crews to come out there and shoot, because their town is really beautiful. Right before they sold the property, I think one of the last films was *The Harder they Fall* for Netflix.

Colors and skin tones?

Pete: One of the things that we liked were the colors and layers of color, for example red in the actors' shirts and the warmth in the air. The skin tones impressed me on this camera as well. I was a little scared when I heard 8K. But then I actually think it's smoother looking in this resolution.

Were you shooting Full Frame? What lenses?

Pete: We were shooting Super35 anamorphic with the VENICE 2 5.8K 6:5 imager mode. We had V-Lite 2x squeeze anamorphic lenses.

Jonny: Those flares add some secret sauce, the way they are hitting every single highlight. Why has it been such a thing, so often, even on commercials, where they're like, "Oh, hide the flare." The flare makes it look like it's the chef's kiss.

Pete: We talked about wanting to get different looks and Johnny said, "I just want this to be a higher sun, hotter look. You don't always want to shoot everything at sunrise and sunset." It's nice, again, how smooth the roll off and gradations work in the high

sun as well.

Dynamic range?

Pete: VENICE 2 8K has more exposure latitude than the orignal VENICE or VENICE 2 6K. That was my second takeaway after the skin tones. We shot the scenes of the cowboys riding on the ridge with full-on sun. I was amazed by the detail that we were maintaining in the highlights in the sky.

Those shots with the horses on the ridge have a pretty high contrast look, with beautiful gradation. Another test of a camera for me is how the detail feels in the darker shadows. You know what you can do and how you can roll that off in the grading. We talked a lot about the highlights, but I thought it was great working on the low side of the camera as well.

LUTs?

Pete: Our DIT, Patrick Evans, spent a lot of time at Sony talking to them, checking the camera and playing with color and LUTs. We tried to create something like a Kodachrome reversal film look. We tested a few LUTs and then came to the one we loved.

Internal NDs?

Jonny: Every DP will say that the 8 single stops of NDs are just phenomenal. As a director, I don't touch them, but I always notice they just make quick little changes. It's so much faster than pulling filters in and out of the Mattebox. And you don't have to worry about slight color shifts from regular mattebox ND filters. Your continuity is always there.

Jonny Mass, Director and Pete Konczal, DP on *Cowboy Currency*

Jon Chema, Cinematographer

Jon Chema with VENICE 2 on Easyrig on short film *Lamento*, directed by Diego Contreras. Photo: Rodrigo Calderon.

VENICE 1 in Rialto mode in foreground; VENICE 2 handheld in background. 1st AC Ben Steen at right.

Born in Flint, Michigan, Jon Chema fell into the film industry after interning, camera assisting, working at a rental house and shooting commercials and music videos in Nashville, Tennessee. After living in New York and LA, he jokes that he currently "lives on an airplane" working on productions in the U.S., Latin America and Europe. Jon is a member of ICG (International Cinematographers Guild).

Jon Fauer: I understand you own a VENICE 2 and other equipment. Rhetorical question—why?

Jon Chema: I purchased the Venice 2 in June 2022. I own equipment for three reasons: the gear makes my life easier on set; it is equipment that I actually use on my jobs; and it provides additional cash flow. As a freelancer, income often resembles that of a roller coaster with many highs and lows. Having passive income or "mailbox" money has been a great way for me to soften the blow of those low points and has allowed me to be more selective with the work I do.

Do you consign your equipment?

I consign my gear with rental houses to avoid the conflict of interest being an owner/operator and having to negotiate rental rates. I don't want to be tempted to use only the gear that I own. I approach each project based on the visuals, the story or the style. Sometimes it's a sharp clinical feel, sometimes super low contrast with a lot of lens flares. I think it's important not to force yourself to use equipment simply because you own it.

Discuss the logistics of owning equipment.

Owning equipment often keeps me up at night. The headache is knowing how to "time the market"—when to buy and when to sell your equipment. Cameras have a rental life and you're usually looking at having to sell them after 3-4 years to purchase the next, latest and greatest model that people will want to rent. Lenses are less volatile but are a much larger initial investment and therefore take longer to break even. I'd be foolish to say there isn't a lot of risk involved.

What monitors and wireless systems do you use?

SmallHD Cine 7" for studio mode and SmallHD Ultra 5" for handheld operating or tight spaces such as car interiors. I usually let my assistants handle all things wireless, however I'll often insist on the highest range Teradek to eliminate any interference or picture interruptions. I've had a lot of luck lately with the new Bolt 6 system that operates on the fairly uncluttered 6 GHz channels.

Favorites lenses with your VENICE 2?

My top five lens series begin with Olympus OM primes. I shot The Weeknd's *Gasoline*, Lenny Kravitz's Cadillac *Celestiq* spot, Travis Scott x Future x Southside's *Hold that Heat*, *The Present* (feature), and *Lamento* (a short in Guatemala).

Rehoused K-35s. They're a great low contrast, low-fi lens option that has the most beautiful flares. For example: Doja Cat's *Streets*, Chris Brown x Wiz Kid's *Call me Every Day*, (Apple Music spot), and a Martell cognac spot featuring Janelle Monae.

Super Speeds. They're tiny, lightweight, affordable, have great contrast and beautiful but subtle lens flares. I've used them often, including on Nao's *Make It Out Alive*, and a SuperShe spot.

Master Primes. My favorite lenses when shooting on 35mm film or when I want subtle lens flares, color consistency, minimal edge warp, high contrast, and smooth round bokeh. They are sharp wide open. Examples: The Weeknd's *In Your Eyes*, H.E.R.'s Amazon Prime Day spot and a Square spot.

Panavision T-series. My favorite anamorphic primes. A nice mix of ergonomics and smooth bokeh that draw your attention to center of frame, with consistent, healthy contrast, and a flare that's subtle but pretty when it hits.

Signature Primes. I had them on Peloton's Row, Blue Moon, Michelob, and a Beam Planet music video. I own a set of Signature Primes. I love these lenses. Although they aren't right for every project, they are my "desert island" lenses. If I had only one set of lenses, I would shoot 80% of my projects with them. They have great color balance, amazing bokeh that smear and distort towards the outer edge, are flattering on skin, cover Full Frame

Jon Chema, Cinematographer

Frame from short film *Lamento*, in Guatemala.
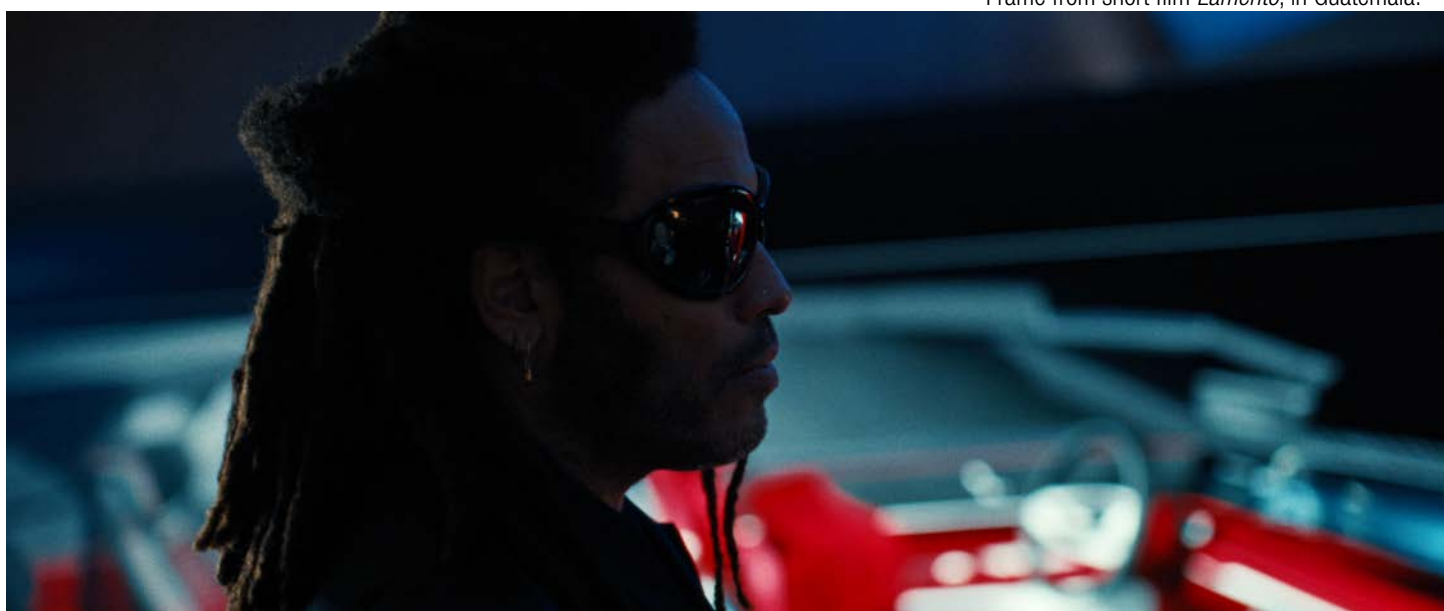
Above and below: Cadillac *Celestiq* spot featuring Lenny Kravitz.

Jon Chema, Cinematographer

Jon Chema on *Lamento* in Guatemala. Photo: Rodrigo Calderon.

and Super35. They are super lightweight and easy for our camera assistants to use. I do much of my "filtration" and "character-building" in-camera with lighting, atmosphere, and collaboration with the art department and at the DIT cart. Signatures are everything I liked about Master Primes and improved upon.

Discuss your recent Guatemala short with VENICE 2.

I recently shot a short film in Guatemala with director Diego Contreras and a Guatemalan artist named Gaby Moreno. We'd wake up, load a boat with equipment, head to our location, shoot, and return by boat. This happened twice a day. It was physically grueling. I needed a camera system that was super quick and easy to use in the field. The VENICE 2 with super lightweight Olympus OM primes were excellent choices to capture the remote beauty of the area where we were shooting in Guatemala.

Specifically, the things that saved a lot of time were the dual base ISO, the full range of ND filters built into the camera, and the ability to switch from Full Frame to Super35 by simply changing a setting. This allowed my camera assistant James Teninty to simply focus on pulling focus, swapping media, and keeping the camera running with fresh batteries. It eliminated having to deal with filter swaps—which in the humid, sandy, salt air environment would have been tough.

Also the efficient X-OCN codec on the camera allowed us to keep our daily card count low and the compact camera size allowed our Steadicam operator Andrew Ansnick and me, work-

ing on an Easyrig, to do long takes without killing our backs. All of that, coupled with 16 stops of latitude and the incredible color science that I've grown to love, really made it the right camera for the job.

Talk about using Easyrig with the VENICE 2.

I have an Easyrig Vario 5 with ball and socket mount. I don't always use it when operating handheld but for long, extended takes, low mode, or other awkward operating angles, it's fairly essential. The new ball and socket quick release marries the simplicity of using a frog clamp with the low profile of the original spring clamp assembly. It's great when trying to move quickly and allows me to unhook the camera without the need for an extra hand nearby to hold the weight while releasing the tension.

Discuss your Workflow with VENICE 2.

I usually capture at the camera's highest codec to eke every ounce of the color science out of the camera. X-OCN XT is remarkable with how efficient the codec is, especially considering it crams 16-bit color information into a lossless RAW file that takes up less space than say Apple Pro Res XQ.

Based on my testing and banter with several working colorists and DITs, I find that X-OCN XT holds up much better when you push it in the grade. Specifically this occurs when dealing with super saturated light sources, harsh highlights, or crazy graduations of contrast or color in a scene. I shoot it that way as much as possible.

Jon Chema, Cinematographer

Above left: On Swing Head with Olympus OM primes rehoused by Zero Optik on *The Present*.
L-R: camera operator Connor O'Brien, DP Jon Chema, director Christian Ditter.
Above, right: Jon Chema handheld with VENICE 2.

LUTs?

I'll use one of several LUTs that I've created with some of my favorite colorists and dial the image as close as possible in camera. I've found that I really like the base 500 or 800 setting and cranking up the ISO 1 or 2 steps to introduce a subtle bit of grain/noise and raise my highlight latitude a stop. Next, I'll usually let my DIT do mild on-set live grading to further refine the image. I don't ever want to push the image too far in the grade as I'm a purist and believe wholeheartedly that it should be dialed in as close as possible in camera to get the most natural looking imagery.

After the live grade on set, I'll usually ask our DIT to polish it one step further. This happens before transcoding dailies. It usually involves applying subtle or medium film grain and/or film style halation. I try to bake as much of this as possible, and as the executives allow, so the client/agency/studio see dailies as we envisioned the shot to look like. From that point, the colorist grades the image with subtle power windows and secondaries. Again, I try and dial everything in as close as possible in camera.

Working with the colorist.

While shooting a recent film *The Present*, I worked with colorist Mikey Rossiter at Rare Medium and DIT Isaac Guy to create and refine a shooting LUT that accurately resembled Kodak 5213 (200T) film stock. I have always loved the look of this film, its shadow curve, rich blacks and rendition of color. I shot the same scene with several rolls of 5213 in an ARRICAM LT alongside the VENICE 2. My camera assistant Ben Steen and I shot several lighting setups in various corners of our sets for the movie to get a wide range of shooting scenarios to build the LUT.

From there, Mikey matched the VENICE 2 LUT to the film

stock and then we proceeded to an official camera test with the cast in a very controlled studio environment under controlled lighting to see how the LUT behaved. We also brought out the ARRICAM LT again and shot additional rolls of 5213 in a side by side configuration. We found that the LUT was rendering things too magenta, so we dialed that out as well as some other weird anomalies that were happening. The final, third revision occurred after our first week of principle photography on the film. Mikey and I sat down with various clips that Isaac had sent over and we further tweaked the LUT. In fact, I'm so happy with the result that it has become my benchmark LUT for pretty much all other short form projects.

Recently, I have been using the FilmBox Plugin by Video Village. It is a plug-in for DaVinci Resolve. It allows a very impressive replication of film grain, halation and gate weave. Although it's not the same as capturing on motion picture negative, it's pretty close. I've been using it as a great tool to add a subtle amount of film magic to the transcodes on set. It's a great way to communicate to the colorist/agency/studio what my intention for the look of the piece should feel like. *videovillage.co/filmbox/*

Filters?

My usual go-to filter is the Tiffen Glimmerglass in its subtle strengths of ⅛ or ¼. I find that it does the right amount of taking any sort of digital edge of the image without feeling too bloomy or artificial.

What's next?

I just wrapped up a few commercials in Europe and am off to start shooting a series in Atlanta.

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sekonic.com
shapewlb.com
vocas.com

Rental Houses
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cinediving.com
www.hd-systems.biz
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servicevision.es
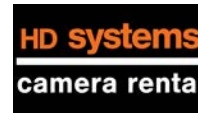storyline.no

Media Partners
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