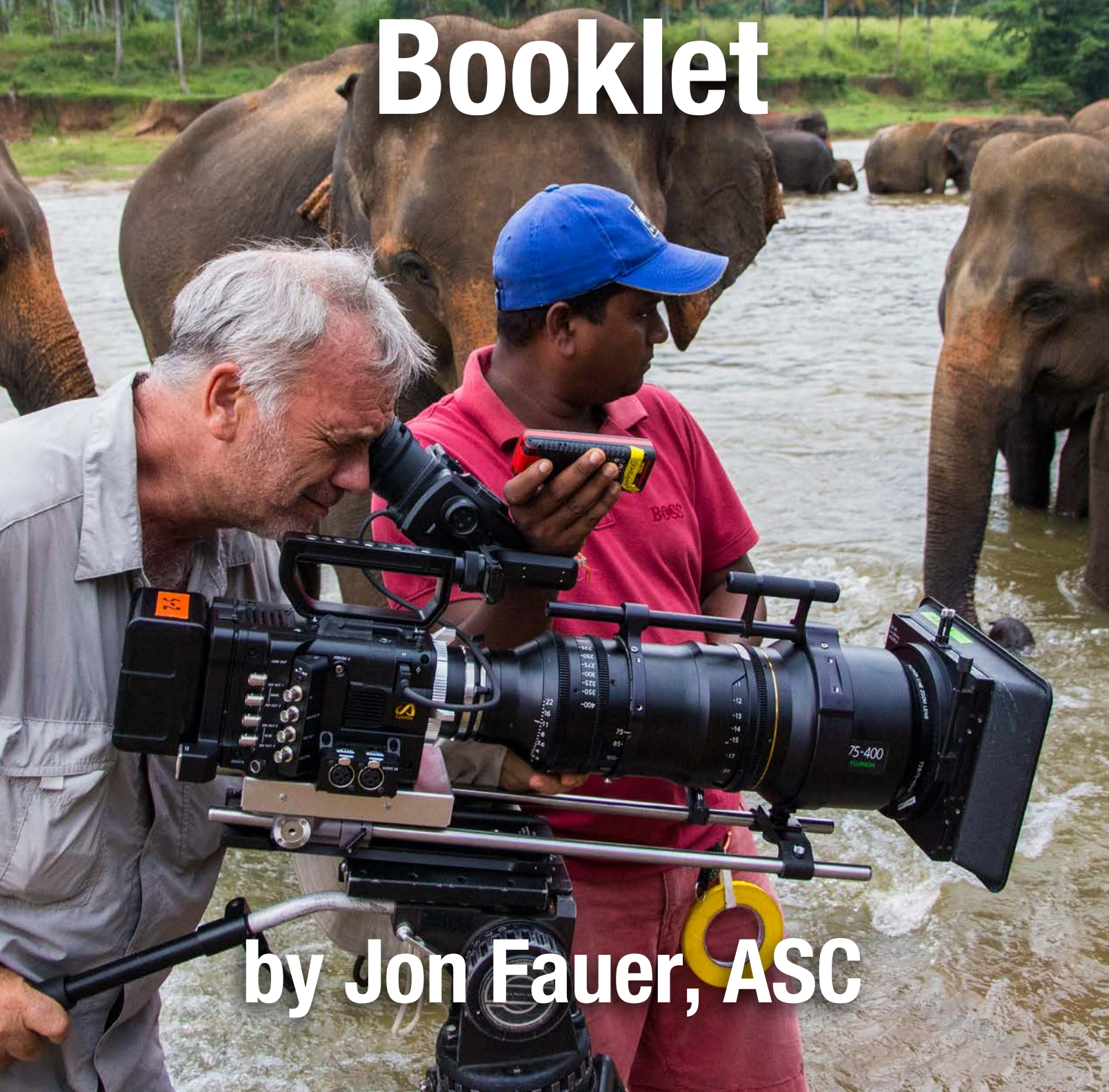


# FILM AND DIGITAL TIMES

Special Report - Updated Feb 28, 2013

## SONY F5 and F55 Booklet



by Jon Fauer, ASC







# SONY F5 and F55 Booklet

by Jon Fauer, ASC

Updated Feb 28, 2013. Includes Sony v1.0 – 1.4 upgrades

the adventure will continue in our Sony F5 and F55 Book

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# SONY F5 and F55 Camera Views



Camera Right  
with Audio and Timecode  
Modules attached



Front view with PL to FZ Adapter





Camera Left  
with 3.5" LCD  
Viewfinder attached



Rear view with Olivine Battery

## Art, Technique and Technology

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

It's written, edited, and published by Jon Fauer, ASC, an award-winning Cinematographer, Director, and author of 14 bestselling books (over 120,000 in print—famous for their user-friendly way of explaining things as if you were right there on location with him). With inside-the-industry “secrets-of-the-pros” information, *Film and Digital Times* is delivered by subscription or invitation, online or on paper. Film and Digital Times doesn't take ads and is supported by readers and sponsors. [www.fdtimes.com](http://www.fdtimes.com)

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by Jon Fauer, ASC

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This Special Report is a work in progress. It began as a stop-the-presses effort when a pre-production Sony F55 camera landed here a few weeks before its big launch event in Los Angeles. Since I have been accused of never having seen a camera I didn't dissect and discuss, this booklet was inevitable but challenging. It was still a prototype and specs were changing faster than words could stick.

My thanks to the enthusiastic team at Sony who helped make this booklet possible, through many time zones, late into the night and sometimes all night in Tokyo, London, Paris, LA, and New York. Special thanks to Stargate Studios, Sam Nicholson, and all involved.

In the first edition, we tried to ensure that facts and figures were accurate up to the printing date, November 19, 2012. This update attempts to update things as of Feb 1, 2013.

Please note that I do not work for Sony and this Film and Digital Times Special Report is not an official Sony document; some have called it “The Unofficial Biography of the F5 and F55 at its launch.” Since the specter of typos and errors lurk, please confirm any doubt, test everything yourself, and remember we are not responsible for loss or damage caused by unwavering faith in the accuracy of our text and pictures.

Also: Please check the appendix on pages 94-95 to see what and when things may or may not be enabled. But, since it is possible that some of the functions and features of the cameras will not stick to this schedule, please look at the Sony website for confirmed specifications and updates.

Cover: Sam Nicholson with Sony F55 in Sri Lanka on “Mahout.”  
Photo courtesy Stargate Studios.

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# The Big Picture

*Jon Fauer spoke to Alec Shapiro, President of Sony Professional Solutions of America, about the launch of the new F5 and F55 cameras, 4K, and the big picture.*

**JON FAUER: Alec, can you give me a little background on how and why this project started and how it evolved?**

ALEC SHAPIRO: Sony is the world's largest image sensor manufacturer and we clearly see it as part of our DNA to lead the 4K evolution. Not just on the professional side, but on the consumer side as well—as evidenced by the 84 inch 4K TV that we've introduced. People who have seen it are very excited.

Major motion pictures shot with the F65 will be released this spring and summer. I think everyone will be excited to see the results. But the overall price of the F65 may have been a little bit high for television production. We have always felt that prime time television is a Sony domain starting many years ago with the F900, and moving to the F23 and F35. Sony cameras were used to shoot quite a few shows. So, we wanted to get back our leadership position in that part of the market.

We also had the F3, introduced almost two years ago. It was a very successful camera for us. We sold over 2000 of those cameras just in the US alone, and world wide it was an even larger success. So it's time for a next model to follow the F3. We had a big gap to fill in our product line between the F3 and the F65, which is where we've positioned the F5 and F55: smaller, high performing 4K cameras that we can deliver to the market at great price-performance positions.

**Were you working on this simultaneously or after the F65?**

The design of the F5/F55 started after the F65—it was a couple of years ago.

**Besides TV and features, what other markets do you think these cameras will attract?**

I think you may find a lot of areas never even dreamed of for a large sensor camera. Higher quality magazine type shows, sports, news, documentaries, weddings, events, business, corporate applications, fashion shows, food shows, medical. Basically, any type of a production where you're looking for the best possible color reproduction and higher resolution would be very applicable for the F5 or the F55.

What's also interesting to watch is how the marketplace changes. Professional sports coverage is now starting to discover 35mm format lenses. While we've been thinking about large sensor cameras with more traditional 2/3" type lenses, it seems that there's a growing interest in trying to apply cinema style lenses to live sports events.

Cameras like the F55 and the F5 are actually going to find homes in markets that have been previously dominated by HD with 1/2" and 2/3" lenses.

**How do you and your team go out and sell these cameras in a market that some have said may be saturated?**

Well, lucky it is not up to me. It is the market that drives us and determines our success. We're counting on program producers to realize they can either purchase or rent one of these cameras for the same price or probably less than competitive 2K cameras and can wind up with a future-proofed 4K master. Even if the program is initially distributed in 2K, they're going to find it very worthwhile to make a switch.

Television programs, for example, rarely make money on their first run. Most of the money is made in syndication. So if the show runs for three or four seasons, that's when the profits kick in. And wouldn't it be great to have a 4K master for syndication when there will be 4K distribution to the home.

There will soon be a population of 4K TVs in homes and that will drive the market. The need for 4K program production is here, today and it goes well beyond motion pictures. Anyone visiting CES this year will quickly see that the consumer television market is significantly going up-

scale in resolution. Whether you call it 4K, UHD, or 4K UHD, it's 3840 x 2160 resolution and it is going to become pretty much standard in consumer television.

**How soon do you think we're going to see these in the home?**

I think you're going to see them beginning as early January or February 2013, and definitely by next holiday season. Sony will begin deliveries of our 84 inch TV at the end of this month.

**Another tough question. What do you tell rental house owners who say, "Cameras are coming out faster and faster, and every year we have to buy a new one?"**

My answer to that is no one has ever been able to stop technology. It presents us with issues as well. We would very much like to enjoy at least two good years of sales for a camera, at minimum. I think that 2013 will be the year of F5 and F55, but I don't expect our competitors to lie down and allow us to enjoy two years plus of profitable sales and growing market share.

**Let's say you guys open a rental house. Shapiro & Shapiro Rentals. How do you compete?**

We would need a whole lot more than cameras. It's not just about the camera. Good rental houses bring much more to the table. Their greatest assets are their expertise and service support as well as their lenses, camera accessories, and everything DPs need to express their creative skills. It's about the support they can give to a total production. The camera is just a piece in the overall puzzle.

**Can we talk a little bit more about your bullishness on 4K? Others disagree.**

There are two different drivers here. What's very easy to see is the consumer market, which is ultimately where entertainment programs wind up, whether they're distributed by satellite, cable, Internet or Blu-Ray. Consumers demand the best performance they possibly can get in their home, especially on their main screen. Whether it's a home theatre or the TV, they view programs on daily.

They want larger screens with great video and sound quality, and manufacturers can deliver these bigger screens, thinner and lighter than ever. The new 84 inch Sony TV is a perfect example. Whether you're looking at 4K content, 2K content or 3D content with passive glasses, this TV is a fantastic viewing experience. It is far better than what I'm watching now on my 46 inch Sony XBR, which I thought was the greatest when I bought it. Everybody wants the bigger screen sizes, even if it requires a little home construction! And as you go bigger in screen sizes, that's where you definitely want the 4K resolution.

**Where does that leave the movie theatres? How are you going to get people out of their homes with their 84 inch TV sets into a really great 4K movie theatre?**

Movie theatres always offer a different, premium entertainment experience. They are also a social experience. It's a place we can get away from the kids, or where the kids can get away from me. It is a place to escape to, to take you some place or somewhere in time that you've never been.

It's tough to compete with the big screen surround sound of quality cinemas like the AMC and Regal theaters that feature Sony 4K SXRD Digital Cinema systems and deliver the ultimate entertainment experiences.

Last but not least, more affordable, higher quality cameras like the F5 and F55 put incredibly powerful production tools into the hands of many more creative filmmakers so, when you go to the movie theatre there is going to be more creative content delivered with more consistency and a higher degree of quality. I think all filmmakers will go completely crazy over the F55 as it will be affordable enough for many of them to own and even easier to rent.

# Two Cameras, No Waiting

## Sony F55 and F5

The pace of camera design, re-design, and release quickens. Lighter, smaller, faster, sooner. More K, more speed, better ergonomics, promising pictures.

Sony launches two new 35mm digital motion picture cameras: F55 and F5. Cameras ship in February 2013.

Some have called the F55 a companion to the F65, and the F5 an upgrade beyond F3. Many will call them Sony's most thoughtful cameras yet — their first comfortably shoulder-resting, modular, compact 4K cameras.

The F55 and F5 are thin—not much wider than a prime lens.

The cameras are modular and highly configurable.

They look similar on the outside, with one distinctive difference.

The FZ mount on the F55 is silver and on the F5 it's black.

PL lenses attach with a PL to FZ mount adapter.

(More on mounts later.)

The big differences are inside.



SONY F5 Camera has a black FZ lens mount

## F5



# Version Upgrades

Please see the Appendix at the end of this booklet to see the features available when the camera ships and when version upgrades become available. Most of the upgrades involve maximum frame rates (fps).

## How do you tell them apart?

- F5 has a black FZ mount.
- F55 has a silver FZ mount.

Both cameras are shown here with the PL to FZ mount adapter that comes with each camera.



F55

SONY F55 Camera has a silver FZ lens mount

PL to FZ mount adapter

# What's Different? What's the Same?

## Main Differences

The F55 is the more expensive, feature-rich sibling. The comparison of features makes the head spin. Here's the two-sentence pitch of differences:

- Get the F55 if you want to record 4K, 2K or HD internally to SxS Pro+ Cards, have electronic frame image scan, and have the same type of color filter array technology used in Sony's F65
- Get the F5 if you want to save money, record 2K or HD internally to SxS Cards (but not 4K internally), skip the idea of electronic frame image scan, and have an F3 type of color filter array.

Electronic frame image scan eliminates "jello effect" on objects moving across the frame and distortion causing vertical lines to tilt.

## More Differences

- F55 has internal 4K recording: up to 60 fps.
- F55 records HD to 180 fps.
- F5 does not have internal 4K.
- F5 records HD to 120 fps.
- F55 has 4K output via SDI connections
- F5 does not have 4K output
- F55 is rated at ISO 1250 (in S-Log 2). Other figures lurk.
- F5 is rated at 2000 ISO (in S-Log 2)





## Common to both cameras

Exposure latitude is 14 stops.

Both the F55 and F5 record 4K (and 2K) RAW onto a modular onboard AXS-R5 recorder that uses a new AXS Memory Card.

Both cameras have a Super 35mm 4,096 x 2,160 single CMOS sensor (11.6M total photosites, 8.9M effective) — Super 35mm 3-perf format size, 24 x 12.7 mm, 27.1 mm diagonal.

The camera weighs about 4 lb 14 oz (body only), and measures 7 5/8" long x 5" high x 5 1/8" wide.

It consumes 12 V DC (11 V – 17 V) at about 25 W in 4K at 60P.

There are 3 behind-the-lens optical filters: clear, ND 0.9 (3 stops) and 1.8 (6 stops).

Electronic shutter angle is variable from 4.2 – 360 degrees.

FPS adjusts from 1 to 60 and some steps from 60 to maximum frame rate.

Shutter speeds adjust from 1/24 – 1/6000 second.

White balance choices are 3200, 4300, 5500K, Memorized, and ATW (Auto).

There are 6 standard Gamma Curves, and 6 HyperGamma Curves: HG1, HG2, HG3, HG4, HG7 and G8. The last two have 800% range, the difference is where middle gray is 33% and 42% respectively.



F55

Note: this picture shows an earlier pre-production main display

# Comparison Chart: F55 and F5

F55



AXS-R5 Recorder  
attaches to both  
cameras

	PMW-F55	PMW-F5
<b>Image Sensor</b>	4,096 x 2,160 S35mm	4K (4,096 x 2,160) S35mm
<b>Frame Image Scan</b>	Yes	No
<b>Color</b>	Color Filter Array is same as F65	Color Filter Array is same as F3
<b>Lens Mount</b>	FZ mount (PL mount w included adapter)	FZ mount (PL mount w included adapter)
<b>Recording Media</b>		
<b>Two SxS slots in Camera</b>	SxS-1/SxS PRO (for MPEG2) SxS PRO+ (for XAVC, SR MPEG4 SStP)	SxS-1/SxS PRO (for MPEG2) SxS PRO+ (for XAVC, SR MPEG4 SStP)
<b>AXS-R5 RAW Recorder</b>	AXS Memory (for 4K/2K RAW)	AXS Memory (for 4K/2K RAW)
<b>4K output</b>	3G-SDI x 4 (square division) up to 60p HDMI x1 (1.4a) up to 30p	— —



F5



AXS-R5 Recorder  
attaches to both  
cameras

	PMW-F55	PMW-F5
<b>Recording Formats: Internal SxS Pro+ Cards</b>		
<b>HD - MPEG2</b>	MPEG2 422 8-bit 1920 x 1080 @ 23.98, 25, 29.97 PsF, 50 & 59.94 interlaced and 1280 x 720 @50P/59P	MPEG2 422 8-bit 1920 x 1080 @ 23.98, 25, 29.97 PsF, 50 & 59.94 interlaced and 1280 x 720 @50P/59P
<b>HD - XAVC</b>	XAVC 422 10-bit 1-120 fps	XAVC 422 10-bit 1-120 fps
<b>HD - SR Codec</b>	SR Codec 444/422 10-bit 1920 x 1080 @ 23.98/24/25/29.97 fps	SR Codec 444/422 10-bit 1920 x 1080 @ 23.98/24/25/29.97 fps
<b>2K</b>	XAVC 422 10-bit 1-180 fps	XAVC 422 10-bit 1-120 fps
<b>QFHD</b>	XAVC 422 10-bit 1-60 fps	—
<b>4K</b>	XAVC 4:2:2 10bit 1-60 fps	—
<b>AXSM Card in Onboard AXS-R5 Recorder</b>		
<b>4K RAW</b>	4K RAW 16-bit linear 1-60 fps	4K RAW 16-bit linear 1-60 fps
<b>2K RAW</b>	2K RAW 16-bit linear 1-240fps	2K RAW 16bit linear 1-120fps

# F55 and F5 High Speed Comparisons

F55 on the left with OLED viewfinder. F5 on the right with LCD finder. Finders come à la carte, as options. The cameras include the battery and PL mount adapter.

It is possible that Sony or their dealers may offer packages consisting of camera + finder.

## F55



F55 shown with optional DVF-EL100 OLED Electronic Viewfinder, 0.7-inch (diagonal) 1280 x 720.

The OLED is small and lightweight — and it is only as wide as its eyecup.

## F55

High speed shooting up to 240 fps in 2K

- 60 fps out of the box (XAVC HD at launch; XAVC 4K, QFHD and 2K with a planned upgrade. These are firmware upgrades at no additional cost.)
- 180 fps with a planned upgrade (XAVC 2K/HD). There is no line-skipping or using smaller area of sensor. Therefore, there's no crop factor, no change in angle of view.
- 240 fps 2K RAW with the optional AXS-R5 outboard recorder and a planned upgrade, retains 16-bit image quality - no matter the frame rate. Again, no crop factor, no change in angle of view.

All the firmware upgrades can be installed by the user at no cost. In fact, the cameras will eventually include all the features listed in this report.

## F5

F5 shown with optional DVF-L350 LCD Electronic Viewfinder. 3.5-inch (diagonal) 960 x 540.

Eyepiece flips up for direct viewing of the 3.5-inch LCD screen.



## F5

High speed shooting at up to 120 fps in 2K

- 60 fps out of the box (XAVC HD)
- 120 fps with a planned upgrade (XAVC 2K/HD). There is no line-skipping or using smaller area of sensor. Therefore, there's no crop factor, no change in angle of view.
- 120 fps 2K RAW, with the optional AXS-R5 outboard recorder and a planned upgrade, retains 16-bit image quality.



# Family History



F65

F55

## Once Upon a Time

Sony embraced the single sensor 35mm digital format with the F35, introduced in 2008. SRW9000PL was released in 2010—using a CCD HD sensor of 6.2 million pixels. Both had PL mounts.

### F3

Sony's PMW-F3 was unveiled at NAB 2010 by Alec Shapiro, and then quickly put under glass. The camera remained under glass at IBC. There was a lot of speculation about two signs that said, "Affordable 35mm Camera" and "It's a 35mm World." Sony engineers discussed goals of "establishing a 35mm line-up to cover applications from high budget to lower budget production." It was described as a democratization of the format.

Two months after IBC 2010, Alec officially introduced the PMW-F3 on the lofty 35th floor of Sony's Madison Avenue headquarters in New York. "Affordable" was an understatement. The camera was priced around \$16,000.

One of the biggest attractions of the F3 was its FZ mount with a very shallow flange focal depth (19 mm). You could attach almost any lens on the planet using simple adapters. Every F3 camera shipped with a Sony F3 to PL adaptor. Additional mounts came from companies like MTF, Denz, 16x9 Inc, and others.

Like the IBC sign said, it was a 35mm world, not just a PL mount camera world. But there was one thing about the F3 that had many of us whining. The eyepiece was stuck at the rear, and it wasn't a shoulder-resting camera.

### F65

At NAB 2011, Sony introduced the F65, their next generation CineAlta camera for Motion Picture Production, with an 8K sensor and SRMemory.

Sony engineers and executives explained how this next leap beyond HD and 2K would be applied not just in entertainment, but also in medicine, industry, graphics, education, museums, product design and simulations.

The F65 camera captured 8K 16-bit RAW files to on-board SRMemory at sustained data rates up to 5Gbps.

Sony's new F65 camera introduced a new 20 Megapixel Super35 single CMOS imager, whose active image area was 24.7 mm x 13.1 mm, 28 mm diagonal.

When the new SDK is released, all F65 recording will be able to be "developed" as 6K or 8K.

### NXCAM Super35

NXCAM Super35 NEX-FS100 also premiered at NAB 2011. It had a 3.4 Megapixel Super 35mm single CMOS imager (23.6 x 13.3 mm, 27.1 mm diagonal) and an 18 mm flange depth E-mount. The NEX-FS700 followed a year later at NAB 2012, with a higher resolution sensor (8.3 Megapixels effective in HD), improved ergonomics, ISO 320 - 20,000 (depending on gamma curve), and speeds to 240 fps in HD and 960 fps with reduced resolution.



## Meet the family. Left to right:

Sony F65 with onboard SRMemory Recorder  
 F55 with onboard AXS-R5 4K/2K RAW recorder.  
 F5 (identified by black lens locking ring)  
 F3 with Fujinon 19-90 zoom lens

F5

F3

## Mounts and Design

The PL mount played a big part on all the new cameras. F35, 9000PL, and the new F65 camera had an integral PL mount. F3 and NXCAM S35 cameras accepted PL adaptors.

F65 design was reminiscent of F35, F23, Panaflex Millennium, Arricam Studio, and Moviecam Compact. The designers shaped the F65 to accommodate an onboard SRMemory Recorder like a film magazine. The bottom of the camera was ready to go from handheld to studio configuration, with a forward flat section where you attach a sliding baseplate, and a sculpted rear section for a comfortable shoulder-moulded cushion.

## F55 and F5

I'm sure the lights have been burning late in Atsugi, Sony's professional design facility. The F55 and F5 have been in the planning stages for 2 years.

Peter Crithary, Sony Marketing Manager for Large Sensor Cameras, told us, "This effort is a result of considerable feedback from the industry. We did a lot of feedback tours. Two years of research. Over 500 engineers on this project.

"It's very scalable. There's an inclusive spread between the F5 and the F55, especially when you hear the pricing and how people will be able to access it. The strengths and flexibility of features are going to apply everywhere and help the bottom line.

"The pleasing look, the depth of field of the 35mm format, is becoming more and more the norm. So developing a sensor technology with a very high level of performance will influence production. You're going to see the F5 and F55 go into all markets—and markets that typically wouldn't have used this format: documentaries, news, sports, education.

"The advantage of the 4K canvas is real. You can zoom in and select any region of the picture and maintain resolution for sports, together with high frame rates."

For the past two years, Sony engineers were interviewing DPs, ACs, DITs, Colorists, Editors, Post and Rental House Personnel. This began immediately after the F3 launched and during the F65 cycle. The engineers heard that the rear eyepiece on the F3 was fine for tripod work but made it difficult to hold the camera handheld. Camera operators lobbied for a moveable finder that was sharp enough to see critical focus. As for the F65, its image quality was undisputed. But could Sony build a companion camera that was smaller, thinner, lighter?

No wonder there's a well-attended Starbucks on the ground floor in Atsugi.

The results of two years of hard work in Atsugi and at Sony are reported in these pages.

# Camera Comparison: New Sony 35mm "F" Family

## F65

8K CMOS sensor  
up to 120 fps

This picture and chart shows the most recent F family. Missing are F3, F35, and other older siblings.



	F55	F5	F65
<i>CMOS Sensor</i>	4096 x 2160 (11.6M total photosites, 8.9M effective)	4096 x 2160 (11.6M total photosites, 8.9M effective)	8192 x 2160 (20M total photosites, 18.7M effective)
<i>Sensor Size</i>	24 x 12.7 mm (1.89:1 format 17:9)	24 x 12.7 mm (1.89:1 format 17:9)	24.7 x 13.1 mm (1.89:1 format 17:9)
<i>Image Diagonal</i>	27.1 mm	27.1 mm	28 mm
<i>Shutter</i>	Frame image scan, electronic: 4.2° - 360°	electronic 4.2° - 360°	Rotary shutter
<i>Shutter Speeds</i>	1/24 - 1/6,000 second	1/24 - 1/6,000 second	
<i>ISO</i>	1250 in S-Log 2	2000 in S-Log 2	200-3200
<i>SxS Internal Recording</i>	1-60 fps 4K/QFHD 1-180 fps 2K/HD	1-120 fps 2K/HD	-
<i>RAW Recording on Modular Onboard Recorder</i>	on AXSM Cards 1-60 fps 4K RAW 1-240 fps 2K RAW	on AXSM Cards 1-60 fps 4K RAW 1-120 fps 2K RAW	on SRMemory Cards 1-120 fps 8K RAW
<i>RAW Lite mode</i>	—	—	F65 has RAW Lite mode
<i>Mount</i>	FZ (and PL adapter)	FZ (and PL adapter)	PL
<i>Flange Focal Depth</i>	19 mm	19 mm	52 mm (31.5 mm to cover glass)
<i>Behind-Lens Filters</i>	Clear, ND 0.9, ND 1.8 (0, 3, 6 stops)	Clear, ND 0.9, ND 1.8	Clear, ND 0.9, 1.2, 1.5, 1.8 (0, 3, 4, 5, 6 stops)
<i>Weight body only</i>	4 lb 14 oz / 2.2 kg	4 lb 14 oz / 2.2 kg	11 lb / 5 kg
<i>Average Power</i>	12 V DC, approx 25 W	12 V DC, approx 25 W	12 V DC, approx 65 W



## F55

4K CMOS sensor,  
internal 4K, 2K, HD recording  
onboard 4K, 2K RAW recording



## F5

4K CMOS sensor,  
internal 2K, HD recording  
onboard 4K, 2K RAW recording



	F55	F5	F65
Data Rate SxS Pro+ Cards	up to 600 Mbps	up to 600 Mbps	-
Data Rate AXSM card	up to 2.4Gbps	up to 2.4Gbps	-
Data Rate SRMemory	-	-	up to 5 Gbps
<b>Recording to SxS Pro+ Card</b>			
4K / QFHD XAVC	1-60 fps	-	-
2K / HD XAVC	1-180 fps	1-120 fps	-
HD MPEG4 SR Codec	23.98/24/25/29.97 fps	23.98/24/25/29.97 fps	-
HD MPEG2 (can use any SxS Card)	1920 x 1080 @ 23.98, 25, 29.97 PsF, 50 & 59.94 Interlaced, and 1280 x 720 @ 50P/59P	1920 x 1080 @ 23.98, 25, 29.97 PsF, 50 & 59.94 Interlaced, and 1280 x 720 @ 50P/59P	-
<b>Recording to AXSM Card</b>			
4K RAW	1-60 fps	1-60 fps	-
2K RAW	1-240 fps	1-120 fps	
<b>Recording to SRMemory Card</b>			
4K RAW	-	-	1-120 fps

# 360° Camera Views

F55 stripped down, showing native FZ mount. No top handle or battery. Shown with audio module, timecode module attached.



# Camera Menu Simulator

An F5/F55 Camera Menu Simulator will be available.



The simulator shows ISO settings. On the camera's Setup Menu, you can also change the menu to dB units.



Set the gamma



Set the frame rate, shown here in S&Q (Slow and Quick) Mode



# Camera Views

Bottom view with timecode and audio modules and PL to FZ adapter attached



Top view with top handle, timecode and audio modules, and PL to FZ adapter attached

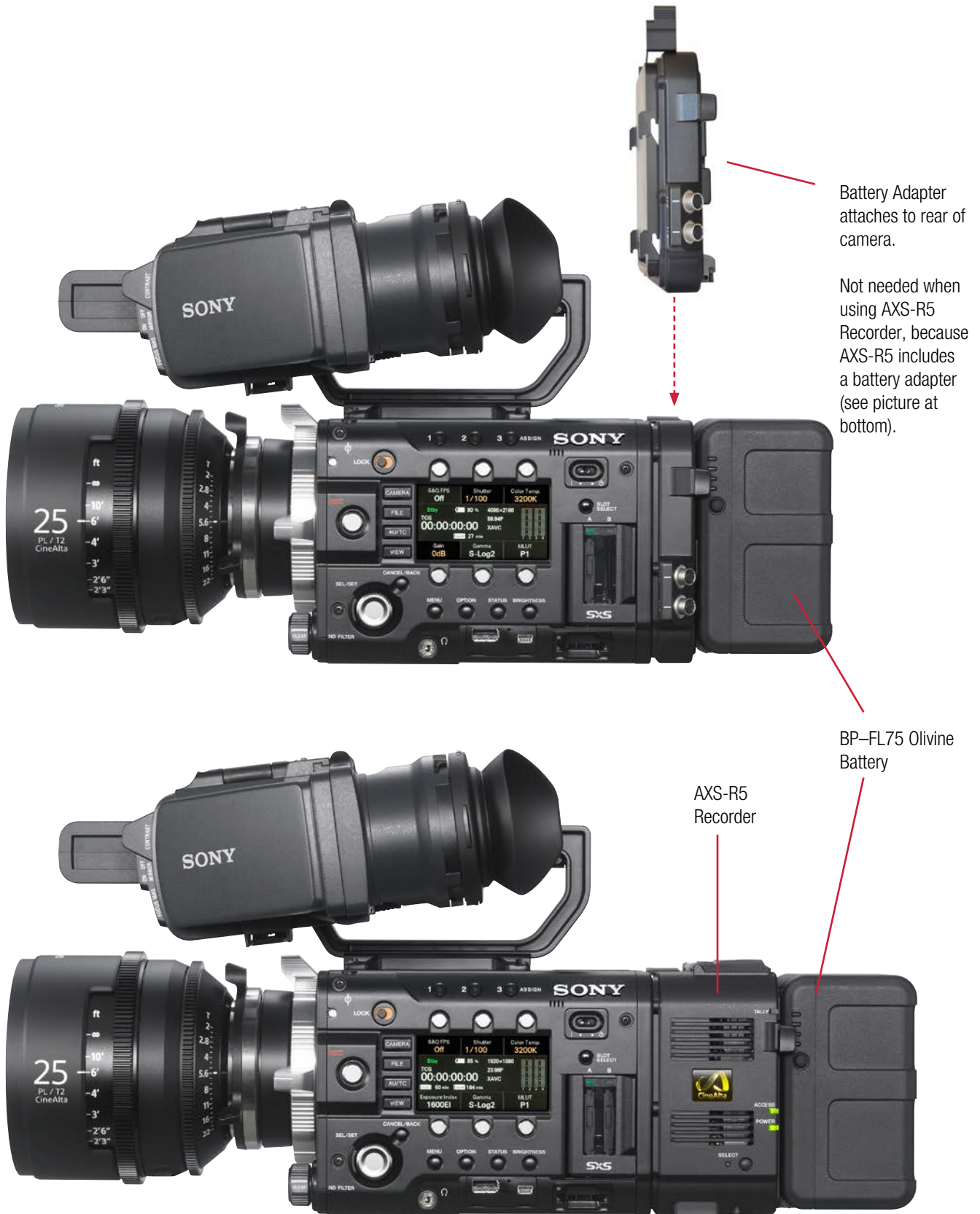


# The F5 and F55 System



DVF-L350 3.5" QHD  
LCD Viewfinder in  
flipped up position





# F5 and F55 System





## Design

With these new cameras, it appears that Sony has recognized the importance of complete systems, not always proprietary, and built to work with other vendors' accessories, lenses, grips, handles, rods, monitors, and paraphernalia.

The F5 and F55 are highly configurable and flexible in how they can be used. The design is inspired — first looks reveal what I think may be the best Sony camera design so far. One might be tempted to say the F5 and F55 are epically modular, alexandrine in ergonomics, canonical in open architecture, and atoning in shoulder-restability — could it be they got everything right?

We'll see. Built-in iPhone dock to call one's agent? Actually, WiFi is coming soon on these cameras.

## Modular

The F55 and F5 cameras are small, light and modular. The AXS-R5 RAW recorder snaps on between the body and on-board battery. The time code/genlock connections and XLR audio inputs come in two detachable modules. The camera body is only slightly wider than a typical PL mount prime lens.

## Shoulder Rig

An optional Sony-built shoulder mount and pad attaches to the camera's base. It is lightweight and has industry-standard rosettes on both sides (O frabjous day! Callooh! Callay!) for quick and easy attachment of third-party handgrips and accessories. Existing F3 shoulder rigs from 3ality Technica, Vocas, Chrosziel, 16x9, Shape, and others may fit with modifications — but expect to see new models specifically for F5 and F55.

The shoulder rig has a unique design; it enables sliding the camera front to back on the rig for balance. Concurrently, the viewfinder can also slide front to back to compensate for camera position.

My grouching about lack of rosettes on the camera body itself elicited muffled chortles by the designers: did we want a bigger camera body with rosettes or a smaller body without? They made the right decision. There are ample threaded holes on top and bottom.

## Viewfinders

The F55 has a choice of 2 viewfinders.

OLED: DVF-EL100. This 0.7-inch (diagonal) 1280 x 720 viewfinder offers high definition, and improved brightness, contrast and response. No smear usually present in LCD. Superb optics. Very small.

LCD: DVF-L350. This 3.5-inch (diagonal) 960 x 540 LCD viewfinder has higher resolution and 10 times the contrast of previous LCD models. The eyepiece flips up to reveal the 3.5-inch LCD screen. The eyepiece has a compound mechanism; the optics can flip up to see from the rear, or the entire mirror and optics flip up exposing the LCD from the side.

## Monitor

LCD monitor: DVF-L700. This compact 7-inch (diagonal) 1920 x 1080 LCD on-board monitor works with the camera's 2K and 4K output modes, and provides pixel-for-pixel 1920 x 1080 viewing in HD.



# Camera Prep

The top carrying handle has five  $\frac{3}{8}$ -16 and four  $\frac{1}{4}$ -20 threads to mount accessories.

Note: the PL to FZ lens mount adapter is installed.

Also, the audio module and analog signal module are attached.





The standard Sony top handle attaches to the camera with four screws.

Note that there are four ¼-20 threads on top for alternative mounting and carrying schemes.



# Base



Removable Audio Module

Removable Analog Signal  
Module (Genlock, Timecode,  
etc.)

There are 6 industry-standard mounting threads on the bottom of the F5 and F55:

- three  $\frac{3}{8}$ -16 ( $\frac{3}{8}$ " diameter, 16 threads to the inch)
- three  $\frac{1}{4}$  - 20

$\frac{3}{8}$ -16 is industry standard, and essential when adding anything more than a lightweight prime lens.

But  $\frac{1}{4}$ -20 can be very helpful when Air Katmandu has lost your luggage (of course you hand-carried the camera) and the only tripod available in Tengboche is a long-abandoned, battered still tripod cast off by tired trekkers.



# Audio

Audio recording on the F5 and F55 is Linear PCM, 2 channel, 24-bit, 48 khz.

The audio module attaches with two screws to the right side of the camera. It provides two standard 3-pin XLR female connectors, switchable from Analog to Digital:

Analog: CH 1 and CH2 for Line/Mic/ Mic +48 V (phantom power).

Digital: 4 channels AES/EBU (Audio Engineering Society/European Broadcast Union).

“How can you get 4 channels of digital audio into two XLR connectors?” A single 3-pin XLR AES/EBU connector can handle 2 channels simultaneously (multiplexing).

Audio output on the camera is via a phone jack (CH1/CH2), with a monaural speaker output and a 3.5mm stereo mini jack, selectable in menu: stereo/mono head set and signal: L, R, L+R and Stereo.



# FZ Lens Mount



## FZ Lens Lens Mount

The F5 and F55 have a Sony FZ mount (same as on the F3).

The flange focal depth is 19 mm. The diameter of the mount is approximately 84 mm. That's much wider than an E mount or PL mount (54 mm diameter).

There are 14 gold-plated contacts in the FZ mount (9-o'clock position) for lens control, metadata, and power.

The bayonet locking ring (silver on F55, black on F5) is beefy and gets a seal of approval from the crew that recently used these cameras with big Fujinon Premier 75-300 mm zooms in the mon-soons of Sri Lanka, mounted by way of the PL to FZ adapter.

F5 and F55 cameras come with a Sony PL to FZ mount adapter.





# PL to FZ Lens Mount Adapter

## PL to FZ Mount Adapter

F5 and F55 cameras come with Sony's PL to FZ mount adapter that will let you use almost all PL mounts on the planet.

PL mounts are 54 mm internal diameter, with a 52 mm flange focal depth.

The PL to FZ Adapter is equipped with 4-pin gold-plated pin contacts for both /i data (12 o'clock position) and LDS lens data (3 o'clock).



## /i and LDS Lens Metadata

F5 and F55 cameras record /i and LDS lens metadata. The open-architecture /i data protocol comes courtesy of Cooke Optics. The LDS system is, I believe, licensed from ARRI.

LDS and /i are important features that provide frame-by-frame information about lens aperture, focus distance, zoom (on zoom lenses), serial number, and type of lens. This information can be sent in real time to camera crew, script supervisor and everyone else on set. The information is also stored as frame-accurate metadata, which speeds up post production, effects work for mattes, plates, and match-moving. And, gasp, if there's a dreaded re-shoot, you'll have all the information needed.

Cooke /i lens data contacts, shown here on a 5/i, are positioned at 12 o'clock



Cooke /i lens contacts are at 12 o'clock—shown here on an S4/i



ZEISS/ARRI LDS lens contacts are positioned at 9 o'clock when you look at the back of the lens, which is 3 o'clock when you face the camera's PL mount from the front—shown here on a Master Prime





# Fujinon Cabrio /i and LDS Lens Metadata



To use wireless remote Focus-Iris-Zoom, a new Preston Fujinon Cabrio box connects between MDR and Cabrio Servo Control. The cable's 4 pin Lemo plugs into the MDR Serial port. The 20 pin Hirose connector plugs into the Cabrio Servo Handgrip.



19-90 mm Cabrio



85-300 mm Cabrio

The two new Fujinon Cabrio zoom lenses incorporate both Cooke /i and ARRI/ZEISS LDS contacts in their PL mounts. You choose which protocol to use with a dip switch in the servo control (handgrip) unit.

Focus, iris, zoom, and other lens metadata from the Fujinon Cabrio is sent to the F5/ F55 camera through the selected set of pins.

In addition, the focus, iris and zoom servo motors are powered by the camera, sending 12 volts DC through the lens data pins.

The servo control unit can be removed quickly with four screws when you want to use external Preston, cmotion, Chrosziel, Betz or other wireless lens control systems.

## F5 / F55 for ENG, Sports, Docs

The Sony F5 and F55 could be widely accepted for ENG News, Sports, Docs and similar venues previously entrenched in  $\frac{2}{3}$ " format.

"But the depth of field is too shallow!" I can hear the howls of protest already.

Not to worry. With F5 and F55 sensors so sensitive that producer Gary Krieg described seeing nighttime stars in the sky, you can comfortably stop down to retain the same deeper depth of field.

How so?

To get the same depth of field you enjoyed on your  $\frac{2}{3}$ " camera, you only have to stop down 3 stops more on your F5 / F55.

A 50 mm lens on your  $\frac{2}{3}$ " camera gives you the same angle of view as a 135 mm lens in the F5/F55 35 mm format (10.1 x 7.6 degrees).

If you were shooting at T2 focused at 40 feet with your  $\frac{2}{3}$ " lens, you should set your aperture to T6.2 on the 35mm format lens.

Bottom line: stopping down 3 stops on the F5 / F55 gives you the same familiar look as your venerable  $\frac{2}{3}$ " camera.

Of course, if you like shooting at T11 on  $\frac{2}{3}$ " you will be hard pressed to close down an additional 3 stops on your 35mm camera.

# Access to Most Lenses in the World

## FZ Adapters

A couple of years ago, I said it was a PL World. Now it is much more. The FZ mount's short, 19 mm flange focal depth provides access to most 35mm format still and motion picture lenses in the world. Existing Sony F3 Mount adapters should fit—many are already available from IB/E Optics, AbelCine, Band Pro, ZGC, MTF Services, P+S Technik, Denz, and others.

After-market adapters will let you attach Canon EF, Canon FD, Nikon F (DX), Leica R, Leica M, and many other lenses to the F5, F55 or F3. Here's a list of mounts and flange focal depths in mm:

- Sony FZ (F55, F5, F3) mount 19 mm
- Sony E-mount 18 mm
- Canon Manual FD mount 42 mm
- Canon EOS EF mount 44 mm
- Nikon F-mount 46.5 mm
- Leica M mount 27.8 mm
- Leica R-mount 47 mm
- PL mount 52 mm

## B4 to FZ

Mount your favorite B4 mount 2/3" lenses. (HD ENG zooms, DigiPrimes...) The ratio of "blow-up" from B4 to 35mm format is 2.5x.

The HDx35 B4/PL Optical Adapter is designed and built by IB/E Optics. Mount a B4 2/3" lens to the HDx35. Attach the HDx35 to the PL-to-FZ mount. The HDx35 fills the F5/55's 35mm format frame. Thanks to its built-in 2.5x extender (you lose 2.5 stops of light) almost any B4 2/3" lens will work. AbelCine is the exclusive US distributor. Band Pro is a distributor in Europe and Shanghai Transvision distributes in Asia. [www.ibe-optics.com](http://www.ibe-optics.com)

Sony is working on a B4 to FZ mount adaptor.

MTF services makes a B4 adapter with .5x extender inside. It requires using a B4 2/3" lens that has a built-in doubler (2X extender) engaged.



MTF Services  
Nikon G to FZ



MTF Services  
Canon EF to FZ



MTF Services  
Canon FD to FZ



B4 to PL:

HDx35 B4/PL Optical Adapter  
by IB/E Optics

B4 to PL to FZ:

Canon ENG zoom lens  
+HDx35 B4/PL Optical Adapter  
+PL to FZ Adapter  
on Sony F55

(photo courtesy AbelCine)



# Sony Zooms



## Sony 18-252 mm Zoom

Sony's SCL-Z18X140 is a 14x zoom lens with an FZ mount. It was originally introduced with the F3 camera.

The SCL-Z18X140 is an ENG-style 18-252 mm T3.8-6.8 FZ-mount auto-focus, auto-iris, image-stabilized servo zoom.

The short flange focal distance is one of the things that helps shrink its variable overall length to a mere 6.8-8.6 inches long.

The lens can be used with F55 and F5 by firmware update.

- Focal Length: 18 - 252 mm
- Mount: Sony FZ mount
- Image Format: Super 35mm
- Zoom Ratio: 14x (Manual / Auto)
- Auto Focus: On/Off
- Widest Aperture: T3.9 - 6.8 variable (max 22)
- Iris: Manual / Auto
- Image Stabilizer: On/Off
- Front Filter Size: 82 mm
- Weight: 4.9 lbs / 2.2 kg
- Variable Length: 6.8" / 17.3 cm – 8.6" / 21.6 cm
- Minimum Object Distance (M.O.D.) 3.4' / 1.05 m



## Sony 11-16 mm Zoom

Sony's SCL-P11X15 is a wide angle PL mount 11-16 mm zoom lens. It does not have optical stabilization or internal servo motors.

- Focal length: 11mm to 16mm
- Mount: PL mount
- Image Format: Super 35mm
- Zoom ratio: 1.5 ×
- Widest Aperture: T3.0
- Iris: T3.0 - 22
- Close focus: 13.8" / 0.35 m (from image plane)
- Front Filter Size: 105 mm
- Weight: Approx. 2.42 lb / 1100 g



# Sony CineAlta PL-Mount Primes



Focal length	20 mm	25 mm	35 mm	50 mm	85 mm	135 mm
Close focus	250 mm	250 mm	350 mm	500 mm	850 mm	850 mm
Aperture	T2-22	T2-22	T2-22	T2-22	T2-22	T2-22
Weight	2.3 kg	2.2 kg	2.1 kg	2 kg	2 kg	2.4 kg
Length of lens	120 mm	120 mm	120 mm	120 mm	120 mm	145 mm
Flange focal distance	52 mm (in air)					
Focus rotation	240 degrees					
Iris blades	9					
Filter thread	95 mm (excluding 20 mm lens)					
Mount	PL mount					
Supplied accessories	Front cap, rear cap, shim set, instructions					



## Sony PL Primes

Sony introduces a second generation of inexpensive PL mount prime lenses, with improved mechanical design.

Focal lengths are 20, 25, 35, 50, 85 and 135 mm, all T2.

All have the same widest diameter of 118 mm and the same front diameter (114 mm)

Geared lens rings are all in the same relative locations.

All primes are 120 mm long, except the 135 mm, which is 145 mm long.

They each have a 9-bladed iris.

The focus ring rotates 240°.

# Main Display

## Control Panel and Menus

The new menu and control interface is refreshingly intuitive (hurray). Gone is the dreaded Sony menu diving. The F55 and F5 have direct, one-touch buttons for frame rate, shutter speed, color temperature, ISO and gamma. Soft keys above and below the display are context sensitive for direct access to key parameters. Assignable buttons give you direct access to favorite adjustments.



# F55 Actual Size

## F5-F55 Simulator

Take the cameras for a test drive and learn how to navigate the interface and menus.

Sony's interactive online HTML camera simulator let's you try the camera out.





# Recording and Workflow



SRMemory Card for F65  
60 x 105 x 9.4 mm



AXSM Card for F5 / F55  
60 x 81 x 9.4 mm



SxS Pro+ Cards for F5 / F55 internal  
35 x 75 x 5 mm

F5 records HD and 2K internally onto SxS cards. It cannot record internal 4K, nor RAW. F5 does HD and 2K internally up to 120fps. The on-board AXS-R5 handles 2K RAW up to 120fps, and 4K RAW up to 60fps.

## Onboard

Both the F55 and F5 record 4K (and 2K) RAW onto the new AXS Memory Card in the modular onboard AXS-R5 recorder.

## Production Scenarios

With 8.9 megapixels (effective), Sony's new image sensor lets you shoot in 4K, 2K, or HD. Here are some scenarios:

Here's where the eyes glaze over, hopefully not bewildered, but dazzled by the plethora of choices.

In a nutshell, the F5 and F55 not only aim high toward 4K, but also provide workflows in many flavors of HD and 2K

The cameras give you a choice of recording in 4K, 2K or HD. Sony seems to have headed off any "Why didn't you" comments with a head-spinning alphabet soup of choices, codecs and compressions. A benefit of the 4K sensor is that HD and 2K are super-sampled and then down-converted.

## F55 and F5 Recording

### Internal

F55 records internal 4K (not RAW) to SxS cards, along with varieties of HD and 2K. Cinema 4K (4096 x 2160) and Consumer 4K TV QFHD (Quad HD 3840 x 2160) are both supported on SxS cards. F55 will record 4K and QFHD up to 60 fps. HD and 2K up to 180 fps. And 2K RAW up to 240 fps. (Only the Sony F65 records 4K RAW up to 120 fps.)

## Shoot, Record, Master and Distribute in 4K

Why 4K? There are more than 13,000 theaters with Sony Digital Cinema 4K projectors, and a large number of additional screens with 4K projectors from the other major brands. Sony's new 84" 4K TV is on display in Sony stores. A new LG 84" 4K TV went on sale a couple of days ago. JVC showed 4K home projectors recently. At PhotoPlus in New York, and Photokina in Cologne, we saw 4K computer monitors from EIZO, Fujifilm, Canon, and 4K production monitors from Sony and Dolby. Sony is introducing a new 30" PVM-X300 LCD 4K field monitor.

## Shoot, Record and Master in 4K

Originate in 4K. Distribute in HD or 2K. Future-proof your original as a 4K archival master for future 4K release. Meanwhile—edit, post, and distribute in HD or 2K.

## Work in 2K/HD

Record, Master and Distribute in 2K/HD. And so on.



# Onboard AXS-R5 RAW Recorder

## AXS-R5 4K/2K RAW recorder

For RAW recording, Sony's optional, modular AXS-R5 recorder snaps on behind the F5 / F55 camera body.



## AXS – R5 Onboard Recorder

16 bit Linear 4K RAW - 1/3.6 compression  
(4096 x 2160) 16-bit RAW,  
23.98, 24, 25, 29.97, 50 and 59.94p, S&Q 1 to 60 fps

16 bit Linear 2K RAW – 1/3.6 compression  
(2048 x 1080) 16-bit RAW,  
S&Q 1 to 120 fps on F5; 1 to 240 fps on F55

HD-SDI Monitoring output R/T Debayer (10 bit 4:2:2)  
Power: 22W

## AXSM Memory Cards

The onboard AXS-R5 records onto AXSM memory cards at various data rates (e.g. 1.0 Gbps for 4K RAW at 24 fps, 2.4 Gbps at 60 fps.) The cards are the same width as F65 SRMemory Cards (60 x 105 x 9.4 mm), but shorter (60 x 81 x 9.4 mm.) They will come in 512 GB capacities.

As the result of user-feedback to just have one capacity and less confusion.

### exFAT

The Memory Cards are formatted in exFAT, which works on Mac or PC, without the need for a software driver, and providing instant mounting with fast and simple file transferring of data.



## 4K or 2K RAW

Record RAW in native 4K or “derived” (supersampled) 2K. RAW recording is like having a digital negative with greater possibilities for color and contrast manipulation in post.

The cameras record 16-bit. The F55 uses the same color gamut and bit depth technology used in the 16-bit linear recording F65 camera. (F5 has a similar color space of the F3.) F55/F5 is compatible with the Academy Color Encoding System (ACES) specifications. Compression of 16-bit 4K and 2K RAW is about 1/3.6, which is the same as the F65.

# SxS Pro+ Cards



## 64 GB SxS Pro+ Card

records 10 minutes of 4K XAVC Intra 422 @ 60P, 25 min @ 24P  
60 minutes of HD XAVC Intra 422  
120 minutes of HD MPEG2 422

## 128 GB SxS Pro+ Card

records 20 minutes of 4K XAVC Intra 422 @ 60P; 50 min @ 24P  
60 minutes of HD XAVC Intra 422 @ 60P; 150min. @ 24P  
240 minutes of HD MPEG2 422 @ 30P; 300 min. @ 24P

## High-speed SxS PRO+ Media Cards

The F55 and F5 cameras are capable of high-data-rate onboard recording. This requires next-generation SxS recording media—Sony's 64 and 128 GB SxS PRO+ memory cards—and a next-generation SxS USB card reader, the SBAC-US20.

SxS Pro Cards were introduced in 2007. They have a sustained data rate of 400 Mbps, and a maximum readout speed of 1.2 Gbps.

SxS PRO+ Cards are being introduced in 2013. They have a sustained data rate of a whopping 1.3 Gbps, a top readout speed of 1.6 Gbps, and top write speed of 1.5 Gbps.

One of the Sony designers half-jokingly said that a 128 GB SxS Pro+ Card recording 4K XAVC Intra 422 24P (50 minutes) was like having a 4500 foot magazine of 35mm film (24 fps, 4-perf, 90 feet per minute).

Or 3,375 foot magazine using 3-perf camera.

The comparison of an SxS Pro+ Card recording HD MPEG2 is even crazier: equivalent to a 27,000 foot magazine of 35mm film (24 fps, 4-perf).

## Recording Formats for Internal SxS Cards

The F5 has 3 recording formats and the F55 has four recording formats for internal SxS media. Here's a list of format, color, bit-depth, bit rate at 30 fps unless otherwise noted, and description:

MPEG-2 HD. 4:2:2. 8-bit. 50 Mbps.

Well-accepted standard for television production.

XAVC HD (2K expected as a future upgrade). 4:2:2. 10-bit. 100 Mbps.

This next generation of H.264/AVC Intra-frame coding proposes a cost-efficient system for High Frame Rate HD and 4K/60p production.

SR Codec (future upgrade). 4:2:2, 4:4:4. 10-bit. 220 and 440 Mbps.

The SR Codec (MPEG4 SStP) is widely used in production and post. Once the upgrade is ready, the F55 and F5 will record files in the same codec used on SR tape.

XAVC 4K (QFHD with future upgrade) on F55, not F5. 4:2:2. 10-bit. 240Mbps at 24P.

If your view of 4K is that it can be a data challenge with large files and lots of storage, Sony proposes this version of H.264/AVC Intra-frame encoding with reasonably compact files.

## SxS PRO Card Compatibility

Current SxS PRO cards can be used for XAVC HD/2K fixed frame rates—not just SxS PRO+ cards.

Furthermore, SxSPRO+ cards can be used with older card readers—however the file transfer speed will be slower than with the new USB3 reader.

## SBAC-US20 SxS USB 3.0 Card Reader

USB 3.0. Maximum readout speed of 1.6 Gbps.





# AXSM (Access Memory) Cards



AXS – 512S24

AXSM – Access Memory

Uses exFAT file system, much faster than SRMemory

16 bit Linear 2K RAW and 16 bit Linear 4K RAW recording

512GB – 2.4Gbps - 300MB/s write speed

250MB/s read speed (1.95Gbps)

## AXSM Memory Cards

These new memory cards inherit high speed access technology from SRMemory Cards (used on F65).

Cards will come in 512 GB with 2.4 Gbps (300 MB/sec) write speed.

You can determine the write speed by the name of the card. In the picture above, the 512S24 card has a 512 GB capacity and “S” for Speed of 2.4 Gbps.

Cards are formatted in exFAT file system, which can be read by both Mac and PC.

AXSM Cards have similar performance of SRMemory S25 Cards at half the cost (price/GB).

## Recording time with AXS-512S24

F55 4KRAW

23.98p SQ: Approx. 60 min

59.94p SQ: Approx. 24 min

F55 2KRAW

23.98P SQ: Approx. 240 min

59.94p SQ: Approx. 96 min

## AXS – CR1 Card Reader

AXSM Memory Cards can be read by the AXS-CR1, an affordable USB 3.0 reader with up to 2 Gbps (250 MB/s) transfer speeds to the computer. Using USB 3.0, you can easily connect to the new MacBook Pro, MacBook Air and Windows computers.

The Card Reader, as the name suggests, can read files, but cannot write them. It can, however, format an AXSM Card.

The Card Reader requires a 12V DC Power Supply, from external battery or supplied AC Adapter. USB Bus Power is not supported.

4K RAW files transfer at 2x real time, so 60 minutes of material off-loads in 30 minutes. This is faster than an SRMemory Card. 2K RAW 24p files move at 8x speed, so it takes about 8 minutes to off-load.



AXS – CR1 Card Reader

# Combination Recording

## Simultaneously record RAW (on AXS-R5) and SxS Pro+

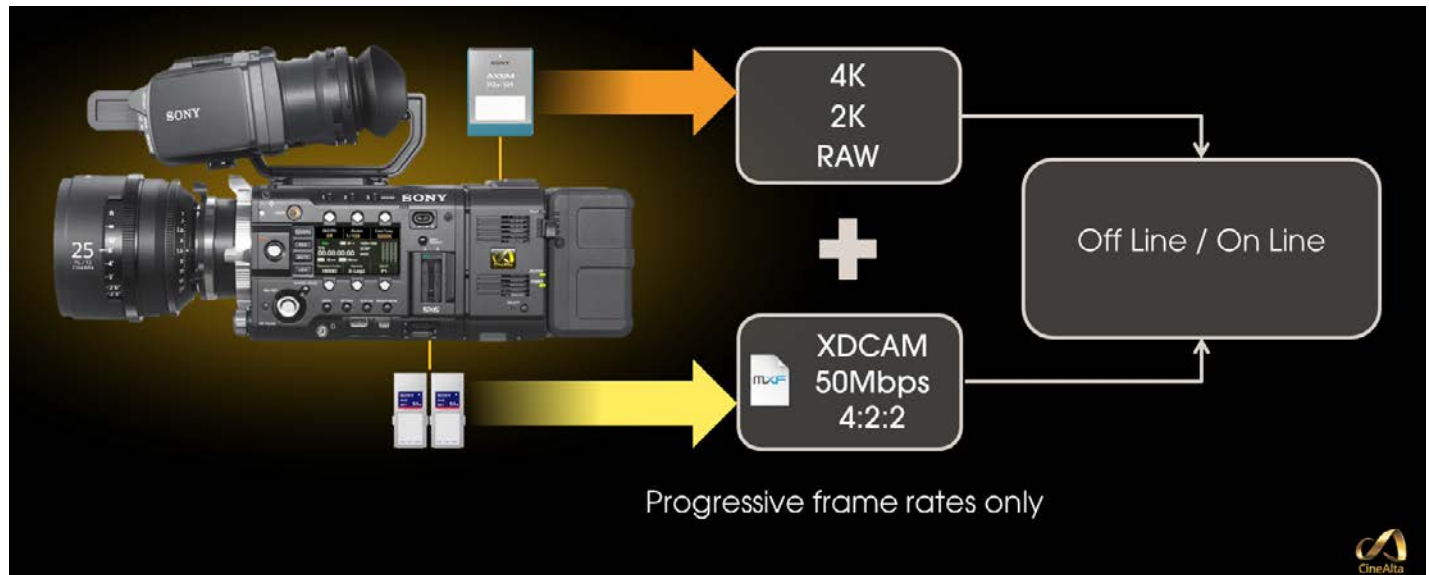
You can simultaneously record RAW files to the AXSM Card in your onboard AXS-R5 RAW recorder and record HD or 2K to an SxS Pro+ Card in one of the camera's two internal SxS slots.

The RAW files are like your camera original "negative." The SxS cards are like your "workprint," and their files can be edited immediately. Files on both cards will match frame-accurately as to

timecode, start frame, stop frame, file names and other metadata.

The camera supports the following RAW + Onboard combinations:

- 4K/2K RAW + XAVC 2K\*/HD (\* Expected as a future up-grade.)
- 4K/2K RAW + MPEG-2 HD422
- 2K RAW + XAVC QFHD\*/4K (on F55, not on F5), and more.



## Dual File Recording (F55 only)

### Simultaneously Record 2 Files to one SxS Pro+ Card

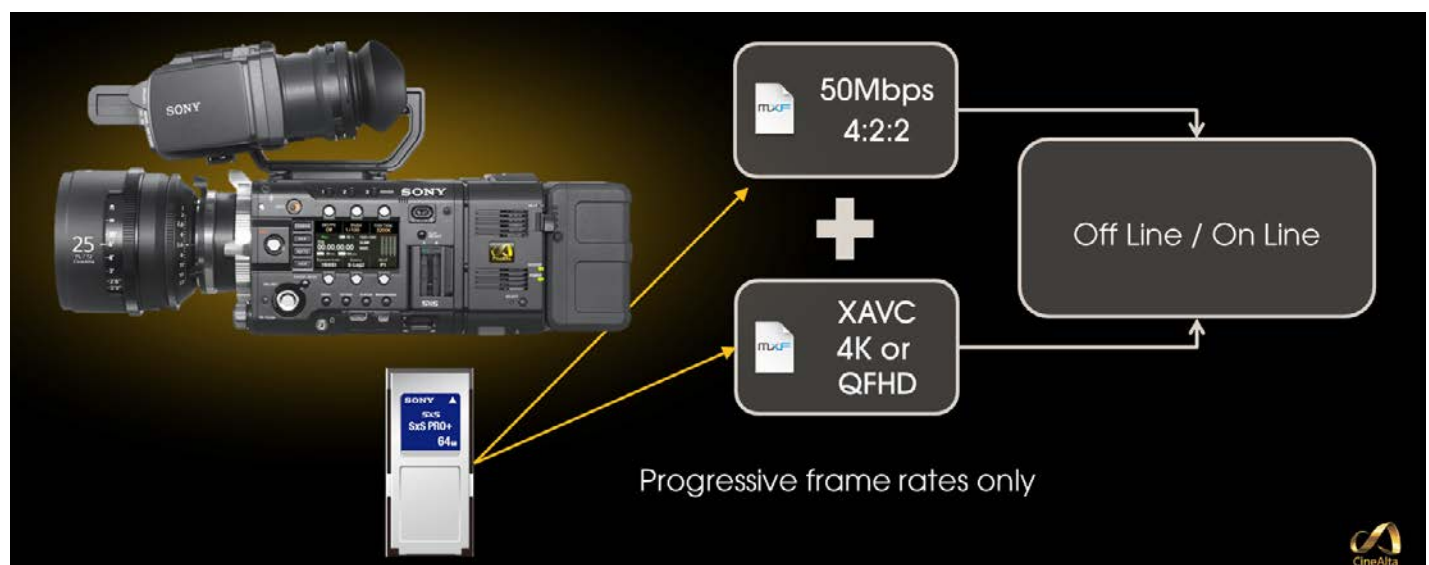
The original intention was that you would be able to record to two internal SxS Pro+ Cards at the same time.

In mid-January, it was announced that dual slot recording has been canceled due to hardware limitations.

However, simultaneous dual file recording to one SxS Pro+ Card is possible.

For example, you can record 4K XAVC and MPEG2 HD onto a single SxS Pro+ card. This will be supported from the beginning, v1.0.

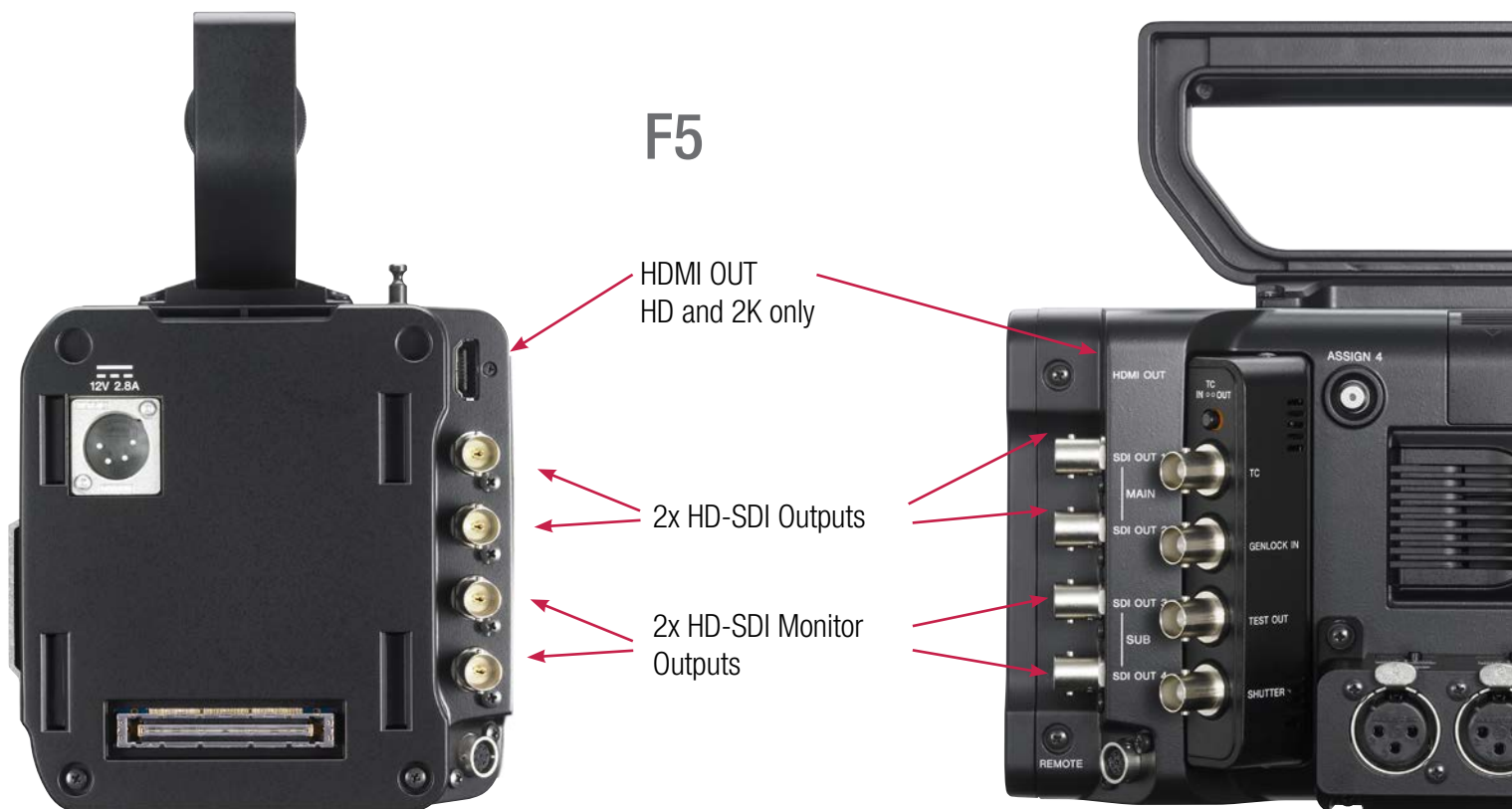
Files in both formats will match file names, timecode, start frame, stop frame, and other metadata, accurate to the frame.



# SDI and HDMI Output

This is the page for AJA, Codex, Convergent Design and other external recording device users.

## F5



## F55





# Sony F5 and F55 November Launch

Sony launched the F5 and F55 cameras at Sony Pictures in Culver City, CA on November 27, 2012 and the following day at Camerimage in Poland. The Hollywood event began at 6pm, with a reception near the main gate of the Sony lot. At 7:30pm, the doors to the Cary Grant Theatre opened. Alec Shapiro, President of Sony Professional Solutions of America, welcomed a standing-room only audience and presented the two new cameras. Sony Electronics President and COO Phil Molyneux explained how this was part of Sony's commitment to 4K, and that additional exciting news would be announced in a couple of days. (Suspense relieved two days later: Sony's Ultra HD Video Player comes loaded with

10 4K movies and ships with the new 84-inch 4K LED TV.)

Peter Crithary, Sony Marketing Manager for Large Sensor Cameras, conducted a technical tour of the new cameras. Short films, clips, and demos were presented by Sony, Stargate Studios, Tribeca Films, USC, and Daryn Okada, ASC, followed by panel discussions moderated by Jon Fauer.

The "show" then moved on to Colorworks for workflow and post demonstrations, and to Stage 7, home of Sony's Digital Motion Picture Center (DMPC) for hands-on time with all the new equipment.







Photos by James Sicignano, 3ality Technica, Jon Fauer, Sony

# Ergonomics and Sony Shoulder Rig



Sony's multi-position bracket positions the Electronic Viewfinder way forward for comfortable shoulder-resting balance or well aft for fluid or geared head operating.

Finder rotates 360 degrees parallel to the camera body, and moves in-out for either right or left-eye viewing.

Sony's shoulder baseplate has industry-standard rosettes on both left and right sides and accepts 15mm lightweight support rods.

The bottom of the shoulder rig attaches to Sony's quick-release VCT-14 tripod adapter.



Sony shoulder baseplate

The shoulder baseplate from Vocas holds 15mm rods in front and at the rear. The modular bottom can accept a Sony VCT-14 tripod plate, Vocas flat plate, Touch and Go Quick Release Plate, and Arri BP-8/9 Studio baseplate.



Vocas shoulder baseplate



# Mounting and Viewing

Element Technica and their new top handle lets you mount the viewfinder in all kinds of positions: up front for handheld, at the rear for operating on a geared head or dolly. Plus mounting of

cold-shoe, rosette or Sony EVF dovetail. Below, right: F55 with Element Technica Micron base-plate system, Angenieux Optimo DP 16-42 mm zoom, ARRI mattebox, OConnor 1030D fluid head.



Element Technica  
Accessories

ARRI's Pro Camera Accessories for Sony's new F5 and F55 are fully compatible with ARRI support and all industry-standard mattebox and follow focus systems. The baseplate includes a built-in "Touch and Go 35" plate for quick mounting. Rosettes on each side provide mounting points for handgrips and extensions. For

studio configuration, the baseplate accepts studio bridge plates such as ARRI's BP-8 or BP-9. The shoulder pad mounts directly to the bottom of Sony F5 and F55 cameras with a hand screw and can be used independently of the baseplate. When used with an ARRI's base plate, the shoulder pad can remain attached.



ARRI Pro Camera Accessories



# Machinists' Page

Clairmont, Nemenz, Piff, Denz, Chrosziel, Vocas, Shape, Technica, OConnor, 16x9, Band Pro, Abel-Cine, Dorn, Eckerl, Vischer, Voss, Pizzo, Ortega, Schmidles, Martin, another Martin, Baumler, Steeles, Pazagurtunduas, Delacoux, Nussbaum, Musitellis and more...these are the people who never saw a camera they didn't want to accessorize.

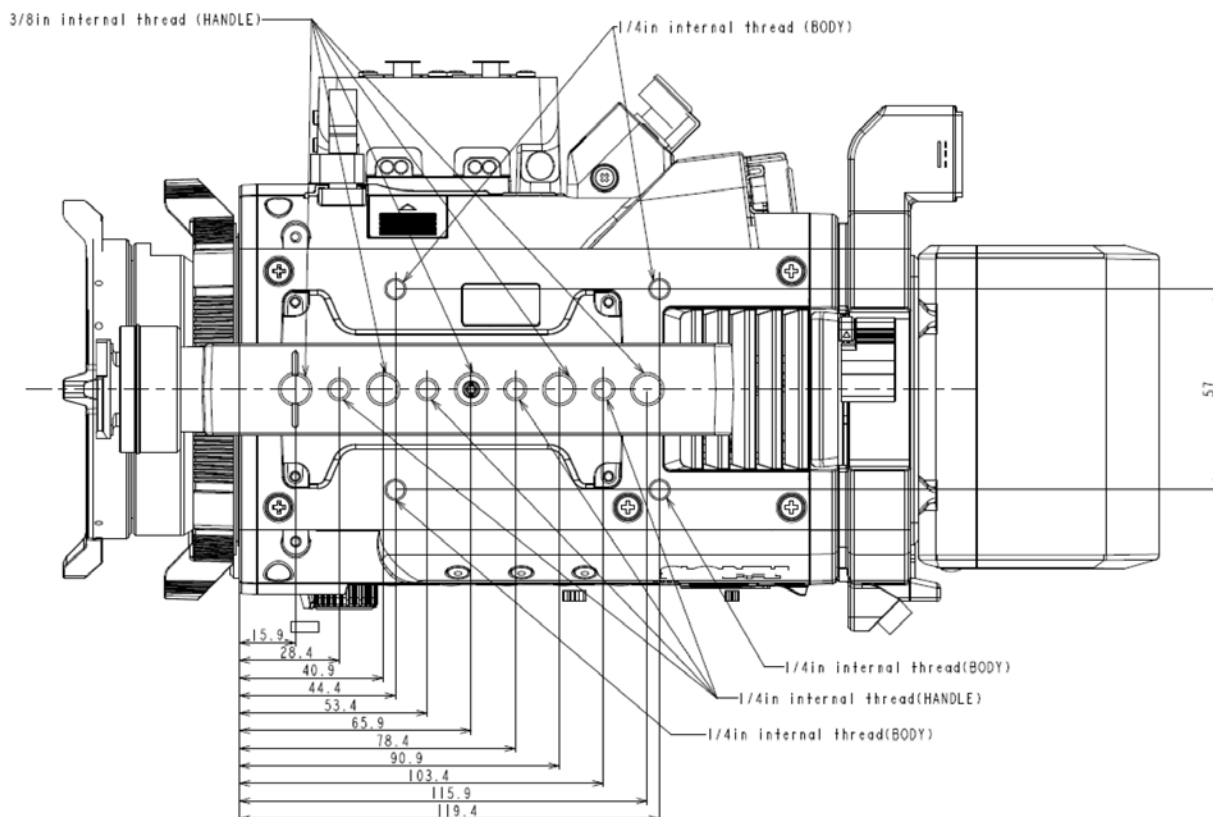
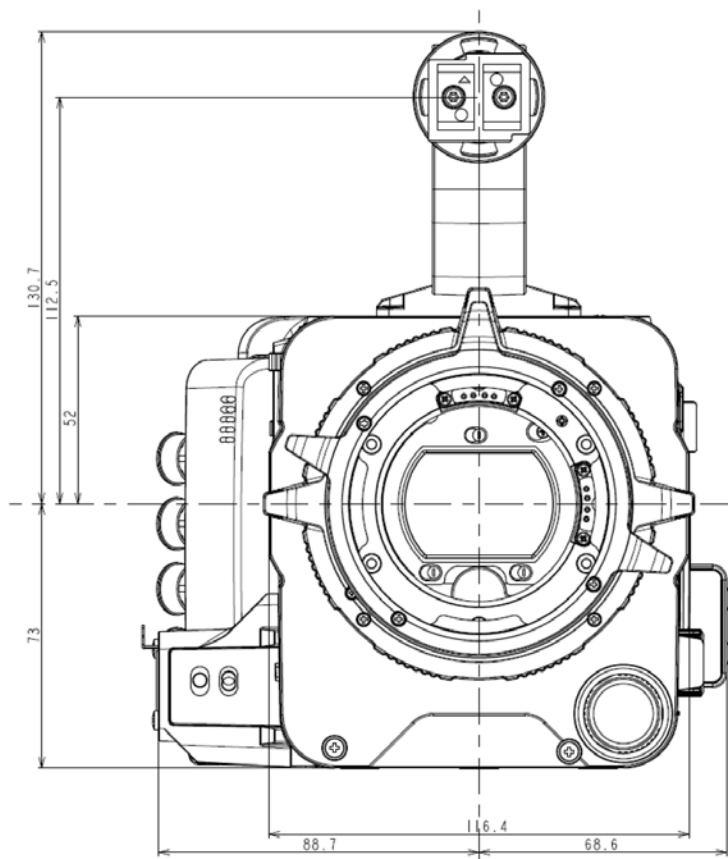
So...gentlemen...start your engines and CNC machines.

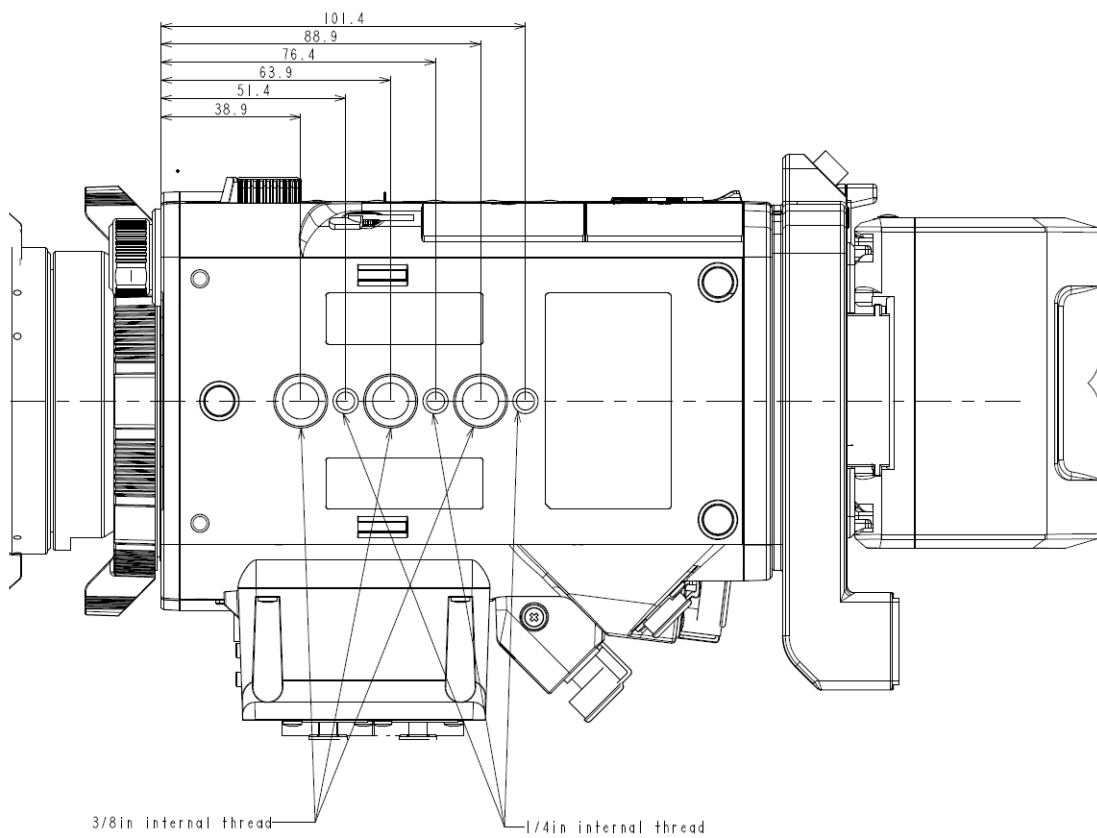
Your customers will be calling for Sony F5 and F55 studio baseplates, FZ adapters, accessory handles and brackets.

These cameras are so well thought-out, I don't think you'll need cages, however.

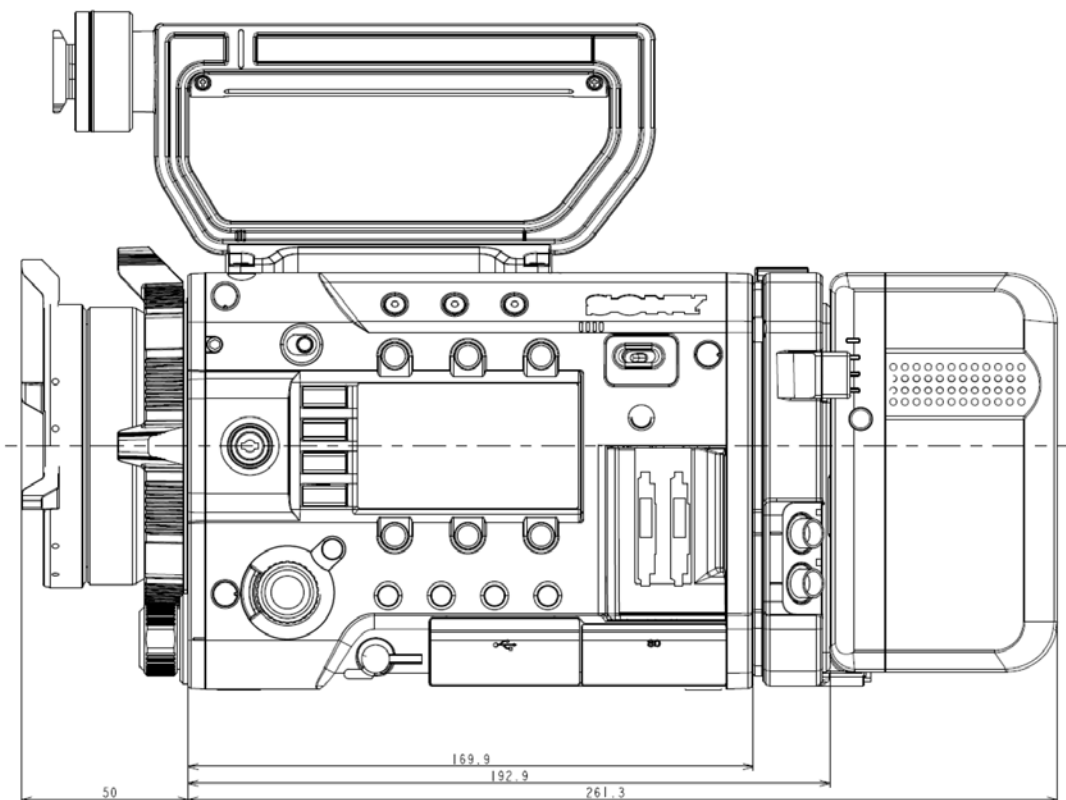
Body only dimensions:

7 7/8" long x 5" high x 5 1/8" wide.





7 5/8" long x 5" high x 5 1/8" wide.





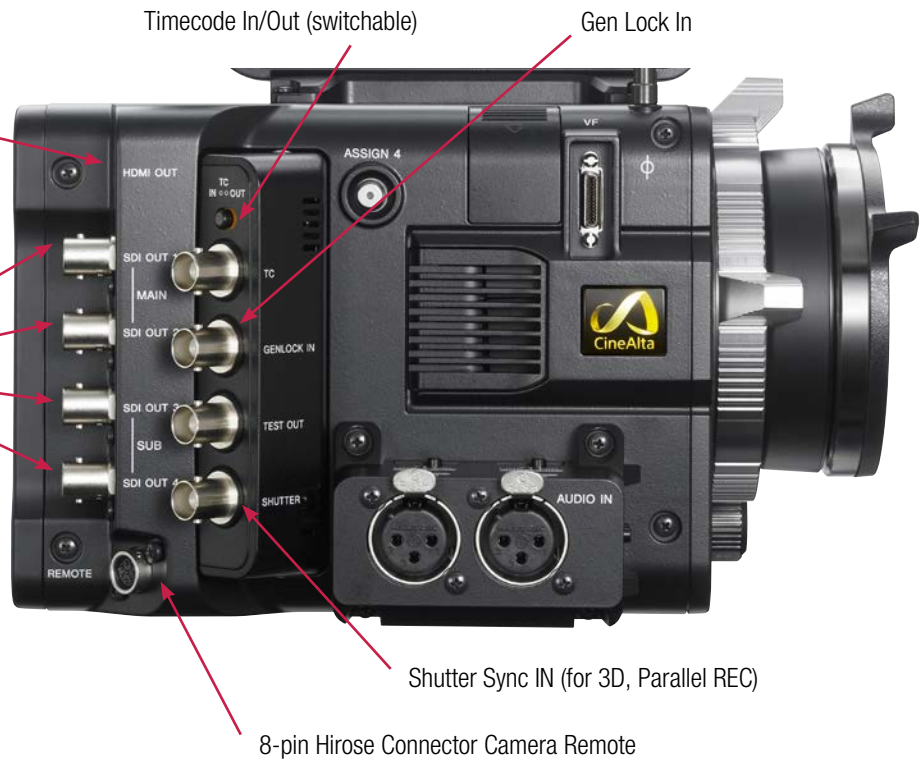
# Connections

on F55:  
HDMI OUT (up to 4K)

on F5:  
HD and 2K only

on F55:  
Configurable x4 SDI Outputs  
4x 3G-SDI for 4K up to 60p Outputs  
2x HD-SDI Outputs  
2x HD-SDI Monitor Outputs

on F5:  
2x HD-SDI Outputs  
2x HD-SDI Monitor Outputs



## BNC connectors

The F55 camera has 4K output, up to 60p, via four 3G-SDI BNC connectors for real-time viewing on a compatible monitor.

The HDMI connector provides HD, 2K and 4K output.

The F5 has four HD-SDI outputs (not 4K) and the HDMI is for HD and 2K only.

## Analog Signal Module



# Power



XLR 4-pin DC-IN +12V

Rear View of Camera Body

V-Mount Battery Module  
attaches to rear of camera

The Adapter is not  
needed if AXS-R5  
is attached to the  
camera directly

XLR 4-pin  
DC-IN +12V



BP-FL75 Olivine  
Battery

## Olivine Battery

The F55 and F5 benefit from Sony's BP-FL75 battery pack, which uses Olivine—Lithium Iron Phosphate—instead of conventional Lithium Ion cathodes. The result is a substantial increase in charge-discharge cycles compared to previous Sony batteries.

Olivine batteries offer longer cell life: more than two times current cell technology. Recharging is rapid: Rapid recharging, 60 minutes compared to previous 120 minute charge time.

The Olivine battery works with Sony's BC-L90 quick charger.

The F5 and F55 cameras are also compatible with Sony's V-Mount batteries BP-GL95A, GL65A, L80S and L60S, which use the BC-L70 and L160 chargers.

Good news: Olivine chargers and batteries are backwards-compatible with current Li-ion chargers and batteries.

## Specs

BP - FL75 - same height and width as F5/F55 camera

70Wh capacity, more than one hour operating time

Works with BC-L90 Quick Charger

Size: 92w x 69d x 120 hi (mm)

BC-L90 Quick  
Charger



# EVFs



## DVF-EL100 0.7" OLED Viewfinder

- Resolution: 1280×720
- OLED offers accuracy of focusing

Buttons:

- Focus Magnification
- Display On/Off (Characters and Info Superimposed)



## DVF-L350 3.5" QHD LCD Viewfinder

- Resolution: Quarter HD (960×540)
- Doubly articulated swing-away and flip-up mechanism for direct monitoring of LCD, see picture below:



Both viewfinders use the connector on the camera right side.  
Both come with an adjustable finder bracket

Focus Magnification



Focus Magnification





# DVF-L700 7" Full HD LCD Viewfinder-Monitor



Sony calls it a Viewfinder. It's like an onboard mini monitor, but it plugs into same camera-right side connector as the OLED or 3.5" EVF. The DVF-L700 will be especially helpful for shots where you can't put your eye to an eyepiece and need a screen larger than the one in the 3.5" EVF. Like when you're bouncing around in the back of a pickup truck, hanging out the back, holding the camera by its handle for a low-angle shot.

- New Full HD LCD Viewfinder
- Resolution: Full HD, 1920 x 1080
- High Contrast (1000cd/m2) for outdoor shooting
- HD-SDI as an additional input
- HD-SDI output. Convenient for using additional monitor:  
Two monitors on camera are helpful: one for camera assistant and the other for Operator or Director
- 3.5" and 7" can be used at the same time with F5/F55:  
3.5" uses Digital VF interface and 7" uses HD-SDI input with external 12V DC power from power tap on the battery adapter or AXS-R5 DC 12V output.
- Can be used as small HD monitor for other cameras

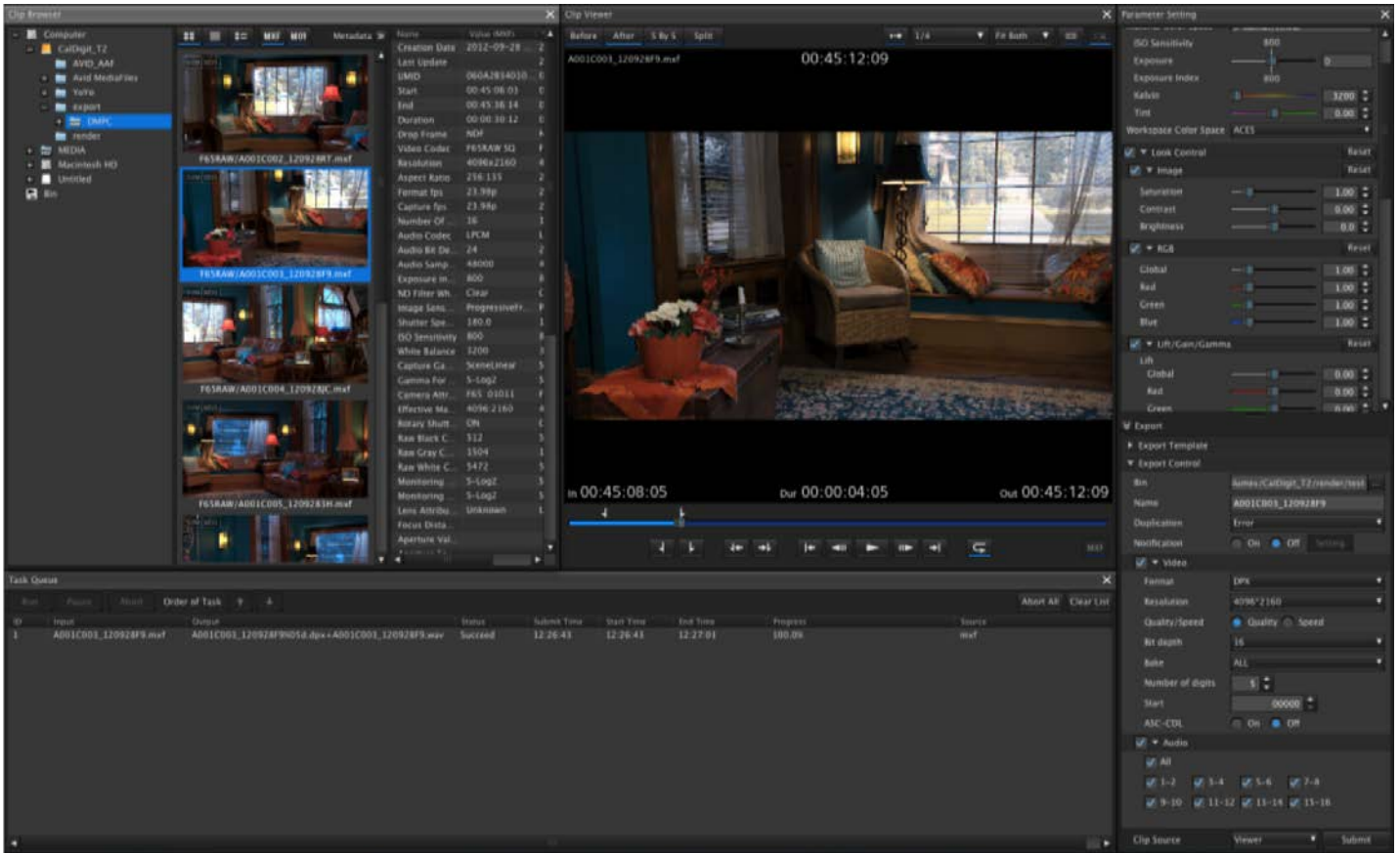
## Sony 30-inch 4K Monitor



Sony 30-inch LCD + white LED 4K Monitor

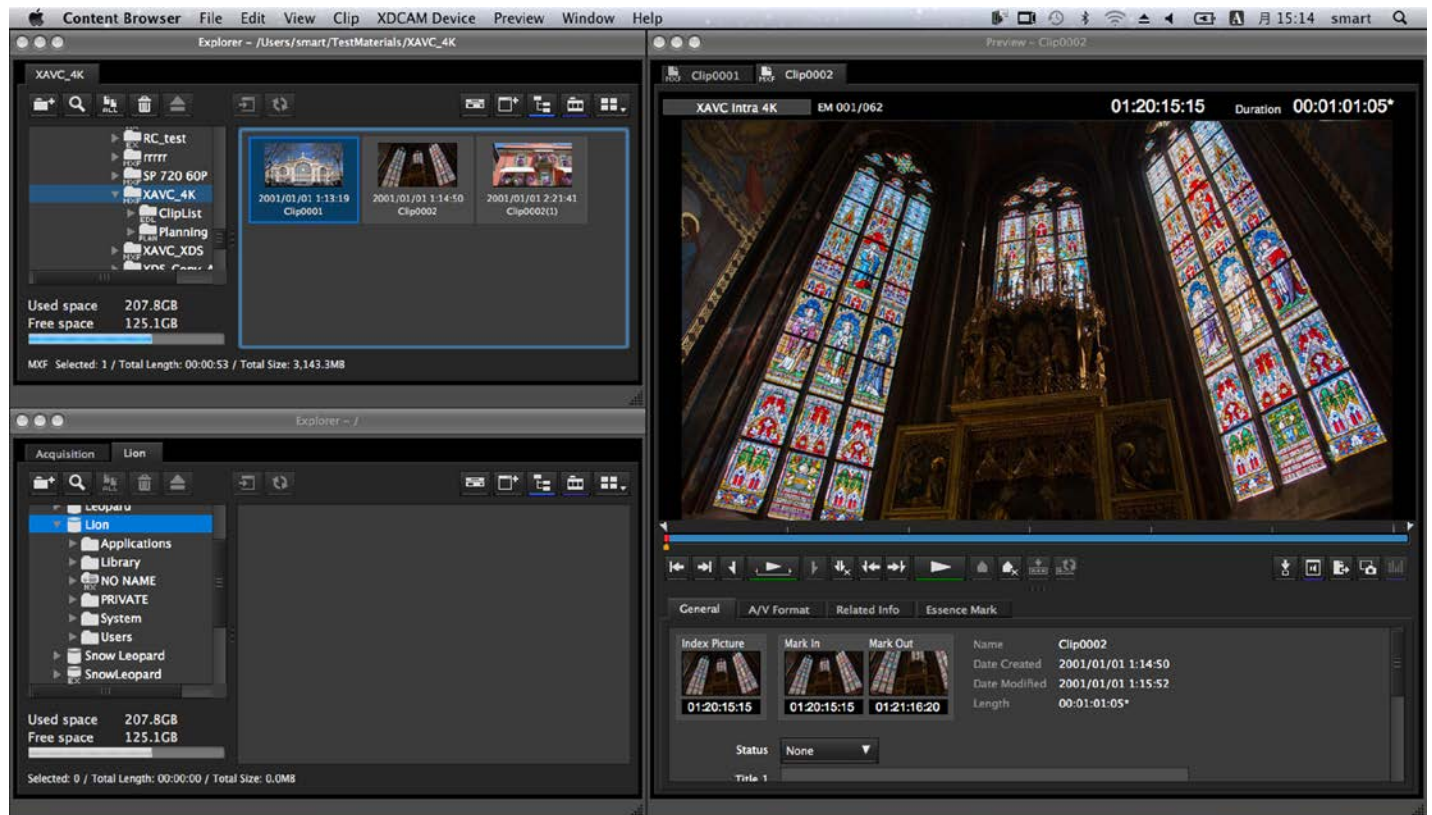
- 4096 x 2160
- 10 bit panel
- 3G/HD-SDI x 4, Display ports x 2
- HDMI (v1.4) x 4
- 4K Mode, Quad View, 2K / HD Zoom
- PC / MAC Control panel
- Dockable adapter to play back XAVC 4K SxS Pro+ media from F55 (Future product available in 2013 summer)

# Workflow



RAW Viewer (RAW Toolkit) above. RAW files can be viewed on your laptop or desktop using Sony's free RAW Viewer software for Mac and PC — works on F65 and F5/F55.

Below: Sony's Content Browser for Windows and Mac.



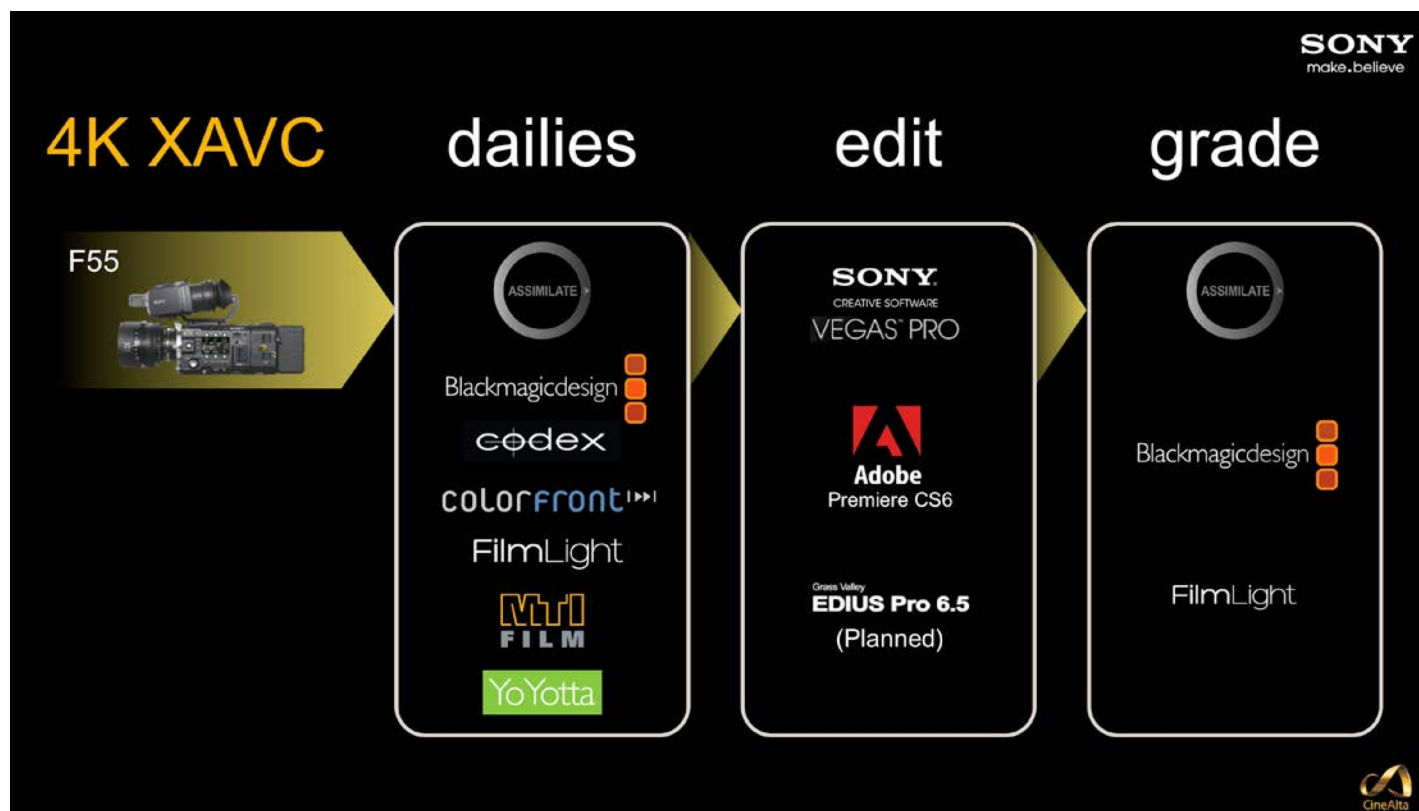
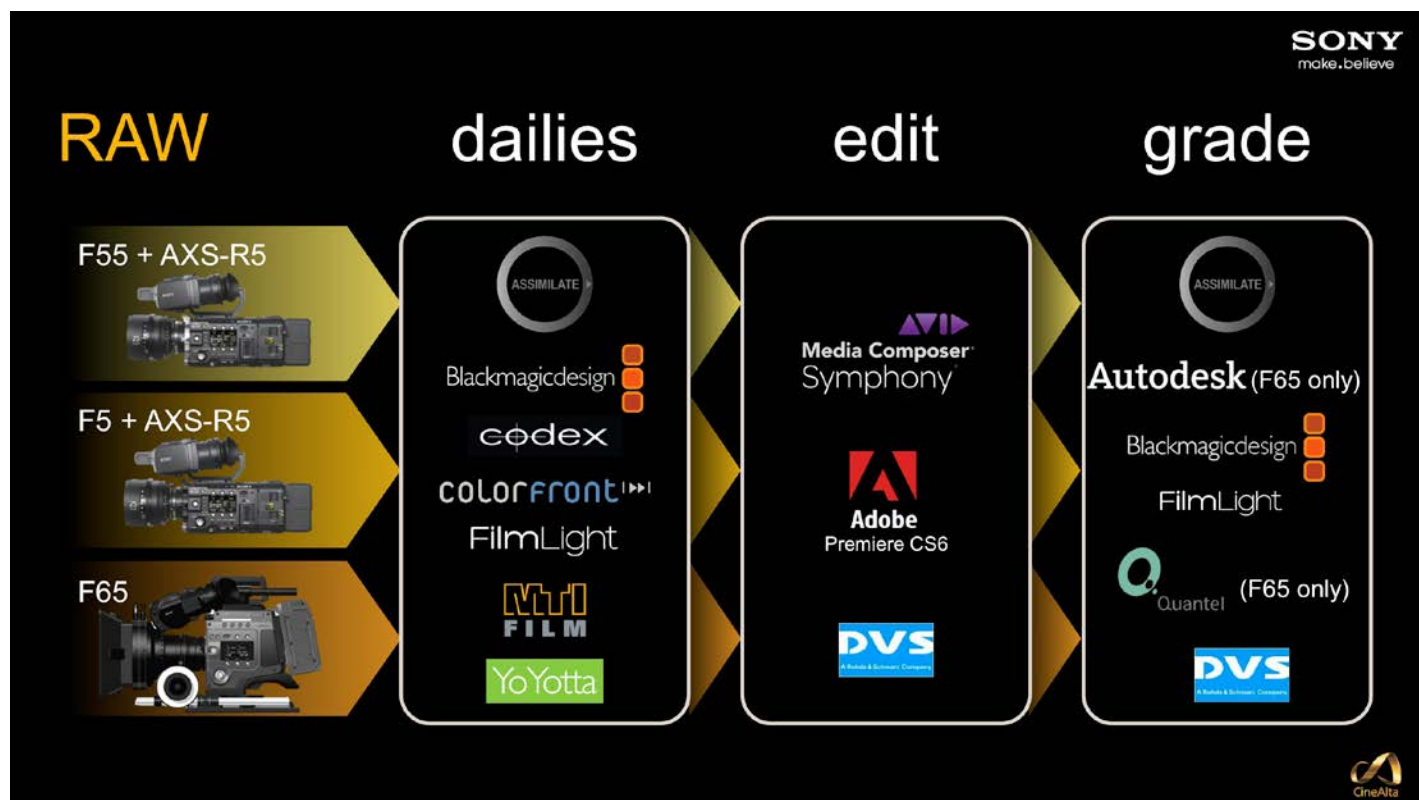
# Workflow Scenarios and Charts

The charts on this page and the next ones are what we know as of Jan 29, 2013.

They are subject to change and the whims of software, beta-testing, strategic alliances and allegiances.

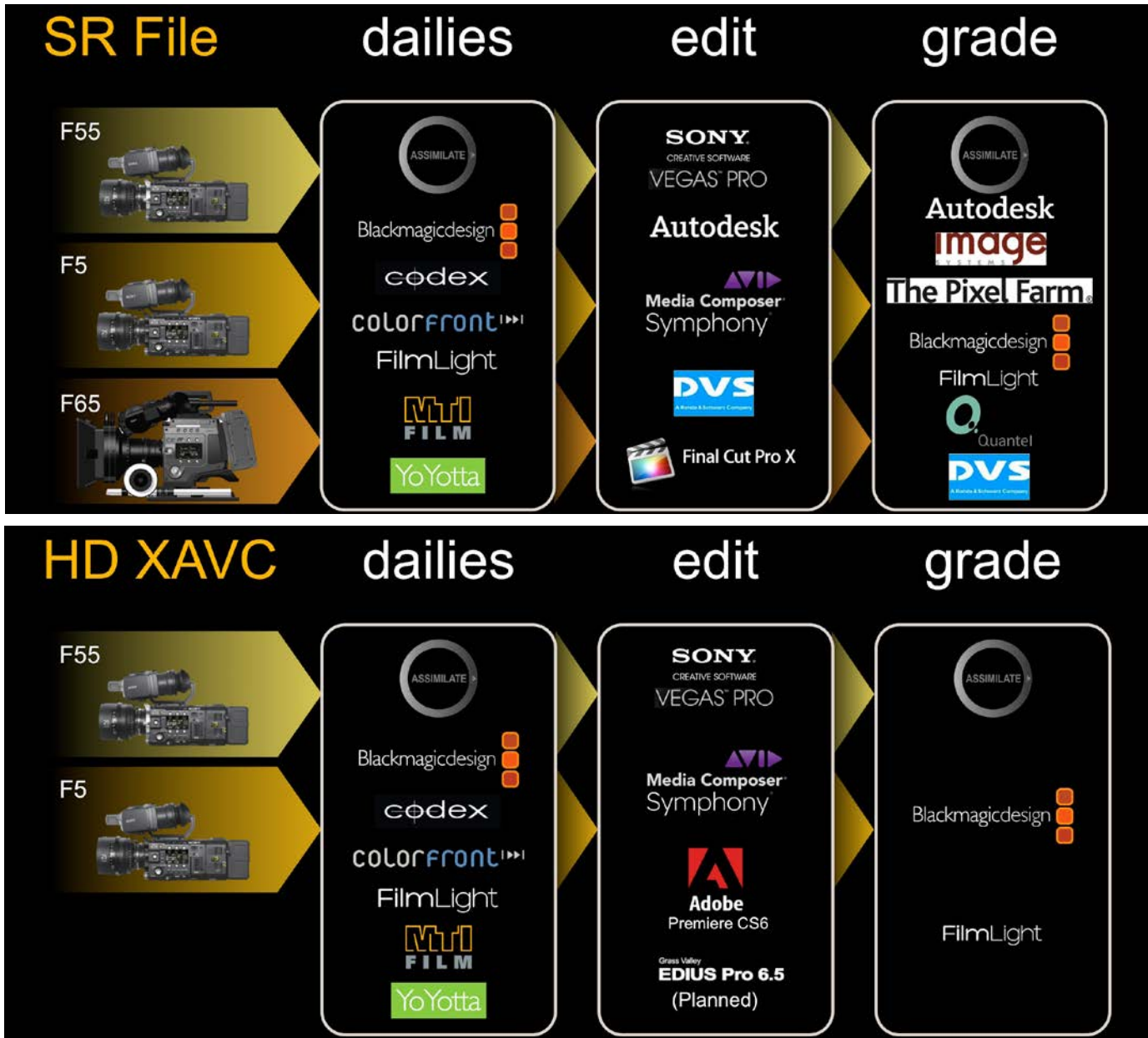
Caution: test your entire workflow from pre- through post- before embarking on actual production.

Charts are courtesy of Sony. Welcome to the world of upgrading your camera like your software.





# Workflow Scenarios, cont'd



## Choices of Internal Recording Formats

**MPEG-2 HD on F5 / F55 4:2:2 8 bits 50 Mbps (at 30 fps)**

This is widely used for television production. The 50 Mbps 4:2:2 codec provides good pictures and compact files. The workflow is well established, efficient, and has widespread third-party support.

**XAVC HD (2K\*) on F5/F55 4:2:2, 10 bits, 100 Mbps (at 30 fps)**

The next generation of H.264/AVC intra-frame coding, the XAVC format is a cost-efficient system for High Frame Rate HD and 4K/60p production. It supports high data rates needed beyond HD, with efficiency and 10-bit pictures. The XAVC format also delivers the efficiency of multi-pass encoding, more refined bit allocation based on visual perception and better multi-generation performance.\*\*

**SR Codec\* on F5/F55 4:2:2, 4:4:4, 10 bits, 220, 440 Mbps (at 30 fps)**

The F5/F55 will soon\* have the same the SR codec used on SR tape. It is recorded as a file. The SR Codec is widely supported.

**XAVC 4K (QFHD\*) on F55 4:2:2, 10 bits, 300 Mbps (at 30 fps)**

4K can lead to large files and higher storage costs. Sony proposed to "tame the gusher" through this implementation of H.264/AVC intra-frame encoding. You get 4K image quality with reasonably compact files.

\* Expected as a future upgrade \*\* Compared to previous professional AVC Intra-frame only encoding. Bit rates shown for 30 fps.

# F5 and F55 Recording Format List


(Chart as of January 16, 2013)

Resolution	CODEC	MAX Frame rate	Max Data rate	Recording Media	Comment
4K (4096 x 2160)	XAVC Intra 422	60p	600Mbps	SxS PRO+	F55 Only
		60p (S&Q)			
QFHD (3840 x 2160)	XAVC Intra 422	60p	600Mbps	SxS PRO+	F55 only
		60p (S&Q)			
2K (2048 x 1080)	XAVC Intra 422	60p	200Mbps	SxS PRO/SxS PRO+	
		180p (S&Q)	600Mbps	SxS PRO+	F5 Max : 120p
HD (1920 x 1080)	XAVC Intra 422	60p	200Mbps	SxS PRO/ SxS PRO+	
		180p (S&Q)	600Mbps	SxS PRO+	F5 Max : 120p
	MPEG 422	30p	50Mbps	SxS-1/ SxS PRO/ SxS PRO+	
	SR File 422	30p	220Mbps	SxS PRO / SxS PRO+	
HD (1280 x 720)	MPEG 422	30p	440Mbps	SxS PRO+	
		30p	50Mbps	SxS-1/ SxS PRO / SxS PRO+	
4K (4096 x 2160)	F5/F55 RAW	60p	2.4Gbps	AXS 512GB	
		60p (S&Q)	2.4Gbps	AXS 512GB	
2K (2048 x 1080)	F5/ F55 RAW				
		240p (S&Q)	2.4Gbps	AXS 512GB	

## F5 and F55 Recording Formats

End-user firmware updates are FREE of charge.

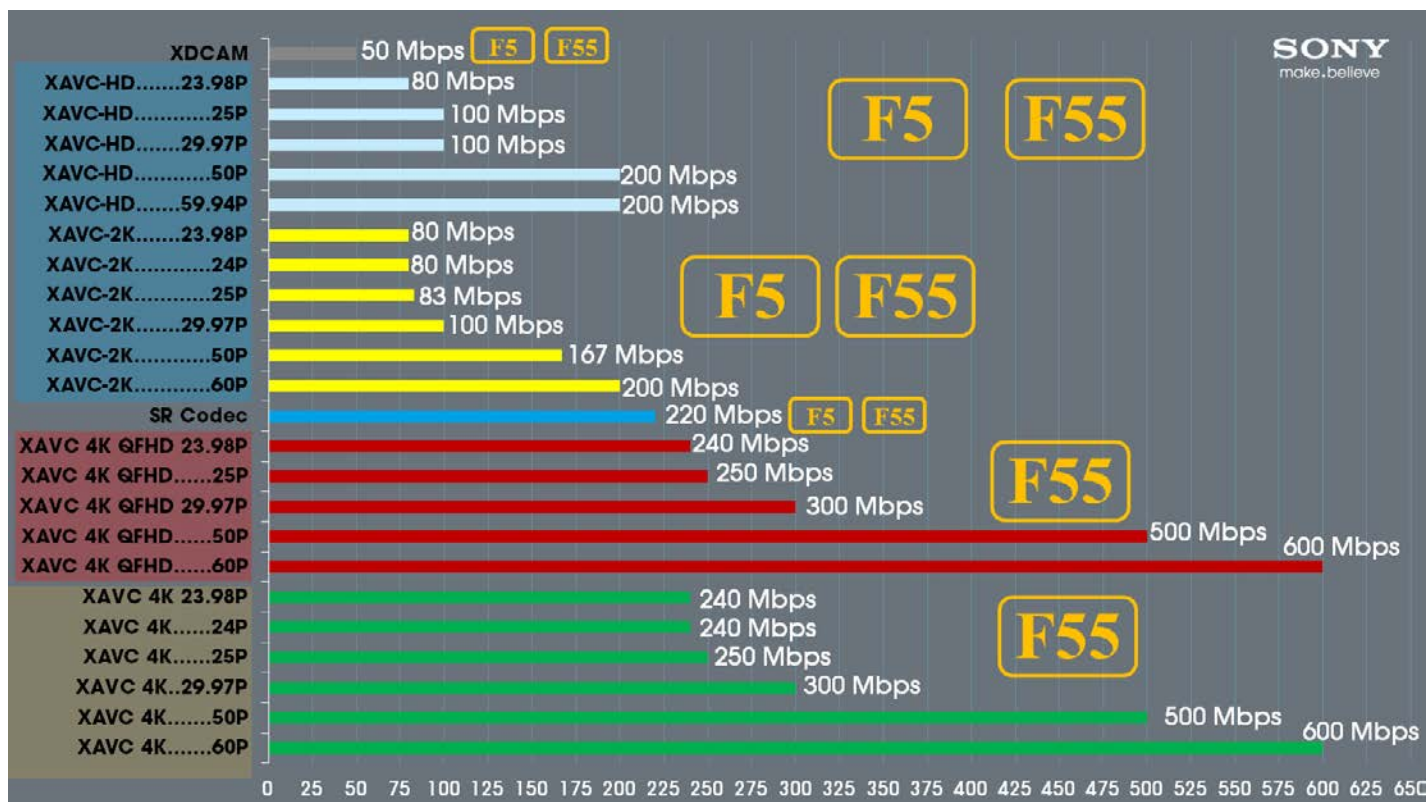
Features and specifications are subject to change. (Chart as of January 29, 2013)

<div>  <b>F5/F55 Recording Format</b> <div> <span>Ver 1.0</span> <span>Ver 1.2</span> <span>Ver 1.3</span> <span>Ver 1.4</span> </div> </div>										
Resolution	Format	Frame Rate								File Wrapper
		23.98P	24P	25P	29.97P	50i	59.94i	50P	59.94P	
4K (4096 x 2160)	XAVC 4:2:2	■	■	■	■	—	—	■	■	MXF
QFHD (3840 x 2160)	XAVC 4:2:2	■	—	■	■	—	—	■	■	MXF
2K (2048 x 1080)	XAVC 4:2:2	■	■	■	■	—	—	■	■	MXF
HD (1920 x 1080)	XAVC 4:2:2	■	—	■	■	—	—	■	■	MXF
	MPEG HD 4:2:2	■	—	■	■	■	■	—	—	MXF
	SR File 4:2:2	■	■	■	■	—	—	—	—	MXF
	SR File 4:4:4	■	■	■	■	—	—	—	—	MXF
HD (1280 x 720)	MPEG HD 4:2:2	—	—	—	—	—	—	■	■	MXF
4K (4096 x 2160)	RAW 16-bit linear	■	■	■	■	—	—	■	■	MXF
2K (2048 x 1080) *S&Q Only	RAW 16-bit linear	■	■	■	■	—	—	—	—	MXF

## F5/F55 Record Times with SxS PRO+ Cards

Resolution	Codec	Frame Rate	Data Rate	SxS PRO +	
				SBP64B	SBP128B
4K (4096x2160)	XAVC Intra 4:2:2	60p	600Mbps	10min	20min
QFHD (3840x2160)		60p	600Mbps	10min	20min
2K (2048x1080)		60p	200Mbps	30min	60min
		180p (S&Q)	600Mbps	10min	20min
HD (1920x1080)		60p	200Mbps	30min	60min
		180p (S&Q)	600Mbps	10min	20min
	MPEG 4:2:2	30p	50Mbps	120min	240min
	SR File 4:2:2	30p	220Mbps	27min	54min
	SR File 4:4:4	30p	440Mbps	14min	27min

## XAVC Data Rate Comparison with F5/F55





# XAVC

This explanation of Sony's XAVC comes from a Sony paper.

Sony's XAVC is an H.264 MPEG4 format in an MXF "wrapper" that also contains audio and metadata.

XAVC promises to be a professional production tool that can economically handle High-Frame-Rate (HFR) HD and 4K formats.

The XAVC format is intended for both cinema and television applications: 4K DCI (Digital Cinema Initiative) 4096 x 2096 and QFHD (Quad HDTV) 3840 x 2160.

The new Sony PMW-F55 camera records 4K XAVC Intra-frame between approximately 240 Mbps (at 24P) to 600 Mbps (at 60P) internally. These high data rates are made possible with Sony's newly developed, cost efficient, compact solid state media: the SxS Pro+ memory card family. The SxS Pro+ memory cards are compatible with all devices that have an SxS card slot, and achieve a sustained recording data rate up to 1.3Gbps. On a single SxS Pro+ 128GB memory card, the PMW-F55 records up to 50 minutes in 4K/24P or about 20 minutes in 4K/60P.

ACES (Academy Color Encoding System) is a system that standardizes the look for images coming from different cameras and sources, through color grading, and on to delivery—independent of manufacturer. Sony is an active participant in the ACES consortium, and its recent cameras reflect this commitment. Sony's F65+SR-R4, F55+AXS-R5, F5+AXS-R5 camera systems have the ability to record 16-bit linear RAW files using compact on-board recorders.

While the new F5/F55 cameras are recording camera RAW files onto AXSM Cards in the AXS-R5 onboard recorder, the in-camera SxS card slots can simultaneously record XAVC files at HD resolution, perfectly matching the RAW files' In/Out points, audio, timecode, lens metadata, file names, and other data. The XAVC files can be used to edit immediately; the RAW files are like the camera original negative.

In many scenarios, the XAVC files will be the ones used for finishing; the RAW files become the future-proof archival masters. Although it is agreed that camera RAW files offer the most control over color, contrast, and look, the inevitable "time is money" syndrome can hold sway.

To edit and grade using the camera RAW files, an extra image processing step (called de-Bayering, or de-mosaicing) is required.

4K XAVC files may provide a cost-efficient alternative to camera RAW files. 4K XAVC file size is similar to many current HD files.

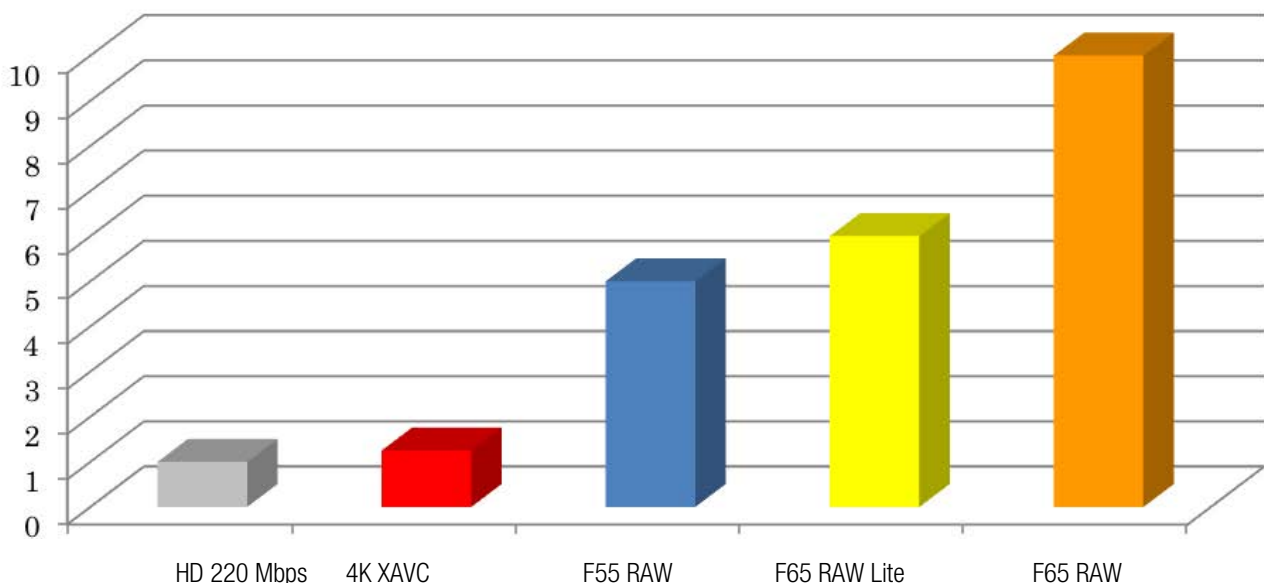
The Sony report says that 4K XAVC files will be one of the major driving forces in expanding 4K production.

How is this possible? The Sony report explains that new compression algorithms are more efficient than their predecessors. Improved image quality can be achieved with smaller amounts of data (or bit-rate). However, it's not a free lunch: the increased complexity of coding demands more computational (hardware) power.

The new F5 and F55 have an XAVC pre-coding mechanism integrated into both software and hardware encoders. This two-stage encoding process takes place during high-frame-rate and 4K recording.

To build portable camcorders with modest power consumption, Sony has developed a custom hardware chipset that handles the XAVC encoding and decoding process. This chipset has the ability to encode/decode MPEG2 as well. This multi-codec capability will allow facility and equipment owners to easily move back and forth between MPEG2 and XAVC. The first product to make full use of this multi codec capability is the PMW-F5/F55 production camcorder, which handles MPEG4 SStP and RAW in addition to XAVC and MPEG2.

Image File size comparison



**Stargate in Sri Lanka**

**Watch Stargate's "Mahout" on iPad  
or online at [vimeo.com/54499106](https://vimeo.com/54499106)**







Dana Christiaansen and Sony F55 in Sri Lanka.  
Photos courtesy of Stargate Studios.





Director/Cinematographer Sam Nicholson, left  
Cinematographer Dana Christiaansen, right









# Stargate Studios with Sony F55 in Sri Lanka



*I spoke to Sam Nicholson by phone as he was packing up in Sri Lanka with about 30 pieces of excess baggage and heading back to LA.*

## **JON FAUER: Tell me your elephants tale.**

**SAM NICHOLSON:** It's been a very interesting trip and a great experience with the Sony F55.

I don't know what inspired me to come halfway around the world with probably the most unpredictable story you could imagine for a camera test. But we did. The first week we were here, it was a typhoon. All the electricity went out, the rooms flooded in the hotels. We were worried that we might get blown out regardless of how the cameras worked.

It's a story of an orphan girl who discovers a captive baby elephant and goes on a journey across Sri Lanka to free him and return him to his herd. It's a short story, told in bits and pieces. We boiled it down from a feature script that we've written. You might call it "Free Willy with an Elephant."

It's a very endearing story and our cast here in Sri Lanka, and the kids, were fabulous. None of them had ever acted. They did a fantastic job. We got the cutest baby elephant ever. He was with

us the entire time wherever we went. We got him on board a train. We did all sorts of stuff that we thought you could never do. And at that point, you really want a really dependable camera technology.

Of course, the cameras were prototypes. Luckily, four engineers from Sony joined us here.

The cameras were really remarkable. They delivered some really, truly amazing images. In a very small package. The F55, I think, is going to be a highly accepted camera. The image quality is fantastic. And the size and workability of the camera is very small. It's almost like working with an F3. The lovely thing about this camera is the internal 4K on SxS and the onboard 4K RAW on AXS Card.

## **Tell us more about the cameras.**

The cameras we had were pre-production models—and they were really remarkable. They delivered some truly amazing images.

You have to be prepared to handle some data. We had three camera bodies with us. They worked very well. We put them through some extremely challenging circumstances. Heavy, heavy rain. Downpour like an inch an hour.





Sam Nicholson with Sony F55 in Sri Lanka.

And, a herd of elephants, running at the camera, which is very unpredictable with any camera. We did a lot of low light shooting. We shot sideways out of a train.

Denny Clairmont was nice enough to set us up and support us for the shoot. We outfitted everything at Clairmont and 3ality Technica did all the handheld accessories. We had some great support.

#### **Which eyepiece did you use? The LCD or the OLED?**

We used the LCD's, so I'm very much looking forward to the OLEDs. The LCD finder has this double flip up viewfinder where you can shoot off the LCD. You're hanging out of a train and there's no way you're going to look through an eyepiece. Being able to very quickly strip the eyepiece off the camera and use it as a viewing device for framing is great. Then you don't have to have an onboard monitor.

You can be rolling on a Sri Lankan train and be shooting within 10 minutes. Running and gunning in 4K is kind of a new concept for me.

They've redesigned the cards: there's an SxS Pro+ card and the AXS card. One of the problems we've had in the past is the high

cost of memory. To shoot you had to add many thousands of dollars. I think that the the AXS card has been designed to be much less expensive.

The lovely thing about shooting digital is you can roll. We went out in the rain and we were rolling 10 minute takes just because we didn't know what was going to happen. With a herd of elephants, you have no idea what's going to go down, so you just have to roll. Having the luxury of rolling for extended periods, almost documentary style with 4K, is really a luxury.

#### **What about shooting in 4K?**

I think once you shoot 4K, it's very addictive because you have the ability to go into post-production and reframe to a considerable extent. Stabilize, do a lot of things you just can't do in HD. And the dynamic range of this camera is really remarkable. It is 14 stops. In the RAW mode, we've been able to review our material on laptops, bringing it straight out of the reader in 4K.

We reviewed it in reduced rez in real time. You can review it pixel for pixel on your laptop. When you slide the exposure bar up and down three stops, you see what is burned out in highlights. You can see into the shadows and you can see into the highlights incredibly.

We're finishing at Sony Colorworks. Our data is back there now and what we're hearing is that there is remarkable detail in all the highlights. We're anticipating a great DI session that gives us an added couple of stops and 4K resolution in post.

### **What was the ISO rating of the camera?**

The base ISO of the F55 camera is recommended by Sony as 1250. We went up to 6400. Generally we tried to stay at about 3200 for low light. There was a little grain increase or a signal to noise increase when you gain it. But it is very quiet. What I believe we're seeing is 4K "grain" or 4K noise. It is much finer than HD signal to noise.

Remember, these were prototypes, much like what we tested for other manufacturers. They were right off the bench and the engineers were sort of sweating bullets, but that's the way these things are. What we were really going for was to find out about the dynamic range, the color imagery and the resolution of this camera.

Everything else is software. I think Sony's very good at that. This small and lightweight camera delivers on the resolution, the color imagery, and the color depth. And it's easy to use. It's a square module that you can attach things to, which is very nice.

### **Does it fit comfortably on your shoulder?**

Yes, primarily because it's so small anyway. The camera is spectacular. Recording onboard 4K with something that sits on your shoulder--we were using it handheld at 60 frames per second with the Fujinon 19-90 Cabrio, and what a combination that is. You don't have any lens rods. As I said, it sits on your shoulder. You've got a zoom control on the Fujinon lens with an ENG style rocker. So you're holding the lens itself with one hand. You're focusing with the other hand. You're zooming with your fingers on the right hand. You're focusing with your left hand. And it's sitting perfectly balanced on your shoulder with the R5 module on there with the AXS card, shooting 4K RAW.

### **Did you have the new Olivine batteries?**

The new batteries charge twice as fast. They integrate perfectly with the camera. They're a square block that fits exactly on the back of the camera. It's a very integrated system between the R5, the new battery packs, and the F55 camera itself. You configure this camera correctly and you've got a camera that's equally good in the studio configuration, delivering the close to the quality of an F65, but it is modular so you can strip it down and stick it on your shoulder and run out in the field with it and shoot like it's a news camera. So it's a very versatile system.

### **I think it may be Sony's best designed camera yet.**

I would agree with that. We met with them very early on last year. In television production, you sort of ask why 4K? For me, the ability to reframe and have a lot more color depth and dynamic range is fantastic. You can really perfect your images, re-position, enlarge part of the frame.

I have many other cameras. I have done many tests. They're all different tools. But, a lot of times when I go out and shoot plates and visual effects, I want 4K. For the big screen, you really have to have it.

And I think that this camera in the SxS mode delivers to the television market exactly what they need. I think in the 4K RAW

mode, coming off the R5 with the AXS memory, the 4K RAW is great. For the big screen, I think 4K will become a standard.

### **Were you recording simultaneously 4K raw and 4K to the SxS?**

The prototypes wouldn't do that yet. So we'd set up one camera in 4K on SxS and one in the 4K RAW. My opinion of the SxS at this point from what I've seen is that at 600 megabits, it will be very difficult to tell the difference on screen. The difference is going to be told in the DI suite in terms of how much latitude you have, the RAW image versus the thing which has gone through a greater amount of compression.

But, 600 megabits per second on that SxS Pro+ card is absolutely extraordinary; 600 megabits per second to an on board SxS card is 12 times the data rate most cameras are sending to a CF card (50 Mbps).

Sony has taken a ground-up approach towards this camera, because it's very apparent that without the SxS Pro+, you could never expect to record 4K 600 Mbps to an internal recorder. And the AXS card has been designed to make it much more affordable and deliver at even higher data rates.

Sony has come up with an integrated system with the memory, the batteries, and the camera itself.

### **What lenses did you bring?**

I think everyone is going to have to reassess the quality of their lenses because the Leica lenses are performing beautifully on these cameras. Band Pro lent us a set of Leicas; we wanted to shoot with the best lenses that money could buy to put on a camera. We also had ARRI/ZEISS Ultra Prime lenses. We also wanted to use small lenses. Many lenses are big—almost as big as the F55 body itself. But I think that kind of defeats the portability issue of the camera. We shot with the 19-90 Fujinon Cabrio, and the Fujinon Premier 14.5-45 and 75-400 — phenomenal zoom lenses. We had an assortment of lenses.

### **Did you have a data wrangler or a DIT or how did you deal with data?**

We had a pretty small crew. Only five of us came out of Los Angeles. Dana Christiansen, our DP; Robert Scott Wildes, 1st AC, Jim Riley, writing-producing partner, my wife Diane, who did hair-makeup-wardrobe, and me. Robert Wildes, our 1st AC, did all the data wrangling on this.

I think it's important to say that we didn't have to have a big data wrangling setup. We went out in the field and shot RAW 4K with three cameras. We had all Sri Lankan 1st AC's and 2nd AC's here. They picked up on the camera instantly.

It really is something that is easy to use. That's important. If the camera's too difficult to use, what's the point, no matter what the quality? I like the fact that we could come to a foreign country and the local crew intuitively picked up on the camera to a point where within a week we were all shooting like any unit anywhere.

### **Did you have to download data every evening? Or you just kept the cards as "negative?"**

We downloaded every night. We had a Macbook Pro laptop and a 20 terabyte RAID array. It's something that you can do out of a hotel room...a hotel room that had iffy power and sometimes no Wi-Fi. We were on the other side of the world in Sri Lanka. It's



was a little bit unpredictable.

And in monsoon season, which is really something. When you're under a couple of umbrellas with a brand new camera and it's absolutely pouring rain, and you're standing in six inches of water, as the street is beginning to flood--the cameras functioned right through all those kind of those situations. I was very concerned about the humidity.

**I have a question about the lens mount. It has a PL to FZ adaptor. Does that hold up even when you're using the big Fujinon 75-400?**

It's built like a rock. They definitely didn't mess around with with the lens mount. It is really solid.

I'm very interested to see what other lens adaptors you can put on this camera, because with the FZ mount, the imaging chip is within less than an inch from the surface of the mount. So I think you can put any lens ever made on this camera.

**Engineers from Sony came to Sri Lanka?**

At one point we had four engineers overseeing and improving the cameras as we were going. We could literally make a comment and they would go to their laptops and the next morning, they'd have a software revision that would address that function.

I think it speaks highly of Sony's commitment to filmmaking that they are sending their engineers out in the field to experience the rigors of making a movie when you're standing in pouring rain on a street or you're up to your waist in water with a herd of elephants running at you, or you're doing a shot hanging out of a train. They're all very difficult situations.

And the engineers have been with us every step of the way. We meet every morning for breakfast. We went out on location together. They were part of the crew.

**What about crew and casting?**

We got a local casting person here in Sri Lanka. We had a fabulous Indian crew. Part of our crew came down from Stargate Mumbai. We had a full Sri Lankan local crew.

I think at one point we had about 60 people. Everyone was very excited to work with the F55. Our Sri Lankan camera assistants were proud of the fact that they were some of the first people in the world to work with the technology. It was a very international crew.

We had very challenging circumstances. Due to the storyline, primarily. And the location. But the technology performed really admirably. I'm very excited to see this one finished because I think it's going to be the best one we've done yet.

**Did you record sound as well?**

We recorded separate sound. We put sound on the SxS card and on the AXS card. One of the things that you can do is strap a microphone on the top of this camera and deal with it like an ENG camera and it gives you a lot of diversity at that point. I love the modularity.

I think that Sony's given filmmakers a lot of options and people will find their own unique blend of how they will outfit the camera to suit their particular production, everywhere from the very high end shows to the big screen and down to documentary television style run and gun shooting.











### **What was your style on this production? Was it sort of run and gun documentary style?**

It was both. You're not going to run and gun with a big Fujinon 75-400 lens on there. That lens was funny because this camera is so small, you sort of attach the camera to the back of the lens and stick it on a big set of sticks. At the same time, with the lightweight Fujinon Cabrio lens, we could run and get a tremendous amount of material handheld.

We did the POV of the elephant during the escape. A lot of things we were just handholding, intentionally doing some very low budget style production. You never have enough money to do these tests anyway. But I think it's important to put it through all the exercises of the type of filmmaking that the camera will be challenged with. Everywhere from big studio productions, to where you're trying to track focus on a 400 mm lens on something a quarter of a mile away, to picking up the camera and hanging out the side of a train and trying to get a shot where it's really a matter of how far you can get your arm outside that train. So you want the camera to be light at that point, believe me.

### **How did you handle lighting?**

We did everything with portable lights. We had one 2500 HMI light on the show with a generator which was for the train yard. But everything else was battery operated lights. We used Litepanels. We did a lot of shots in existing, available light with very little. Our entire lighting package consisted of four LED lights in one case. All battery operated. We had a Litepanels 1x1 and little 1 Litepanels frenels. They're like an Obie light that is a LED. One time, we were desperate for a little fill light for one of the scenes with our small actress rummaging through trash in the middle of the night, so we took two flashlights, strapped them together and bounced them off a bead board. And that was plenty of fill light at 3200 ISO on this camera.

I think this represents my favorite kind of filmmaking, which is to go anywhere from big to small. And when you want a smaller footprint, you can get it. I personally am not into the big army approach to filmmaking. I think that I'd rather have a smaller team and come out with stunning images. And the F55 gets you there.

It really was an honor to be able to work with this camera so early on and be included in the development of it. It's a great team that Sony has on the camera. And I think it's going to do very well.

### **What software were you using to view material in Sri Lanka?**

The Sony RAW Viewer was excellent. It's just fantastic to be able to pull the card out of the camera and to really look at your RAW data on any laptop. We could scan the images and make selects. It gives us a great deal of confidence in the field.

We got to the point where we had a laptop with an inverter in one of the vehicles and we'd just pull a card and send it over to the vehicle and ask how it looked. You can get your negative report while you're shooting.

It answers concerns about holding the highlights, or should we come down, or what the signal to noise looks like? I think we had about a three hour training session at Sony in LA before we left, so we were kind of learning on the fly while we were shooting. Things like, "Gee, it looks a little hot in the eyepiece. Are we holding those highlights?" That kind of thing. In the middle of a monsoon. With an elephant that is unpredictable. Imagine: we had a bunch of kids, an elephant, a prototype camera, and you mix it up with a monsoon. I'm telling you, it was a challenge.

But, you know, I'm very proud of it. I'm very proud of our Sri Lankan crew. And our American crew, our Indian crew, and our Japanese crew. We're going to change the future of cameras, because these engineers are going to go home with a different vision of what it means to make a movie.



# Elephants on Location



## Stargate Studios Workflow

*Jason Sperling, head of post-production at Stargate, went over the “Mahout” workflow — from Sri Lanka to Stargate — with us.*

1. Recorded in Sony RAW on AXSM Cards at 23.98 and up to 59.94P.
2. Also used SxS Pro+ Cards XAVC 4K at 23.98 and 59.94P in 4:2:2 10-bit I-frame.
3. Data was offloaded via USB 3.0 to an ARECA ARC-5040 8-bay 21 TB portable RAID array via a MacBook Pro.
4. This RAID Array was hand-carried back to Los Angeles (as hand-luggage onboard the airplane).
5. Once in LA, the data was immediately backed up at Stargate, and then delivered to Colorworks.
6. Offline editing was done at Stargate on ProRes Rec 709 files in Final Cut Pro.



# Elephants in the Room



*Images of elephants, that is. The story of Mahout the Elephant and Stargate's excellent adventure with Sony F55 cameras in Sri Lanka continues at Colorworks. Bill Baggelaar, SVP, Technologies of Colorworks at Sony Pictures Entertainment, explains the workflow.*

## **Please explain Stargate's "Mahout" workflow.**

We had conversations with Sony Electronics and Stargate to prepare for how we would approach this project, before they started to shoot. There was not much time to do much camera testing before the Stargate team was off to Sri Lanka to start shooting.

Based on some test files we were able to create on the F55 camera, we started to update many of the tools we created for the F65 camera to handle F55 files. This includes our custom pull system for the Sony Pictures Production Backbone; a large scale storage infrastructure where we store all of the camera original content.

We also were also in communication with Stargate throughout the shooting period establishing the handoff protocol, testing dailies, from editorial to conform, as we knew we would have little time to do that once the Stargate team returned with the footage.

Taking the time up-front to prove out each portion of the workflow and establish the framework was (and almost always is) critical, especially given the quick turn-around on this project.

## **Stargate delivers you the 4K RAW on AXSM cards and SxS Pro+ cards. Please tell us what next.**

We received a USB3 RAID array from Stargate containing 4K F55 RAW files and some 4K XAVC files.

We loaded all of that data onto our high-performance SAN, where we could then catalog and collect the metadata with our proprietary tools we have developed for F65, and now F55.

We produced ProRes dailies from all of the source F55 RAW and XAVC files using our Baselight BLT-XL dailies system.

Color was applied to balance out the shots that needed it.

Sound syncing was also done in Baselight.

Edit in Final Cut Pro.

EDLs will be returned that we will use to conform against.

Conform will take place on Baselight, using the F55RAW and XAVC sources and any EXR/DPX VFX that may be created.

## **What's on the SxS cards? 4K XAVC files? Same workflow?**

We didn't directly receive the cards, but yes, same workflow. XAVC goes to the new SxS Pro+ cards. F55 RAW goes to new AXSM cards. Sony's new AXSM reader downloads over USB3.0.

## **16-bit DPX files? S-log2 color space?**

We will be working in Sgamut/Slog2 on this project in order to mix both XAVC and F55RAW.

## **LUTs?**

LUTs are being used to take Slog2 to P3.

## **Grading on what? Baselight like After-Earth?**

Yes, Baselight is the core of our workflow. We have worked closely with FilmLight to get the F55 SDK features implemented very quickly. FilmLight has been a fantastic partner, supporting Colorworks in our creative and technical endeavors.

## **Conforming on what?**

Baselight as well. For any VFX that may be needed, we will use Flame and/or Nuke.

## **Delivery as what? 4K DPX ?**

By the time we are done there will be a variety of deliverables, certainly 4K 16-bit P3 DPX.

We will also create a 4k wide-gamut 16-bit half-float EXR.

As we are now creating 4K, wide-gamut, H.264 deliverables for display on the new 4K TV sets, I imagine we will be making those as well.

## **What Sony 4K projector will be used in DI and for the premiere?**

DI will be on a Sony R320 projector. The plan for the event may be a Sony R420 projector.

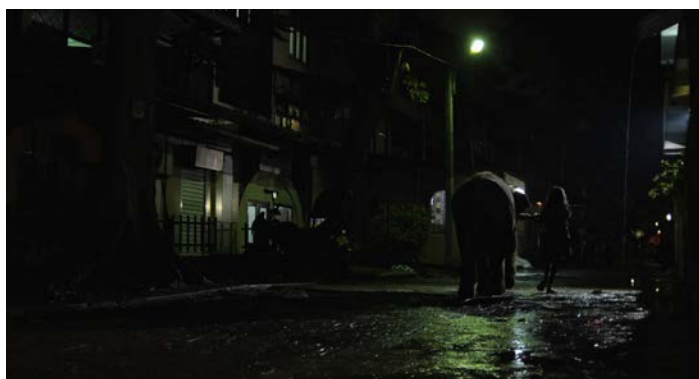
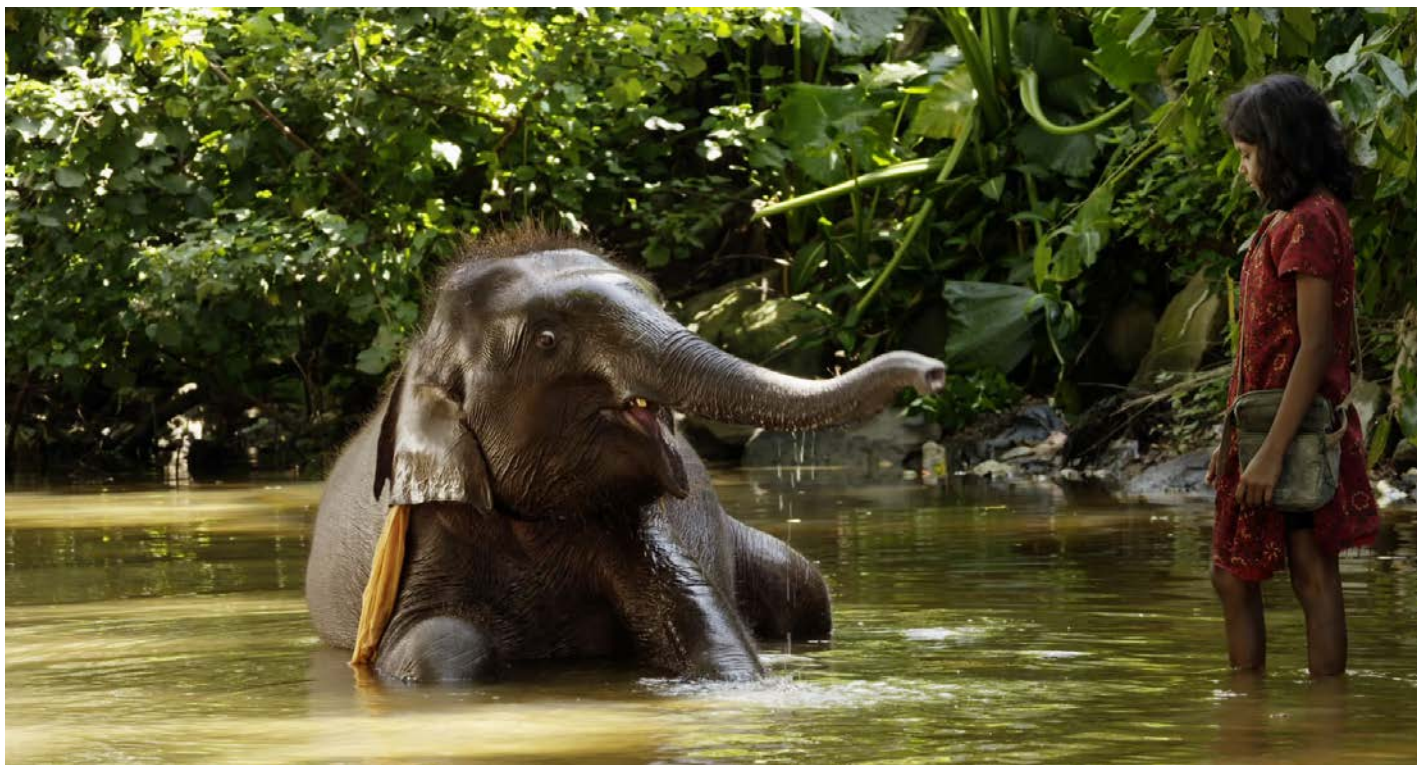
# Framegrabs from Stargate's "Mahout"



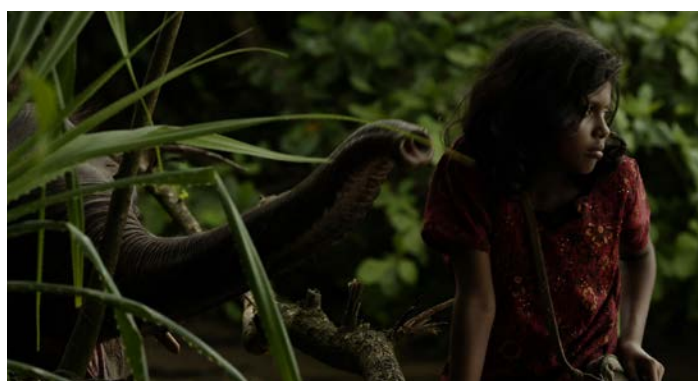
















Martin Scanlan, Director, above  
Steve Lawes on camera  
Jodi Clark, Dolly Grip





# UK F55 Production “Dig”

*Martin Scanlan, Director of the Short Film “Dig” writes:*

I’m not a big fan of shooting test charts, so we knew from the start that we wanted to shoot something real. The main thing we wanted to do with “Dig” was to see how the F55 would slot into an existing narrative drama environment because that’s what Steve and I felt that people would want to see. That meant shooting day and night, interior and exterior, low light, available light, handheld, on the dolly and anything else we could throw at it and afford.

The real challenge with the film was to tell a story with no dialogue that could embrace all those different environments and still have some kind of vague merit as a piece of cinema. I also was very keen that anything we did had a European sensibility as it’s very much where I come from cinematically and I knew that the premiere would be at the Camerimage festival in Poland. Slightly intimidating if truth be told ...

Ultimately “Dig” is about closure, it’s about two people trying to move on at the end of a relationship and the process they need to go through to move on. The story is largely told through flashbacks, through their memories of moments in their relationship and how those memories get distorted by time. It’s not a linear story and probably raises as many questions as it answers. It makes sense to me but might need a couple of viewings for everyone else. If nothing else I think it worked as a great test for the camera.

I think we really put the F55 through its paces. When I mentioned to Steve that I had 102 setups on my shot list for 3 days he told me I should go away and get it below 75; challenging enough for any camera, but particularly for a new camera with prototype firmware. I think in the end we shot about 115.

There are a lot of different styles within the piece and we really tried to do what was appropriate for each individual scene within the time we had available. Sometimes that meant chasing the light, but we made the best of what we had and tried to treat it like any other job. I’m pleased with what we’ve done, we’ve turned the film around in less than a month and next week we’ll be seeing it in 4K. I’m looking forward to that immensely.

## Partial Credits

Writer/Director: Martin Scanlan  
Executive Producer: Steve Lawes  
Producer: Cheryl Jarrett-Davies  
Production Co-Ordinator: Ross Southard  
Production Designer: Andy Phipps  
1st Assistant Director: Ryan Drawbridge-Harding  
3rd Assistant Director: Polly Green  
Cinematographer: Steve Lawes  
Focus Puller: Leo Holba  
Camera/Loader: Tomoi Summers  
Camera Assistant: Adam Dunnett  
Grip: Jodi Clark  
Gaffer: Steve Cook  
Electrician: Joff Cox  
Location Manager: Jason Keatley  
Location Assistant: Jerry Lockett  
Make Up & Hair Artist: Alison Webb  
Colourist: Dado Valentic  
Sound Design & Music: Brendan Crehan  
Actors: Andrew French and Fliss Walton









# Steve Lawes on “Dig”



*Steve Lawes spoke with us by phone from London, where he was working on the post and grading of “Dig.” Here are his comments:*

I did a short little shoot with the F55 last week. Sony approached me at the beginning of October and asked me whether I'd be interested in shooting a little test piece on it and I said yes.

It was deemed that I would get to shoot the F55 and they've also done a shoot in France on the F5.

I took the camera into a camera rental facility in London called Take 2 Films, with whom I work closely. The Sony designer was there, along with Richard Lewis from Sony UK, and we did a series of tests, over and under exposure tests, interior, exterior, shooting onto RAW format with the cards of the new medium and then got those off to a post facility in London. They managed to turn it around within 48 hours, which is pretty amazing.

I just treated it like you would a film camera: as if it's a film stock. I basically used my light meter and used S-Log to monitor, and we did a three-day shoot last week, which involved some interior, some exterior, some studio work, basically a low budget short film. It is going to be about five minutes long, a piece about a man and a woman. One of the ideas that Sony gave us was that they wanted a piece without any dialogue because this was going to be for a European launch of the F55.

They wanted a silent film, effectively, so that they wouldn't get into subtitling issues or dialogue issues

It has a cinematic feeling to it, but also, it actually tests the camera in different environments, exteriors, interiors, high contrast, low contrast lighting situations, etc.

The shoot was kind of busy. We did about 115 slates in three days and it was quite a small crew, probably around about 15 people, very limited lighting-wise. The biggest HMI I had was a 2.5K because I didn't want to get into hauling a big lighting kit around.

I rated the camera at 1600 ISO. I was quite interested in seeing what you could get away with in a package that wasn't huge and the shoot went fine.

The images that I could see coming out of the camera looked very promising and the rushes, which have been through Resolve and then kicked out as proxies for the offlines looks very interesting. Dado Valentic, our colorist who's done a lot of F65 work, says he feels that the images are very, very close to an F65.

From basic offline editorial, we will next go to grade. I've got a two-day grade and then we've got two reviews in London, we deliver, and I've just been told today that this film is also going to be shown in L.A. as well as at Camerimage in Poland.

That's the background of what we did.

Physically using the camera, it's a great size to work with and we did some handheld in the back of a car and it was really good to work with it in terms of the size. You can just strip it down. It's kind of like almost having an Alexa M without having the cable in the back of it, which is good.

The LCD viewfinder is new. I think the OLED viewfinder will be a lot better because it's actually looking straight at the screen, which is an improvement. It certainly should be an improvement on the existing viewfinder that was on the F65 and the F35.

I was rating the camera at 1600 ASA and I would say that's kind of accurate. If anything, perhaps a half a stop left. What I do with any camera, like what I do with any film stock, I do seven or eight stops of under and over-exposure increments when I test a camera.

It also has an ND.9 and ND 1.8 built in and I just used ND to bring the depth down.

For lenses, we used Cooke S4/i primes, which were always my favorite piece of glass because they're a complete kit and



I like all the lenses in the box. I've shot with Cooke's the last six years. I think we used an ARRI/Fujinon Alura 45-250 mm zoom for one shot, and I didn't use any diffusion whatsoever.

I just used ND, but my basic theory was, because we were shooting a 4K production, it was going to be scrutinized for the camera. It wasn't really a good idea to start putting diffusion in front of the lens. I kind of wanted to keep it clean, just to show what the camera could do, warts and all, whether that's good or bad.

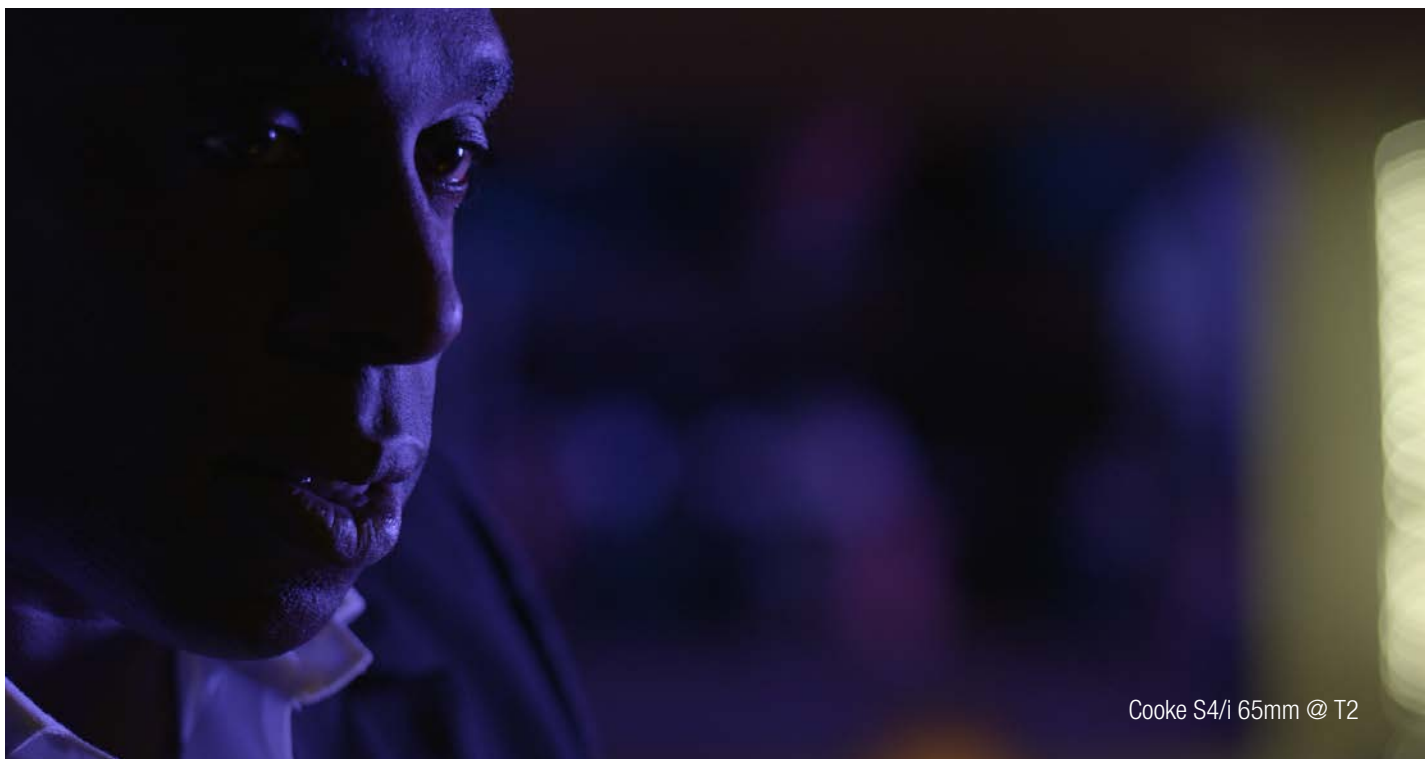
One of the things that I'm keen to do whenever I shoot with a new camera, is to shoot it in an environment similar to how we would normally shoot. Sometimes you see a lot of camera test

films which are just a bunch of test charts or time lapses and that don't really ever tell me much about what a camera can do.

I like to see a camera test with skin tones and people and drama in an environment similar to where we would normally use a camera, at the levels of light that I'm used to working.

I have not changed what I normally do to make the camera look better. Put it in, do what I normally do, see how the camera reacts to it. Try and get an idea how well the camera work in certain situations, how it works with certain colors, and skin tones.

So that's what we tried to do. We had a black male actor and a white female actor so it'll be quite interesting in putting two dif-







ferent tones of skin in the same frame and the same lighting situation and then working with that.

The post is being done at a place called Mytherapy. The chief colorist there, who's working with us on the project is Dado Valentic.

Dado is very technically gifted as well as being a very creative colorist.

He got the F55 RAW files and then within three or four days he got a beta version of software from Resolve that could work with the files. Resolve turned it around pretty quickly.

Our post route is through DaVinci Resolve. The grade will be done on Resolve. I think we're probably going to grade it on a 2K proxy and then make a 4K DCP.

Speaking of ergonomics, this is one of those cameras that is small enough to get into interesting places. I think it will be great for Steadicam, they'll love it. 3D will probably love it as well.

As for the look, I actually think the look is very close to the F65 from my experience. I feel with this camera the look is natural in the way it renders color and the way it renders flesh tones.



Leo Holba, Focus Puller and  
Steve Lawes, Cinematographer





# F5 Production in France: “Images”

Lucie Wendremaire reports from Paris on the short film with a working title of “Images.” Looking at the production stills, it appears that a location near Paris is the setting of a tropical forest in which crew members are wearing winter gear.

This project addresses the independent cinema community. It will underline contrast and effects, and play on the sounds and feelings of two characters meeting each other in what seems to be a tropical forest.

A young woman is walking in the humid heat of a tropical forest. The moon light is hardly visible through the thick foliage.

Her skin shines slightly in the night. Suddenly, a move in the foliage – another silhouette moves between the trees, the face of a young man appears.

The two characters are observing each other.

She follows him but loses track of him. He finds her, she opens her eyes, looks at him. They smile.

Director: Lucille Hadzihalilovic

Cinematographer: Dominique Colin

Camera Assistant: Galate Politis

Producer: Edith Pommerol

PA: Capucine Henry

Assistant Director: Edith Pommerol

2nd AD: Sabrina Gorand

Making of: Cezara Popovici

Gaffer: Sébastien Gaulon

Grip: Pierre Lemée

Actress: Olga rRazanova

Actor: Ousseni Pepouna Munchili







Above: Galate Politis, Dominique Colin's camera assistant.  
Opposite, top, left to right: Lucile Hadzihalilovic, Director  
Dominique Colin, DP; Cezara Popovici, cinema student shooting the  
behind the scenes documentary





# F5 “Images”





# F5 “Images”





# USC F5 Productions



Robert Kositchek, Sean McDaniel, Rodney Hooks



Robert Kositchek, Tho Doan, John Bradbury, Bubba McLean, Navneet Samra

*Douglas Wellman, Assistant Dean of Facilities & Operations at the School of Cinematic Arts, University of Southern California, describes the productions.*

Our objective was to test the range of the Sony F5 camera by creating two short narrative films, radically different in tone and setting. Cinematography professors Rob Kositchek and Gary Wagner were tasked with putting the camera through its paces, particularly in pushing the dynamic range.

To accomplish our objective we chose a script for a comedic chase film “Safety Zone,” which deals with dodging skate board and bicycle traffic on a college campus. Cinematography professor Gary Wagner used the bright Southern California sun, the shadows of campus buildings, water fountains and camera movement to present as many challenges as possible to the camera at one time.

The second film, “The Contract” is the exact opposite in almost every way. It is the dramatic story of a white man who wants his African-American friend to go into business with him. Even though they are friends, the African-American man has issues in his past that keep him from being entirely trusting of his friend. The entire film is shot at night.

Cinematography professor Rob Kositchek shot part of the action in a car moving down Wilshire Boulevard at night with only one small light used sparingly. The objective was to test that camera on contrasting skin tones in a dark moving car with the bright city lights outside. There is one additional exterior scene and two night interior scenes shot in low light.

The films presented different challenges and opportunities. “Safety Zone” was shot outdoors with a Chapman dolly and most of the chase scenes were done from from a golf cart using both a Tyler Minigyro, and a Kenyon Gyro Stabilizer with an EZ-rig (each



Tyler Gunderson

used on separate days due to availability).

The small size and light weight of the camera was an advantage here. Size was also a factor in “The Contract” where one scene was shot from inside a moving vehicle and another was shot with the camera and operator in the back of a convertible.

From the perspective of equipping a cinema school, the F5 offers many advantages. USC Cinematic Arts prides itself in creating an educational experience that is as close to the real world as possible. To this end, we try to mirror current industry equipment and techniques. We have been using the Sony F3 with S-log, but the F5 will allow us to move to XAVC and RAW. We have two color correction/DI suites in the school, one of which is quite large and used for teaching both the technology and art of the process. The F5 will allow us – as an educational institution – to send our graduates into the workplace with hands-on experience in 4K.



L-R: Rodney Hooks, Sean McDaniel, Bubba McLean, John Bradbury





*Gary Wagner, Cinematography Professor at USC, describes his production with the F5.*

We shot 1920 x 1080 HD, 80 Mbps, XAVC HD, 4:2:2, in S-Log2 S-Gamut. The F5 was set to 5500K, with an effective ISO of about 1250. I used the built-in NDs to keep the aperture around f/5.6 as much as possible. With the exception of a polarizer filter, I avoided using filtration on the lens. Low light images seemed to be very good. I did a couple of pre-dawn shots which had a surprising amount of information.

We had most of our locations planned for specific times and lighting conditions. However, due to circumstances beyond our control at the university, we missed most of the planned times and had to shoot in less than ideal situations. While we couldn't do much to change that, the resultant images held up much better than I expected, holding detail in both the highlights and shadows.

The camera was lightweight with very low power consumption. The menus were easy to use with most settings viewable on the side panel, as well as the EVF. The EVF was traditional front-left side mounted with a large eyepiece and good image quality.

## Partial Credits

### "The Contract"

Director-Writer: Rodney Allen Hooks  
Cinematographer: Rob Kositchek  
Producers: John Matthews, Andrew Hachem  
Executive Producer: Douglas Wellman

### "Safety Zone"

Director: Steven Wasserman  
Writer: John M. Broderick  
Cinematographer: Gary Wagner  
Producer: Katrelle Kindred  
Executive Producer: Douglas Wellman

L to R: Mary Brown, 2nd AC; Gary Wagner, DP (at camera); Ryan Griswold, 1st AC; Jack Alexander (barely visible behind Ryan), Dolly Grip; Victor Solis (red jacket), Gaffer; Tyrell Lloyd, AD



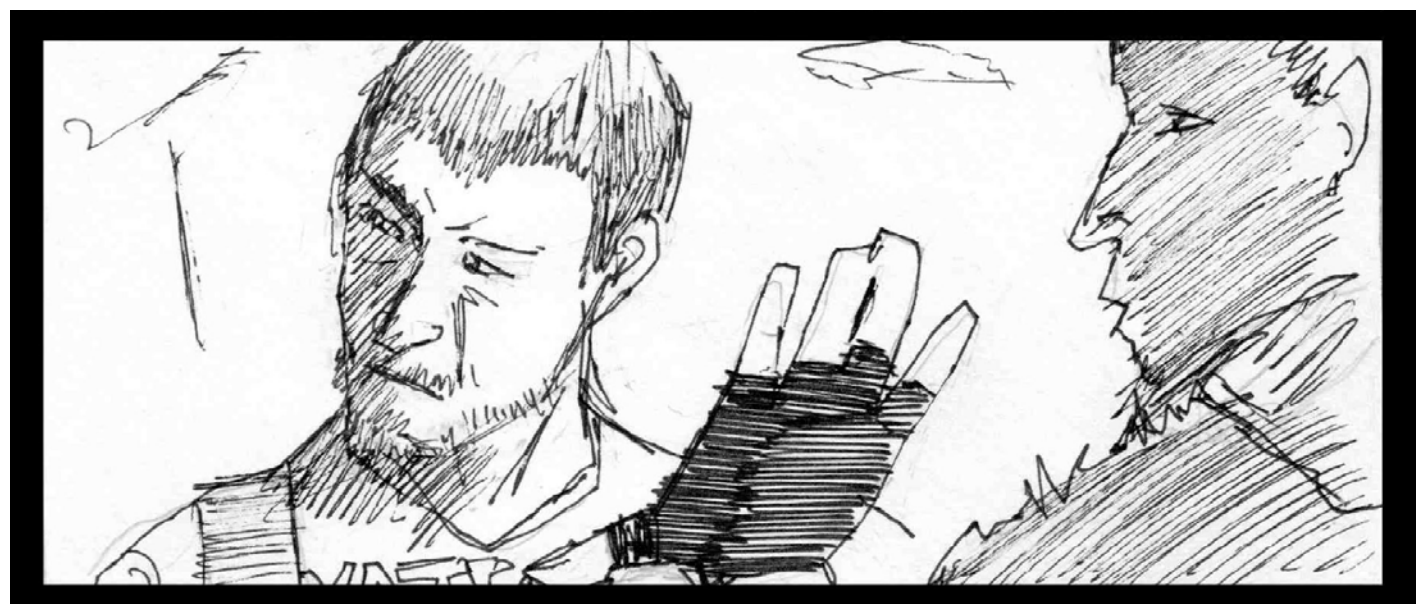


# Tribeca Films F55 and F65 “7x6x2”

Yeah. I had the guys from Tribeca last night talking to me about how, you know, they thought there was a light on in the shot. And it turned out, no, it wasn't a light. It was Jupiter.



Above: framegrabs from “7x6x2”  
Below: frame from storyboard





# “7x6x2”

by Sridhar Reddy, Co-Director

## Synopsis

In a remote desert on an unspecified planet, a large terraforming robot – called a MEK- has gone down. A lone serviceman has been sent out into the hostile, unforgiving location to repair the machine, only to find that he is not alone. Surrounding his campsite are seven hungry Rock People, weaponized monsters who were believed to have become extinct after the war. Armed only with the tools of his trade and a campfire to keep the creatures at bay, the old serviceman is paid an unlikely visit in the middle of the night by a young surveyor who stumbles onto the campsite, unaware of the threat of the Rock People. Together the serviceman and surveyor must survive the night as the campfire dies out, and the serviceman draws upon a premonition to fight their way out of an impossible situation.

## History

The initial concept for “7x6x2” came from the imagination and pen of Paul Pope, an award-winning graphic novelist. The transition from page to screen was facilitated when Tribeca Films approached Pope with an offer to bring one of his science fiction stories to the screen. After weeks of development in conjunction with Sundance Institute trained filmmaker Sridhar Reddy, the screenplay for “7x6x2” was finished and brought to the attention of Sony, who were seeking narrative stories that would serve as a showcase for their latest digital cinema camera, the F55.

Paul’s story featured ample opportunity to shoot in extremely low-light situations, with slow motion and a wide variety of shots that would test the camera’s abilities. On October 26, 2012 the film was green-lit by Sony and immediately went into pre-production in Los Angeles, with a goal to shoot on location in the Mojave Desert on November 3rd and 4th. The quick turnaround meant an extremely ambitious production schedule that had to accommodate a remote location shoot, creature design and choreography, and the construction of a robot within the span of a week. To say the film was ambitious was an understatement.

## Pre-Production

Gary Krieg, producer at Tribeca Films, partnered with Native Films in LA to quickly assemble a production design team in order to bring the science fiction elements of “7x6x2” to life. Cinematographer Jesse Greene joined Co-Directors Paul Pope and Sridhar Reddy to scout desert locations and determine the look of the film, which would draw upon elements ranging from the paintings of Andrew Wyeth to the photographs of Bill Henson.

A camera test for the F55 was conducted at Sony Studios in Culver City, where the low-light capabilities of the camera were put to the test in a controlled environment. The camera performed remarkably, with the ability to produce beautiful exposures with a single candle providing illumination.

Later in the week, actors were auditioned and brought in for fittings, and within days the production was ready for its move to Lancaster, California to begin principle photography. Because of the ambitious number of shots required for the film, a decision to shoot with two cameras was approved, with Sony’s F65 joining the F55.

## Production

The “7x6x2” shoot had two locations – the desert and an old Victorian home located two hours away. A skeleton crew was deployed with the F55 to the Victorian home, where half the day was scheduled to film a highly impressionistic scene between Bryce the serviceman and his mother, Luana. The remainder of the crew was sent to primary desert location to build the Mek robot and prepare for the core of the shoot.

By sundown the entire crew had shifted to the desert, and the cameras were set up. As confirmed by the results of the camera test, the primary light source was decided to be the campfire itself, with a subtle backlight provided by battery powered LED Litepanels. The simplicity of the lighting scheme allowed for quick setups using four-foot sliders on each camera, which allowed the crew to capture the maximum amount of coverage with a tremendous diversity of shots. Day one of the desert shoot was dedicated to dialogue sequences, with the second day devoted entirely to creatures and action.

The second day saw the arrival of the Rock People, who were coordinated and designed by LA-based choreographer Paradox Pollack, who had worked previously with Marvel Studios to design creature movements for their films. Pollack created a detailed backstory for the creatures, and designed a specific language and hierarchy for the tribe. The production powered through the day, finishing the schedule with only minutes before the sun rose in the California sky.

## Post-Production

Tribeca Films shifted its post-production back to New York City and immediately started editing the footage that had been processed at Final Cut Studios in Los Angeles. At Final Cut’s offices in New York, editor Stéphane Dumonceau began cutting the film. It was completed within a week. Sound design by Hobo Audio in NY and CGI effects by Smoke and Mirrors commenced immediately, and co-director Paul Pope, who is also a musician, began recording an original score with Brooklyn-based musician Ben Rubin.

## Some Credits

Directors: Paul Pope & Sridhar Reddy  
Producer: Gary Krieg  
Executive Producers: Jane Rosenthal, Matt Spangler, & Tomer Devito  
Director of Photography: Jesse Green  
Edited by: Stephane Dumonceau  
Line Producer: Elisa Morse  
Production Designer: Mike Conte  
Creature FX: Eric Fox  
Wardrobe Design: Susan Chan  
Movement Director: Paradox Pollack  
Graphic Design: Jim Pascoe  
A Camera 1st AC: Brad Rochlitzer  
A Camera 2nd AC: Joseph Canon  
B Camera Operator: Brandon Musselman  
B Camera 1st AC: Kathryn Begle  
VTR: Xan  
DIT: Will Chung  
Electric  
Gaffer: Lee Spencer  
Best Boy: Art Hernandez









Jesse Green with F55 in the Victorian house location



# Appendix 1: Sony F5 and F55 Version Upgrades

Charts courtesy of Sony, subject to change. RAW recording requires optional AXS-R5

## F5

RAW recording requires optional AXS-R5. End-user firmware updates are FREE of charge. Features and specifications are subject to change. (Chart as of January 29, 2013)

	Ver 1.0 Feb 2013	Ver 1.2 July 2013	Ver 1.3 Fall 2013	Ver 1.4 Winter 2013
<b>4K</b>	<ul style="list-style-type: none"> <li>S-LOG Hyper Gamma</li> <li>4K RAW 23.98/ 25/ 29.97/ 50/ 59.94p</li> <li>4K RAW/HD Simul REC</li> </ul>	<ul style="list-style-type: none"> <li>Wi-Fi Remote</li> </ul>	<ul style="list-style-type: none"> <li>User Gamma</li> <li>4K RAW 24.0p</li> </ul>	<ul style="list-style-type: none"> <li>S-LOG EI mode Monitor LUT</li> <li>4K RAW S&amp;Q 1p to 60p</li> </ul>
<b>2K</b>			<ul style="list-style-type: none"> <li>2K RAW HFR 120p</li> <li>XAVC 2K 4:2:2 23.98/ 24/ 25/ 29.97/ 50/ 59.94p</li> <li>2K RAW/HD Simul REC</li> </ul>	<ul style="list-style-type: none"> <li>2K RAW S&amp;Q 1p to 120p</li> </ul>
<b>HD</b>	<ul style="list-style-type: none"> <li>XAVC HD 4:2:2 23.98/ 25/ 29.97/ 50/ 59.94p</li> <li>XAVC HD 4:2:2 S&amp;Q 1p to 60p</li> <li>MPEG2 4:2:2 23.98/ 25/ 29.97p, 50/ 59.94i</li> </ul>	<ul style="list-style-type: none"> <li>SR CODEC 4:2:2 and 4:4:4 23.98/ 24/ 25/ 29.97p</li> </ul>	<ul style="list-style-type: none"> <li>XAVC HD 4:2:2 HFR 120p only</li> </ul>	<ul style="list-style-type: none"> <li>XAVC HD 4:2:2 S&amp;Q 60p to 180p</li> <li>MPEG2 4:2:2 720 50/ 59.94p</li> </ul>

## F55

RAW recording requires optional AXS-R5. End-user firmware updates are FREE of charge. Features and specifications are subject to change. (Chart as of January 29, 2013)

	Ver 1.0 Feb 2013	Ver 1.2 July 2013	Ver 1.3 Fall 2013	Ver 1.4 Winter 2013
<b>4K QFHD</b>	<ul style="list-style-type: none"> <li>S-LOG Hyper Gamma</li> <li>4K RAW 23.98/ 25/ 29.97/ 50/ 59.94p</li> <li>XAVC 4K 4:2:2 23.98/ 25/ 29.97/ 50/ 59.94p</li> <li>XAVC 4K/MPEG2 Simul REC</li> <li>4K RAW/HD Simul REC</li> </ul>	<ul style="list-style-type: none"> <li>Wi-Fi Remote</li> </ul>	<ul style="list-style-type: none"> <li>User Gamma</li> <li>4K RAW 24.0p</li> <li>XAVC 4K 4:2:2 24.0p</li> </ul>	<ul style="list-style-type: none"> <li>S-LOG EI mode Monitor LUT</li> <li>4K RAW S&amp;Q 1p to 60p</li> <li>XAVC 4K/QFHD 4:2:2 S&amp;Q 1p to 60p</li> <li>XAVC QFHD/MPEG2 Simul REC</li> </ul>
<b>2K</b>			<ul style="list-style-type: none"> <li>2K RAW HFR 120p, 180p and 240p</li> <li>XAVC 2K 4:2:2 23.98/ 24/ 25/ 29.97/ 50/ 59.94p</li> <li>2K RAW/HD Simul REC</li> </ul>	<ul style="list-style-type: none"> <li>2K RAW S&amp;Q 1p to 240p</li> </ul>
<b>HD</b>	<ul style="list-style-type: none"> <li>XAVC HD 4:2:2 23.98/ 25/ 29.97/ 50/ 59.94p</li> <li>XAVC HD 4:2:2 S&amp;Q 1p to 60p</li> <li>MPEG2 4:2:2 23.98/ 25/ 29.97p, 50/ 59.94i</li> </ul>	<ul style="list-style-type: none"> <li>SR CODEC 4:2:2 and 4:4:4 23.98/ 24/ 25/ 29.97p</li> </ul>	<ul style="list-style-type: none"> <li>XAVC HD 4:2:2 HFR 120p only</li> </ul>	<ul style="list-style-type: none"> <li>XAVC HD 4:2:2 S&amp;Q 60p to 180p</li> <li>MPEG2 4:2:2 720 50/59.94p</li> </ul>



# Appendix 2: Sony AXS-R5 Version Upgrades

## AXS-R5

End-user firmware updates are FREE of charge.  
Features and specifications are subject to change. (Chart as of January 29, 2013)

Ver 1.0	Feb 2013	Ver 1.2	May 2013	Ver 1.3	Fall 2013	Ver 1.4	Winter 2013
<b>R5</b>	HD Monitor OUT	FS700 4K RAW HXR-IFR5					
<b>4K</b>	4K RAW 23.98/ 25/ 29.97/ 50/ 59.94p No HFR			4K RAW 24p No HFR		4K RAW S&Q 1p to 60p	
<b>2K</b>				2K RAW HFR 120p, 180p and 240p (F5 120p only)		2K RAW S&Q 1p to 240p (F5 up to 120p)	

## Appendix 3: F5-F55 Simultaneous Recording

### 4K/2K RAW (on AXS-F5) and XAVC or MPEG2 HD (on F5 / F55)

Version Upgrades as of Jan 29, 2013

Combination	Format	Resolution	Frame Rate	Available Version
4K RAW + 2K/HD	XAVC 2K	2048 x 1080	23.98/ 24/ 25/ 29.97/ 50/ 59.94p	V1.3
	XAVC HD	1920 x 1080	23.98/ 25/ 29.97/ 50/ 59.94p	V1.0
	MPEG2 HD	1920 x 1080	23.98/ 25/ 29.97p	V1.0
4K RAW (S&Q) + 2K/HD	XAVC 2K	2048 x 1080	23.98/ 24/ 25/ 29.97/ 50/ 59.94p	V1.4
	XAVC HD	1920 x 1080	23.98/ 25/ 29.97/ 50/ 59.94p	V1.4
2K RAW (S&Q) + 2K/HD	XAVC 2K	2048 x 1080	23.98/ 24/ 25/ 29.97/ 50/ 59.94p	V1.4
	XAVC HD	1920 x 1080	23.98/ 25/ 29.97/ 50/ 59.94p	V1.4

Record onto AXS-R5 for 4K or 2K RAW (online, master, etc.) Record 2K or HD as backup and for offline edit.

### 4K/QFHD and MPEG2 Proxy Simultaneous Recording on the same card

Version Upgrades as of Jan 16, 2013

Main	Proxy	Frame Rate
XAVC 4K (4096 x 2160) <b>V1.0</b>	MPEG2 HD (1920 x1080)	23.98/ 25/ 29.97p
XAVC QFHD (3840 x 2160) <b>V1.4</b>	MPEG2 HD (1920 x1080)	23.98/ 25/ 29.97p

Record XAVC 4K or QFHD for online finishing. Record HD for offline edit.

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