

Anamorphic Formats in Post-Production ALEXA 35

WORKFLOW GUIDELINE

Date: 6th November 2024

Version History

Version	Author	Change Note
2024-10-24	Simon Duschl	First Version
2024-10-31	Simon Duschl	Added sample for 4.6K 3:2 Open Gate
2024-11-04	Simon Duschl	Added sample for 3.3K 6:5
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Introduction

This workflow guideline shows some examples of anamorphic sensor modes and recording resolutions for the ALEXA 35 camera in relation to post-production. The guideline is organized into various chapters, each dedicated to a specific sensor mode and its corresponding recording resolutions and framing. Each chapter includes sections on:

- Preparation, Framing and Recording
- Color Grading and Finishing
- Rushes and Dailies
- VFX

1 ALEXA 35 and Anamorphic Formats

This table provides a brief summary of the available anamorphic options for the ALEXA 35 camera. For a comprehensive overview of all possible sensor modes and recording resolutions, we recommend referring to our ARRI Formats and Resolution Overview of ARRI digital motion picture cameras.

Sensor Mode Recording Codec	Recording Resolution	Lens Squeeze Options
4.6K 3:2 Open Gate		
ProRes	4.6K (4608x3164)	1.0 / 1.25 / 1.30 / 1.33 / 1.50 / 1.66 / 1.80 / 1.85 / 2.0
ARRIRAW	4.6K (4608x2592)	1.0 / 1.25 / 1.30 / 1.33 / 1.50 / 1.66 / 1.80 / 1.85 / 2.0
4.6K 16:9	·	
ProRes	4K (4096x2304) *	1.0 / 1.25 / 1.30 / 1.33 / 1.50 / 1.66 / 1.80 / 1.85 / 2.0
ARRIRAW	4.6K (4608x2592)	1.0 / 1.25 / 1.30 / 1.33 / 1.50 / 1.66 / 1.80 / 1.85 / 2.0
4K 16:9		
ProRes	4K (4096x2304)	1.0
ARRIRAW	4K (4096x2304)	1.0
ProRes	UHD (3840x2160)	1.0
ProRes	2K (2048x1152)	1.0
ProRes	HD (1920x1080)	1.0
4K 2:1		
ProRes	4K 2:1 (4096x2048)	1.0
ARRIRAW	4K 2:1 (4096x2048)	1.0
3.8K 16:9		
ARRIRAW	UHD (3840x2160)	1.0
3.3K 6:5		
ProRes	3.3K (3328x2790)	1.0 / 1.25 / 1.30 / 1.33 / 1.50 / 1.66 / 1.80 / 1.85 / 2.0
ProRes	4K 2.39:1 Ana 2x (4096x1716) **	2.0
ARRIRAW	3.3K (3328x2790)	1.0 / 1.25 / 1.30 / 1.33 / 1.50 / 1.66 / 1.80 / 1.85 / 2.0
3K 1:1		
ProRes	3.8K 2:1 Ana 2x (3840x1920) **	
ProRes	3K 1:1 - 3K (3072x3072)	1.0 / 1.25 / 1.30 / 1.33 / 1.50 / 1.66 / 1.80 / 1.85 / 2.0
ARRIRAW	3K 1:1 - 3K (3072x3072)	1.0 / 1.25 / 1.30 / 1.33 / 1.50 / 1.66 / 1.80 / 1.85 / 2.0
2.7K 8:9		
ProRes	UHD 16:9 Ana 2x (3840x2160) **	2.0
2K 16:9 S16		
ProRes	2K (2048x1152)	1.0

* Apple ProRes (downscale)

** Apple ProRes (desqueezed & scaled)

2 Examples for anamorphic workflows

In this section we will go through possible anamorphic sensor modes, recording resolutions, lens squeezes and the correct processing in the post-production. We also include considerations for a protection area e.g. a safe area for repositioning and stabilization for VFX pulls/plates.

2.1 2.39:1 with 2.0x Anamorphic Lens in 4.6K 3:2 Open Gate - 4.6K (4608x3164)

In this example we are aming a final aspect ratio of 2.39:1 e.g. for a 4K Digital Cinema Package (DCP) in scope with a final resolution of 4096x1716 (= 4K DCl scope). As source format we choose ALEXA 35 with 4.6K 3:2 Open Gate – 4.6K (4608x2164). The used lens is a 2.0x anamorphic lens. With the VFX facillity we decided shooting the VFX plates with a 5% safe area.

2.1.1 Preparation, Framing and Recording

The ALEXA 35 camera is set to 4.6K 3:2 Open Gate sensor mode and 4.6K (4608x2164) recording resolution.

Deserting	Recording			Recordins	Project Settings	
	Recording Codec	ARRIRAW	Madia	Recording	Project Rate	24p
Media	Sensor Mode	4.6K 3:2 Open Gate	Media	Sensor Me	Next Reel Count	1
Monitoring	Rec Resolution	4.6K (4608x3164)	Monitorin	Rec Resol	Camera Index	A_
age	Project Settings	>	ba	Project Se	Camera Index Color	White
₽ stem	Rec Beeper	>	* stem	Rec Beep	Lens Squeeze Factor	2.00
Setup	Decreaseding may D	uration Ec	Setup	Drorocore		

Since we are using a 2.0x anamorphic lens, we set the lens squeeze factor to 2.00. We decided to use a 5% safe area for stabilization and reposition, therefore we must generate a custom 2.39:1 frame line with 95% scaling (100% - 5% = 95%) for a lens squeeze of 2.0x. This can easily be achieved by using the Frame Line & Lens Illumination Tool on our website.

- Set Camera Model 1. = ALEXA 35
- 2. Set Sensor Mode = 4.6K 3:2 Open Gate
- Set Recording Resolution = 4.6K (4608x3164) 3. = ARRIRAW
- 4. Set Codec: = 2.0
- 5. Set Lens Squeeze
- Set Frame Line A 6. 7.
 - Set Aspect Ratio = 2.39:1= 95%
- 8. Set Scaling

This results in a framing resolution for Frame Line A of 3588x3006. This will be our active image from a camera, sensor and lens perspective.

3588 / 3006 = 1.19361277 1.19361277 * 2.0 = 2.38722555 ≈ 2.39

Click here to get the current framing setup for frame line A.

~

Next, download the frame line *.xml file and put it on the USB stick under ARRI -> ALEXA35 > FRAMELINES.

Download & Share			
File Name Maximum 58 characters (34 left)	A35-OG-A239_2xAna_95safe	Download PNG	Download PNG
Download Frame Line File	Download XML	Create Setup URL	Copy URL

Connect the stick to the camera and load the frame line file to the camera via Menu > Monitoring > Frame Lines > Frame Line > Add and select your *.xml frame line file > import. In a next step select your frame line and press > set.

Recording	Monitoring		Frame Lines installed delete
Media	VF	>	
Media	SDI	>	
Monitoring	Master Magnification	100%	None
୍ର ଅନ୍ୟୁ ଅନ୍ୟୁ	Frame Lines	>	ARRI 1.00
<u>ç</u> stem	Peaking	>	ARRI 1.33
Setup	Doturo Io		cancel add set
	Frame Lines on USB		Frame Lines installed delete
	Frame Lines on USB		Frame Lines installed delete
	Frame Lines on USB		Frame Lines installed delete
A35-OG-A	Frame Lines on USB 239_2xAna_95safe		Frame Lines installed delete None A35-OG-A239_2xAna_95safe
A35-OG-A	Frame Lines on USB 239_2xAna_95safe		Frame Lines installed delete None A35-OG-A239_2xAna_95safe ARRI 1.00
A35-OG-A	Frame Lines on USB 239_2xAna_95safe		Frame Lines installed delete None A35-OG-A239_2xAna_95safe ARRI 1.00 ARRI 1.33

In a next step, we suggest downloading the PNG and the Frame Leader and shoot a frame leader you're your ALEXA 35 camera and the corresponding settings from above.

Frame Line & Lens Illumination Settings						
Frame Line A Frame Line B	Frame Line C	Lens Illumination Guide	Frame Leader			

The frame leader clip should be forwarded to every person involved to your post-production. It ensures a correct framing in every step of your production, from rushes/dailies processing, editing, color grading and mastering.





Spherical Frame Leader with 2.39:1 framing and 5% safe area

2.0x Anamorphic Frame Leader with 2.39:1 framing and 5% safe area



2.1.2 Color Grading and Finishing

In post-production, it is essential to verify whether the lens squeeze factor is automatically recognized through the clip metadata in the software being used. If the software detects it correctly, there is no need to manually adjust the lens squeeze factor or pixel aspect ratio. However, if automatic detection does not occur, please ensure you select the appropriate de-squeeze option in your chosen software.

Clip Attributes			
Video		Timorodo	
Video	Audio	Timecode	Ivaille
Video Frame Ra			
Data Leve	els O Auto Video Full		
Pixel Aspect Rat			
Image Fl			
Image Orientatio			
Input Sizing Pres	et None		
Alpha Moo	de None		
Super Sca			
Sharpne			
Noise Reductio			

We will set the target format to 4K Scope (4096x1716) and resize the image, taking our frame leader into consideration.

Format	Monitor	Output		olor				Outp	ut	
Timeline Resolution	Custom					Use	Timeline Sett	ings for Ou	tput Scaling	
	For 4608	x 3164 Pro	ocessing							
Pivel Asnert Ratio	Use vertio				Output Re	solution	Custom			
river Aspect Rau	16:9 Anar						For 4096	x 1716	processing	
	Cinemaso	ard Definition ope			Pixel Aspe	ect Ratio	Square			
Timeline Frame Rate		Frames per se	cond				4:3 Stand	ard Definiti		
					Mismatched Re	solution	Center crop	with no re	sizing 🗸	
					Suc	er Scale	None			
ismatched Resolution	n Center crop	with no resizing								

Please refer to the manual of your post-production software for detailed instructions, as there are several methods to accomplish this. In this example, we will use Blackmagic DaVinci Resolve Studio, adjusting the image through 'Output Sizing' and creating a preset.

Sizing - Output Sizing	Format Preset
Sizing	Name 4.6K 3:2 Open Gate - 4.6K (4608x3164) - 5% safe
Pan 0.000	
Tilt 0.000	Pan: 0 Tilt: 0 Zoom: 1.148 Rotate: 0
Zoom 1.148	Width: 1 Height: 1 HFlip: 0 VFlip: 0
Rotate 0.000	Default Close Save

This will result in correctly framed image inside our target resolution and aspect ratio, which is 4K scope with 4096x1716 pixels. Since there is a 5% safe zone it is still possible to slightly adjust the image with a pan, tilt or zoom.



2.1.3 Rushes and Dailies

The rushes and dailies could also have included the 5% safe area, this depends on your pipeline. In our example we are only using the active image area with 3588x3006 pixels for the rushes. We assume the editor requests UHD dailies in 3840x2160 (16:9 / 1.78:1) for editing e.g. DNxHR SQ files.

imeline Settings			Tin	eline Settings			
Format		Output Color				Output	
Timeline Resolutio	Custom	V		U:	se Timeline Set	tings for Output Scaling	3
Pixel Aspect Rat	Use vertical ri	esolution		Output Resolution	3840 x 216	0 Ultra HD 🗸	
	16:9 Anamor 4:3 Standard Cinemascope			Pixel Aspect Ratio	Square 16:9 Ana	imorphic	B
Timeline Frame Ra	te 24 V Fr	rames per second me Timecode		Mismatched Recolution	4:3 Stan	dard Definition scope	
Mismatched Resolutio	Align Clips to Center crop with	rce processing Frame Boundaries n no resizing V		Super Scale	None	p with no resizing V	
Use Project Settings		Cancel OK		Use Project Settings			
			_				
Sizing - Outp	out Sizing	Format Preset					
Sizing		Name UHD_239:1_F					
Pan	0.000	Pan: 0		Zoom: 0.9	38		
Tilt	0.000	Width: 1					
Zoom	0.938	Left: 0		Bottom: 18	34	Right: 3840	
Rotate	0.000	Default					\supset

Since our target aspect ratio is 2.39:1 this will result in an active image of 2.39:1 with letterbox inside the UHD container, which is 1.78:1. For a correct 2.39:1 letterbox we must set a crop for 2.39:1 here, which results in Top = 276 and Bottom = 1884 pixels/lines.



2.1.4 VFX

For generating VFX pulls/plates it's necessary to include the 5% safe area to the rendered files. Most VFX facilities nowadays are working with OpenEXR/Scene Linear files (single file sequences). These files should also have included the 5% safe area, which can be used for repositioning or stabilization.

Please note: Before rendering VFX pulls/plates, please get in touch with your VFX vendor, clarify their needs and set up a VFX and finishing pipeline. The process we are showing here is just an example and there are different pipelines possible. Therefore, please clarify with your production in advance. Typical questions are related to:

- Scaling and filters
- Squeezed or de-squeezed formats
- Active image area / safe area

In this example we assume that we must generate anamorphic VFX pulls/plates incl. the 5% safe area. Therefore, this results in an anamorphic image with 4608x3164 resolution. The active image area will be 3588x3006 inside that 4608x3164 area.

3588 / 3006 = 1.19361277 1.19361277 * 2.0 = 2.38722555 ≈ 2.39



The VFX vendor will get files with 4608x3164 pixel resolution. The green area outside of the active 3588x3006 pixels can be used for repositioning and stabilization in VFX.



2.2 2.39:1 with 2.0x Anamorphic Lens in 3.3K 6:5 - 3.3K (3328x2790)

In this example we are aming a final aspect ratio of 2.39:1 e.g. for a 4K Digital Cinema Package (DCP) in scope with a final resolution of 4096x1716 (= 4K DCI scope). As source format we choose ALEXA 35 with 3.3K 6:5 - 3.3K (3328x2790). The used lens is a 2.0x anamorphic lens. With the VFX facillity we decided shooting the VFX plates with a 10% safe area.

2.2.1 Preparation, Framing and Recording

The ALEXA 35 camera is set to 3.3K 6:5 sensor mode and 3.3K (3328x2790) recording resolution. This mode was introduced explicitly for 2.0x anamorphic lenses.

Pacarding	Recording		Pecordine	Recording	Project Settings	
Recording	Recording Codec	ARRIRAW	Recording	Recording	Project Rate	24 p
Media	Sensor Mode	3.3K 6:5	Media	Sensor Me	Next Reel Count	1
Monitoring	Rec Resolution	3.3K (3328x2790)	Monitorin	Rec Resol	Camera Index	A_
Image	Project Settings	>	Image	Project Se	Camera Index Color	White
System	Rec Beeper/Tally	>	System	Rec Beep	Lens Squeeze Factor	2.00
Setup	Drorocording max Du	ration E.c.	Setup	Drorocord		

Since we are using a 2.0x anamorphic lens, we set the lens squeeze factor to 2.00. We decided to use a 10% safe area for stabilization and reposition, therefore we must generate a custom 2.39:1 frame line with 90% scaling (100% - 10% = 90%) for a lens squeeze of 2.0x. This can easily be achieved by using the Frame Line & Lens Illumination Tool on our website.

9.	Set Camera Model	= ALEXA 35
10.	Set Sensor Mode	= 3.3K 6:5
11.	Set Recording Resolution	= 3.3K (3328x2790)
12.	Set Codec:	= ARRIRAW
13.	Set Lens Squeeze	= 2.0
14.	Set Frame Line A	
15.	Set Aspect Ratio	= 2.39:1
16.	Set Scaling	= 90%



This results in a framing resolution for Frame Line A of 2996x2512. This will be our active image from a camera, sensor and lens perspective.

2996 / 2512 = 1.19267516 1.19267516 * 2.0 = 2.38535032 ≈ 2.39

Click here to get the current framing setup for frame line A.

Next, download the frame line *.xml file and put it on the USB stick under ARRI -> ALEXA35 > FRAMELINES.

Download & Share							
File Name Maximum 58 characters (32 left)	A35-6to5-A239_2xAna_90safe	Download PNG	Download PNG				
Download Frame Line File	Download XML	Create Setup URL	Copy URL				

Connect the stick to the camera and load the frame line file to the camera via Menu > Monitoring > Frame Lines > Frame Line > Add and select your *.xml frame line file > import. In a next step select your frame line and press > set.

Recording	Monitoring			Frame Lines installe	d delete
Modia	VF	>			
Media	SDI	>			
Monitoring	Master Magnificatio	on 1009	6 None		
ୁ mage ଅ	Frame Lines	>	ARRI 1	.00	
⊊ stem	Peaking	>	ARRI 1	.33	
Setup			cancel	add	set
	Doturn In				
	Frame Lines on USE	3		Frame Lines installe	d delete
	Frame Lines on USE	3		Frame Lines installe	d delete
	Frame Lines on USE	3	None	Frame Lines installe	d delete
A35-6to5	Frame Lines on USE	_90safe	None A35-6	Frame Lines installe	d delete _90safe
A35-6to5	Frame Lines on USE	3 _90safe	None <mark>A35-6</mark> ARRI 1	Frame Lines installe	d delete
A35-6to5	Frame Lines on USE	3 _90safe	None <mark>A35-6</mark> ARRI 1 ARRI 1	Frame Lines installe to5-A239_2xAna .00 .33	d delete _90safe

In a next step, we suggest downloading the PNG and the Frame Leader and shoot a frame leader you're your ALEXA 35 camera and the corresponding settings from above.

Frame Line & Lens Illumination Settings							
Frame Line A	Frame Line B	Frame Line C	Lens Illumination Guide	Frame Leader			

The frame leader clip should be forwarded to every person involved to your post-production. It ensures a correct framing in every step of your production, from rushes/dailies processing, editing, color grading and mastering.



Spherical Frame Leader with 2.39:1 framing and 10% safe area



2.0x Anamorphic Frame Leader with 2.39:1 framing and 10% safe area



2.2.2 Color Grading and Finishing

In post-production, it is essential to verify whether the lens squeeze factor is automatically recognized through the clip metadata in the software being used. If the software detects it correctly, there is no need to manually adjust the lens squeeze factor or pixel aspect ratio. However, if automatic detection does not occur, please ensure you select the appropriate de-squeeze option in your chosen software.

Clip Attributes			
Video		Timecode	
VIGEO	Audio	ninecode	Name
Video Frame Rate			
Data Levels	AutoVideoFull		
Pixel Aspect Ratio			
Image Flip			
Image Orientation			
Input Sizing Preset	None		
Alpha Mode	None		
Super Scale			
Sharpness			
Noise Reduction			

We will set the target format to 4K Scope (4096x1716) and resize the image, taking our frame leader into consideration.

Format N	Aonitor Output			lonitor	Output	
Timeline Resolution	Custom		III Us	e Timeline Setting	is for Output Scaling	
Pivel Aspert Patio	For 3328 x 2790 Pr	ocessing	Output Resolution	Custom		
Fixer Aspect Natio	16:9 Anamorphic 4:3 Standard Definition Cinemascope		Pixel Aspect Ratio	For 4096 x • Square	1716 processing	
Timeline Frame Rate	24 V Frames per se	cond		4:3 Standard O Cinemascop	d Definition e	
			Mismatched Resolution	Center crop wi	th no resizing \lor	
dismatched Resolution	Center crop with no resizing		Super Scale	None		

Please refer to the manual of your post-production software for detailed instructions, as there are several methods to accomplish this. In this example, we will use Blackmagic DaVinci Resolve Studio, adjusting the image through 'Output Sizing' and creating a preset.

Sizing - Outpu	ut Sizing	Format F	Preset				
Sizing		Name 4	IK Scope 2.39:1 wi	th 10% safe a	area		
Pan	0.000	Pan:				1.378	
Tilt	0.000	Width:					
Zoom	1.378	Left:					4096
Rotate	0.000						
		-					

This will result in correctly framed image inside our target resolution and aspect ratio, which is 4K scope with 4096x1716 pixels. Since there is a 10% safe zone it is still possible to slightly adjust the image with a pan, tilt or zoom.



2.2.3 Rushes and Dailies

The rushes and dailies could also have included the 10% safe area, this depends on your pipeline. In our example we are only using the active image area with 2996x2512 pixels for the rushes. We assume the editor requests UHD dailies in 3840x2160 (16:9 / 1.78:1) for editing e.g. DNxHR SQ files.

Timeline Settings			Timeline	Settings			
-							
Format	vonitor Outp		Fo			Output	Color
Timeline Resolution	Custom			Use	Timeline Set	tings for Output Scali	ng
	For 3328 x 2790	Processing					
				Output Resolution	3840 x 216	0 Ultra HD 🛛 🗸	
Pixel Aspect Ratio	Square 16:9 Anamorohic				For 3840	x 2160 process	ing
				Pixel Aspect Ratio	 Square 		
	Cinemascope						
limeline Frame Rate	24 V Frames	oer second			4:3 Stant	dard Definition	
			Misn	natched Resolution	Center crop	o with no resizing 🗸 🗸	
				Super Scale	None		
Mismatched Resolution	Center crop with no re	sizing 🗸					
Use Project Settings	Cano	el OK	Use F	Project Settings			
Sizing - Output	ut Sizing	Format Preset					
Sizing		Name UHD_3.3K_6:5_3.3k	(_2.0Ana_2.39:1_10%_saf€	e_area			
Pan	0.000	Pan: 0		Zoom: 1.292			
Tilt	0.000	Width: 1					
7000	1 202						
20011	1.292	Left: 0		Bottom: 1884		Right: 3840	
Rotate	0.000	Default					
		Default				Save	

Since our target aspect ratio is 2.39:1 this will result in an active image of 2.39:1 with letterbox inside the UHD container, which is 1.78:1. In this case we don't have to add an additional crop, since the image is already



2.2.4 VFX

For generating VFX pulls/plates it's necessary to include the 10% safe area to the rendered files. Most VFX facilities nowadays are working with OpenEXR/Scene Linear files (single file sequences). These files should also have included the 10% safe area, which can be used for repositioning or stabilization.

Please note: Before rendering VFX pulls/plates, please get in touch with your VFX vendor, clarify their needs and set up a VFX and finishing pipeline. The process we are showing here is just an example and there are different pipelines possible. Therefore, please clarify with your production in advance. Typical questions are related to:

- Scaling and filters
- Squeezed or de-squeezed formats
- Active image area / safe area

In this example we assume that we must generate anamorphic VFX pulls/plates incl. the 10% safe area. Therefore, this results in an anamorphic image with 3328x2790 resolution. The active image area will be 2996x2512 inside that 3328x2790 area.

2996x2512= 1.19267516 1.19267516 * 2.0 = 2.38535032 ≈ 2.39



The VFX vendor will get files with 3328x2790 pixel resolution. The green area outside of the active 2996x2512 pixels can be used for repositioning and stabilization in VFX.



3 Downloads and Links

3.1 Sample DaVinci Resolve Project Archive

https://f.io/wQEP9LQX

3.2 Used Sample Frame Leaders

https://f.io/db5eAF4N

3.3 ARRI Frame Line and Lens Illumination Tool

https://arri.com/flt

3.4 Netflix Framing and Working Resolution Calculators

https://arri.com/netflixcalculators

3.5 ARRI Sample Footage

https://www.arri.com/en/learn-help/learn-help-camera-system/camera-sample-footage-reference-image

4 Contact

In case you have questions or recommendations, please contact the Digital Workflow Support (DWS) team within ARRI via email: <u>digitalworkflow@arri.de</u>