Recording Formats for Cinematic Release from Shoot to Delivery
ALEXA SXT and ALEXA Mini

WHITE PAPER

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Introduction

All ALEXA, ALEXA XT, ALEXA SXT or ALEXA Mini cameras can record in a compressed QuickTime/ProRes format or uncompressed as ARRIRAW in HD, UHD, 2K or 4K resolutions.

Combined with anamorphic and spherical lenses, a number of image formats can be exposed. To clear the mist around our formats jungle this document aims to show how to shoot for the most common formats as cinema releases (DCP, Digital Cinema Packages): 2K Flat/Scope and 4K Flat/Scope.

We strongly recommend shooting a frame leader/framing chart to avoid confusion in post and have a clear way of communicating which part of the image is relevant. See 1.4

Opposed to cinema, creating streaming or TV releases is straightforward HD or UHD. The desired framing must be fitted inside the 1920x1080 or 3840x2160 frame. All formats or framings that do not meet these resolutions have to be rescaled individually. Usually those end up as letter- or pillarboxed formats within the 16x9 image.

Whereas DCPs have a maximum container size which does not need to be filled at all times.
2K DCP: 2048x1080
4K DCP: 4096x2160

This bears the advantage to use the relatively small bandwidth of DCPs more efficiently.

1. Delivery Targets for Cinema

1.1. 2K DCP Flat (1998x1080) – 1.85:1

ALEXA SXT (16:9 Mode)

ProRes 2K (2048x1152, 16:9 Mode)

Of course there are always different ways to achieve a result, as is for this step. We decided to apply a mild down-scale to the image to maintain its field of view; simply cropping to 1998x1080 is also possible. An advantage to this method is to have some padding for stabilization.

ARRIRAW 2.8K (2880x1620, 16:9 Mode)

For ARRIRAW recordings with a 2K Flat delivery, downscaling is mandatory.
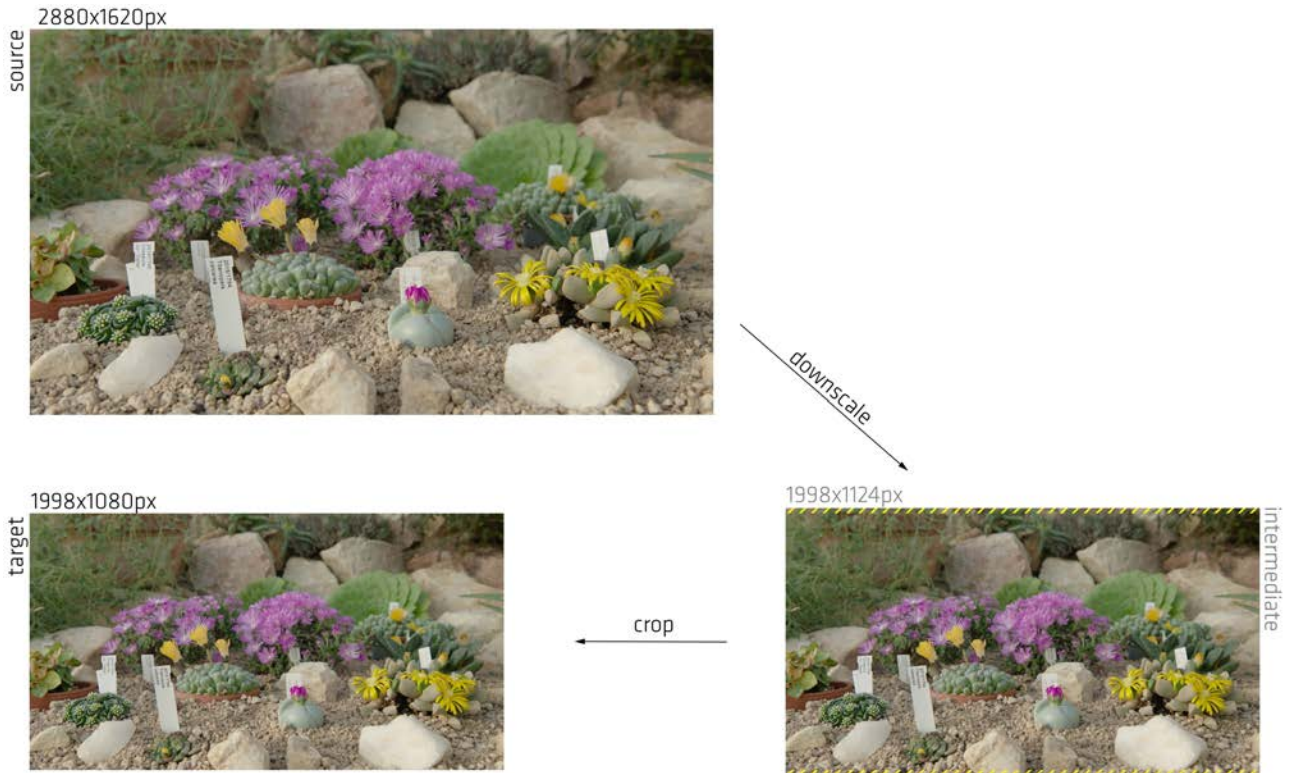
ALEXA Mini

ProRes 2K (2048x1152)

Similar to ALEXA SXT due to the same resolution for 2K ProRes.

MXF/ARRIRAW 2.8K (2880x1620)

Again, similar to the ALEXA SXT ARRIRAW image. Downscaling is a must (if the frame leader tells you different, keep in mind some padding for stabilization might be involved).

1.2. 2K DCP Scope (2048x858) – 2.39:1

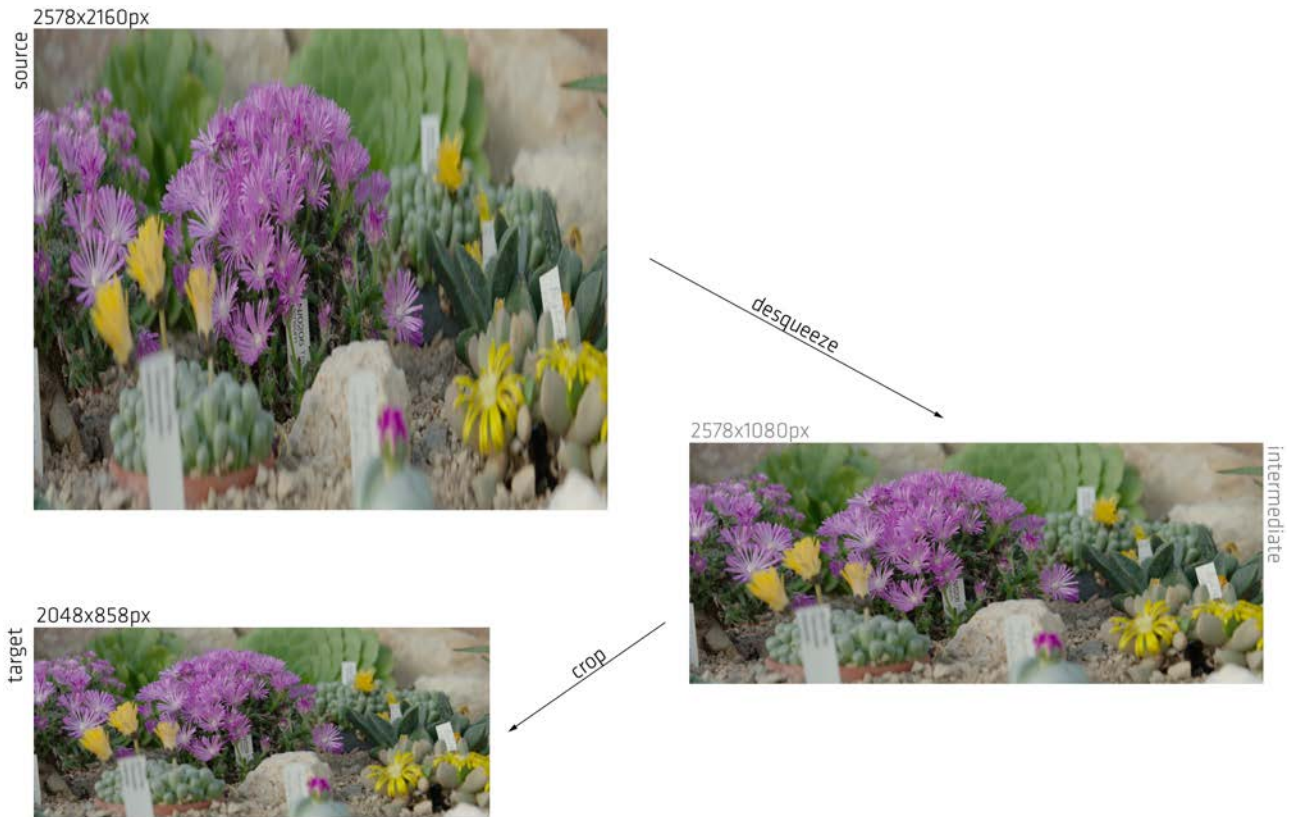<u>**ALEXA SXT (6:5 Mode)**</u>

ProRes 2K Anamorphic (2048x858, 6:5 Mode)

ProRes 2K Anamorphic is a pre-de-squeezed/downscaled format for 2K 2.39:1 deliveries. No image alternations needed. Pixel-aspect-ratio is 1.0.

ARRIRAW 2.6K (2578x2160, 6:5 Mode)

Recording ARRIRAW anamorphic offers flexibility for stabilization or reframing, since the down-scale is a manual process.
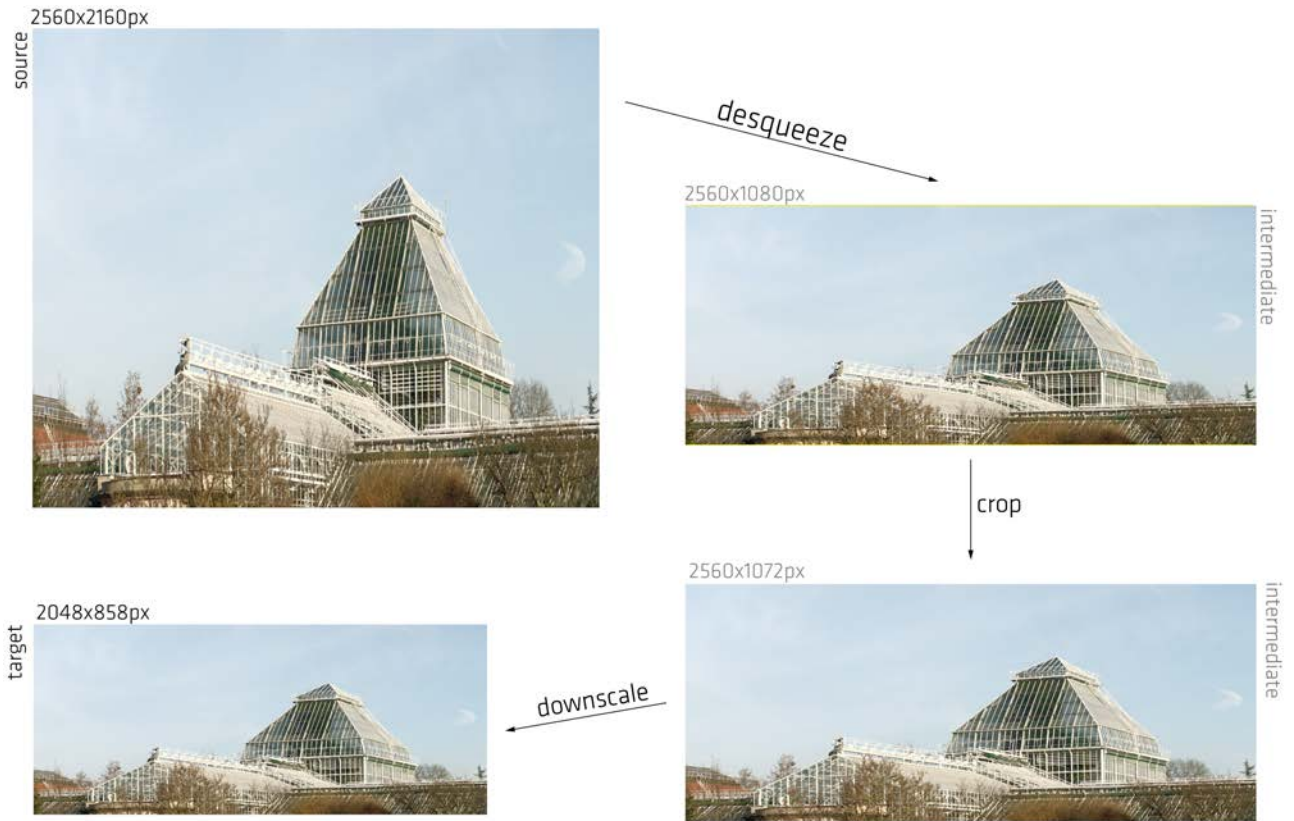

ALEXA Mini

ProRes 2.39:1 2K Ana. (2048x858)

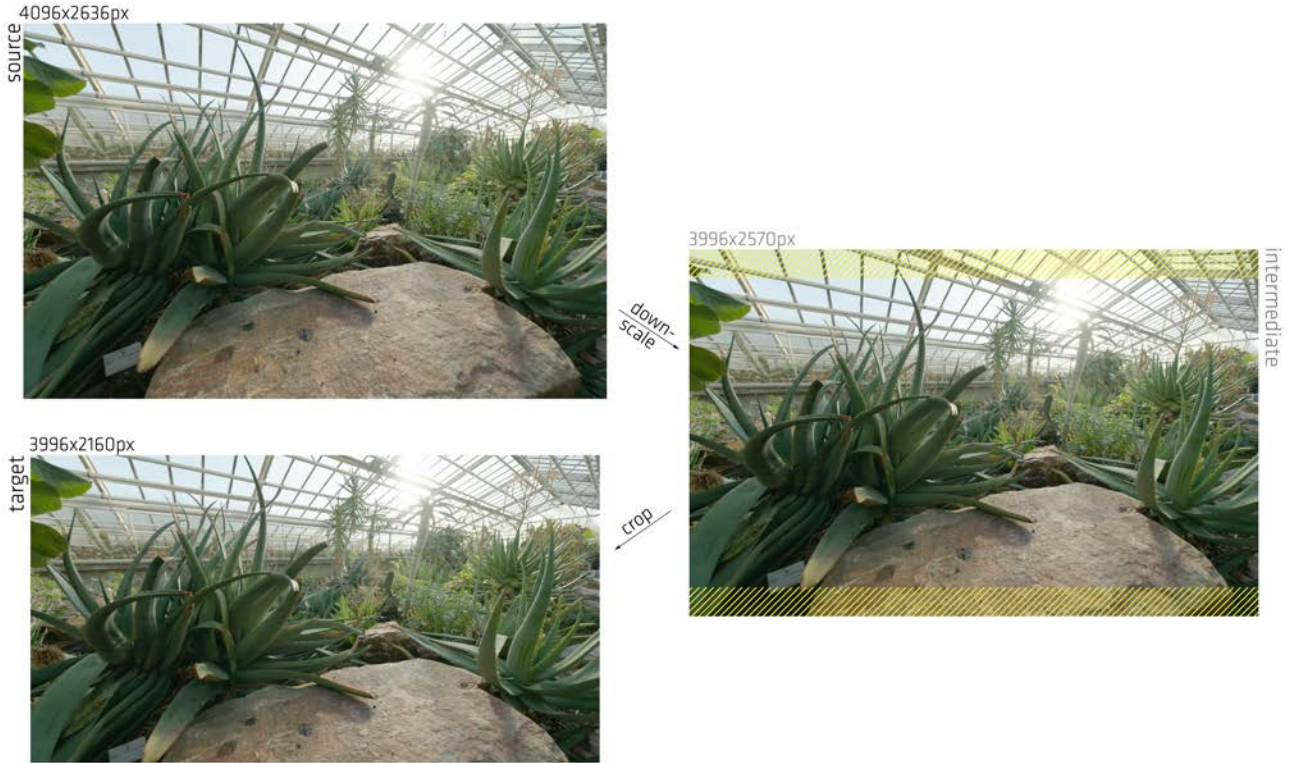Also in ALEXA Mini "2.39:1 2K Ana." is a "ready-to-go" format.

1.3. 4K DCP Flat (3996x2160) – 1.85:1

ALEXA SXT (Open Gate Mode)

ProRes 4K Cine (4096x2636, Open Gate Mode)

For our 4K Cine format, a minimal downscale is necessary before cropping 93 pixel top and bottom.

ARRIRAW 3.4K (3424x2202, Open Gate Mode)

ARRIRAW images created in the highest resolution of ALEXA SXT and Mini need to be up-scaled before cropping 210 pixel top and bottom.

ALEXA Mini

MXF/ARRIRAW Open Gate 3.4K (3424x2202)

There's no up-scaled ProRes format for 4K Flat. If ProRes recording is demanded, use 3.2K ProRes for upscaling to 4096. MXF/ARRIRAW recording offers the same Open Gate format as ALEXA SXT.
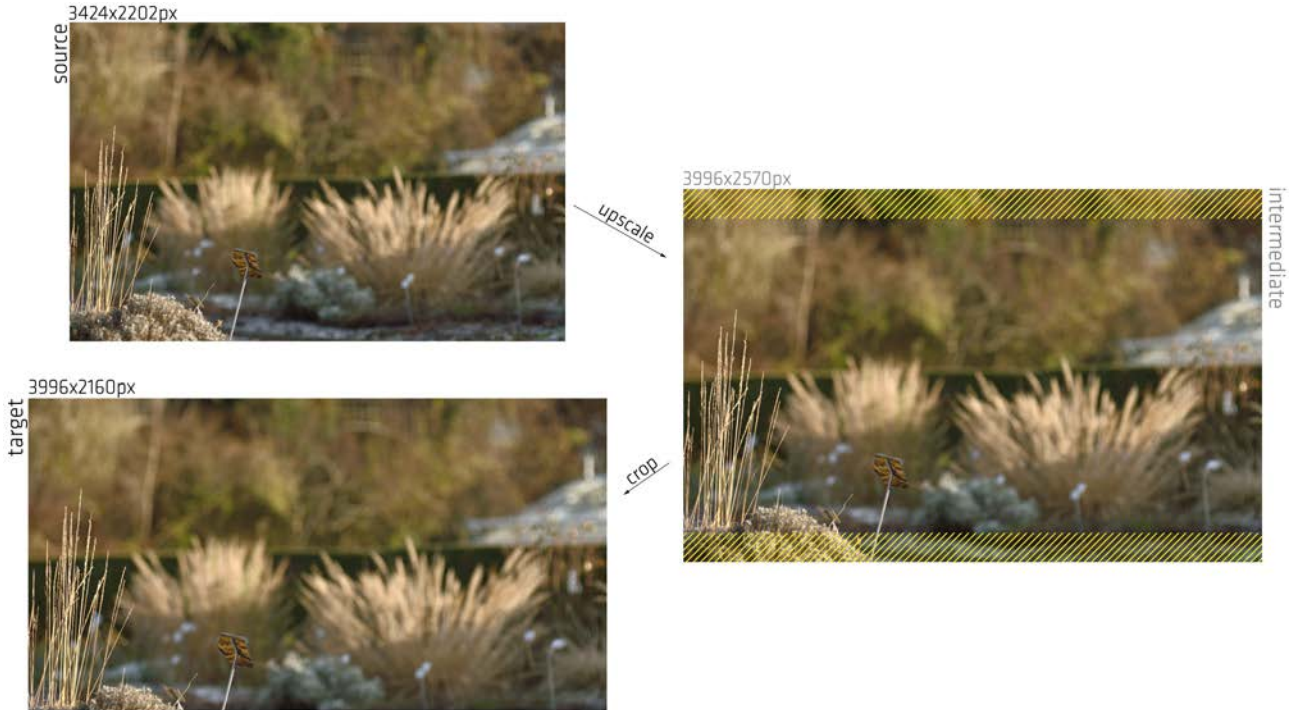
1.4. 4K DCP Scope (4096x1716) – 2.39:1

ALEXA SXT (6:5 Mode)

ProRes 4K Cine Anamorphic (4096x1716, 6:5 Mode)

ARRIRAW 2.6K (2578x2160, 6:5 Mode)

Recording anamorphic with ALEXA cameras yields the highest resolution achievable due to anamorphic capture. For a 4K Scope format an other option is possible, but goes along with a loss of resolution: Squeezing to 2578x1080 and upscaling to 4096x1716. Be aware of this!

ALEXA Mini

MXF/ARRIRAW 2.39:1 2K Ana. (OG 3.4K – 2560x2145)

See ALEXA SXT above, save applies here – besides the resolution is slightly different.

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2. Sample Footage

On the ALEXA and ALEXA Mini website we have created a "Learn" section, where you can find samplefootage of the cameras used in this document:

ALEXA SXT:
http://www.arri.com/camera/alexa/learn/alexa_sample_footage/

ALEXA Mini:
http://www.arri.com/camera/alexa_mini/learn/alexa_mini_sample_footage/

3. Framing Charts

There are various combinations of one or more image aspect ratios and alignments (center, common top…). Shooting a framing chart as a reference is the most reliable method to identify the intended framing in post.
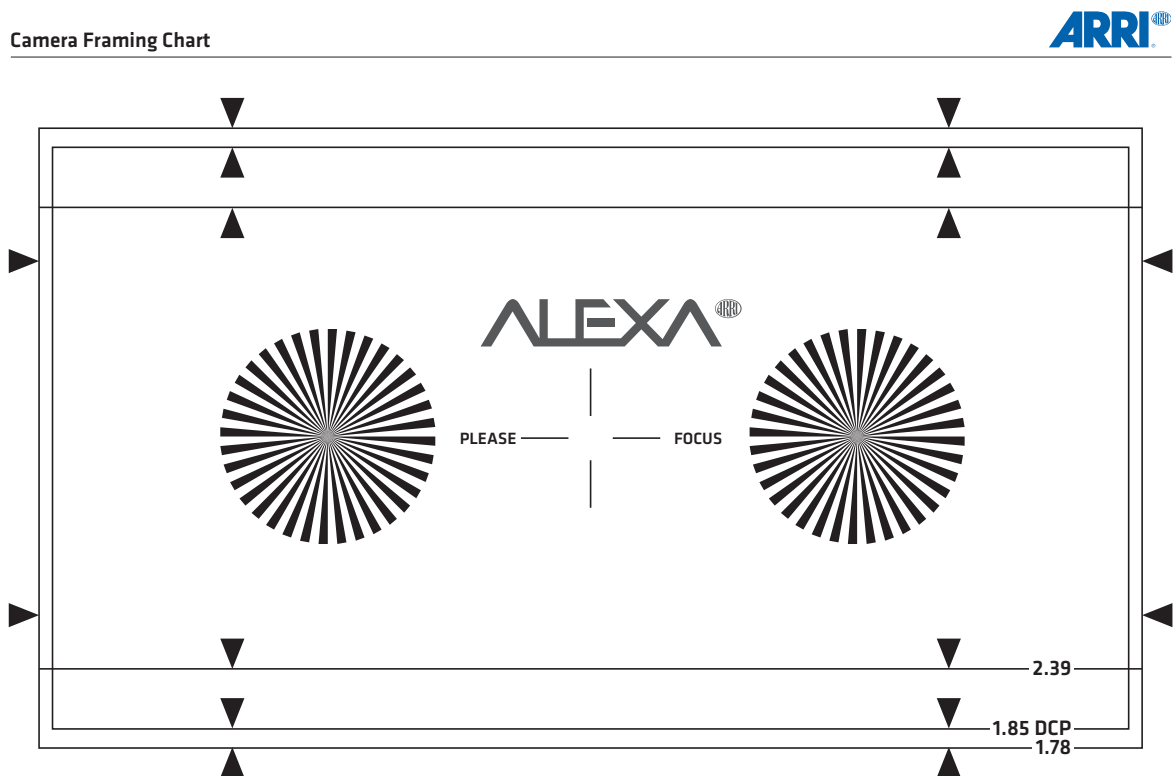
Always ask the camera department to shoot a framing chart as a reference for proper framing!
You can download a sample framing chart at: http://www.arri.com/?eID=registration&file_uid=9451

All methods shown in this document are described to the best of our knowledge. If you find errors, have suggestions or have questions about the general process, please don't hesitate to send an email to digitalworkflow@arri.de.