Spinner S3 13K Optical Zoom And Image Sizes

The brandnew Spinner S3 13K comes with the very latest sensor technology from Sony. The IMX661 sensor has 126 megapixels and is connected to the workstation through a 50 Gbit/s CoaXPress-2 interface.

In the Spinner S3 the imaging sensor can be switched to run in either of three modes:

- Full height mode: **13376 x 9472** at **12 fps** with **14 Bit**
- Half height / realtime mode: **8512 x 4736** at **25 fps** with **14 Bit**
- Quarter height / hispeed mode: **6688 x 2368** at **60 fps** with **12 Bit**

Mode switching is easily done in the flashsuite operational software.

The optical magnification range goes from a film width of approx. **16.5 mm** to **55.0 mm** (zoom factor 3.3x).

The flashuite software allows to cut out any area of interest from the sensor resolution above and scale it to the desired file resolution.

The on-chip digitisation works with 12 or 14 Bit, the image processing pipeline is always 16 Bit wide.

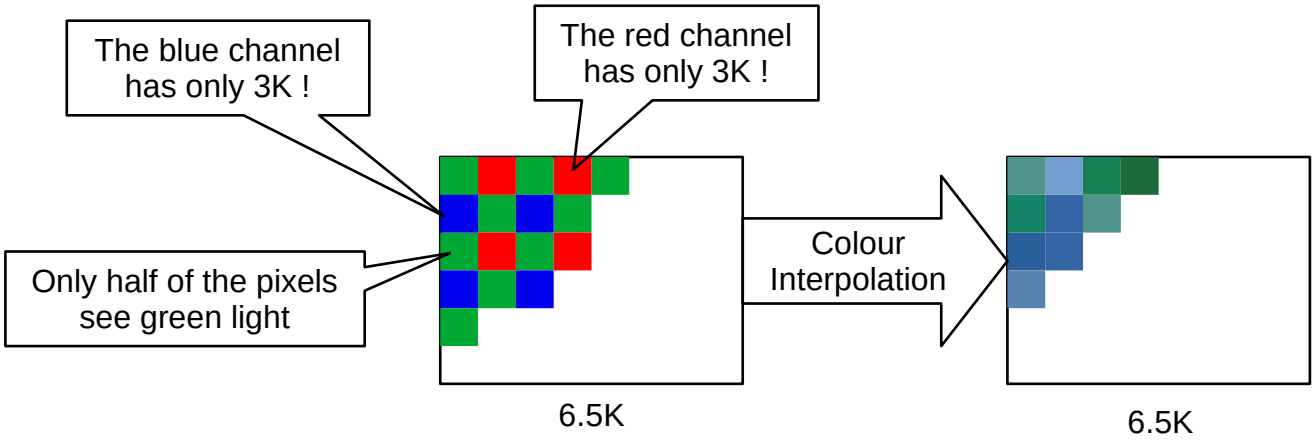
It is recommended to zoom optically to the **largest possible** image resolution and then **downscale** to the file resolution because of the following reasons:

- For the best picture sharpness it is wise to make use of the full image field and thus resolving power of the lens.
- The more photons are collected across the projected image on the sensor the better will be the signal to noise ratio of the downscaled image.
- A smaller film-related raster size avoids aliasing effects. For example scanning in 8K and downscaling to the half results in an alias-reduced "Super-4K" image.
- Unsharpness and mosaicing artefacts coming from the de-Bayer algorithm are eliminated after downscaling. The picture quality equals to an RGB scan but with the advantage of high scanning speed.
- It may not be useful to store the full image because of the enormous amount of data, however it is possible.

The following charts are examples for typical zoom positions and cutout sizes for usual film formats.

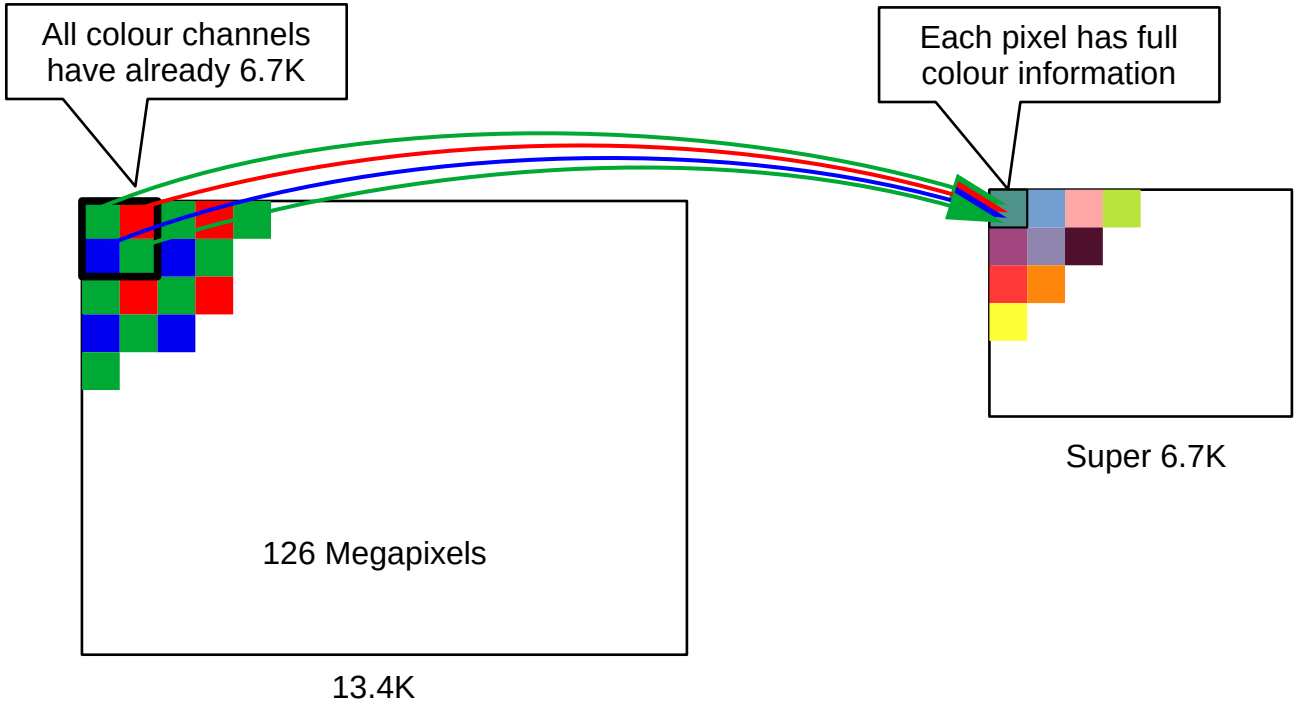
The scanning speeds relate to the sensor. The actual achieved speed also depends on the computer performance.

KG, 06.12.2023



Conventional 6K sensor with Bayer pattern

The actual resolution of the red and blue channel is only half. Aliasing with film grain and fine image details can occur. The output image contains **interpolated** pixels which makes the file size bigger than needed. The sharpness is limited.



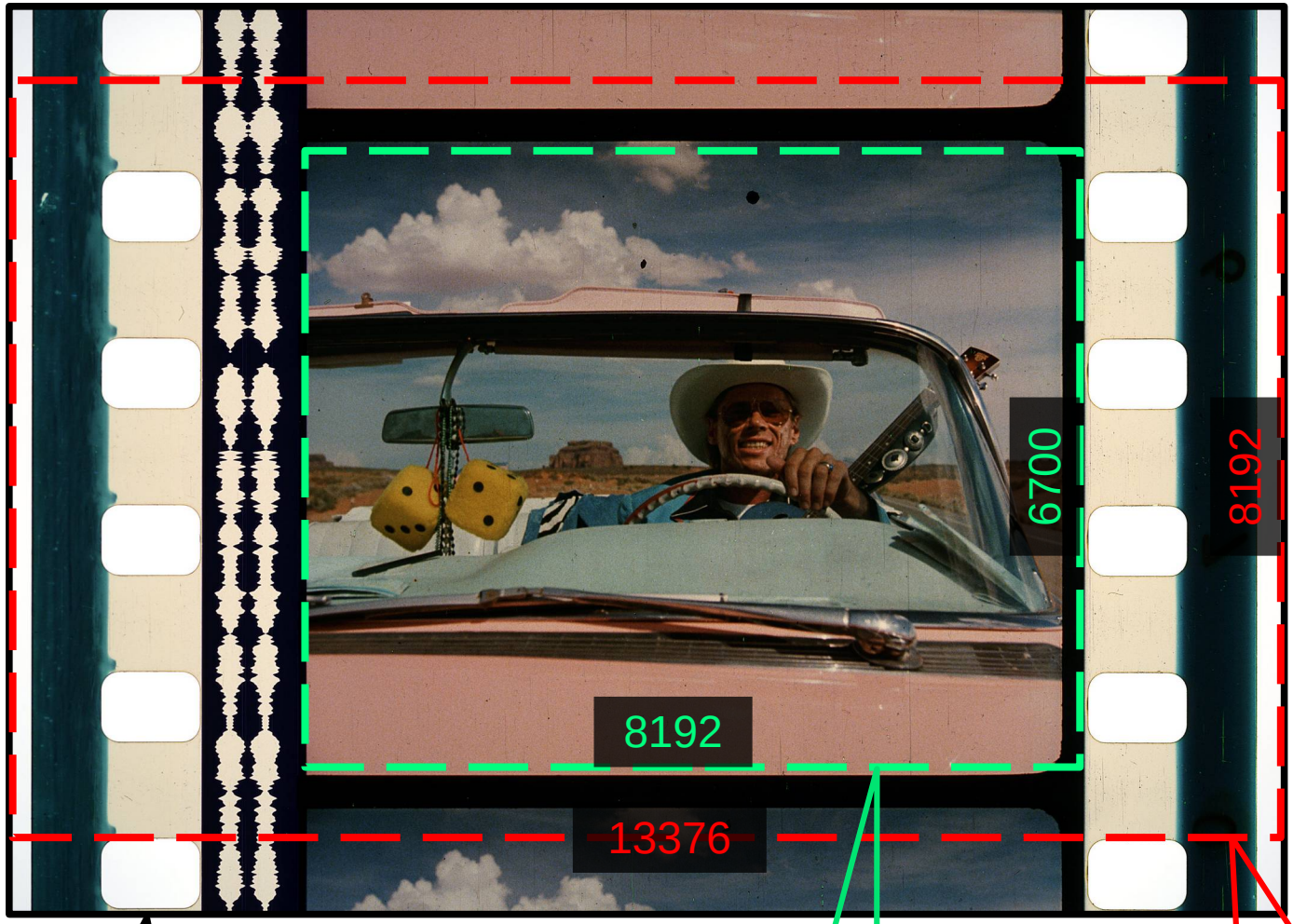
MWA Spinner S3 13K

The 13.4K sensor has 4 times the area thus can provide the full colour resolution for a 6.7K output image. Interpolation (de-mosaicing) is not needed, so unpleasant artefacts will not appear.

The 13.4K sensor works with 14 bits, whereas 6.5K sensors on the market have only 12 bits.

The large image area collects 4 times more light. This increases the dynamic range by 1 further bit. Together with the 14 bit sensor **HDR** is achieved with a single flash at up to 60 fps and 15 Bits dynamic range.

The resulting image quality is comparable to an RGB scanner.



35mm Edge to Edge

Optical zoom: 36.0 mm

Max speed: 12 fps

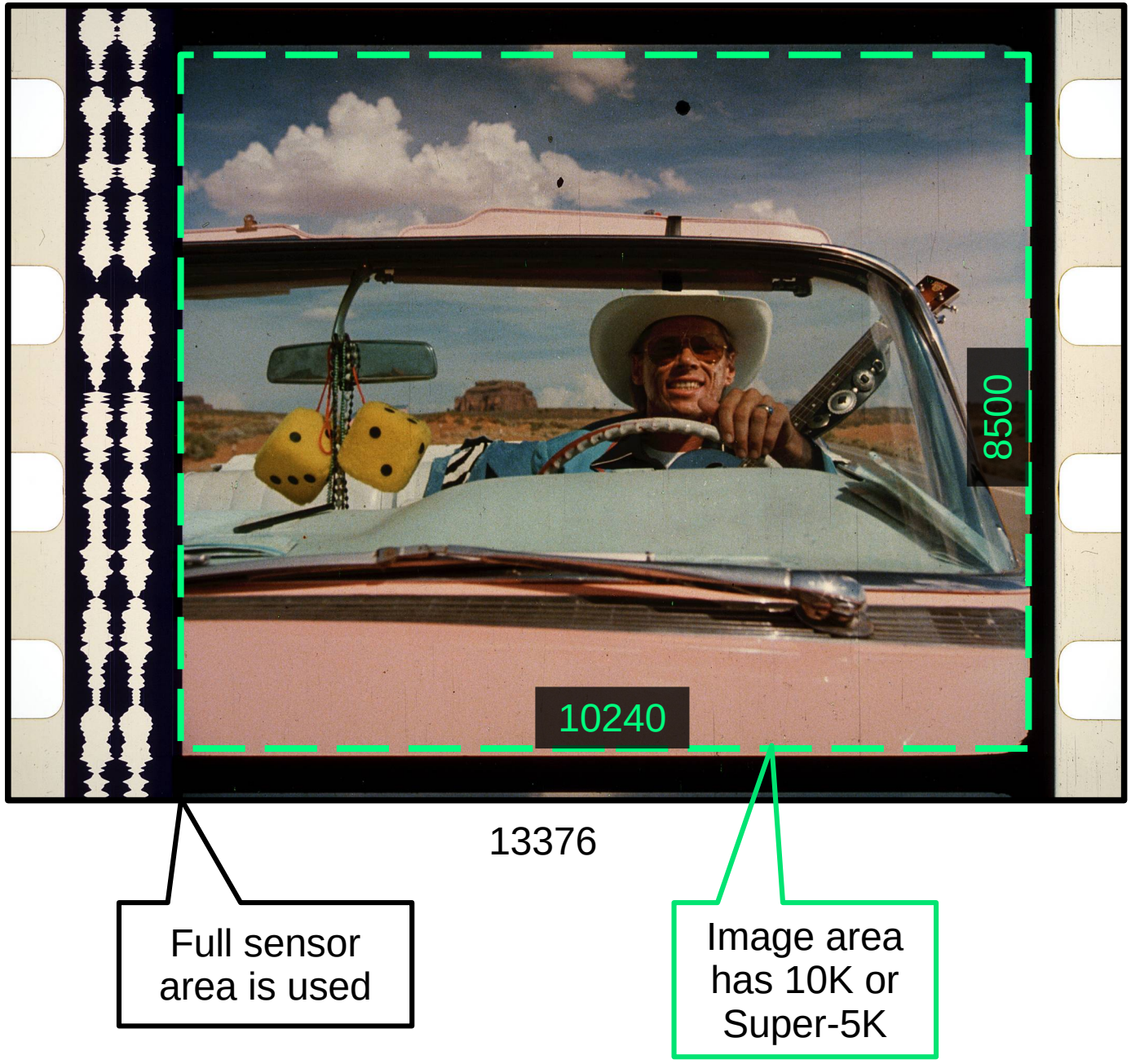
Archive the entire film width at Super-6.7K with the image content at Super-4K.

Attention: One 13K image has 760 MB! (190 MB after scaling to Super-6.7K)

You can store the full sensor size.

Image area has 8K or Super-4K

Example: Cut out edge to edge with overlap



35mm Overscan

Optical zoom: 28.0 mm

Max speed: 12 fps

No cutout needed.

Small overlap.

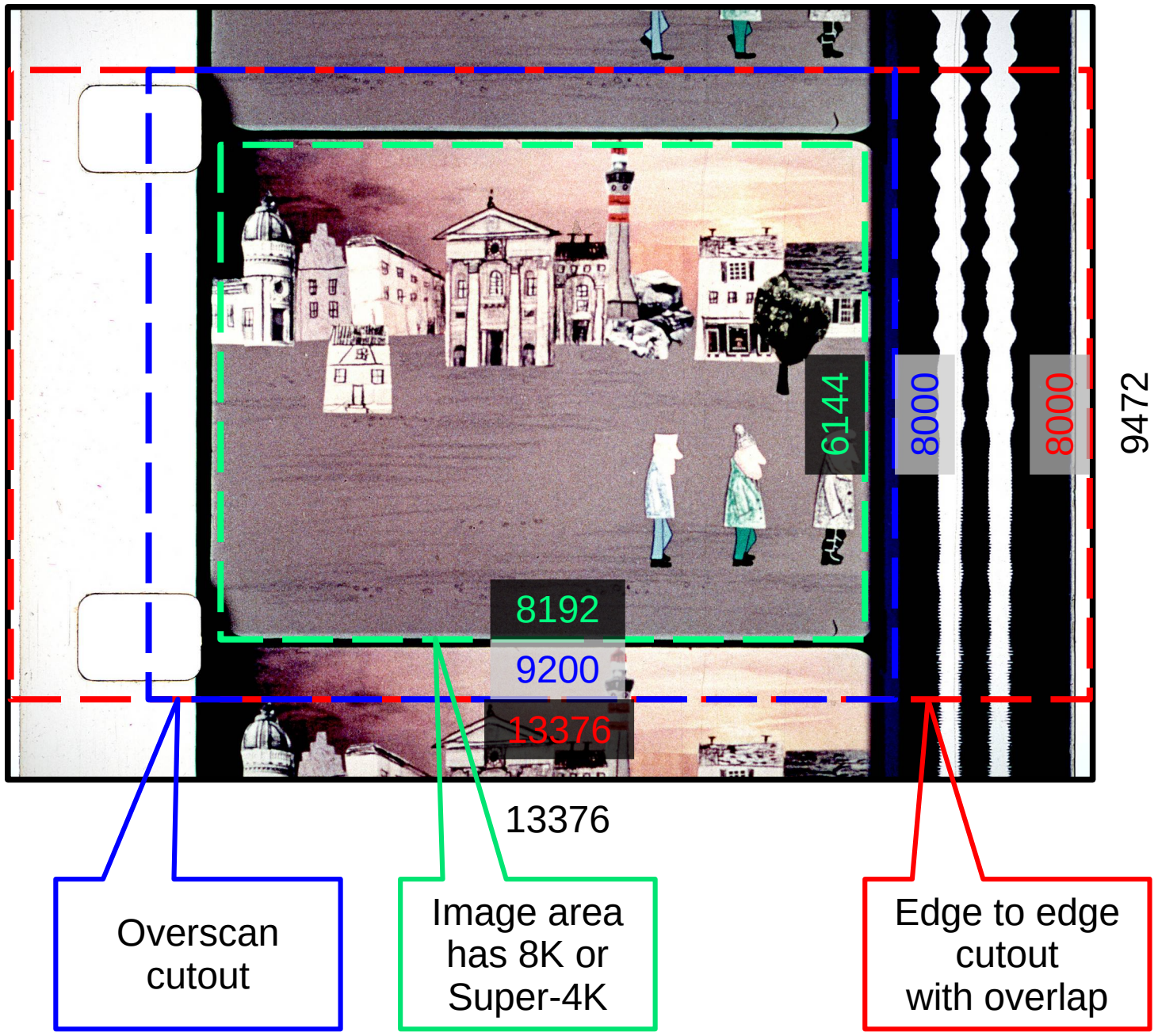
The image area has 10K or Super-5K.

35mm Image Area

Optical zoom: 24.5 mm

Max speed: 12 fps

The full sensor height is used for the image content.



16mm

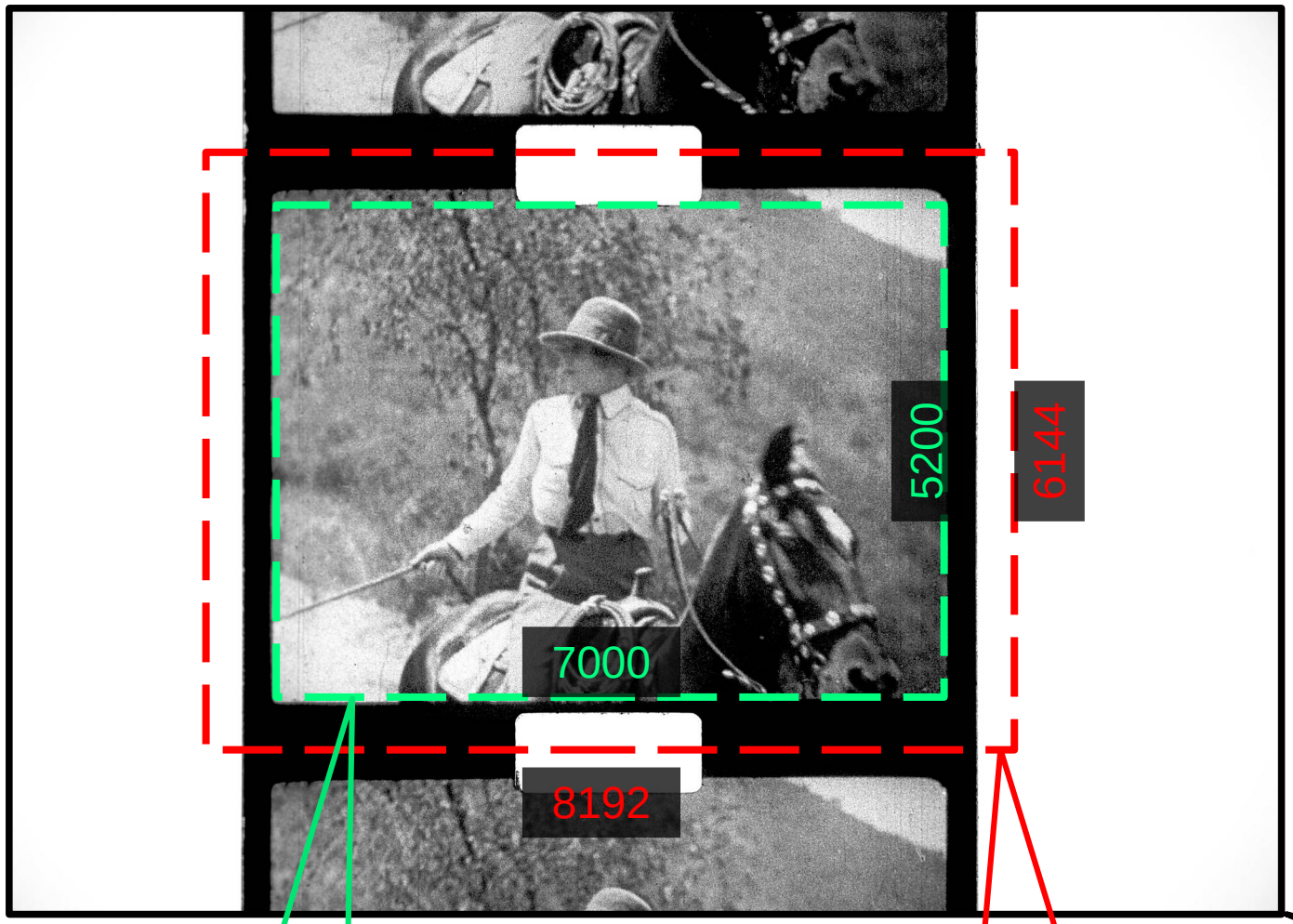
Optical zoom: 16.5 mm

Max speed: 12 fps

Highest possible resolution for 16mm.

Edge to edge cutout has full sensor width.

Image area has 8K or Super-4K.



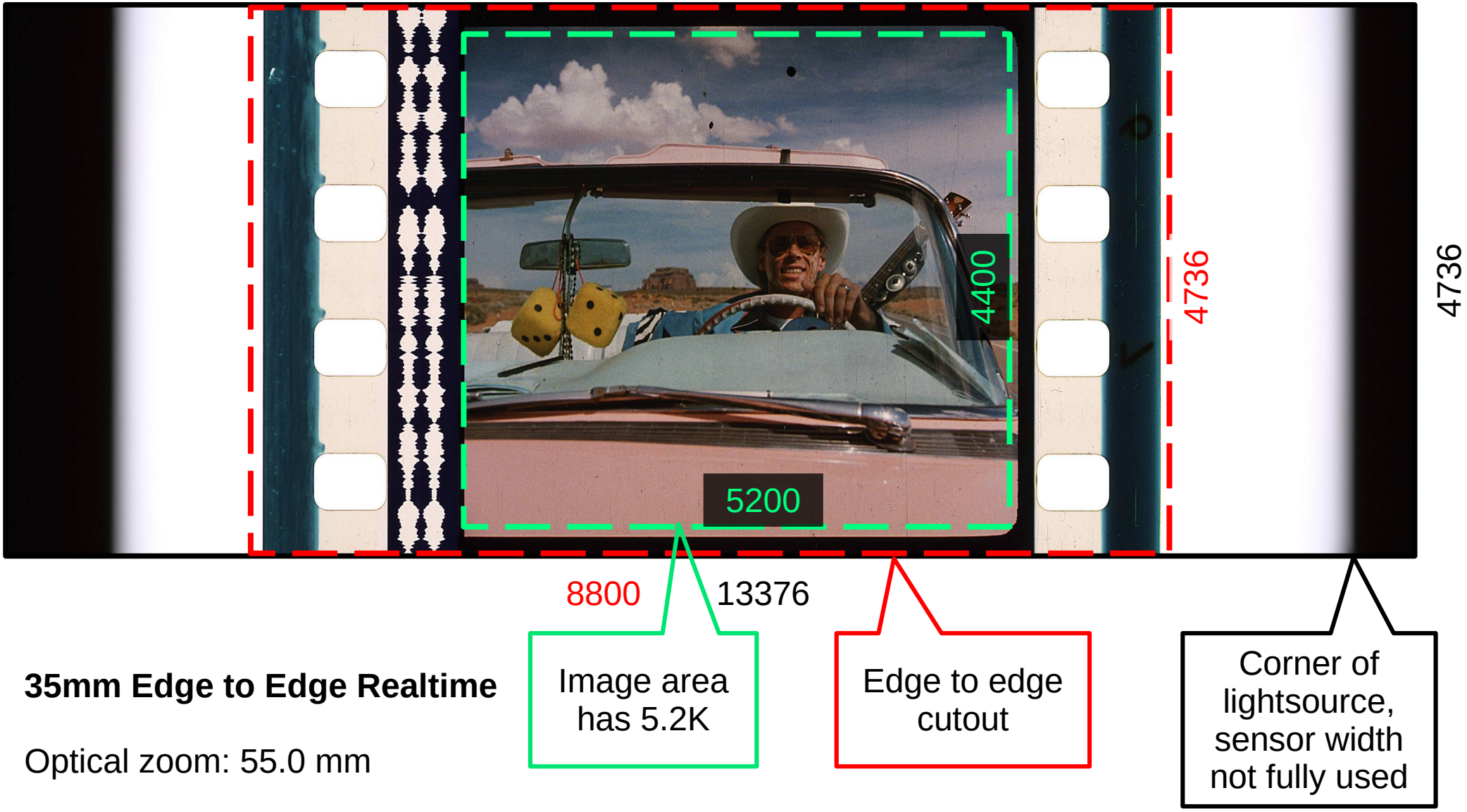
9.5mm

Optical zoom: 16.5 mm

Max speed: 12 fps

Highest possible resolution for 9.5mm.

Edge to edge cutout has 8K or Super-4K.

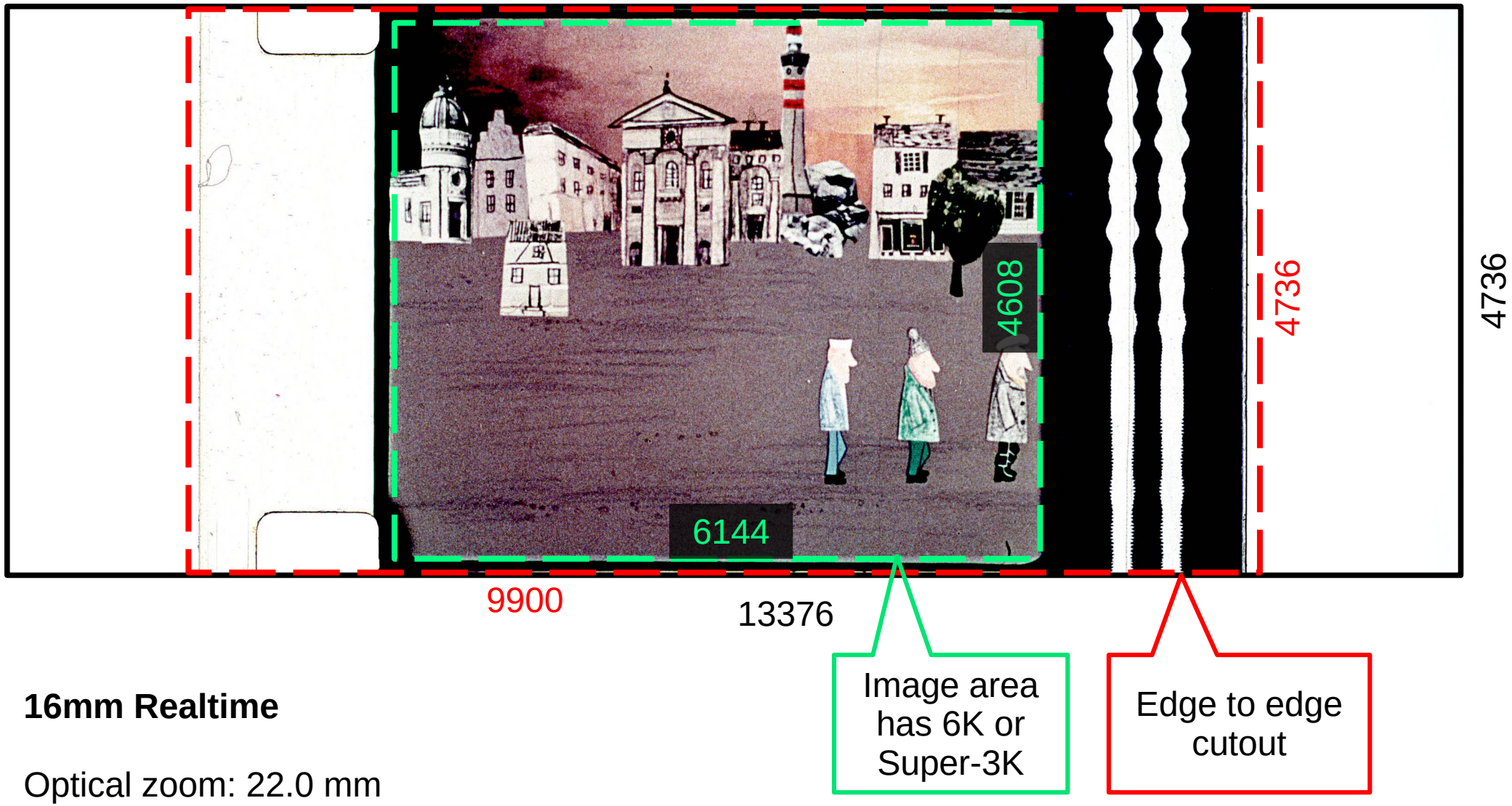


35mm Edge to Edge Realtime

Optical zoom: 55.0 mm

Max speed: 25 fps

Half sensor height is used.

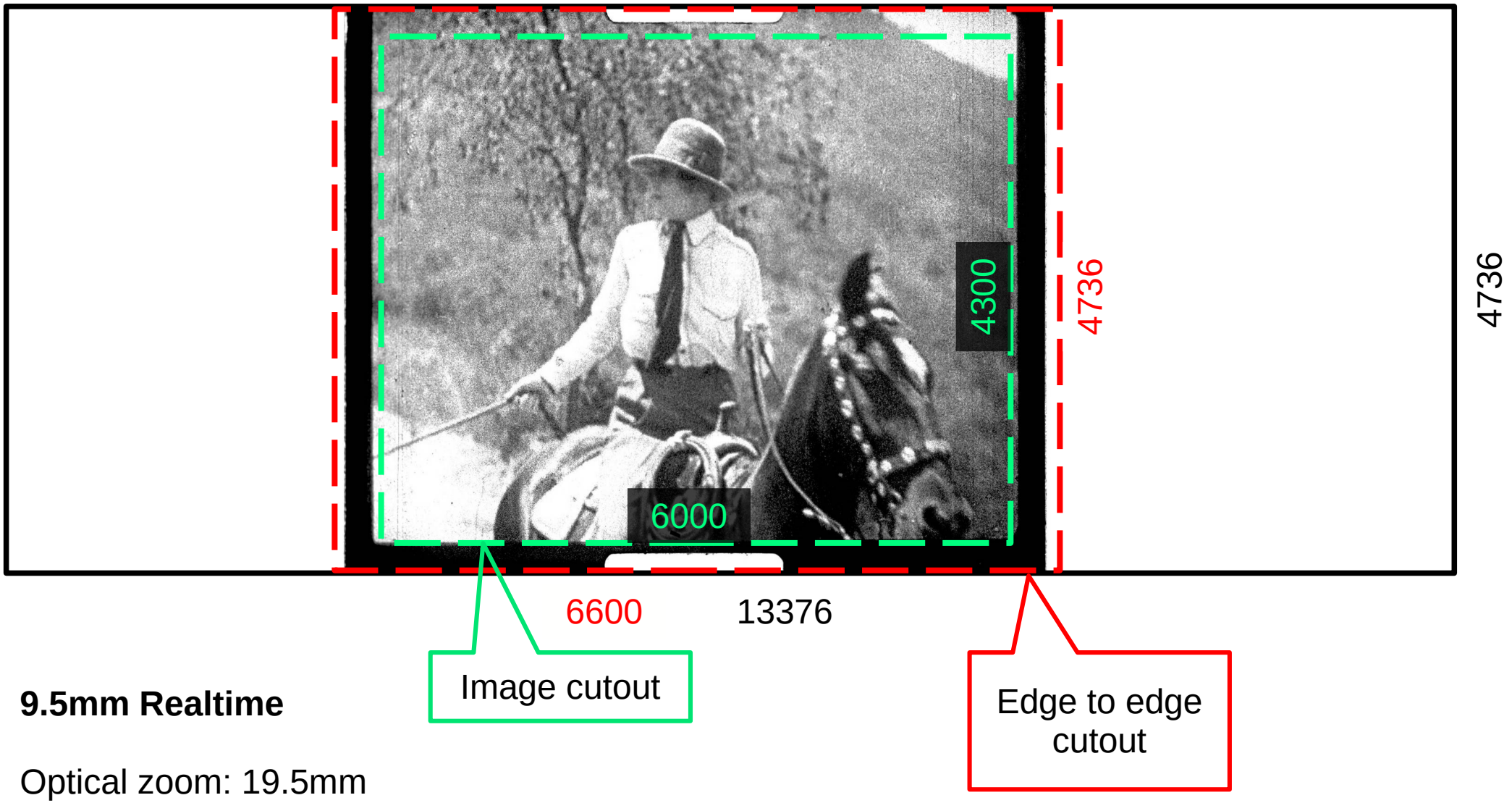


16mm Realtime

Optical zoom: 22.0 mm

Max speed: 25 fps

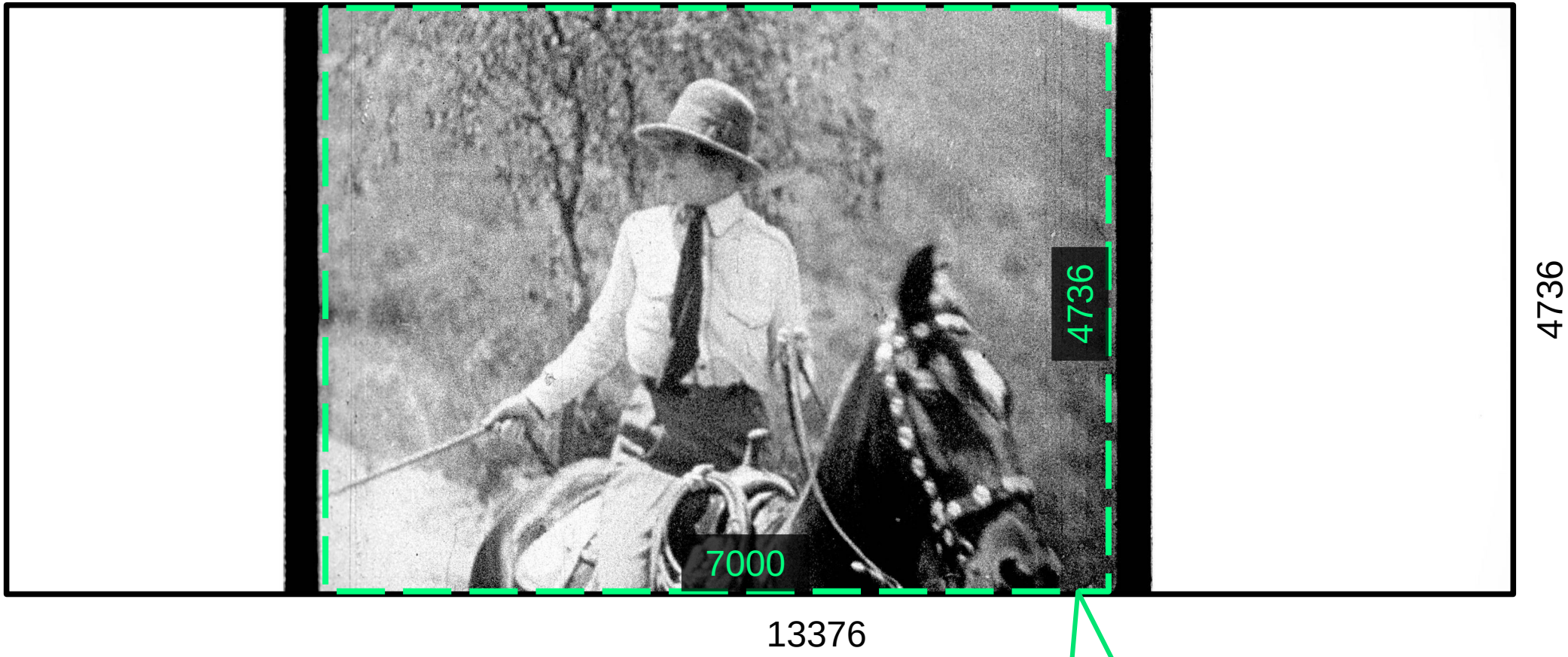
Scan 16mm in 6K / Super-3K in realtime



9.5mm Realtime

Optical zoom: 19.5mm

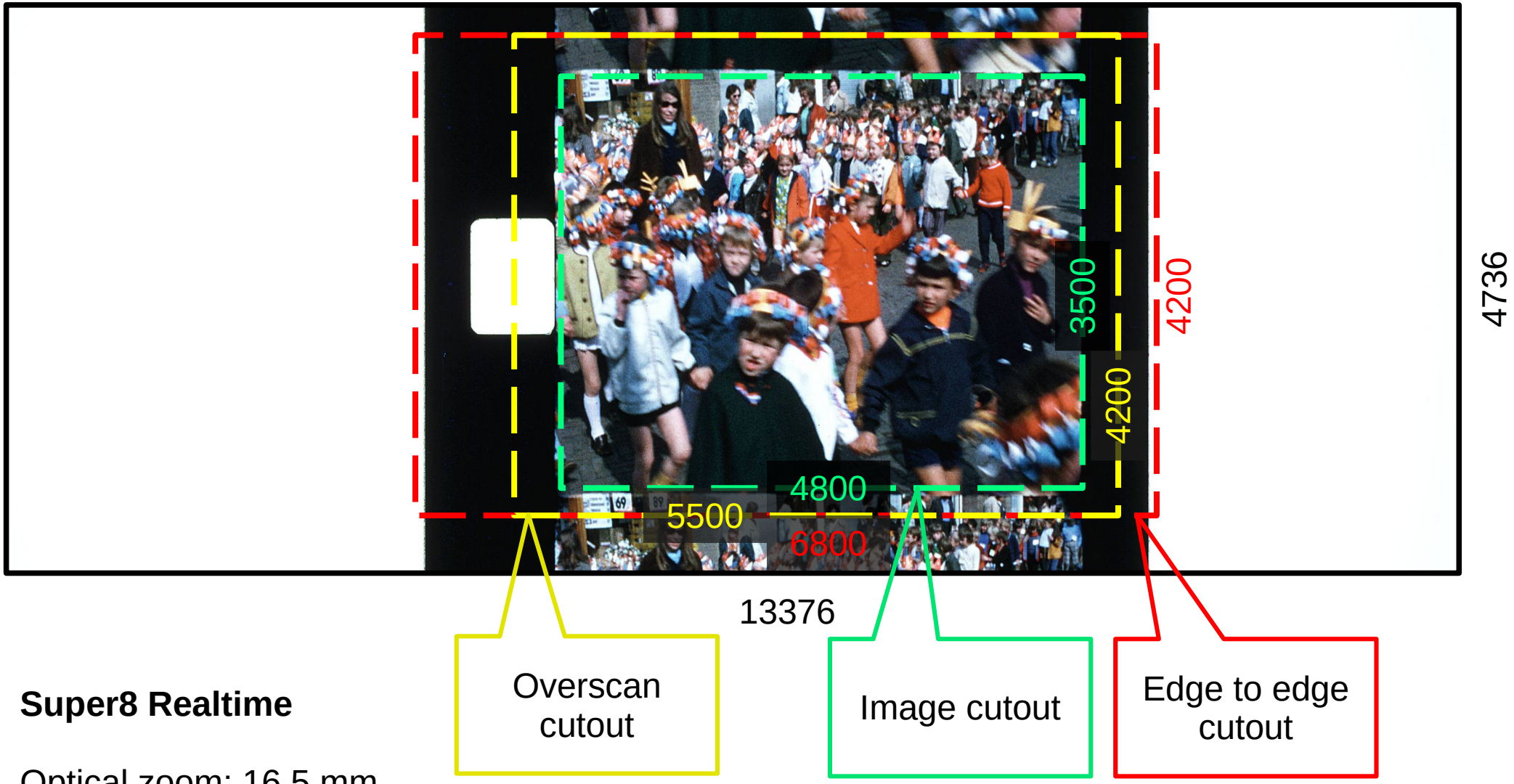
Max speed: 25 fps



9.5mm Image Realtime

Optical zoom: 16.5mm

Max speed: 25 fps



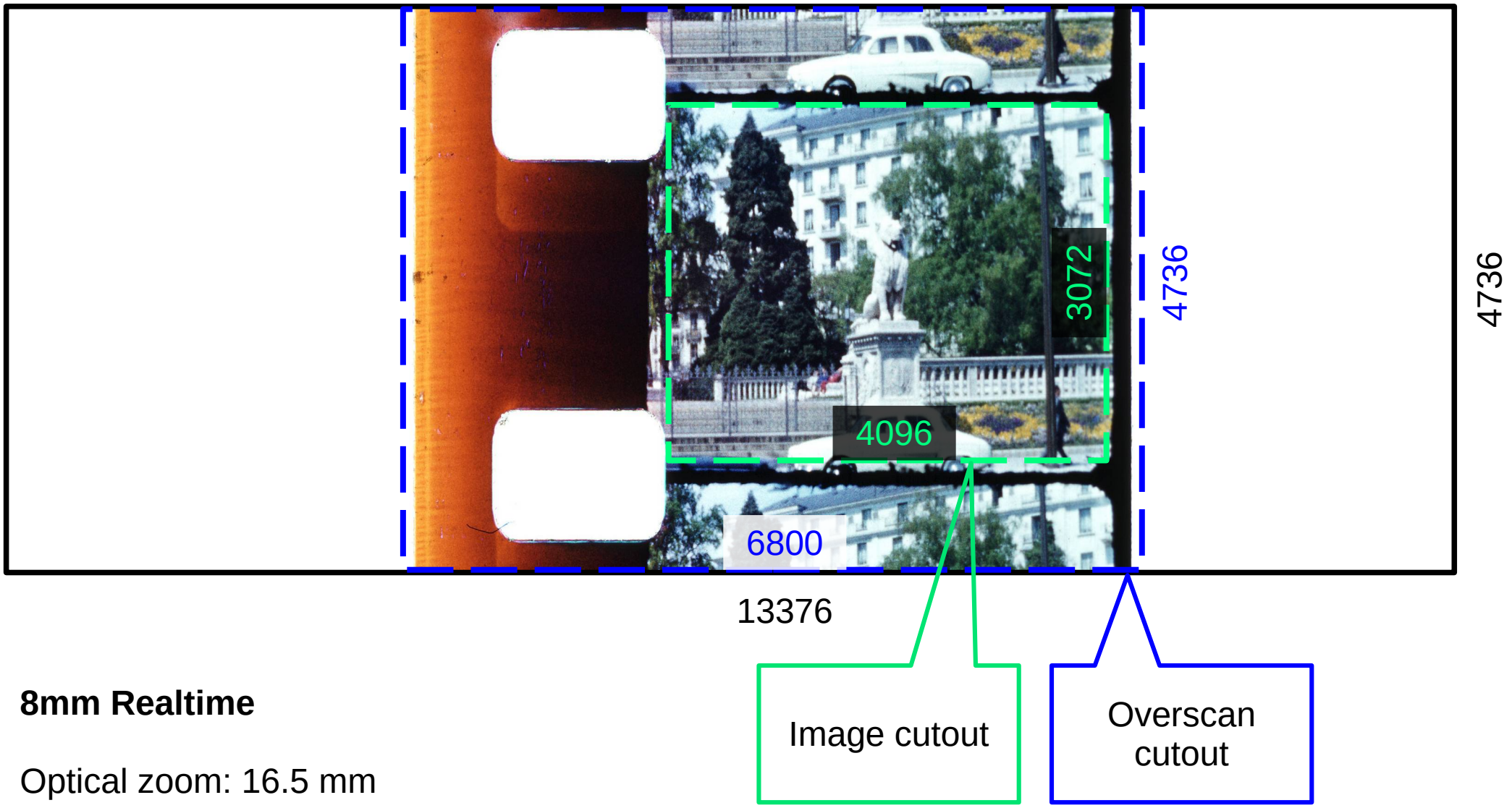
Super8 Realtime

Optical zoom: 16.5 mm

Max speed: 25 fps

Highest possible resolution for S8

Scan Super8 in 4K or Super-2K



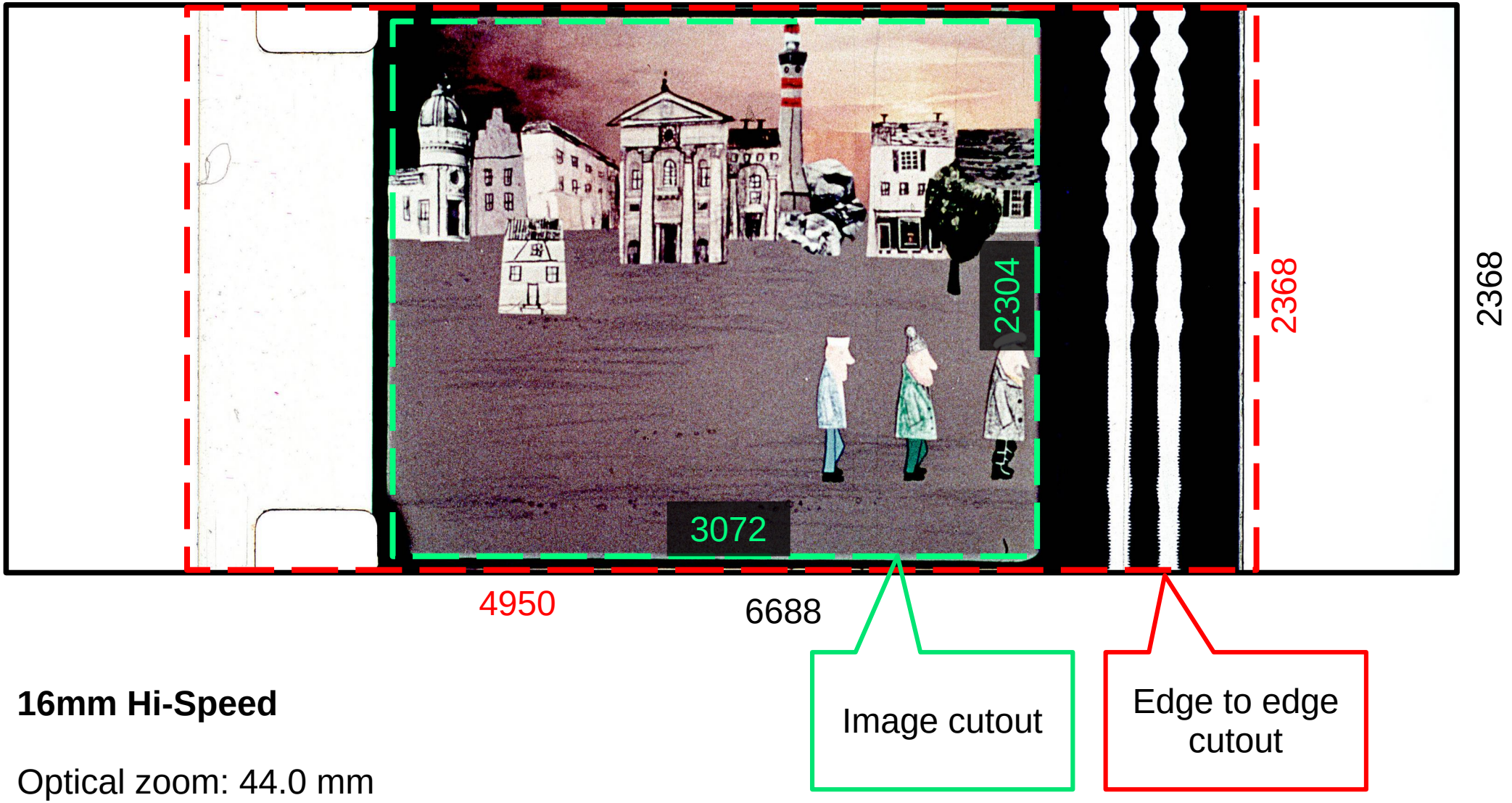
8mm Realtime

Optical zoom: 16.5 mm

Max speed: 25 fps

Highest possible resolution for 8mm

Scan 8mm in 4K or Super-2K

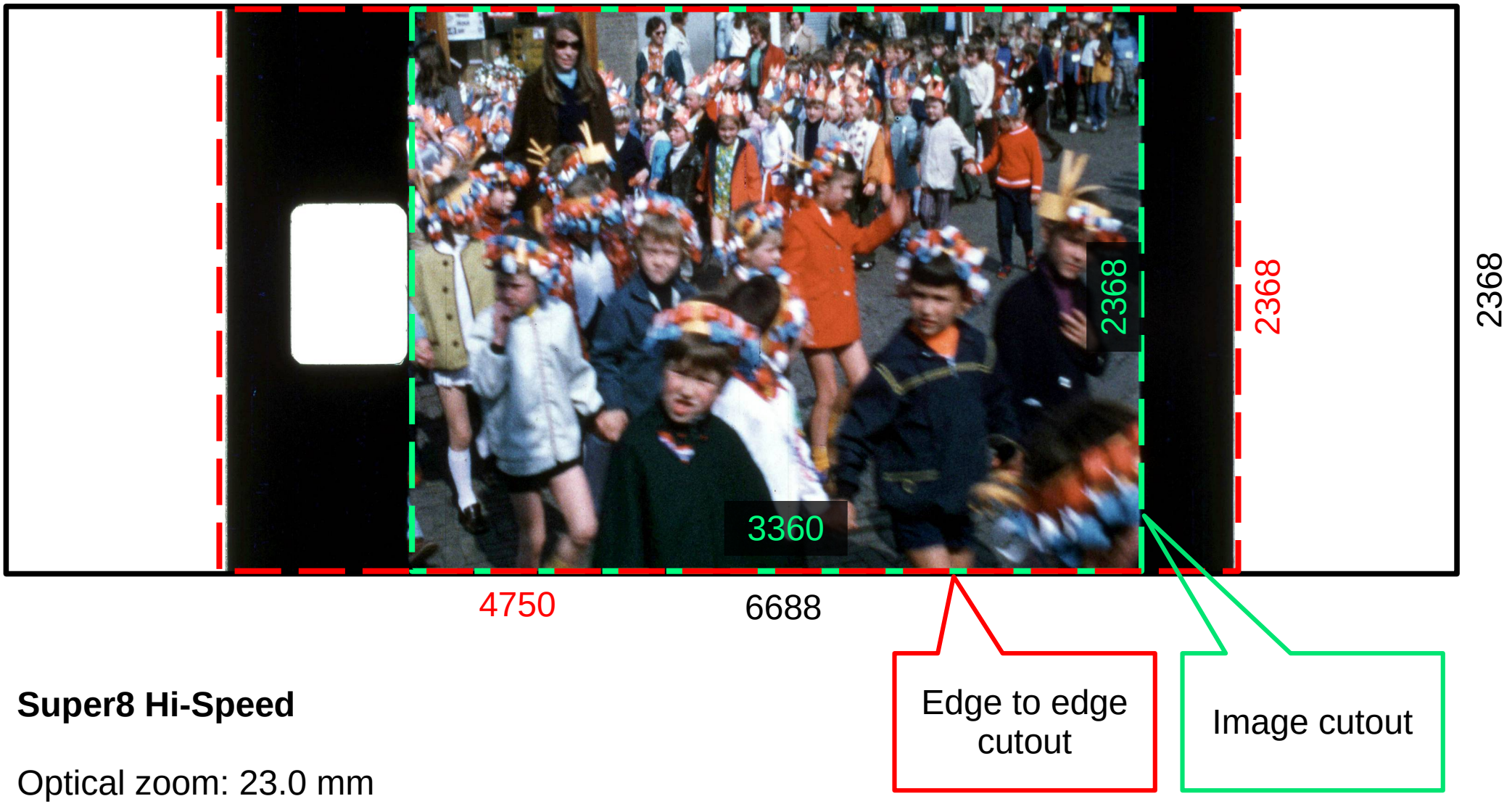


16mm Hi-Speed

Optical zoom: 44.0 mm

Max speed: 60 fps

Scan 3K at more than double speed



Super8 Hi-Speed

Optical zoom: 23.0 mm

Max speed: 60 fps

Scan 3K at more than double speed