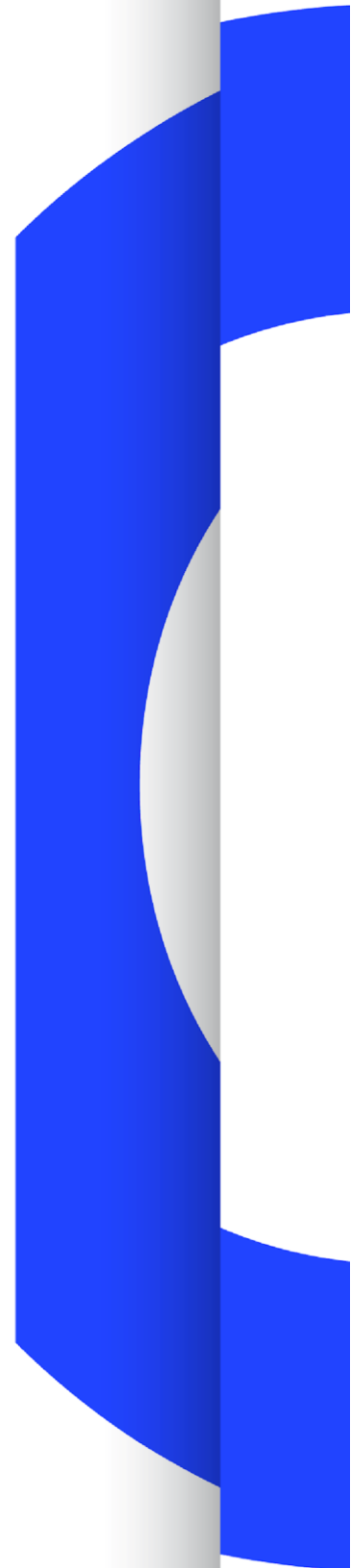# EBU

OPERATING EUROVISION AND EURORADIO

R 155

ARCHIVAL OF VERTICAL ASPECT RATIO VIDEO

Recommendation

Geneva
November 2021

This page is intentionally left blank

Archival of Vertical Aspect Ratio Video

EBU Committee	*First Issued*	*Revised*	*Re-issued*
TC	2021		

Keywords: Archive, Vertical Video, 16:9, 9:16,1:1, Aspect Ratio.

Recommendation

The EBU, considering that:

- Advances in media production, delivery options and viewing devices for various distribution platforms have created the need to handle images with non-traditional aspect ratios.
- Professional applications and infrastructure used by the media industry, have limited support for content that contains a range of different aspect ratio images in the end-to-end workflow, including archival.
- Current professional codec operating points have limited or no support for non-traditional image aspect ratios (SMPTE RDD9, SMPTE RDD32:2017, Apple ProRes, Avid DnX…).

Recommends that:

to ensure the full resolution of a vertical aspect ratio image is preserved during archival,

1. a vertical image be rotated (consisting of direct pixel mapping in the R'G'B' domain) to make a 16:9 image, as illustrated in *Figure 1*, or,

2. where UHD infrastructure options are available, an HD vertical image be positioned at the bottom centre of a black UHD 16:9 frame without rotation, as illustrated in *Figure 2*.

And further recommends that:

when shooting 16:9 video with a view to creating a different aspect ratio output, to easily allow the camera operator to correctly align the area of interest,

3. framing guide-line graticules of the correct aspect ratio should be used to ensure the primary subject of interest is located within the correct area of the image,

4. the entire 16:9 video be framed in such a way that it is safe for broadcast, and

5. the cropping area and guideline graticules shall be aligned centrally in the 16:9 frame. Examples of this for 9:16 and 1:1 are shown in *Figures 3* and *4,* respectively.

6. To aid machine recovery of the correct aspect ratio video, the region of interest pixel co-ordinates, aspect ratio and rotation should be stored in metadata, where possible. Multiple regions of interest may exist allowing for different output platforms.

The EBU further encourages:

7.   Standards Developing Organisations (SDOs) to define metadata describing the region(s) of interest's intended destination format (resolution, "shape" and orientation of the essence in the video file), ensuring the content being archived can be reused with no appreciable loss of quality, and define operating points for commonly-used combinations.

8.   Product vendors, when developing or upgrading professional applications and infrastructure, to include options that can interpret codecs with user-defined operating points, enabling these operating points to be carried end-to-end through broadcast infrastructure.

9.   Users to archive the 9:16 HD raster scaled down in the centre of a 16:9 HD raster without modification to the orientation as shown in *Figure 5*, in circumstances where there is an operational constraint or the infrastructure is not available to preserve the 9:16 HD raster in accordance with the recommended methods in this document,

10. AI / automated systems (aspect ratio and area of interest algorithms) should be designed to consider the recommendations in this document when creating images in different formats.

11. SDOs to define file formats, essence containers and live interfaces independent of resolutions and aspect ratios, in the longer term.
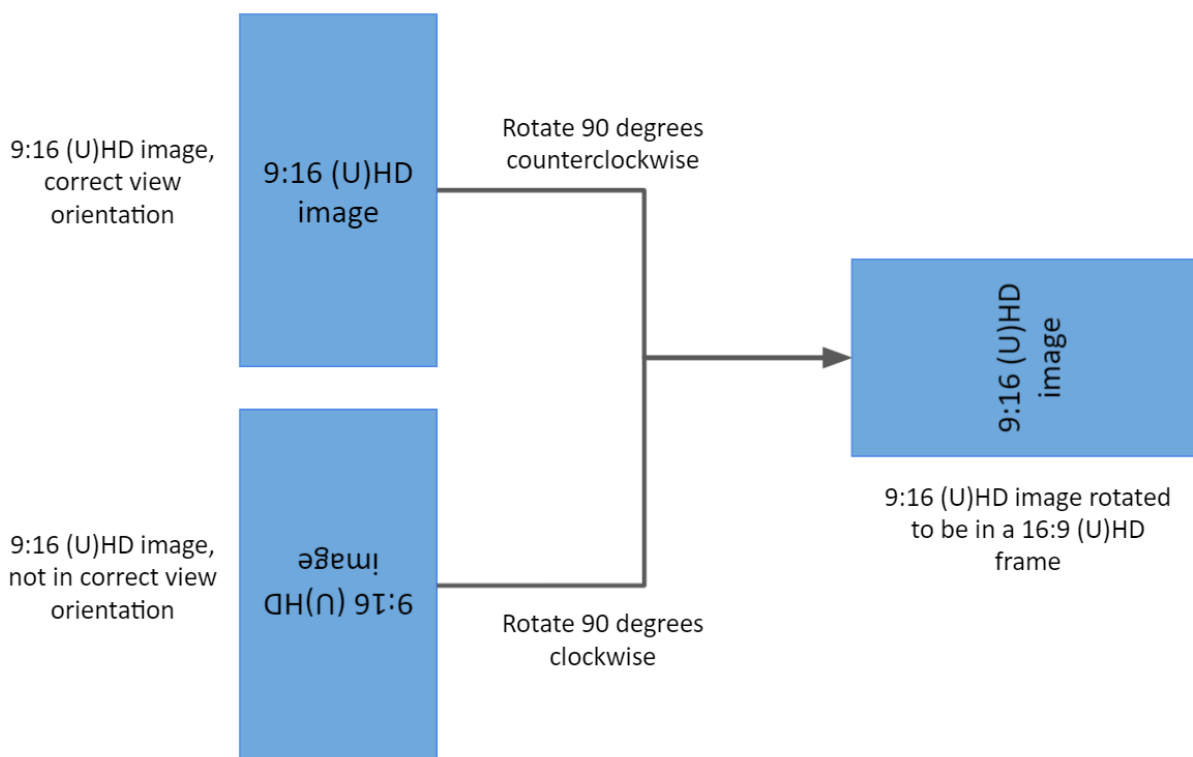
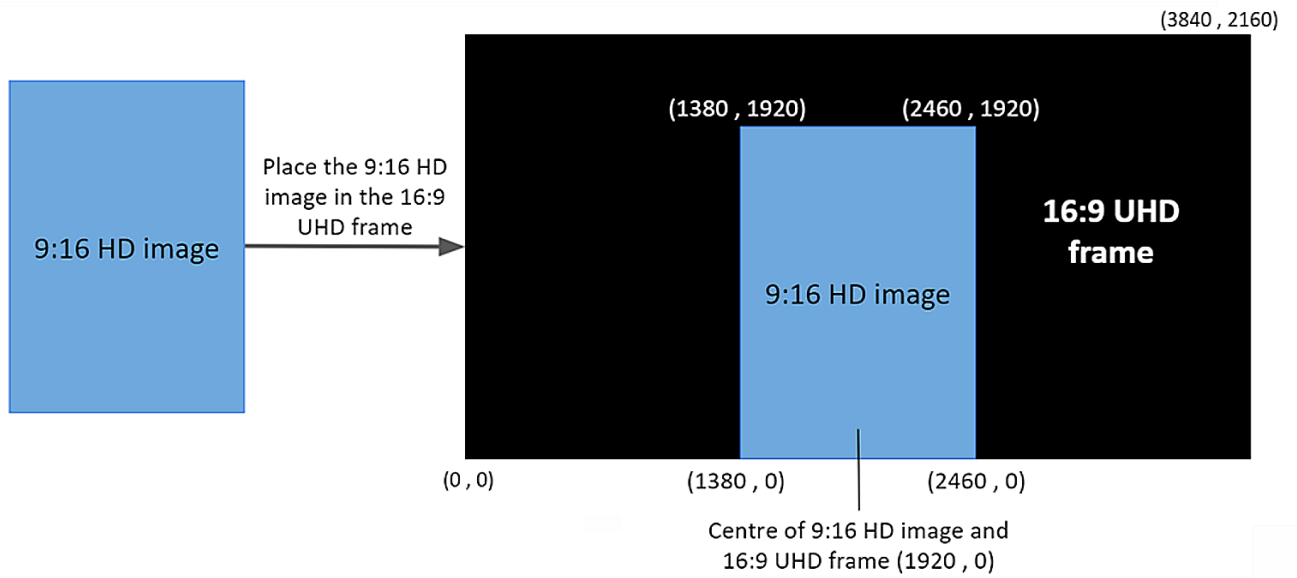**Figure 1:** Preservation of 9:16 images in (U)HD infrastructures

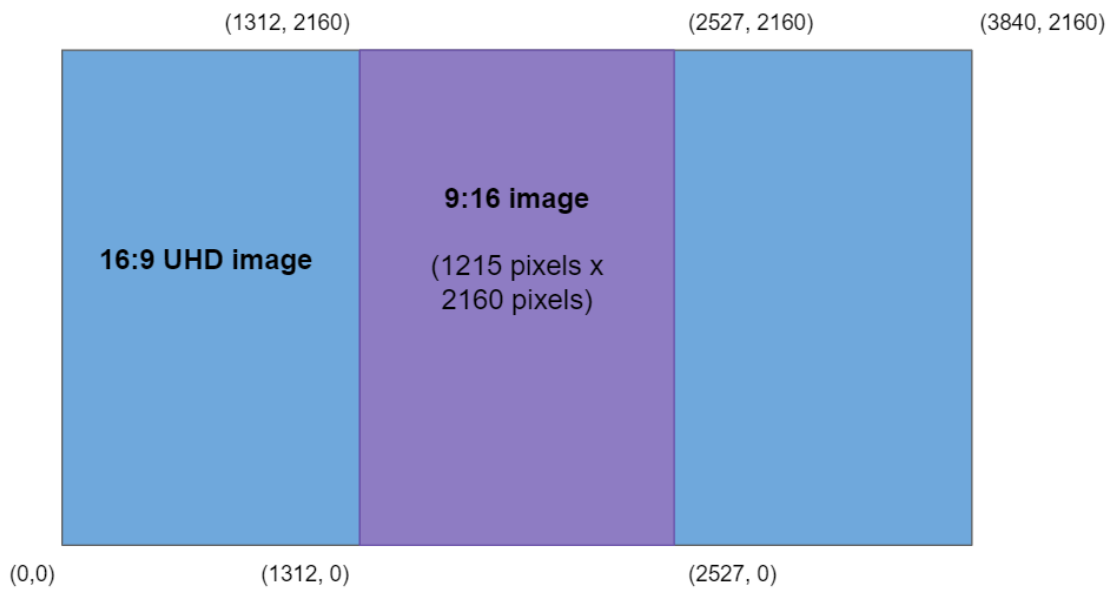**Figure 2:** Preservation of 9:16 images in UHD infrastructures

Figure 3: Use of framing guide-lines to create a 9:16 image from a 16:9 UHD camera
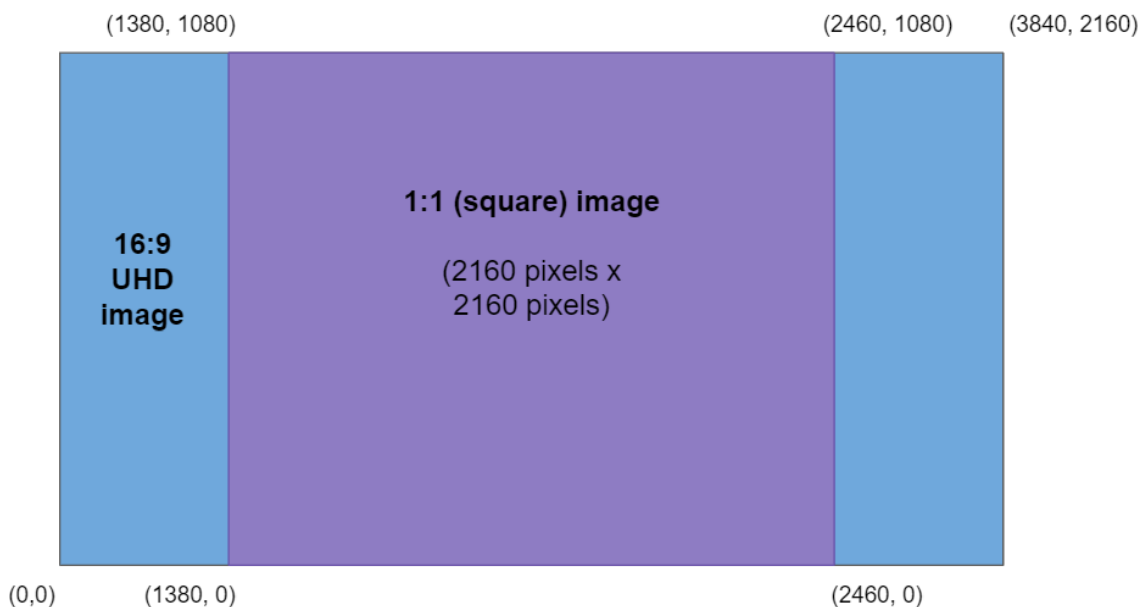
5

(1380, 1080)   (2460, 1080)   (3840, 2160)

1:1 (square) image

**16:9
UHD
image**

(2160 pixels x
2160 pixels)

(0,0)   (1380, 0)   (2460, 0)

Figure 4: Use of framing guide-lines to create a 1:1 image from a 16:9 UHD camera

9:16 HD image

Place the 9:16 HD
image in the centre
of the 16:9 HD frame

(656 , 1080)   (1264 , 1080)   (1920 , 1080)

**16:9 HD
frame**

9:16 image

(0 , 0)   (656 , 0)   (1264 , 0)
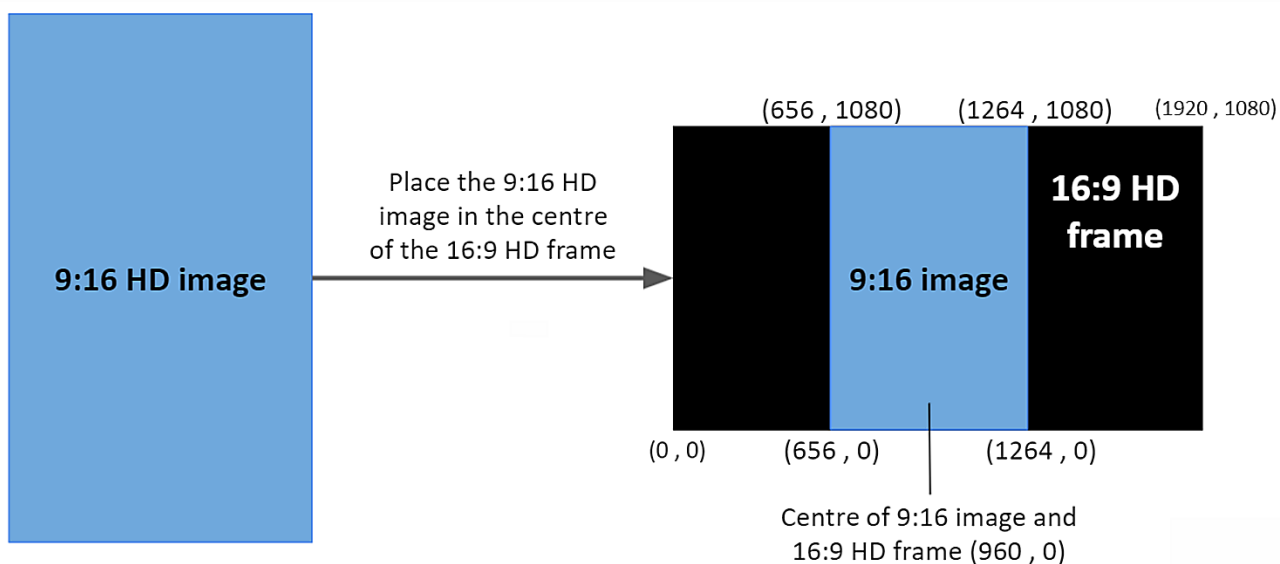
Centre of 9:16 image and
16:9 HD frame (960 , 0)

Figure 5: Preservation of 9:16 HD images when there is an operational constraint, or the infrastructure is not available to preserve the image with the recommended methods