

Pan & Scan

by Chris & Trish Meyer, CyberMotion

The best way to move around large images.

You've heard the saying "you can never be too rich." Well, you can never have too many pixels, either – especially when you're looking for some extra flexibility in customizing how you put a shot to work. With Artbeats starting to offer RED-sourced footage with frame sizes up to 4096 pixels across, you suddenly have a lot more flexibility in how you tell a story with already-shot footage, whether you're working in a high-definition or standard-definition project.

There are two subjects to think about when you employ these large frames:

- 1) Do I have enough pixels?
- 2) What's the best way to move around the frame?

We'll cover both in this tutorial.

Size Matters

Not all frames are created equal, whether you're talking about RED One footage or high definition video. When purchasing a stock footage clip, make sure you're not accidentally getting fewer pixels than you need:

Source RED size	Project (target size)		
	1920x1080	1280x720	standard def
4096x2304	X	X	X
4096x2048	X	X	X
3072x1728	X	X	X
3072x1536	O	X	X
2048x1152	O	O	X
2048x1024	–	O	X

X = works great; more than 50% extra size to pan & zoom
O = will work, but less flexibility
– = will not work; not enough pixels

Why aren't all shots available at the largest size? The RED One camera has a tradeoff where higher frame rates require a smaller frame size. Therefore, some slow-motion shots are only available in "3k" (3072 pixels across) or "2k" (2048 pixels across) versions. The lens used can also have an effect on how many pixels of the camera's sensor are exposed. Also, some shots are framed in a cinematic 2:1 aspect ratio (such as 4096x2048 pixels), while others are framed in a widescreen 16:9 aspect ratio (i.e. 3072x1728 pixels).



Figure 1: This slow-motion shot of the wall of a building being torn down – ACG-FH101-08 on Artbeats FootageHub – is available at a maximum size of 2048x1152 pixels. The smaller size is a tradeoff for the drama of seeing it in slo-mo. However, there are still enough pixels to fit inside a 1920x1080 frame, with more than enough to pan and scale it inside a 720p, DI, or DV project.

(To read more on the details behind some of these issues, see the recent article we wrote on Artbeats' use of the RED One camera:

s3.artbeats.com/assets/articles/pdf/seeing_red.pdf)

Staying Anchored

The intuitive way to reframe a large shot inside a smaller composition is to scale it to the size you want and move it into place. If you want to animate this framing, you would expect to just keyframe the Scale and Position parameters in After Effects (other programs have similar parameters). However, there is a problem with this approach.

When you alter the Scale value for an image, it is scaled up or down around its Anchor Point. The Anchor Point defaults to the center of

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an image. However, quite often the object you want to focus on is not in the exact center of the shot. When you scale the shot, the distance between its center and your object of interest is scaled as well, resulting in your object appearing to drift away.



figure 2A



figure 2B



figure 2C

Figure 2: Say you want to focus on the closest of the windmills in the original shot (A), pushing in over the duration of the edit. You might start by altering the Position of the clip so that this windmill is centered in your frame (B). However, as you increase Scale to push in, the windmill will drift out of frame (C). This is because scaling happens around a clip's Anchor Point (where the cursor is pointing in C), which defaults to the center of a clip, not the center of the composition. Footage from Artbeats FootageHub, clip TP-FH101-28.

The solution to this problem is to move the clip's Anchor Point so that it is centered on your object of interest. After you do this, you can scale away to your heart's content, and your object of interest will not appear to drift – everything else will move in relation to this point. The clip's Position value defines where the Anchor Point (and if you follow our advice, your object of interest) appears in your composition. If you want your object of interest to be centered in your comp, just set the Position to be in the center of the comp as well.

In After Effects, the easiest way to employ this system is to add a clip to a composition, and then double-click the clip to open its Layer panel. If possible, re-arrange the user interface so that you can see the Layer and Composition panels side by side. With the clip selected, press A to reveal its Anchor Point value in the Timeline panel, hold down the Shift key, and then press P plus S to also reveal Position and Scale respectively.

In the Layer panel, drag the Anchor Point icon to be centered over your object of interest. Then in the Comp panel, think about how you want to frame the image. As noted above, traditionally you would center the Position value (where the Anchor Point is) in the composition; that way, altering Scale would zoom around the center of the composition, the way a real camera would work. However, the advantage of using software to reframe a large format image after the fact is that you can offset the Position value to a more artistic location, and zooming will now be centered on that offset location.



figure 3A

Figure 3: In the After Effects Layer panel, position the Anchor Point on the object of interest you wish to remain stable during a push in or pull back, such as the face of this fisherman (A). Then in the Composition panel, frame where you want this object of interest to appear in your video frame – perhaps centered in the upper right quadrant (B). Now as you alter Scale, that object of interest will remain stable, maintaining your framing (C). Footage from Artbeats FootageHub, clip A023-C029.

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Zooming Out

Back when most of us were still doing primarily standard definition production, we advocated building a high definition footage library both to future-proof your archives and to maximize your creative flexibility (for example, see our previous tutorial *The Kid Stays in the Moving Picture* – www.artbeats.com/assets/articles/pdf/using_hd.pdf). Thanks to the RED One camera which many (including Artbeats) are now using, the ability to acquire footage at up to 4k sizes makes the same tricks possible in high definition projects.

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Although we've been focusing on scaling to create zooms, the same basic concept also applies to panning across a large clip: Animate the Anchor Point, not Position. As a result, if you decide to tweak Scale as well, the shot won't drift. In After Effects, you animate the Anchor Point's path in the Layer panel. To ensure that you see the entire path, you need to do two things: Set the View popup along the bottom of the Layer panel to Anchor Point Path, and set Preferences > Display > Motion Path to All Keyframes.

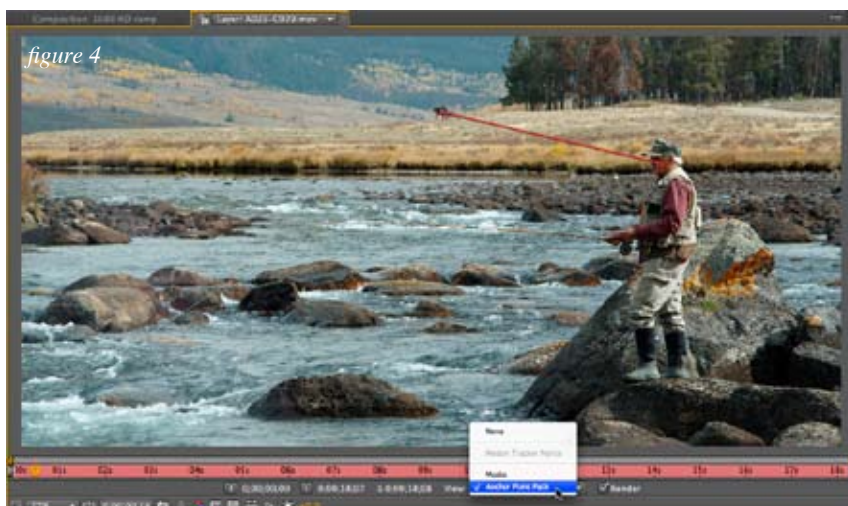


Figure 4 (left): To pan a clip, animate its Anchor Point in the Layer panel. This way, the Anchor Point icon and its path will trace exactly where your point of interest will be from frame to frame. This point will remain stable in the final composition.