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# Animate Time

*Speed ramping footage for intense special effects.*

Perhaps you remember the impact of *The Matrix*; nearly a decade ago, that movie started a number of trends, among them one that is still seen in recent features such as *300*: effective storytelling with footage shot at high speed often means ramping the playback speed, animating time itself. Adobe After Effects was built to do just that, and no production using high-speed footage should be without this option.



by Mark Christiansen

In a speed ramp, time itself is animated;

typically the footage slows down at key moments. This turns slow motion from a pretty effect to a dramatic device, as some of the most intense moments of life – be it a car crash or the winning goal – can leave the memory that time actually slowed down as it occurred.

This example is made up of three clips from the *Ultra Water 2* collection, as well as a short 20 second soundtrack roughed out with *Sonicfire Pro* using material from the *SmartSound Ethereal Dreams* collection (all available from *Artbeats*). *Sonicfire* lets you take modular pieces of music and assemble them any way you like; I designed the soundtrack to have three flourishes where the speed changes are to occur, and so the next task is to edit the timing to the soundtrack.

I create a new composition (*command/ctrl + N*), and in *Composition Settings* choose the *HDTV 1080 24* preset and a duration of 1:00:00 (type 10000 in the duration field). This is much longer than the audio clip, which I now add to the comp, but it allows room for the longer clips.

Twirling down the audio layer settings in the *Timeline*, then *Audio*, and finally *Waveform*, I am able to see where the flourishes occur in the music; they are the widest (or loudest) points in the waveform (FIGURE A). I add a marker for each of these using the \* key (with the layer selected) and can then twirl the controls up again.

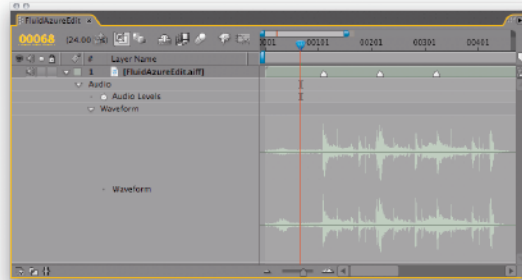


Figure A

Now I add the first video clip to be retimed, *UM207* from the *Ultra Motion 2* collection, a close-up of a woman plunging into a pool shot at 1000 fps but set as a 29.97 fps clip. After *Effects* allows you to freely mix footage of varying frame rates, and to alter it as you see fit.

You may not realize that you can change the frame rate of incoming *QuickTime* movies; in this case, selecting the clip and opening the *Interpret Footage* settings (*command/ctrl + F*), I conform the frame rate to 24 frames per second. Because the actual frame rate of the footage is not 29.97 but 1000, I conform it to the target 24 fps so that I don't have to retime it for smooth slow-motion playback.

The other helpful adjustment for 24 fps footage is to switch the project to display in frames instead of timecode in *Project*

*Settings* (*ctrl+alt+shift/command+option+shift + K*). This also makes it easier to understand how the retimed footage actually works.

Back in the comp, I enable time remapping for 207H (*ctrl+alt/command+option + T*). With the *Current Time Indicator* (or *CTI*, also known as the *playhead*) at frame 96, about 15 frames before the first audio marker, I slide the whole 207H layer so that the (*shift = F9*) visible *Remap* keyframes, by sliding the whole layer the number changes to 190. I add a *Time Remap* keyframe here.

Now I scrub forward to find a frame where the swimmer's head enters the water – around frame 295. I add a keyframe here. Moving the *CTI* back to that first audio marker (you can hold the *shift* key to snap to it), I *shift* select the final *Time Remap* keyframe and drag the keyframe at 295 to the current time (again, holding *shift* to snap).

To see what just happened, enable the *Graph Editor*. You should see the graph for *Time Remap*; if not, choose *Show Selected Properties* under the icon that looks like an eye. In the next menu over, choose *Show Reference Graph* so both the *Speed* and *Value* graphs are displayed (FIGURE B). This is a lot like the type of

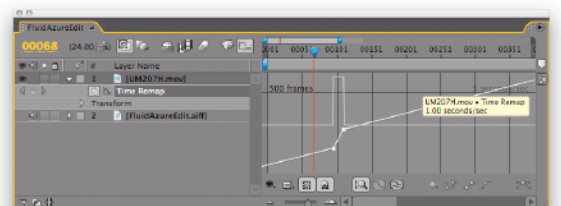
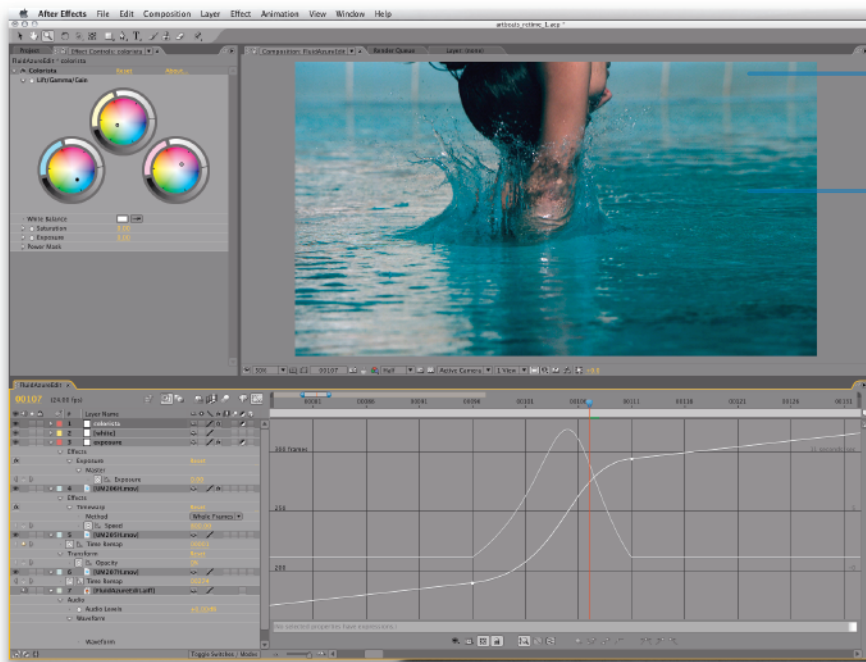


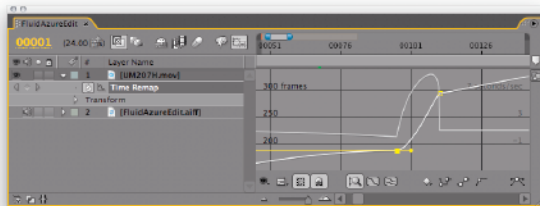
Figure B



Clip UM207 from Ultra Motion 2 is perfect for a speed ramp. You can view the final preview clip of this project at [artbeats.com/animatetime](http://artbeats.com/animatetime)

shot at a higher frame rate, as here, and speed it up as needed. Timewarp is perfectly capable of doing this much simpler task.

All that's required is to apply the Time-warp effect and change the Method to Whole Frames. I then animate the speed from 800% down to 100% (full slow-mo) over the course of about 10 frames, with Easy Ease applied to both. In this case, I don't even have to worry about affecting the rate of incoming and outgoing frames, as they're kept steady by that constant percent setting. Again, if there's any doubt you can check the Graph Editor (FIGURE D).



Ease In (*shift + F9*) for the following keyframe. This keeps the incoming and outgoing speed linear but eases the transition to and from the faster speed; you can see the result in FIGURE C (and in the animation itself, which you'll agree is harder to depict on a printed page).

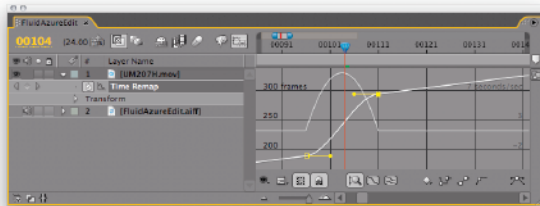


Figure C

retime you'd get by default in most nonlinear editing programs; in both graphs you can see an abrupt shift and hard corners, and by creating a preview you will notice that the speed shift is equally abrupt.

Let's change that. I select the first keyframe of the speed shift (frame 96) to add an ease. The standard Easy Ease (F9) creates eases both in and out of that keyframe, which is not what we want. By moving the cursor over the Speed Graph I can see from the frame values that the frame rate dips near zero prior to the keyframe, where it should remain steady. Undoing that, I instead choose Easy Ease Out (either using the button at the far right bottom of the Graph Editor or via *command+shift/ctrl+shift + F9*) and Easy

That however only covers one of the three time animations in this piece. The second (using the UM205 clip from the same collection) is very much like the first – another plunge shot with an eased transition to slow-mo when the splash is most impressive – but for the third and final one (UM206), let's try a different approach.

It can be difficult to think of retiming the way Time Remap handles it, as it's more natural to think, "I want it to play at 10x speed until a certain frame, and then transition to 1x slow motion." There is however a way to do this in After Effects, including adding eases: use the Timewarp effect. Timewarp is usually associated with slowing down footage that was shot at a normal frame rate, because it can add optical flow analysis to create the missing slow-motion frames. Much better, however, is to start with footage already

To complete the piece, I add fades in and out of white using a solid white layer as well as an Adjustment Layer containing the Exposure effect and create the transitions with keyframes. Finally, over the top of everything, I add an adjustment layer containing the Colorista effect from Red Giant Software, a true lift/gamma/gain color corrector; by blueing out the shadows, greening the midtones and pinking the highlights to bring a cool, soothing, yet human look.

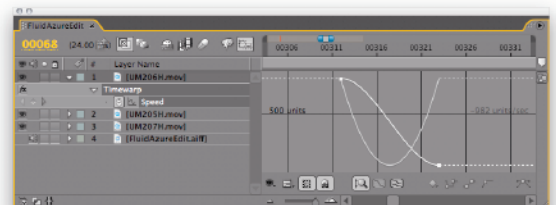


Figure D

Mark Christiansen is the author of *After Effects Studio Techniques* (Adobe Press). He has created visual effects and animations for feature films, network television, computer games, and an array of high technology companies. His feature credits include *The Day After Tomorrow*, *Pirates of the Caribbean 3* and films by Robert Rodriguez.