

Projected Text

by Chris & Trish Meyer, CyberMotion

How to make text appear as if it was projected onto objects in a video.

In the previous article *The Writing on the Wall*, we discussed techniques for making text, logos, and other graphics appear as if they were painted onto surfaces such as wood or concrete. These same techniques can be used to make video appear to be projected onto a surface. In this article, we walk you through making text appear to be projected onto bodies and other objects in moving footage. This is very similar to the technique we used in animating the Deborah Ross-designed opening title to the Anthony Minghella movie *Cold Mountain*.

Top Right: This technique can also be used to displace text with footage such as moving water, billowing fabric, and so on. Featured clip: Artbeats Liquid Ambience LA133.

Bottom Right: Start by creating a nice arrangement or animation of your text over your clip, paying particular attention to where the words and characters fall in relation to details in the footage underneath. Featured clip: Artbeats Fitness FTN116.

What Were You Thinking?

A popular device is to place a “cartoon text balloon” over people in a scene to give us insight into what they’re supposedly thinking. A more subtle approach to this idea is to project the words onto their bodies (such as, say, their foreheads), which make the text seem more integrated and intimate. Artbeats has just released a new collection – Fitness – illustrating a variety of people working out in a gym or exercising outdoors; we’ll use one of its clips to demonstrate this technique in Adobe After Effects. (Note: We are using version CS3. If you are using version 7 or earlier, the Displacement Map effect is included only with the Professional version.)

To start, select the footage you want to use in the Project panel and drag it to the Create a New Composition button at the bottom of the panel. This creates a new composition with the same specifications (width, height, pixel aspect ratio and frame rate) as the movie. As you create additional precomps, the precomps will be based on the current comp size. This is important in ensuring that the displaced text always matches up with the movement in the footage.

The next step is to create your text (using one or more layers) and test its animation directly over the footage. It will be much easier to play with the color, font, and movement now than it will be after we’ve started to make additional compositions to treat the footage and text. You can also experi-



ment with blending modes at this point to see how the text will blend into the footage; remember the mode you chose because you'll need to reset it later.

Displaced Affections

We'll be using displacement mapping to make the text appear to wrap around this woman's garments and features. As mentioned earlier, for this effect to work, both the text and the underlying footage must be in layers that are the same size. You can do this by precomposing: Select your text layer (or layers), and in After Effects use the command Layer > Pre-compose. Along the top of the dialog that appears, give your new composition a useful name such as "Text Precomp." Choose the option "Move all attributes into the new composition," turn off the option to "Open New Composition" and click OK. This will move your text into its own composition which is the same size as the current composition (and thus the same size as the footage), with its placement and animation intact.

Next, we need to prepare a copy of the underlying footage and optimize it for use as a displacement map. Select your video layer, duplicate it (Edit > Duplicate), and also Layer > Pre-compose it, naming it "Map precomp". The "Move all attributes" option should be enabled. Also enable the option "Open New Composition" before clicking OK; this will open your new precomp that contains just the duplicated footage.

In the precomp, first convert this footage copy to grayscale by adding Effect > Channel > Calculations. Study the footage for features you want the text to wrap around: These are the areas where you want to create maximum contrast. Twirl down the Input Channel section of Calculations, and pick the color channel that best reveals the contrasts you've identified. For this clip, we want to emphasize the wrinkles in her sweatshirt, plus also see a good contrast between

her sweatshirt and her neck (so the text will seem to "fall away" as it transitions between her collar and her neck underneath). If you feel the result lacks overall contrast, you can also apply Color Correction > Levels and use it to boost the contrast and move the gray balance around.

Next, soften your displacement map by applying Blur & Sharpen > Fast Blur. Increase the Blurriness a slight amount to 2 or so (you will need to use a higher value – such as 5 or more – for high definition footage or film, as these formats have more pixels).

(Incidentally, the reason you are creating the grayscale/blurred copy in the precomp is that the Displacement Map effect only sees the map layer at its "source." If you applied the effects in the original comp, the effect would ignore them. By applying them in a precomp, the source of the layer is already grayscale and blurred.)

Becoming One

Return to your original composition, and turn off the "Map pre-comp" layer (that contains the grayscale-blurred version you just created) – the effect needs to see this layer, but you don't want to see it in your final composite.

Make sure your text precomp is above your footage layer, and apply Effect > Distort > Displacement Map. Set this effect's Displacement Map Layer popup to the "Map precomp" layer. Then play with the Max Horizontal Displacement and Max Vertical Displacement values so that the text seems to wrap and fall off in the directions you would expect from looking at the result. In our case, we had to set these to negative values to get the text in the neck area to look right.

Finally, set the blending mode popup for the text layer back to the mode you chose earlier (when you created the text precomp, the modes traveled into that comp with the text – they didn't stick



Right: To create an optimal displacement map, precompose your video, pick a color channel that features a nice grayscale contrast, and blur it slightly.

around in your main comp).

Feel free to tweak your settings and pre-comps as necessary. For example, the text was displaced a few pixels away from its original position, so we went back into the text precomp and nudged it in the other direction to compensate. (Don't move the text precomp in your main composition; you will ruin its alignment with the displacement map layer - you have to move the text in the precomp!)

Zooming Out

In this article, we've given you a simplified version of our typical displacement map processing chain. We often go through the trouble of setting up a preliminary source footage comp, and use this precomp instead of the footage itself in both the displacement map precomp and in the main comp. This way, we can quickly swap out the source footage in just one place (the preliminary precomp), and the result will ripple throughout our entire project. This is a good template project to have around in the event you expect to be creating a lot of displaced text treatments in the future.



Left: Use your treated version of the video as a displacement map for the text. Select a blending mode for the text to help make it appear as if an actual light was being projected onto the actress.

###

*Chris and Trish Meyer are the founders and owners of CyberMotion (www.cybmotion.com), an award-winning motion graphics studio in Los Angeles that has created a wide variety of work for film, broadcast, corporate events, and special venues. They were one of the original development sites for After Effects, wrote the highly-acclaimed books *Creating Motion Graphics* and *After Effects Apprentice* (2007), and are long-time Artbeats users.*