



Building Effects with Multiple Layers

In the last tutorial, you built a complicated effect by stacking slightly modified versions of the same video clip. Although it might seem simple, this is an important concept, and an approach that many beginning compositors often miss. It can be tempting to try to create a lot of effects inside of one layer by applying filters and masks. However, most of the time, you'll need to break an effect down into a number of different processes, and use a separate copy of your video for each process. For many effects, you'll create several duplicates of a video clip and spend a lot of time cutting a different alpha channel for each clip. These clips will be filtered and manipulated separately, and then stacked on top of each other.

In the next tutorial, we will combine layer stacking with rotoscoping to create a complicated effects shot of a person literally sneezing his head off.

Exploding Heads

In this tutorial, we're going to create a complex composite using several instances of the same video clip. By combining several hand-cut mattes, a lot of hand-painting, and an After Effects filter called Shatter, (which is part of the standard After Effects package), we will create a movie showing a person's head shattering into fragments after an over-strenuous sneeze. (In the industry, this type of film is known as "high concept.")

When planning an effect such as this, you might not be able to imagine exactly what post-production manipulations the shot will require. Most likely, you'll have to feel your way through the process and add new layers and filters as necessary. However, you can make some informed decisions about how to begin.

The Sneeze tutorial folder contains a video clip called *sneeze orig.mov*. This is our source footage that shows a person sneezing, and then stumbling out of frame. To see how the shatter plug-in works, load the *sneeze orig.mov* footage into After Effects and apply the Shatter effect. You'll see that the entire image shatters, and in a form that doesn't really look like a shattery explosion (Figure 18.18).

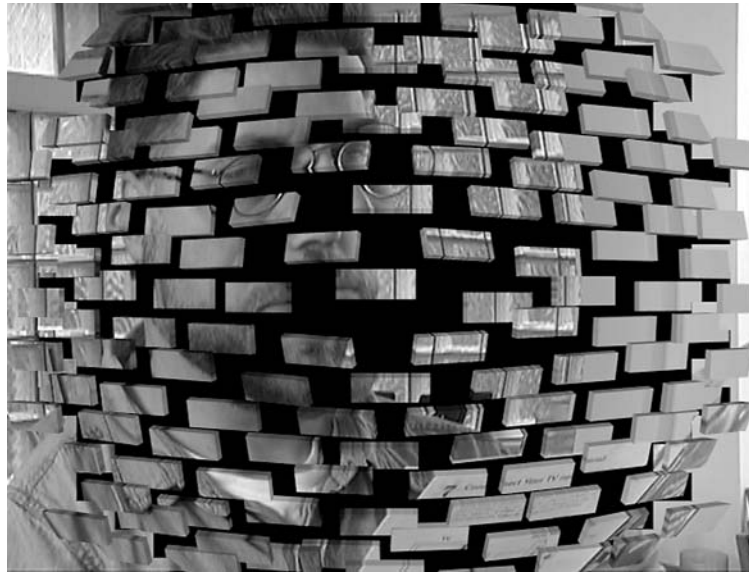


Figure 18.18 The Shatter filter is nice, but we want to change its shatter settings to create more of an explosion effect, and we want the plug-in to only affect the actor's head.

We can easily adjust the plug-in's settings to create a more appropriate type of shatter.

(Figure 18.19) However, since we want just the head to shatter, we need to mask out the rest of the frame using an alpha channel. This will be our starting point.



Figure 18.19 The Shatter filter can easily be modified to create a more appropriate explosion-type effect, but we still need to find a way of constraining the effect to just the actor's head.



Step 1: Create an Alpha Channel of the Head

The Shatter filter works by taking the image of a single frame, shattering it into pieces, and then animating those pieces so that they fly across the subsequent frames of the movie. Therefore, our first step is to decide when in the movie we want the shatter to occur. That frame will be shattered by the Shatter plug-in. However, as we've already seen, we don't want to shatter the entire frame. Instead, we want to create an alpha channel to limit the shatter effect to just the head. Because the shatter effect only operates on one frame, we only have to create an alpha channel for that single frame. We chose 00:00:03:10 (or frame 101) since there's a nice, slight head jerk that will add to the feeling of impact.

Choosing Time Display in After Effects

You can change the time display in After Effects so that it displays frame numbers instead of hours:minutes:seconds:frames. For this tutorial, we opted for frame number display, which you can activate by going to File>Project Settings, and selecting Frames. (In some older versions of After Effects, this setting is kept under File>Preferences>Time.)

For this tutorial, we will be creating masks as separate files, rather than as alpha channels embedded in our movie files. This will allow for more flexibility to correct and change the mattes. As we did in the last tutorial, we're going to create our alpha channel using Photoshop. In After Effects, export a still of frame 101 from the *sneeze orig.mov* movie. To do this, load the *sneeze orig.mov* movie into a composition, select its layer in the Time Layout window, and then choose Composition>Save Frame As.

Rather than create a selection as we did in previous tutorials, you can simply paint over the background areas with black paint, and the foreground areas with white paint.

Because you probably won't need to re-edit this image, go ahead and use Photoshop's Image Size command to perform a 90% horizontal scale. Scaling your image here will save you a tiny bit of rendering time later. Save this image as a Photoshop file called *head matte.psd* (Figure 18.20).



Fig 18.20, Still frame (top), and accompanying matte (bottom).

Step 2: Set Up Your Project

Now, go back to After Effects, create a project, and import the *sneeze orig.mov* movie and the *head matte.psd* file that you just created. Make a new composition with the appropriate size and duration to hold the movie. Name this comp *Main*.

In a moment, we will use our new matte to confine the effects of the Shatter plug-in to the actor's head. Since this matte will eliminate the rest of the frame, we will see only a shattering head. Therefore, as we did in our previous tutorial, we will need to layer two



copies of the same movie on top of each other. The top one will have the matte and the Shatter effect applied, and the bottom will serve to keep our “background” visible.

Place the *sneeze orig.mov* file into your composition. This layer will be our background.

Step 3: Prepare the Second Layer

At this point, we could start heaping more layers on top of the first one. In the interest of housekeeping, though, we’re going to isolate some effects and layers by putting them in their own compositions. These compositions can then be nested inside our main composition to ease organization of our project.

Create another composition with the same settings as the first, but name this one *Exploding head*.

Add the *sneeze orig.mov* clip to the Exploding Head composition, and double-click on it in the Time Layout window. This will open the movie in its own layer and allow you to easily set the in-point. Drag the current time marker to frame 100, and click the In-Point button. Close the window.

With the in-point set here, the movie in this comp now starts one frame before we want our explosion to begin (the Shatter effect doesn’t become visible until the second frame of a clip).

Now, import the *head matte.psd* image you created earlier. Add it to your Exploding Head comp and disable the matte’s visibility by clicking its Eye icon in the Time Layout window. Click on the *sneeze orig.mov* file in the Exploding Head Timeline window to select it. Earlier in this chapter we used the Set Channels filter to define a separate file as an alpha channel for our current layer. Now we’re going to use the Set Matte filter. With the *sneeze.org* layer selected, choose Effect>Channel>Set Matte. Set the Take Matte From Layer popup to *Head Matte.psd*, to indicate that we will be using that layer as the source for our matte. In the *Use for Matte* popup select Luminance to indicate that we will build our alpha channel from the luminance information in the Head Matte layer. (Figure 17.21).

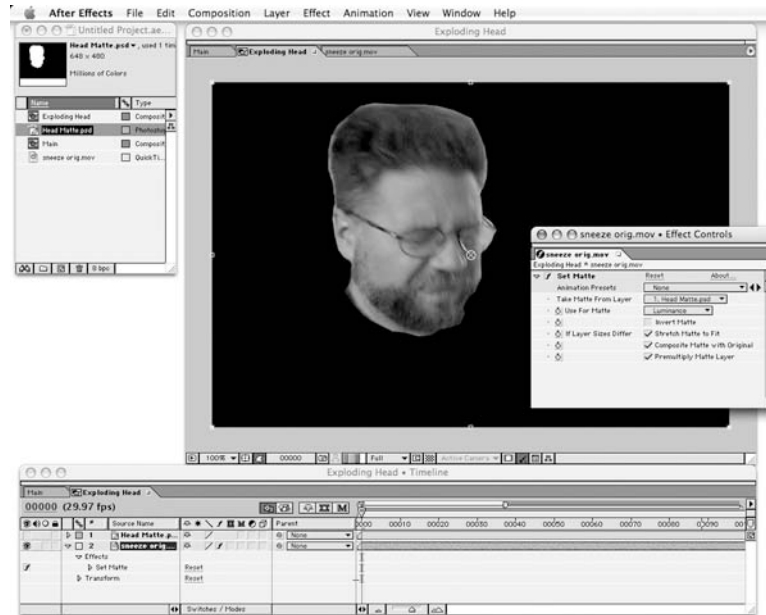


Figure 17.21 Our second composition, Exploding Head, after the footage and matte layers have been added. Note the Set Channel filter, which is used to activate the matte.

Step 4: Add the Shatter

Now, put the Exploding Head comp inside the Main comp. The easiest way to do this is inside the Project window—just drag the Exploding Head comp on top of the Main comp.

The Main comp should now have two layers, the *sneeze orig.mov* clip and the Exploding Head comp. Notice that the Exploding Head comp acts just like any other layer. You can move it, change its in- and out-points, and re-layer it. If you want to go back and change its contents you can, and those changes will automatically filter up to the Main comp.

Re-position the Exploding Head comp so that it begins on frame 100 (Figure 17.22).

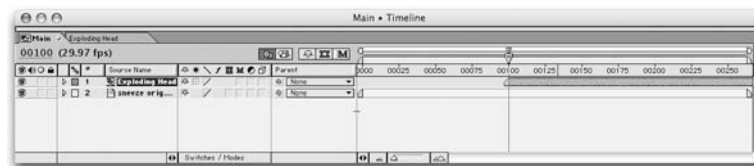


Figure 17.22 With the Exploding Head comp properly positioned, the explosion will occur right after the actor has sneezed.



You can also add filters to a nested comp. Do that now by selecting the Exploding Head layer and choosing Effect>Simulation>Shatter. To get the best-looking shatter, you'll need to change some settings in the Shatter filter dialog. Open the Shape property and set Pattern to Glass.

Click on the crosshairs next to Shape Origin, and click in the comp window, just below the person's nose. Set the Shape Repetitions to 20. Set the shape direction to about 60°, and set the Force 1 position to just above the person's right eye. (Incidentally, there's no science to determining these settings. These are simply parameters that we came up with after much trial and error. As you work through creating the shot, you might want to create a different-looking shatter.)

In the Effects palette, change the View parameters for the Shatter filter to Rendered so that you can see the actual rendered effect. Step forward about five frames to see the beginning of the effect, then render a small test movie so that you can see the entire effect (or, if you have enough RAM, you can do a RAM preview within After Effects). (Figure 17.23).

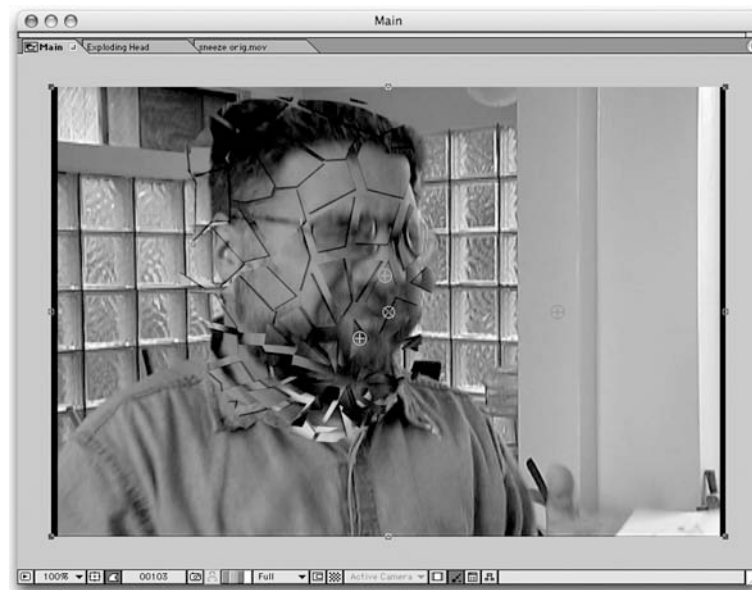


Figure 17.23 The shattering head layer composited on top of our original background footage. Though our original, unshattered version is showing through, at least the shattered layer is constrained to just the actor's head.



Something's very wrong, isn't it? The shattering effect looks nice, but there's still a head left behind. Obviously, the shatter effect can't calculate what's supposed to be behind the head in our original footage, so we're going to need to create that information ourselves through some very tedious rotoscoping.

Step 5: Start Rotoscoping

In our Main comp, we have our original video layer, and a shattering copy of that same video layered on top of it. If our bottom layer was footage of a headless body, then when the top layer shattered, it would reveal the underlying headless footage and our effect would work.

Unfortunately, we didn't shoot footage of a headless body (we had cast a headless body, but he turned out to be a real prima donna and so we fired him), but we can create some headless body footage through rotoscoping.

How to rotoscope is up to you. You could export the movie as a set of still files and repaint them in Photoshop. Alternatively, as we chose to do, you could open the movie file in After Effects and rotoscope it there.

Your goal is to paint out the head, and build a collar and hole to go where the head used to be. After Effects has a Clone tool that works just like the Clone (or Rubber Stamp) tool in Photoshop. But, After Effects clone tool has the added benefit of being able to use *other frames* as a source for cloning. At the end of the original clip are a few frames of footage *without* the actor. We can use these as source frames to clone the background over the actor's head in the earlier frames. (Figure 18.24).



Figure 18.24 In After Effects, we used the clone tool to clone background from an empty frame at the end of the movie into the frames where we want to erase the head.

In the Timeline, double-click the *sneeze orig.mov* to open it up in layer view. Here you can begin cloning. Select the Clone tool in the Tool palette. In the Paint palette, make sure that both Aligned and Lock Source Time are checked. Normally, to clone, you would option-click on the area you want to clone from and then paint into the area you want to clone to. This procedure will work the same way, but first we want to select a frame to clone from. Scrub to the end of the clip and find a frame that includes a clean shot of the wall behind the actor. Option click in any area of the frame, taking careful note of the X,Y coordinates in the Info palette.

Now return to the frame you want to clone into (frame 100). Position your mouse at the same X,Y coordinates that you option-clicked in on the source frame, and click. You have now set up your cloning relationship. Now, you can brush in paint from the source frame into the current frame, effectively erasing the head to reveal the background.

Carefully paint out the entire head, making sure to leave as much of the collar and shirt as possible.

After Effects' painting and cloning tools don't actually change the pixels in the original image. Rather, the location of your paint strokes is stored in the After Effect project file. These paint strokes are composited onto the original media, providing you with a non-



destructive form of editing. More importantly, though, because After Effects is remembering your actual strokes, it can composite them with all of the other frames in your movie, saving you a lot of painting time.

In the Time Controls palette, click the Next Frame button to go forward one frame. You should see that this frame also has the head cloned out. In fact, all of the subsequent frames have been similarly cloned! However, though this is a great time-saver, it's not perfect.

Play the movie and you'll see that, as the body moves around, it falls "behind" the paint strokes that you've created. Though After Effects has saved you a lot of time, you now have to go in and touch up some of your strokes.

Return to frame 101. As you can see, the paint strokes that you originally made have erased part of the collar. You need to restore the collar by *erasing* the clone stroke that you painted here. Grab the Eraser tool, and select Paint Only from the Erase pop-up menu in the Paint palette. Brush over the collar with the erase tool to erase the clone strokes that are obscuring it. If you "erase" some of the head back into view, then use the Clone tool to brush it back out. (Figure 18.25)



Figure 18.25 – Because our original clone strokes are inappropriate for this frame, we have to go in and erase some of those strokes using After Effects' eraser tool.



As you can see, there's no free ride with this kind of rotoscoping. Though After Effects has done a lot of the work for you by replicating your clone strokes onto every frame, you still have to perform some touch-up.

You could perform the same rotoscoping task in any number of ways. Another example:

- Export the frames you want to roto as numbered files into a folder.
- Open the last file in Photoshop, one of the ones that is a shot of the empty, after the actor has wandered off.
- Open the first frame that you want to roto, select all and choose copy to copy the entire frame.
- Switch to the “empty room” frame that you opened first, and choose paste. This will paste the frame you want to roto into a separate layer above the “empty room” frame.
- Using Photoshop's erase tool, simply erase the head from the upper layer to reveal the room layer beneath.
- Flatten and save and then repeat with the next frame you want to edit. (To save some time, build a Photoshop Action that automatically performs the copy and pasting of layers.)

Alternatively, you could save the movie as Filmstrip format and use Photoshop's clone tool to clone from one of the empty frames into your roto frame.

As always, there's no “right” way, and there's no way around the fact that this type of roto work takes a lot of time. There's a reason big budget effects movies are so expensive!

Step 6: Build the shirt collar

Once you've erased the head, you'll need to build the back of the shirt collar, and fill in the hole where the head used to be. All of this can be painted in with black or dark tones of gray. As always, there are a lot of ways to do this. You can step through each frame in After Effects, and paint in the collar and hole, or you can export the frames to Photoshop or Painter and perform your edits there.



However, probably the easiest way is to use After Effects Pen tool to create an animated mask.

Begin by selecting Layer>New Solid to create a solid layer of black in your composition. Position this layer just above the *sneez orig.mov* layer. The sneeze movie will be completely obscured by the black plate. Double-click on the color layer to open it in layer mode and use After Effects' Pen tool to create a rough collar shape somewhere in the middle of the frame. Now click back to the Main comp to view it. You should see the rough black shape that you just drew, superimposed over the sneeze movie. This is the masked black layer that you created.

Edit and reposition the mask to the appropriate shape, as shown in Figure 18.26. What's great about this technique is that you can now tweak the collar mask's control points on subsequent frames, and After Effects will automatically animate the shape and position of the mask for the intervening frames. (Figure 18.27)

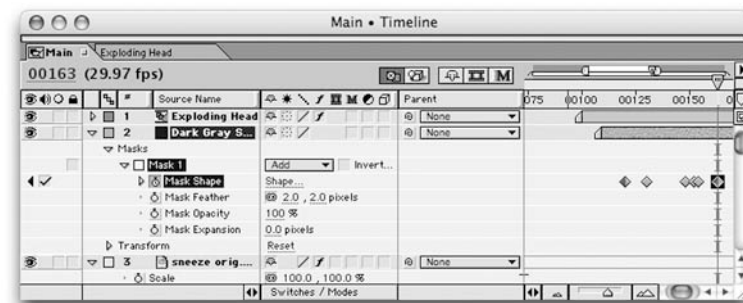
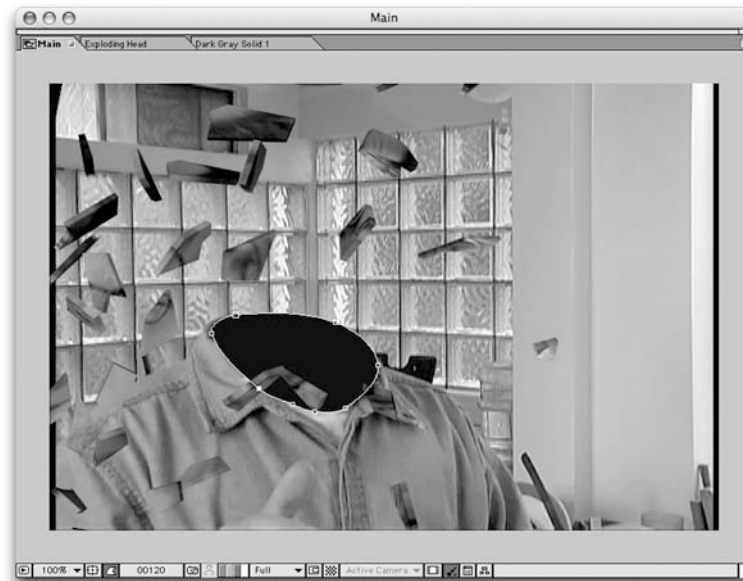


Figure 18.27 – By clicking the stopwatch icon next to the Mask Shape property of the mask on our color layer, we can now edit the shape and the position of the mask at each frame where the headless body changes position. In this way, we can make the mask automatically follow and reshape the collar. In addition, note that we've added a slight feather to the mask's edge so that it blends into the video.

However you choose to do it, the process will take you a while. To save you some time, we have included on the companion DVD a rough, first pass of our rotoscoped movie, a file called *sneeze roto.mov*. Although a good place to start, this file still needs work to clean up some cloning artifacts, and to retouch and improve the collar and neck. For now, it will work fine.



Step 7: Add the Rotoscoped Movie

Back in After Effects, replace the *sneeze orig.mov* movie in your Main comp with your new rotoscoped version. Render the movie (Figure 18.28).



Figure 18.28 The same After Effects project, but now with the rotoscoped, headless version of our original footage.

Now things are looking better! When the head explodes, you should see a headless body that staggers off-screen.

However, the effect could still be better. The explosion looks like an animated explosion stuck on the front of a piece of video. It would be more realistic if the explosion had a sense of depth. Is there a way we could get some of the explosion parts to fly *behind* the body? Of course!

What if we added another copy of the headless body, but this one with a matte, so that the explosion pieces are obscured by the matte? Obviously, we don't want all of the explosion to fall behind the body, so we'll create a second instance of the exploding head layer. This addition will also add drama to the shot by adding even more shattering debris.



Step 8: Mask the Body

Unlike our head matte, the body matte that we'll use to mask our second shatter effect will actually need to be a travelling matte. Using whatever technique you prefer, create a travelling matte of the relevant frames of the headless body movie. Obviously, you don't need to worry about anything before frame 101. Take a look at your previously rendered movie to determine how long the explosion lasts. You don't need to worry about masking any frames after this point.

Again, we chose to use After Effects and created a simple, animated mask to follow the outlines of the body. We rendered the matte as a separate file, which is stored on the companion DVD as *body matte.mov*.

Step 9: Add the New Explosion

Back in After Effects, create a new comp called *body w/matte*. Put the *sneeze orig.mov* and *body matte.mov* files into the new composition. As before, set up *body matte.mov* to serve as the matte.

Now, add the body w/matte comp to your Main comp. Put the current time marker at frame 106. As you can see, the body w/matte layer now obscures part of the explosion, making it look as if the shattered pieces are falling behind the body (Figure 18.29).



Figure 18.29 The shatter fragments now fly behind the body.

Now we need to get pieces falling in front. In the Time Layout window, duplicate the exploding head comp. Drag the copy so that it is the topmost layer. Now you should see some pieces in front of the body as well. Note that, with the same settings, both copies will produce identical shatter patterns. Change the Shatter settings on one of the Exploding Head layers to create a different-looking explosion. We chose to change the lower layer to create the effect of pieces flying backward (Figure 18.30).

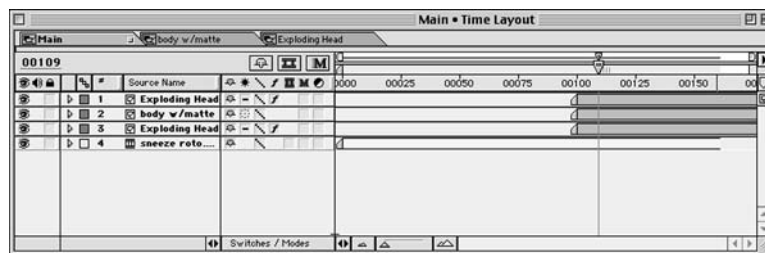


Fig 18.30a,b We managed to get shattering pieces to fly both in front of, and behind the body, by stacking several copies of the same layer.

Now, render the movie.

Looks better, but there's still a problem. The shards of the top explosion fly in front of the actor's right hand. Since the hand serves to indicate a lot of depth in the image, we should create yet another masked layer—this time of the hand—to put in front of everything else.

Step 9: Matte the Hand

Again, using your method of choice, create a matte for the relevant frames of the hand. As before, watch the original footage to try to determine which frames will interact with head fragments. You don't want to worry about masking frames that don't matter.

Step 10: Add the Final Layer



Back in After Effects, create another comp called *Hand*. Add another copy of the *sneeze roto.mov* as well as a copy of the hand matte. Use Set Channels to set up your alpha channel. Add this comp to the Main comp and put it at the very top.

Render the movie.

Much better! Head parts are flying everywhere—in front of the body, behind the body, and behind the hand! However, we want to make one more small adjustment.

The Shatter plug-in renders its fragments with very sharp, defined edges. The amount of sharpness doesn't really match the quality of our original video, so we need to soften the explosion images up a bit to better match our source footage.

Apply a Gaussian Blur filter to both of the Exploding Head layers. Set a Blurriness of 2.0. You can experiment with more blur, but you don't want to blur the images too much, or they'll be blurrier than the source footage (Figure 18.31).



Figure 18.31 The completed composite.

Render the final movie, put it in your editing package, and look at it on your NTSC monitor. There you can better see how to fix the collar and neck roto-scoping, as well as look for any left-over clone artifacts.



After Effects and Echo Fire

The latest version of After Effects lets you preview movies on an external NTSC monitor via a FireWire cable and deck, just like in an editing package. This can save you a trip back to your editing program for NTSC previewing.

To touch up the movie you can choose to re-paint your final movie, or go back and correct the *sneeze roto.mov* file, and then re-render your movie. Because we used multiple copies of that same movie, you can simply correct the original file and your changes will filter throughout your entire After Effects project.

Performing your touch-ups on your final rendered movie might be the best choice, as you won't waste time touching up areas that are obscured by falling debris. In addition, you can use the opportunity to smear the falling artifacts so that their motion quality better matches the footage of the actor.

If you perform your touch-up in the original roto-scoped file, then you can always make other changes and improvements in After Effects, and re-render the file.

You might also play with animating the values of the blur filters that you applied to the Exploding Head layers. By setting keyframes for the blurriness, you can make the fragments get more and less blurry as they speed up and slow down throughout the course of the explosion.

As you can see, with just a single clip of video and some clever layering, you can create very complex effects. Ideally, you'll need to do some planning before you shoot your initial footage. For the exploding head shot, for example, you might have been able to ease your rotoscoping work by shooting some additional photographic plates. In the end, you'll want to weigh the time and money spent rotoscoping against the time and money needed to shoot multiple plates.