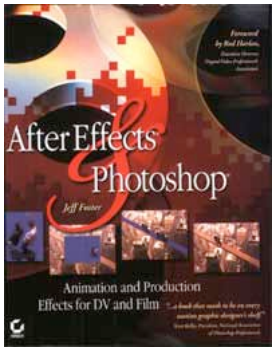
Macworld Conference & Expo

S143: *01/13/2005, 1:15 PM - 2:30 PM*

Animation & Special Effects with Adobe Photoshop and After Effects

Jeff Foster



Excerpts taken from: ***After Effects & Photoshop: Animation and Production Effects for DV & Film*** – Jeff Foster (Sybex, Pub. ISBN# 0-7821-4317-2)

Example movies & project files can be downloaded at http://pixelpainter.com

Extracting the Subjects from an Image

Extracting subjects and layers of depth from your images requires a command of the Clone Stamp tool and some creative image compositing skills. Once you cut out your subjects from the original image, you need to fill the holes behind them (or at least the edges where motion will reveal the void).

In this first example we'll be using the image `Bird-n-BeachFlat.tif` (Figure 11.1).

Figure 11.1: This image is a good example of clear foreground subjects and an easily editable background.

We will extract the seagull and the rocks in the foreground onto their own layer and patch up the background to fill in the missing image area. For the most precise method of accurately dividing the images, it is best to roughly copy and paste the subjects to a new layer and then carefully remove the unwanted material around the edges with the Eraser tool. This gives you great edge control, by changing brush sizes and edge hardness while editing.

1. Open the file and start by using the Lasso tool to quickly select the area well outside of the edges of the seagull and rocks; then press ~CM/Ctrl+J to copy and paste the selection to a new layer (Figure 11.2).

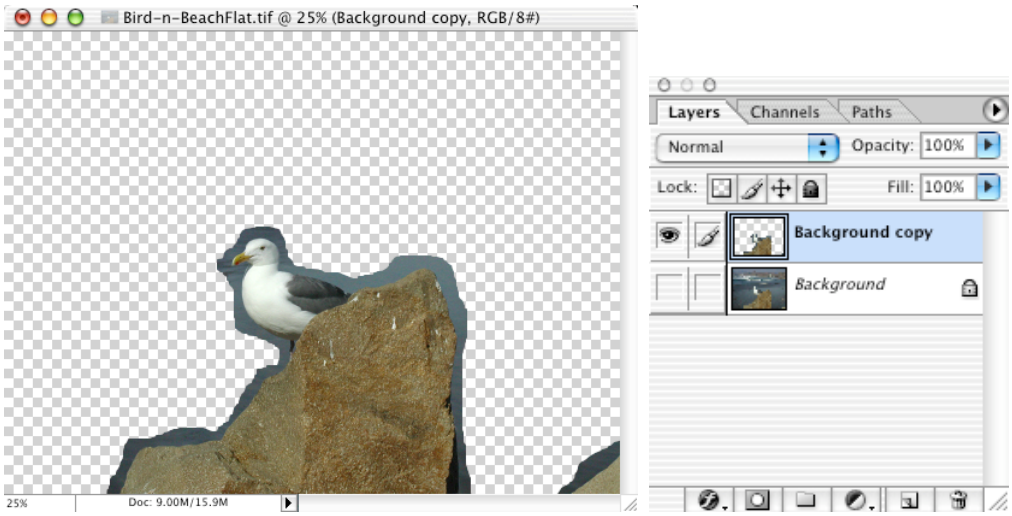


Figure 11.2: Select a rough area around the subjects in the image and copy and paste it to a new layer.

2. Use the Eraser tool to remove the excess material around the foreground subjects, changing brushes as needed to adapt to the edge softness and complexity. With this image, you can start with a larger brush size along the edges of the rocks and switch to a smaller brush in the details, leaving the seagull for the next step (Figure 11.3). Select the seagull from the rocks layer, and use ~CM/Ctrl+J to copy and paste it to a new layer.

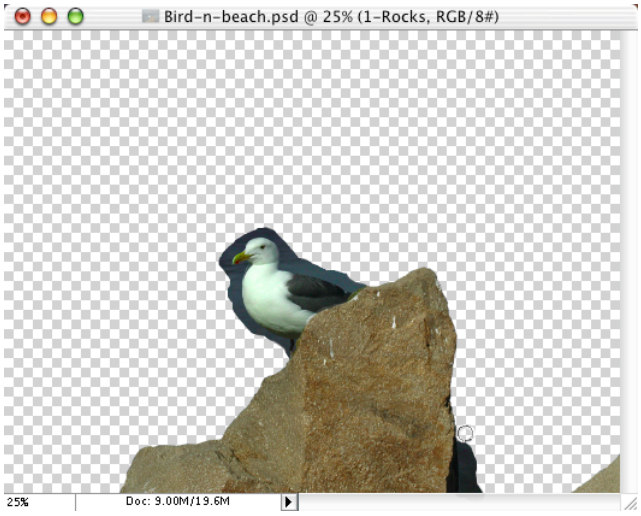


Figure 11.3: Remove the background from around the edges of the rocks with the Eraser tool brush.

3. Return to the rocks layer and use the Eraser tool to remove the seagull and remaining background material from around the rocks.

4. Go back to the seagull layer and use smaller Eraser tool brushes to remove the background material around the edges.

5. Since the seagull will have some slight motion from behind the rocks, we need to add just a little more of the bird's image area. Use the Clone Stamp tool with a small soft-edge brush to carefully fill in toward the tail and legs of the seagull—adding about ~QF~IN more of the image area (Figure 11.4).

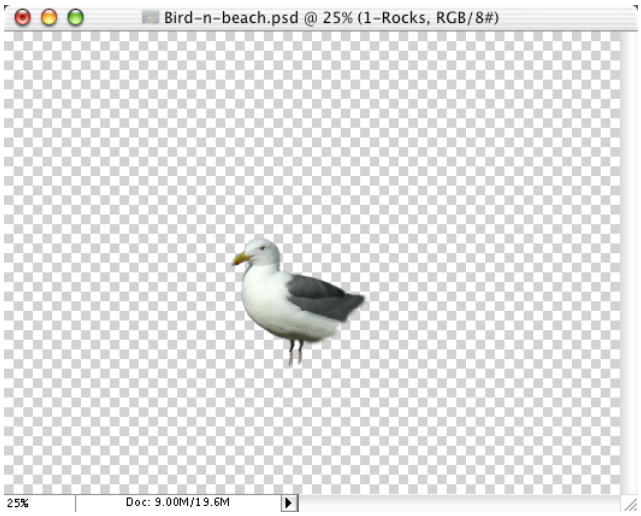


Figure 11.4: Use the Clone Stamp tool to add some more feathers to our friend!

6. We now have three layers in our image: the background layer, the rocks layer, and the seagull layer. Select the background layer, hide the top two layers, and use a combination of techniques to fill in the area where the rocks and seagull were previously. I find that a random application of the Clone Stamp tool with a large soft-edge brush works well in this case, taking care not to create a repeating pattern in the water and sand. If this occurs, you can use the Healing brush to touch up some of the repetitions (Figure 11.5).

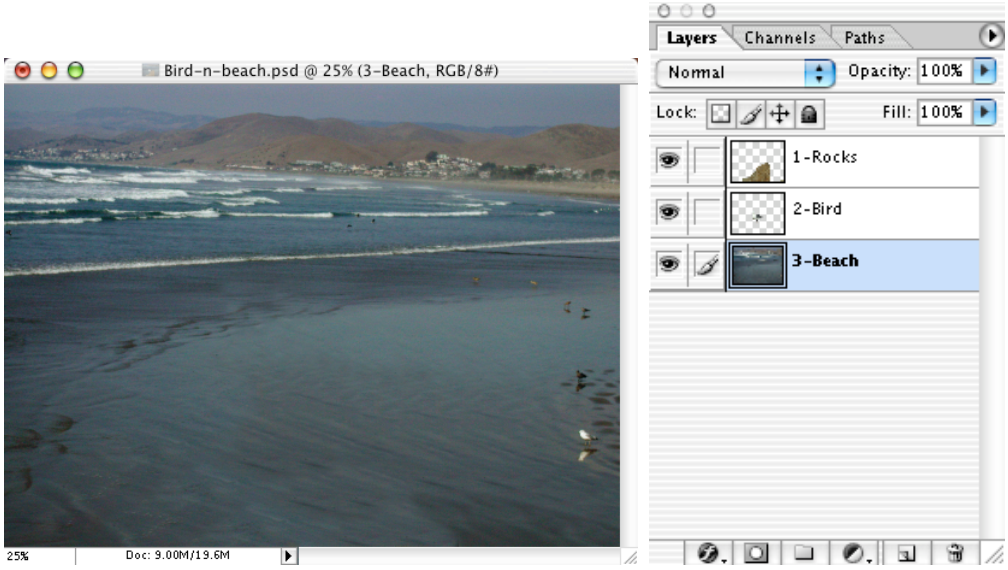


Figure 11.5: Use the Clone Stamp tool and Healing brush to fill in the background image where the subjects have been removed.

Creating Zoom Effects with Moving Layers

Simply zooming in on a static image in After Effects provides expected but limited results—it still looks like a static image. This is commonly known in the industry as the *Ken Burns effect*. But by separating the elements of an image and putting them into motion during a zoom-in, you will create a dramatic and realistic effect that has dimension and interest. This effect requires files that are at least twice the size of your movie window, because we will be increasing the layer dimension to create the zoom in After Effects.

1. Using the layered image we created in the preceding section, or the file `Beach-n-Bird.psd`, import the image into a new project in After Effects as a composition to retain all of the layers. For this project, set the project composition to standard NTSC 640×480 default, 3 seconds in length.

2. Drag the entire PSD file folder from the Project window, center it in the Comp 1 window, and scale down the group to slightly larger than the Comp 1 window area, as shown (Figure 11.6). This will be the position for Frame 1 of the zoom effect animation.

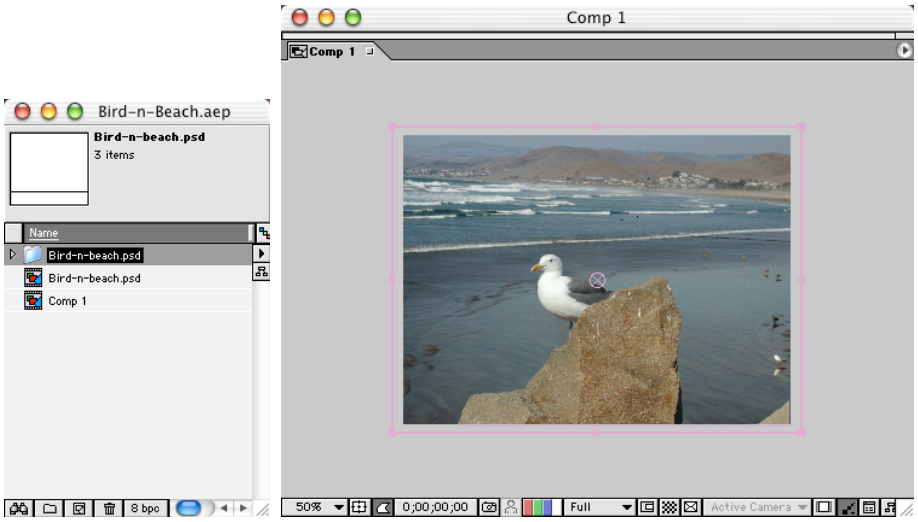


Figure 11.6: Import and place the Photoshop layers into your Comp window, and scale down to set the beginning of the zoom effect.

3. Hide the top two layers in the Timeline window, and move the Current Time Indicator to approximately 7 frames. Select the background layer, and press the S key to reveal the Scale settings for that layer in the Timeline window. Click the Time-Vary Stopwatch to set the current scale setting for this layer (Figure 11.7).

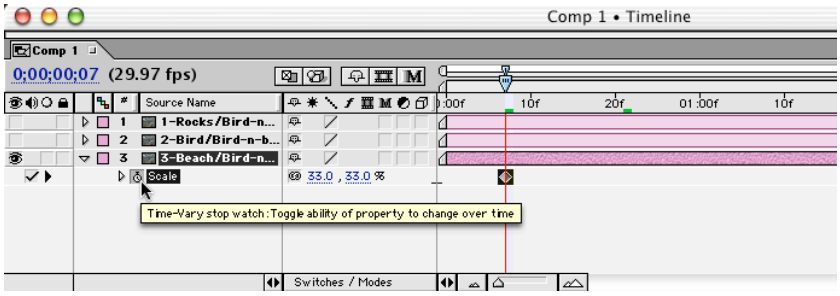
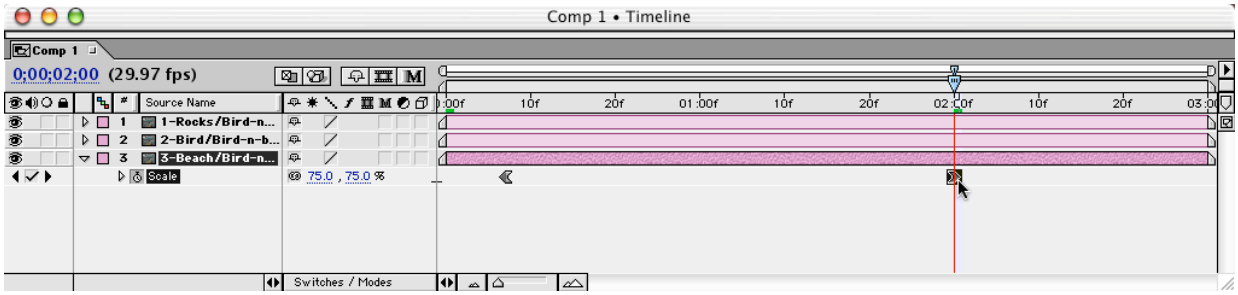


Figure 11.7: Begin the background zoom a few frames in from the beginning of the animation.

4. Move the Indicator down to the 2-second mark, and adjust the scale up to 75%. Right-click/Ctrl+click the scale marker, and select Keyframe Assistant ➤ Easy Ease Out (Figure 11.8). This will automatically slow down the end of the zoom to give a more natural camera feel and not have an abrupt mechanical stop.

5. Repeat with the first scale marker at Frame 7, but select Easy Ease In.



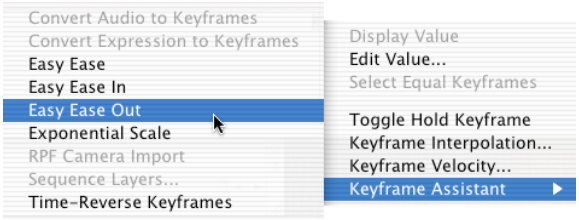


Figure 11.8: Applying the Easy Ease In and Out Keyframe Assistants will give a more natural camera zoom effect.

6. Make the rock layer visible, and move the Current Time Indicator to the same Frame 7 marker that the background layer is set to. Press the S key to reveal the Scale settings in the Timeline window, and click the Time-Vary Stopwatch to set the current scale.

7. Repeat for the seagull layer, and apply the Easy Ease Out Keyframe Assistant to both markers (Figure 11.9).

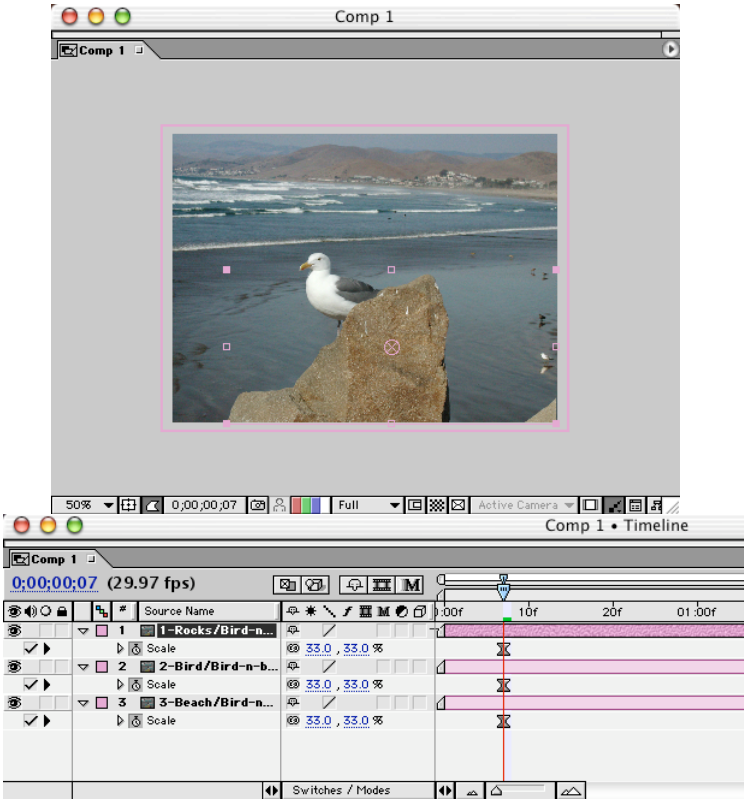


Figure 11.9: Set scale markers for both the rock and seagull layers.

8. Move the Indicator to the 2-second mark, increase the scale of both the rock and seagull layers to 55%, and apply the Easy Ease In Keyframe Assistant to both markers (Figure 11.10). The reason we aren't increasing the scale of these layers (or "zooming in") as much as the background layer is to give the effect of a camera lens that "pulls" the background and foreground together and decreases the depth of field.

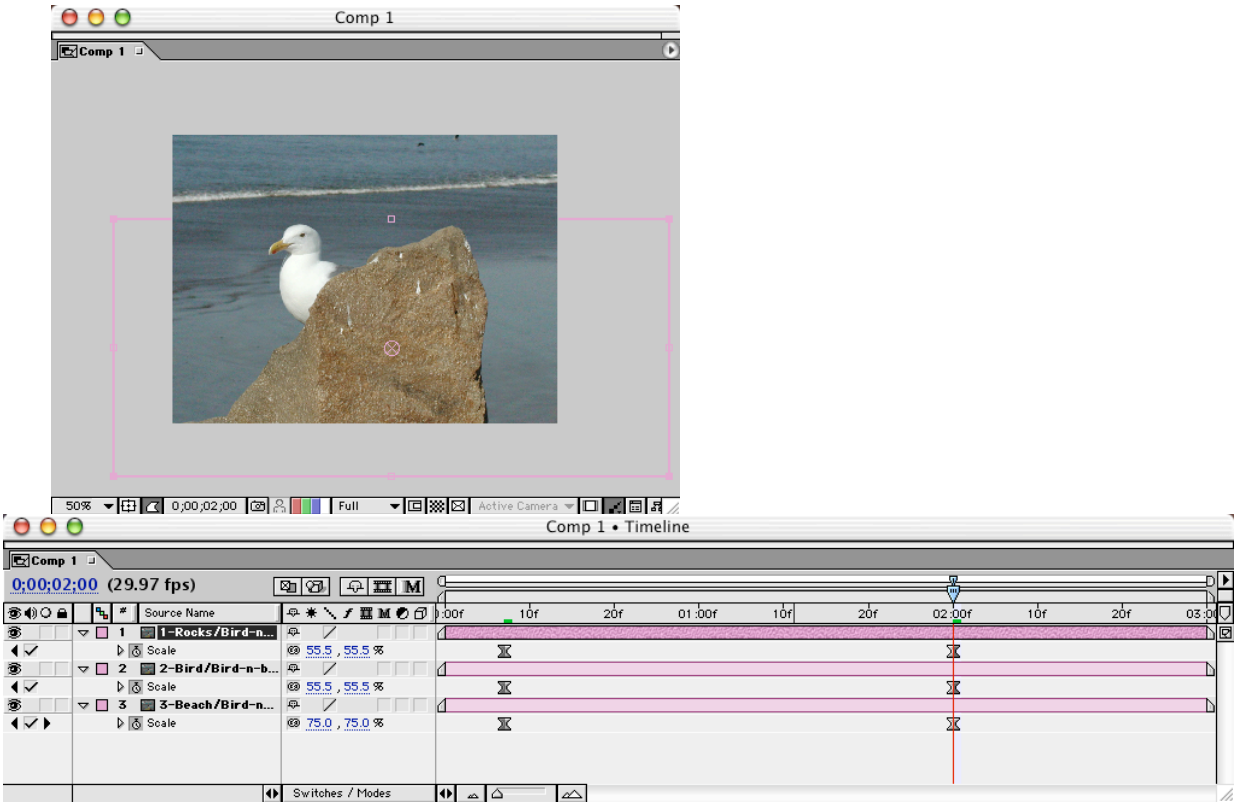
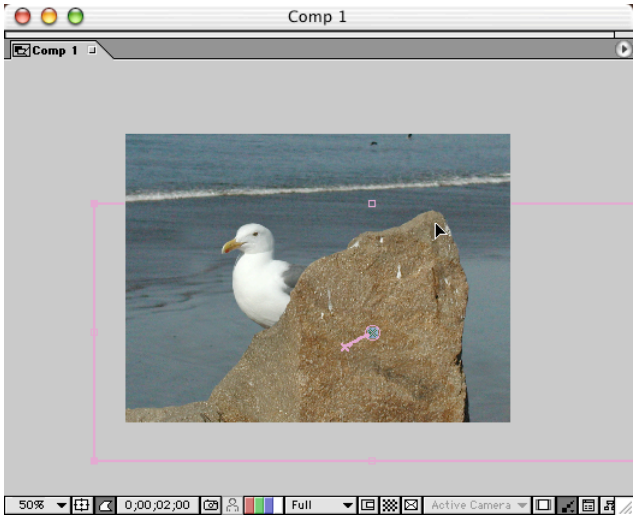


Figure 11.10: Increase the scale of the rock and seagull layers and set the time markers.

Since the different layers scale at separate center points, it's important to align them to keep the focus of the motion centered in the Comp 1 window frame and not move toward the bottom of the frame.

9. With the rock layer selected, return to the Frame 7 marker and press P for the Position settings in the Timeline window. Click the Time-Vary Stopwatch to set the current Position setting. Move the Indicator to the 2-second mark, and then drag the rock layer in the Comp 1 window to bring it up in the frame. Scrub the Indicator back and forth to see the motion of the rock layer. Be sure to move it in a matching vertical alignment with an object in the background layer, such as the birds along the water's surface, as shown in Figure 11.11. Set the marker in the Timeline and apply the Easy Ease In Keyframe Assistant.



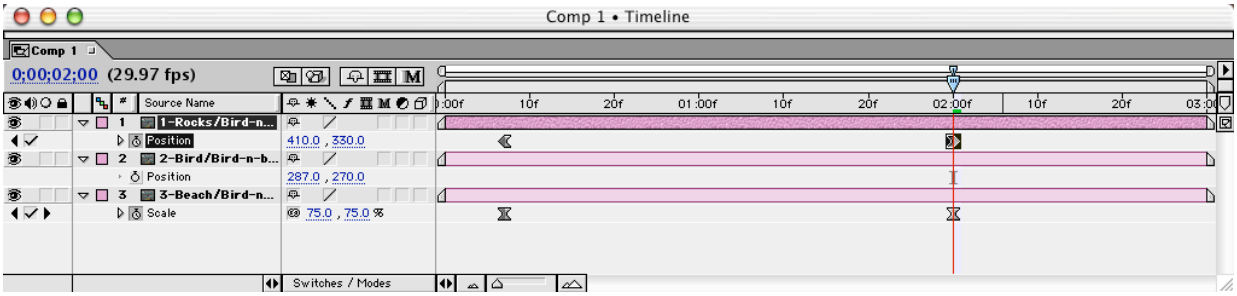


Figure 11.11: Move the rock layer up in the frame to keep it centered in the motion zoom path.

10. Repeat the above process with the bird layer, keeping it in the same vertical path in relation to the rocks, but position it slightly lower (behind the rocks) to reinforce the motion zoom effect (Figure 11.12). After applying the Easy Ease In Keyframe Assistant to the marker, check that all of the markers at the 2-second mark have the same ease-in amount applied by right-clicking/Ctrl+clicking the marker and selecting Keyframe Velocity (Figure 11.13). Check the markers at the Frame 7 mark as well.

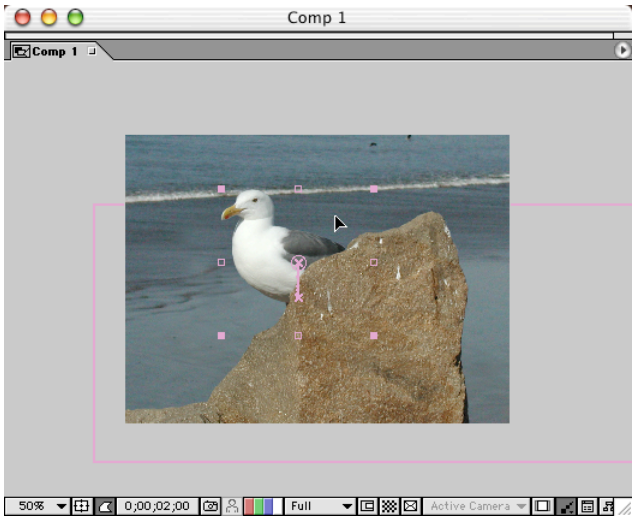


Figure 11.12: Move the bird layer in a vertical path to match the movement of the rock layer, and scrub the Indicator to view the motion path.

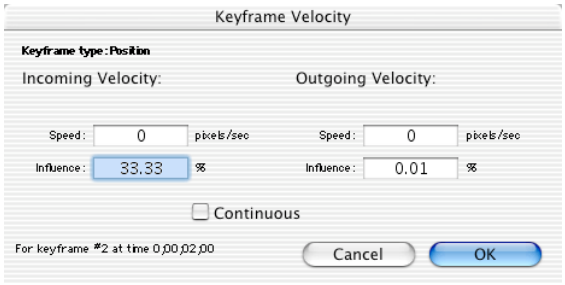


Figure 11.13: Check the Keyframe Velocity of all the markers to make sure the ease-ins and -outs all match.

For variation, experiment with adding blur to the background layer over time, as shown in Figure 11.14. Though, in reality, a zoom wouldn't necessarily take the background out of focus like that, it does give a nice effect that puts the focus of the frame onto the foreground subjects.

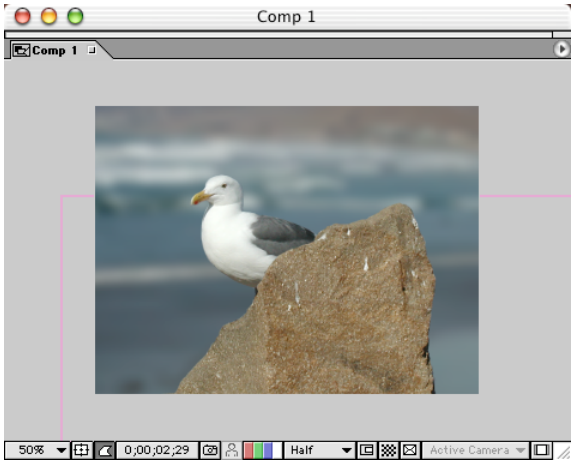


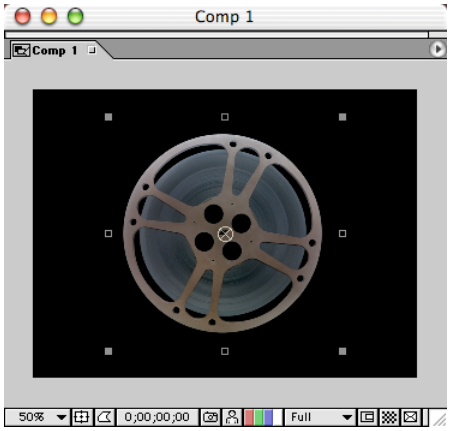
Figure 11.14: Try adding a blur over time in the background layer for an interesting effect

Basic 3-D Layers in Motion

Setting up a basic 3-D animation in After Effects requires some basic knowledge of multiple views and moving layers in three-dimensional space, or X-, Y-, and Z-axis. It's really much easier than it sounds, and this project will introduce you to some of those basic controls.

1. Start a new project file in After Effects and import two single-layer Photoshop files, `FilmReel.psd` and `MovieText.psd`. Import them as composite files to preserve the transparent layers.

2. Create a new composition, 640×480 NTSC, drag the film reel composition file from the Project window onto the Comp 1 window, and resize the layer to 70% (Figure 3.1).



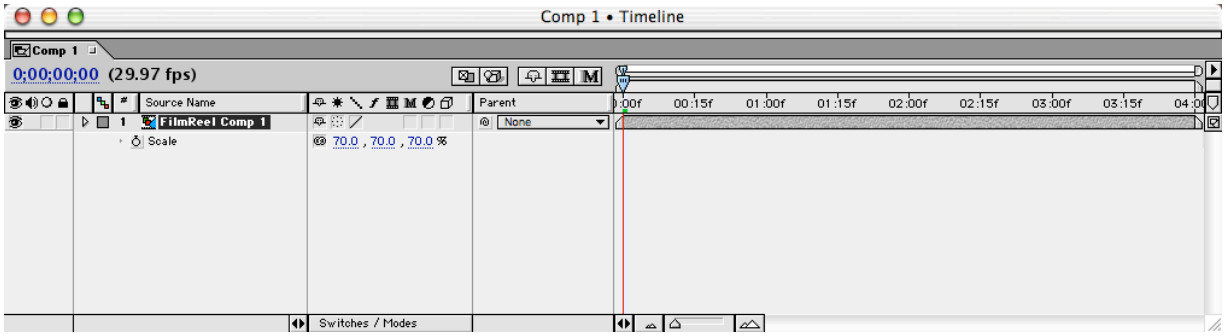


Figure 3.1: Import and place the film reel composition and resize the layer.

3. Select the film reel layer, right-click/Ctrl+click it in the Comp 1 window, and select 3-D Layer from the context menu. This will convert the layer to a 3-D layer, using the transparent space of the Photoshop layer as the defining edges in 3-D. (You can, instead, click the 3-D Layer checkbox on the Timeline to convert layers.) This layer can now be moved in all three directions, as shown with the X-, Y-, and Z-axis arrows in the middle of the layer (Figure 3.2).

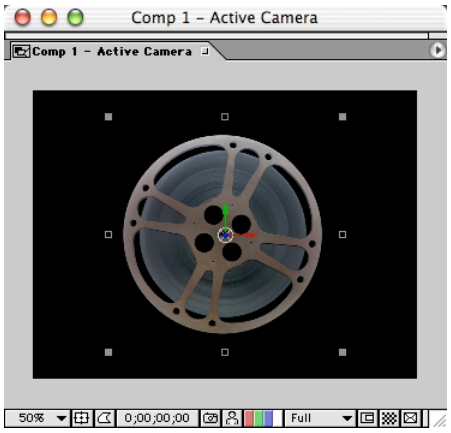


Figure 3.2: Converting the layer into a 3-D layer will allow it to be moved in X-, Y-, and Z-axis.

4. To make the third dimension more predominant, we'll add the ability for this layer to cast shadows when we shine a light on it. Drop down the settings for the layer and open Material Options. Turn the Casts Shadows option on.

5. Duplicate the layer in the Timeline window (~CM/Ctrl+D) and press the A key to reveal the Anchor Point settings on both layers.

6. Right-click/Ctrl+click the Comp 1 window tab to bring up the context menu and select Switch 3-D View ➢ Left.

7. On the top layer, set the Z-axis Anchor Point to –20. On the bottom layer, set the Z-axis Anchor Point to +20. This will separate the two layers at the center point, creating a simulated film reel (Figure 3.3).

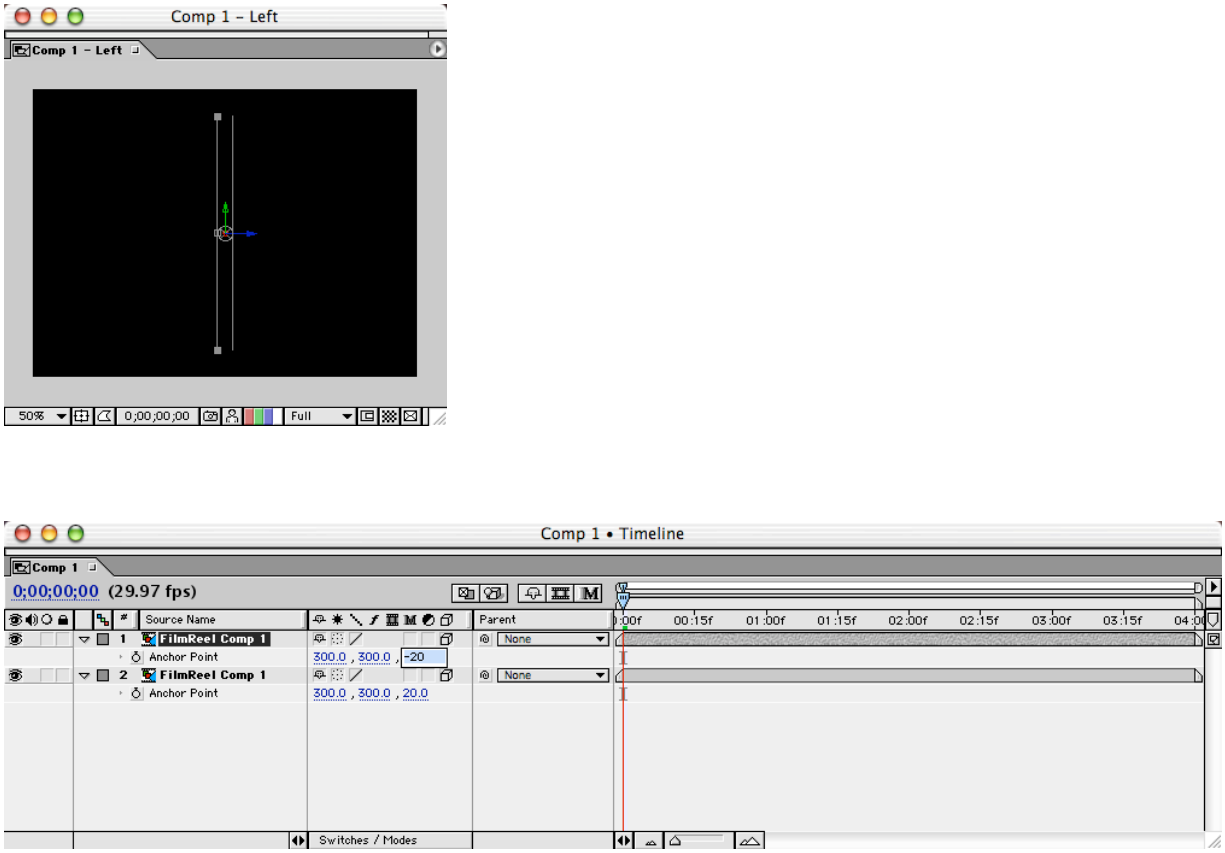


Figure 3.3: Offset the anchor points at the center core to simulate two halves of a film reel.

Parenting the Layers and Adding Text

Now we will connect the two halves of the film reel so they will move in sync with each other.

1. Select the top layer and the Parent pull-down menu in the Timeline. Select the second layer as its parent—the top layer will now copy anything that is applied to the bottom layer. They will now rotate around the center of their perspective anchor points, as if they were actually connected.

2. Press the R key to reveal the Rotate settings, and click the Stopwatch to set the first marker at the beginning of the Timeline.

3. Move the Indicator down to the 6-second mark on the Timeline. Set the Y-axis rotation to 3 × +0.0º—this will make the film reel spin three complete revolutions in six seconds (Figure 3.4).

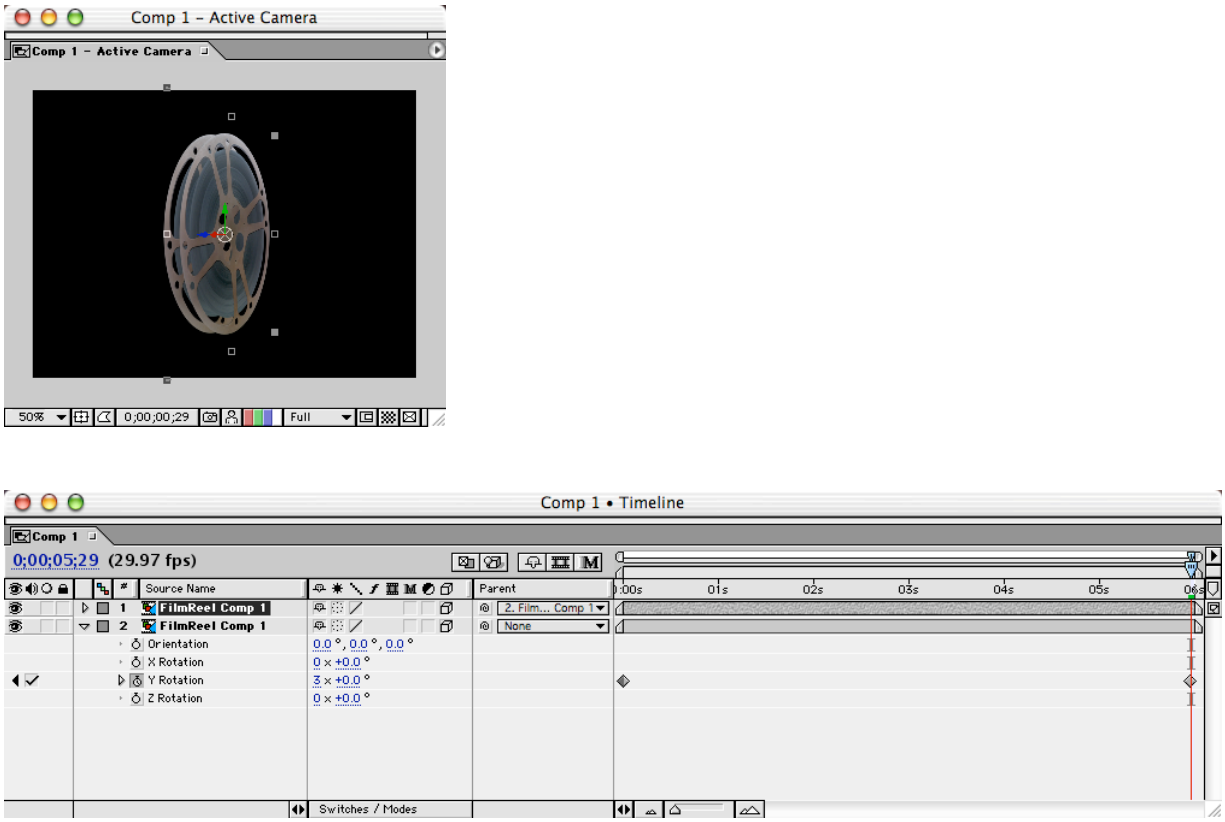


Figure 3.4: With the film reels connected through parenting, they will move together on their anchor points and appear as one object when rotated.

4. Add the movie text layer to the Comp 1 window and scale it down to 85%, centered in the window. Right-click/Ctrl+click it in the Comp 1 window and select 3-D Layer from the context menu.

5. Right-click/Ctrl+click the Comp 1 window tab to bring up the context menu and select Switch 3-D View ➢ Left. Drop down the settings for the layer and open the Material Options. Turn the Casts Shadows option on.

6. Move the Indicator in the Timeline down to the point where you see the movie reel at a perfect 90º angle. You will see how the movie reel slices right through the text layer. Select the movie text layer and drag the Z-axis arrow to the right until the layer is just out of reach of the movie reel (Figure 3.5).

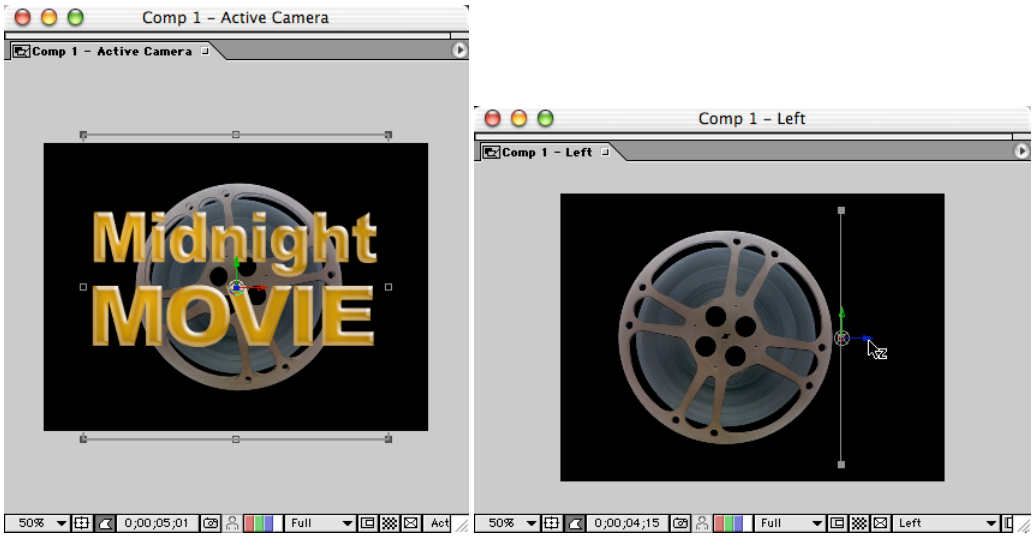


Figure 3.5: Make the movie text layer a 3-D layer and move it out of the rotating motion path of the film reel.

7. Up to this point, there isn't any real light source shining on the scene, so no shadows are visible yet. Create a spotlight for the scene by selecting Layer ➢ New ➢ Light. When the Light Settings dialog pops up, choose Spot as the Light Type and select the Casts Shadows check box. Adjust the Shadow Darkness to 85% and the Shadow Diffusion to 20 pixels (Figure 3.6).

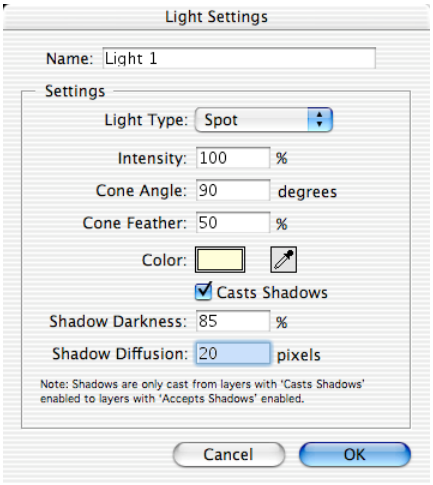


Figure 3.6: Create a spotlight for the scene that will cast shadows and add depth and realism.

> 🕮 *For more natural-looking light, add a little yellow or orange tint to the light source. It will warm up your scene as if lit by incandescent light—or even natural sunlight. If you leave it white, your scene will retain a bluish cast and appear cold.*

Positioning Lights and Layers

From this point, we will be working in several views on our scene to help us position our lights and layers: the main Active Camera view and Top, Front, and Left side views. Right-click/Ctrl+click the Comp 1 window tab and select Apply Workspace and Two Comp Views. This will create two comp windows on your screen, so if you're working on a smaller monitor, things might get a bit crowded. Just resize the windows to see the entire comp area and stack them up if necessary. You should leave one of them in the Active Camera view all the time, because you will need to see the effects from all of your movements. At times you will need to adjust the scale of the preview window to be able to see some of the objects that move outside the view window, such as lights, cameras, and layers that fly in and out.

1. Open a side view window, right-click/Ctrl+click the Comp 1 window tab to bring up the context menu, and select Switch 3-D View ➢ Left. You can also use the view tab on the bottom right side of the Comp window to change views.

2. Drag the light up to the right of the object layers, and then drag the Point Of Interest handle down to the center of the movie reel. Open the Front view window and drag the X-axis arrow to pull the light slightly off-center and to the right. This will provide a shadow that will be down and to the left of the movie text layer as it rests in front of the film reel (Figure 3.7). You may wish to zoom out in the Comp window so you can see where you are moving the light beyond the boundaries of the frame.

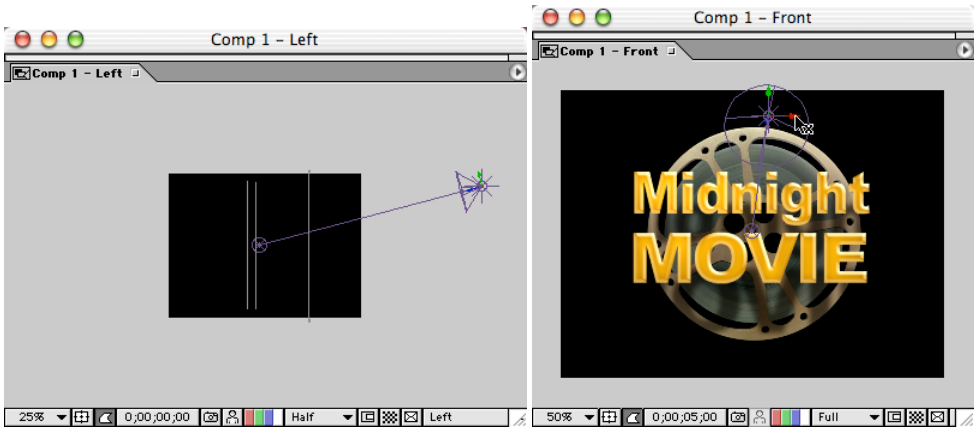


Figure 3.7: Move the light into position to create a shadow that is cast on the lower-left side of the film reel.

3. Once the light is set into position, hide the layer so the redraw time won't slow down with each move you make of the Timeline Indicator. Move the Indicator down to the 3-second mark, select the movie text layer in the Timeline, and click the Position Stopwatch. This will set the final position of the movie text fly-in animation (Figure 3.8).

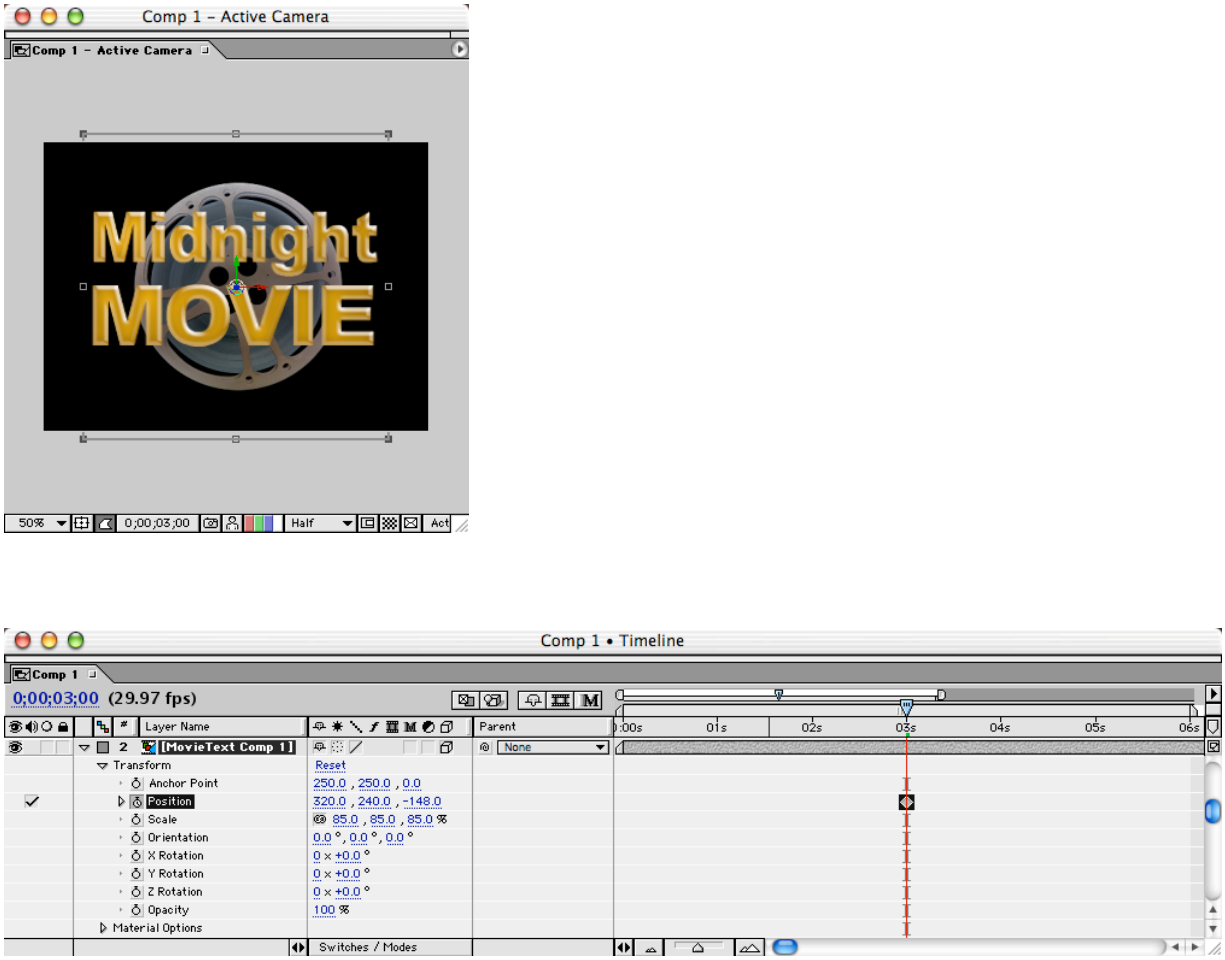


Figure 3.8: Set the final rest position of the movie text layer at the 3-second mark.

4. Move the Indicator to the first frame on the Timeline, and set the Z-axis of the movie text layer to –890. This makes the layer disappear from the Active Camera window, but viewing the Left side window, you will see it's just out of camera range (Figure 3.9). This gives the appearance that the text will fly in from behind the camera and pull into the spotlight before resting in front of the film reel.

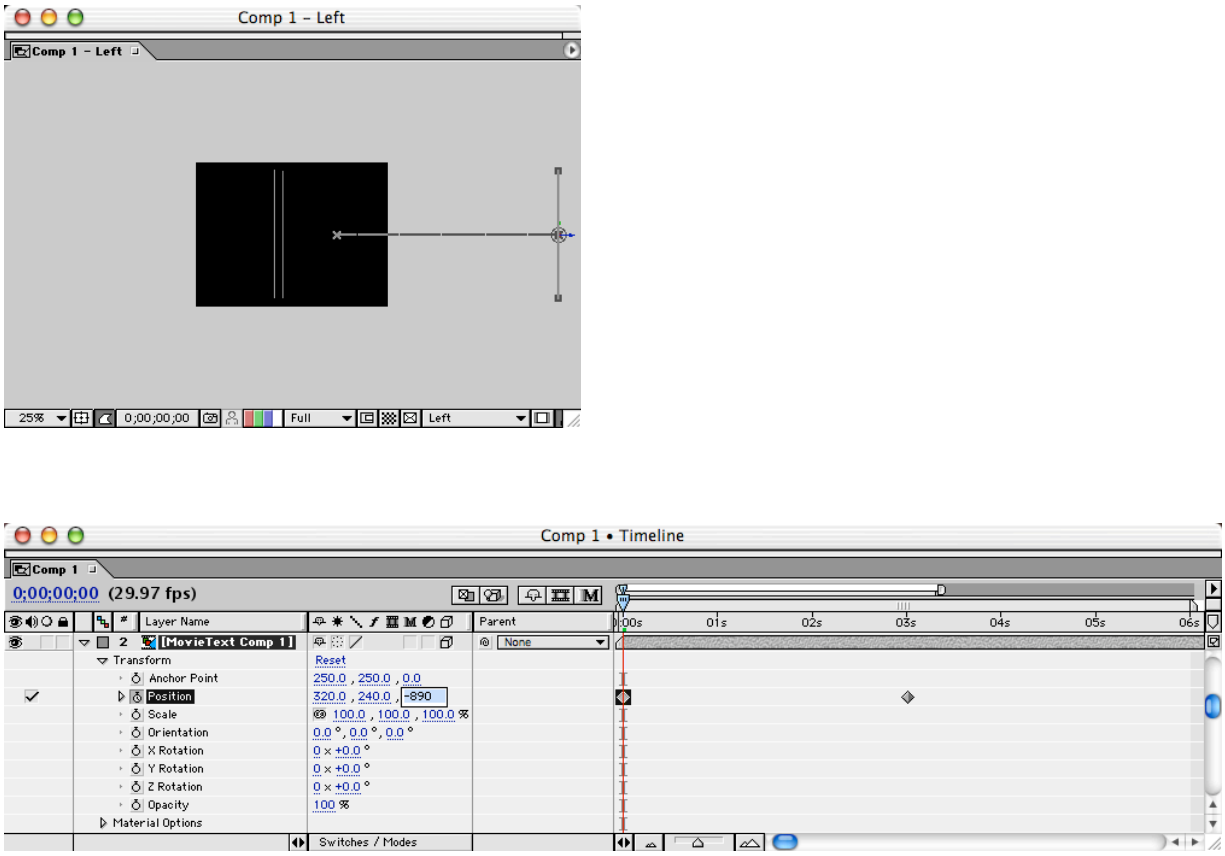
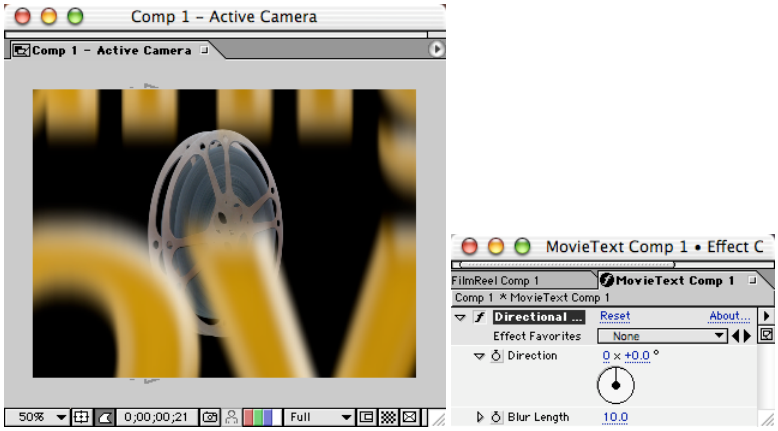


Figure 3.9: Move the movie text layer along the Z-axis to pull it out of frame so it will appear to fly in from behind the camera.

5. To enhance the realism in this effect, we will add motion blur to the movie text layer as it first enters the frame and pulls into the spotlight. At Frame 1 on the Timeline, apply the Directional Blur filter to the movie text layer, Effect ➤ Blur & Sharpen ➤ Directional Blur. Adjust the Blur Length to 10 pixels and leave the default angle at 0º (Figure 3.10).



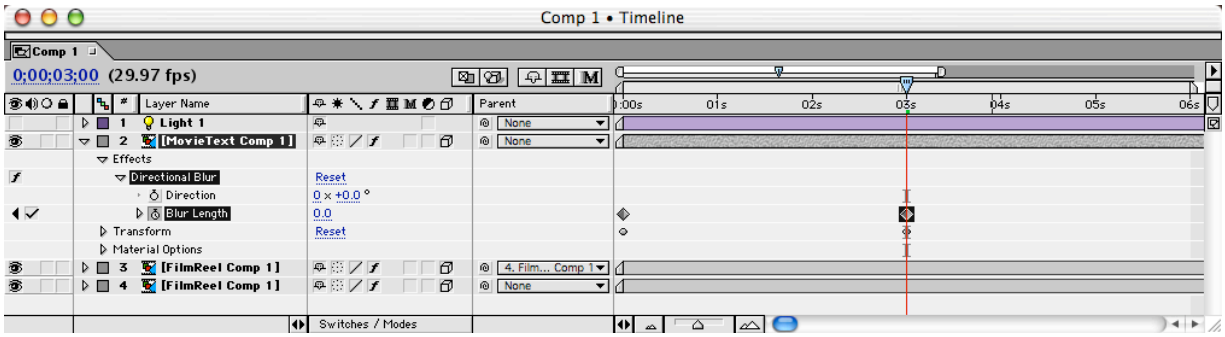


Figure 3.10: Adding motion blur to the movie text will enhance the fly-in motion.

6. Set the Effects Stopwatch on the Timeline and move the Indicator down to the 3-second mark. Change the Blur Length to 0, because the movie text layer is no longer in motion at this point.

Use a RAM Preview to check that all of the motion is working properly. Though the light and shadows are in the right place at this point, the scene seems a bit muddy—so we'll add some warm ambient light to brighten up the highlights and shadows. Select Layer ➢ Light and choose an Ambient light, set at 35% Intensity without casting shadows. It will help to adjust the color to a darker orange to be sure the shadows are warmed up a bit as well (Figure 3.11). Notice the big difference a small amount of ambient light can have on the entire animation!

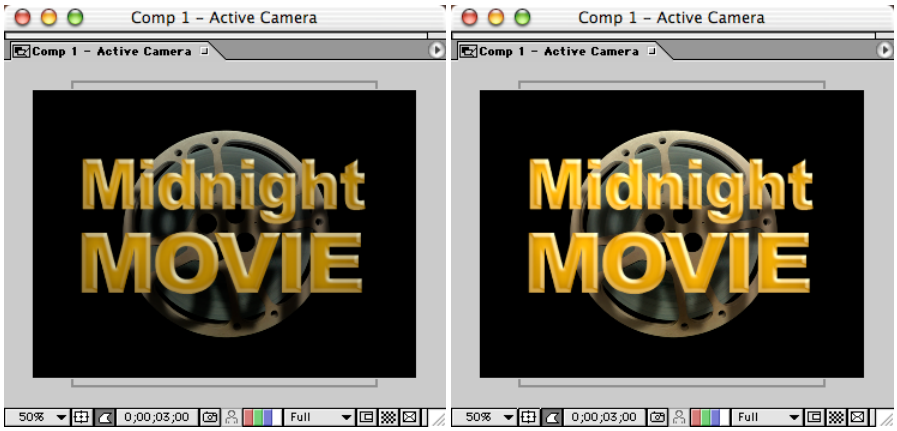


Figure 3.11: Adding a little ambient light to the scene brightens up the layers and warms up the shadows.

Kinematics: Human Figure Character Animation

Kinematics, in computer graphics language, is motion created by the force of another material body in motion—usually something that's attached, like a hand is to an arm. If the arm is moved, then the hand must go with it, even though the hand is still free to move on its own.

This is something usually practiced by 3-D character modelers who create video games and animated motion pictures. Fortunately, After Effects gives us some pretty powerful tools to accomplish kinematic motion on two-dimensional characters that can really fool the eye!

For these examples, I've taken a single stock image of a skeleton that had an alpha channel already created, and I tore it to bits! You'll find the Photoshop image, `SkeletonSmall.psd` online in the download section, so you can see the many layers that were created out of this original image (Figure 5.31).

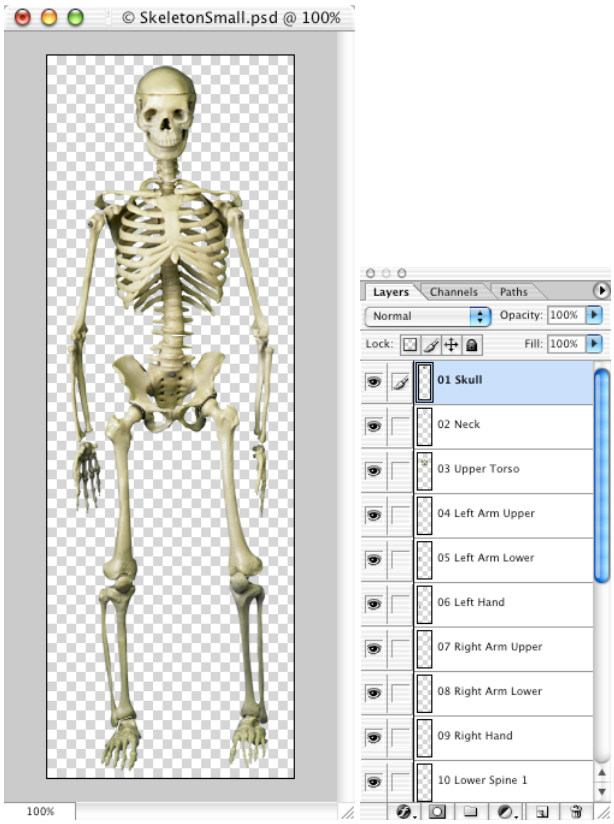


Figure 5.31: Open the skeleton Photoshop file to examine how the layers are created and how they go together.

Create a new project file in After Effects, and import the file `SkeletonSmall.psd` as a composition to retain the layer information. Open the composition from the Project window, and edit the Composition Settings to resize it and allow more side-to-side motion when animating the layers.

Determine a central point of the body, which all the other parts can link to and move naturally. I've chosen the upper torso layer, where the arms, neck, and spine can connect to it. From this point, we will work out from the upper torso through all of the extremities. You may want to at least peek at the After Effects project file, `Skeleton_Practice.aep`, also available online, to follow along until you get the hang of what we're doing.

The Knee Bone's Connected to the Leg Bone

Connecting the layered pieces together will require important techniques: proper positioning of the Anchor Points and parenting the layers. The Anchor Points need to be located on each layer where the swivel point of the joint would naturally move. This is where it will be "connected" to the layer it is parented to.

Moving the Anchor Point on each layer requires you to open each layer in its own window and zoom in so you can really see what you're doing! Drag the Anchor Point to the joint or nearest connector point where it can swivel around (Figure 5.32).

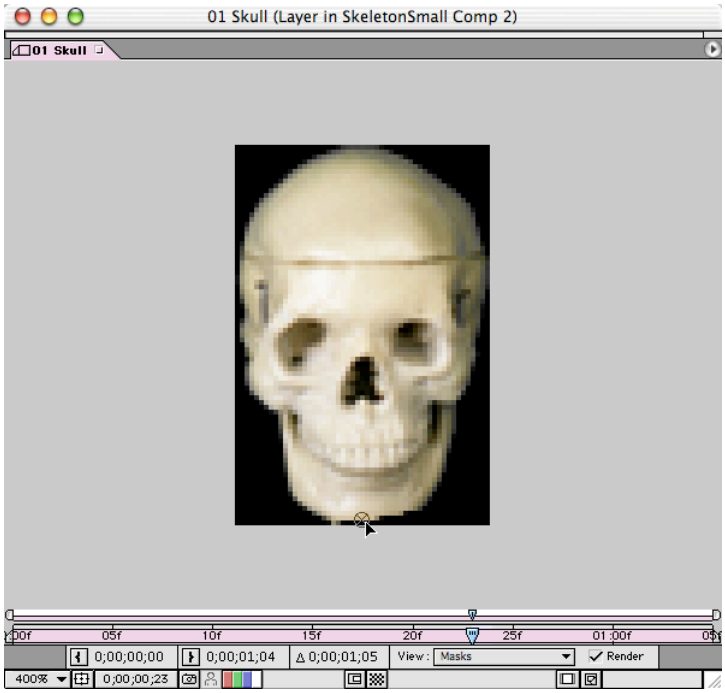
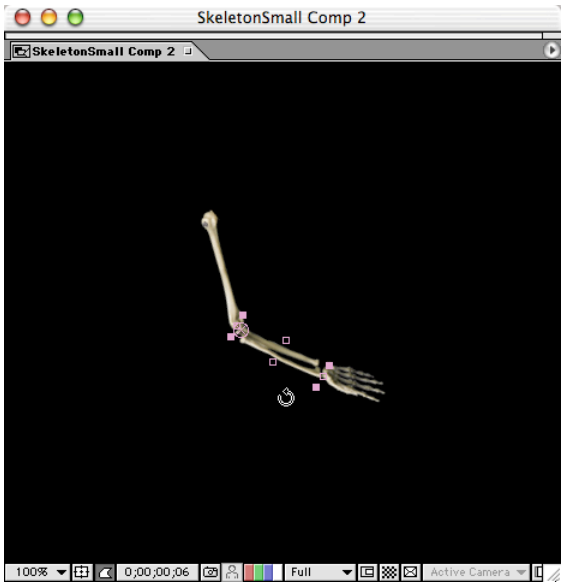


Figure 5.32: Zoom in on each layer and reposition the Anchor Points where they connect with other pieces.

To "connect" the layers, we use the Parent option on the Timeline. This doesn't really completely connect the layers, but it does allow you to move the parented layer and have those layers attached to it move with it. Parenting also allow you to rotate layers, and they will rotate around the Anchor Point that you positioned at the joint, so they will appear to be attached to the parented layer.

Let's look at a smaller segment to further understand how this works. Hide all of the layers except for the two left arm layers and the left hand layer. With the Anchor Points at the joints connecting to the preceding layer, select the preceding layer as a parent layer using the Parent Layer Selector on the Timeline (Figure 5.33). Rotate the lower arm layer and see how it moves at the elbow. Rotate the hand layer, and it should bend at the wrist. Move or rotate the upper arm layer, and both the lower arm and hand move with it.



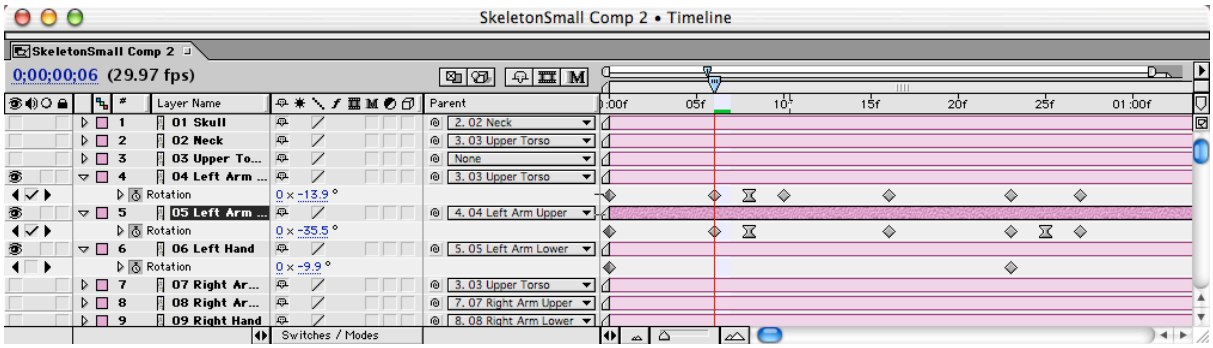


Figure 5.33: Experimenting with a small section of the skeleton will help you understand the physics of the motion and how the layers work together.

With everything parented in all the way to the upper torso layer, you should be able to move the layer, and the whole skeleton will move with it. If you rotate the upper torso slightly, you will need to rotate the spine segments, lower torso, and legs to bring the feet back down to the ground (Figure 5.34).

Figure 5.34: Rotate the upper torso layer, spine segments, and lower torso layer to see how twisting the body makes the rest of the limbs react.

Making adjustments to all of the limbs from this position, you can start to emulate graceful movements (Figure 5.35). It's like combining a stop-motion wire figure animator with a puppeteer. With a little creativity and finesse, you can really have fun animating your skeleton character!

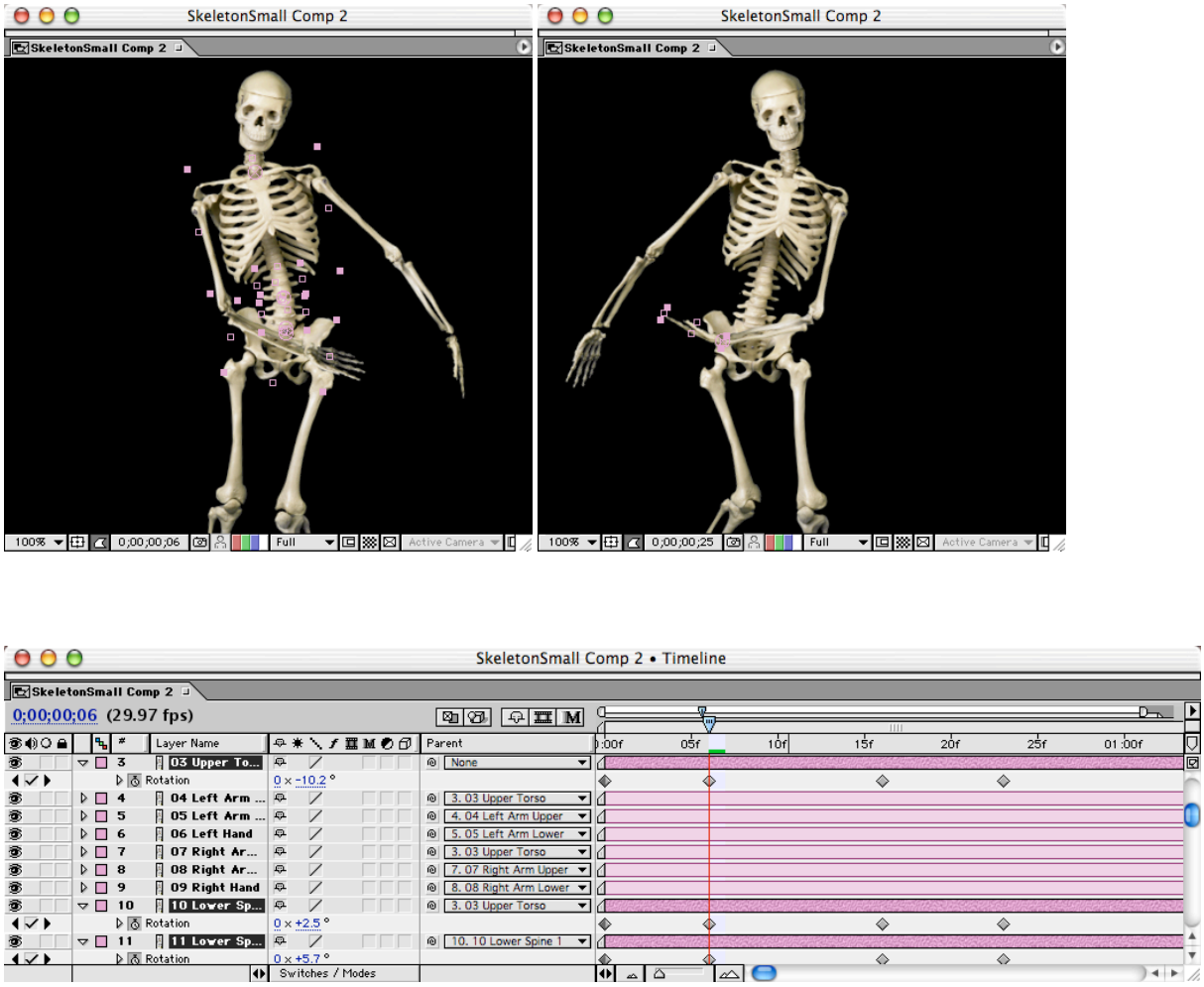
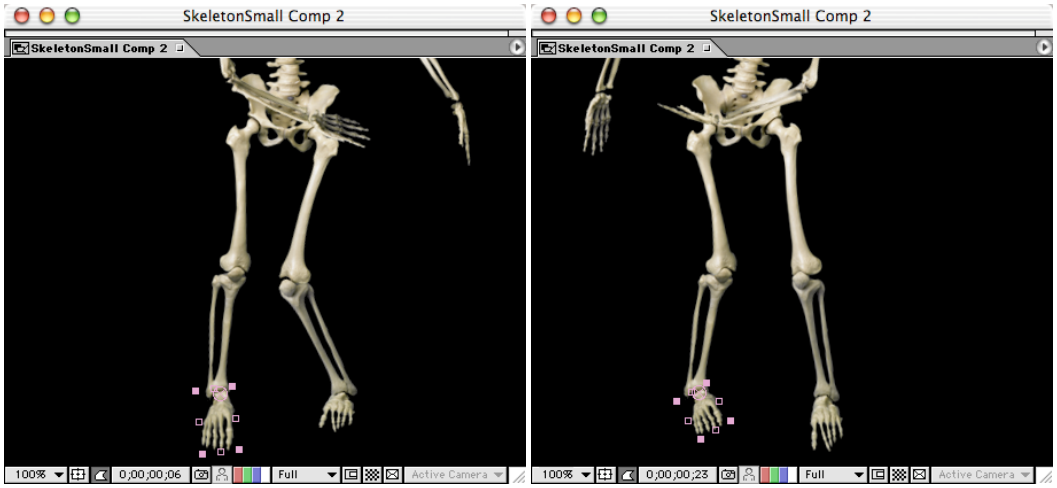


Figure 5.35: Some experimentation and practice will help you get the feel for putting your character in motion.

In some cases, you will need to adjust the length of a foot, arm, or leg segment to give the appearance of upward or downward motion in the Z-axis—even though there is no Z-axis present in a two-dimensional animation (Figure 5.36).



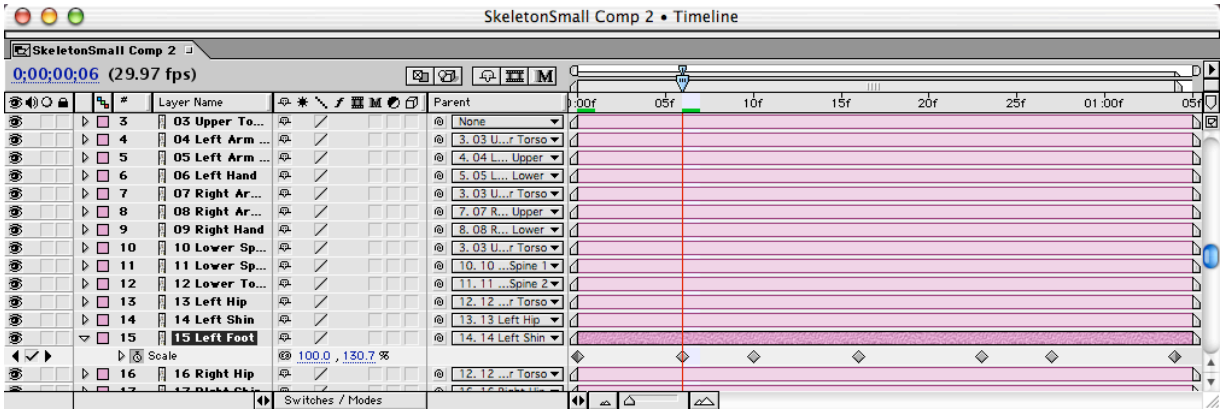


Figure 5.36: Scale the length of a segment to adjust for the lack of a Z-axis in a two-dimensional animation.

Kinematic Animation Example

Let's make a simple animation that moves every layer in our skeleton, simply by rotating layers with kinematic motion. Using the principles previously covered, we'll build this animation keyframe by keyframe, instead of layer by layer.

Because of the possible variations in building your model, it would be best to use the file `Skeleton_Practice.aep`. The parent layers have already been applied, so all you have to do is follow the settings in Table 5.12 and study what is happening in each layer's rotation.

Table 5.12: Simple Kinematic Skeleton Keyframes (all in degrees)

Layer Transform Rotation	00;00	00;06	00;08	00;10	00;16	00;23	00;25	00;26	01;04
01 Skull	–0.8	+11.1			+0.5	–14.3			–1.9
02 Neck	–0.3	+11.7			–3.1	–16.5			+0.8
03 Upper Torso	+1.1	–10.2			+4.7	+17.5			+1.0
04 Left Arm Upper	+0.0	–13.9	–17.5	–4.6	–0.3	+23.3		+15.5	–1.1
05 Left Arm Lower	+6.2	–35.5	–58.0		–3.3	–14.6	+5.2	–7.1	+8.6
06 Left Hand	–7.4					–16.9			–9.7
07 Right Arm Upper	–0.9	–22.9	–29.2	–23.7	–6.6		+11.5	+3.5	+0.2
08 Right Arm Lower	–5.0	–4.0	–10.0	+10.0	–1.4	+39.6	+48.4		–8.2
09 Right Hand	+5.2	+27.8					+41.2	+24.5	+12.7
10 Lower Spine 1	+1.1	+2.5			–3.7	–5.7			–1.3
11 Lower Spine 2	+0.0	+5.7			–4.1	–5.0			–1.3
12 Lower Torso	+1.4	+13.0			+5.9	–1.6			+5.2
13 Left Hip	–5.6	–8.7	–9.4		–8.1	–15.2	–20.7	–15.8	–4.2
14 Left Shin	+2.8	+6.5		+7.5	+9.9	+23.1	+48.7	+35.5	+0.1
15 Left Foot	–6.1	–15.0		–9.2	–18.6	–45.2	–52.8	–43.1	–4.7
16 Right Hip	+2.2	+10.5	+16.2	+9.7	+2.6	–5.1		–0.5	+4.7
17 Right Shin	+0.0	–43.6	–55.8	–35.1	–3.2	–6.4			
18 Right Foot	–11.0	+26.9		+25.3	–3.5		–3.6	–8.9	–5.1

Details in Kinematic Animations

Subtle movements and fine details are what give realism to figure animation. Though this skeleton doesn't have individual moving fingers and toes, you can still apply movement that emulates a real figure, just by keeping constant motion present in small amounts.

The effects of kinematic motion are most noticeable when you are applying them to shoulders or hips, where there are many intersecting points. The tilt of a shoulder will cause necessary adjustments of the head and neck, as well as of the arms and the lower spine. Something as simple as crossing the arms or shifting to one foot causes a ripple effect throughout the entire body.

When creating animations that require precision in movement, it's necessary to use rulers and guides to keep track of where your character is moving. While you are concentrating on the upper body, the legs may shift out from under you, and before you know it, you end up with a floating ghost with dangling legs!

While shifting the weight of the figure to one foot, you can see how much the rest of the body is influenced by this move (Figure 5.37). When the leg crosses over, the hips swivel upward, the spine adjusts to keep the head and upper body level, and the body comes to rest centered over the standing leg.

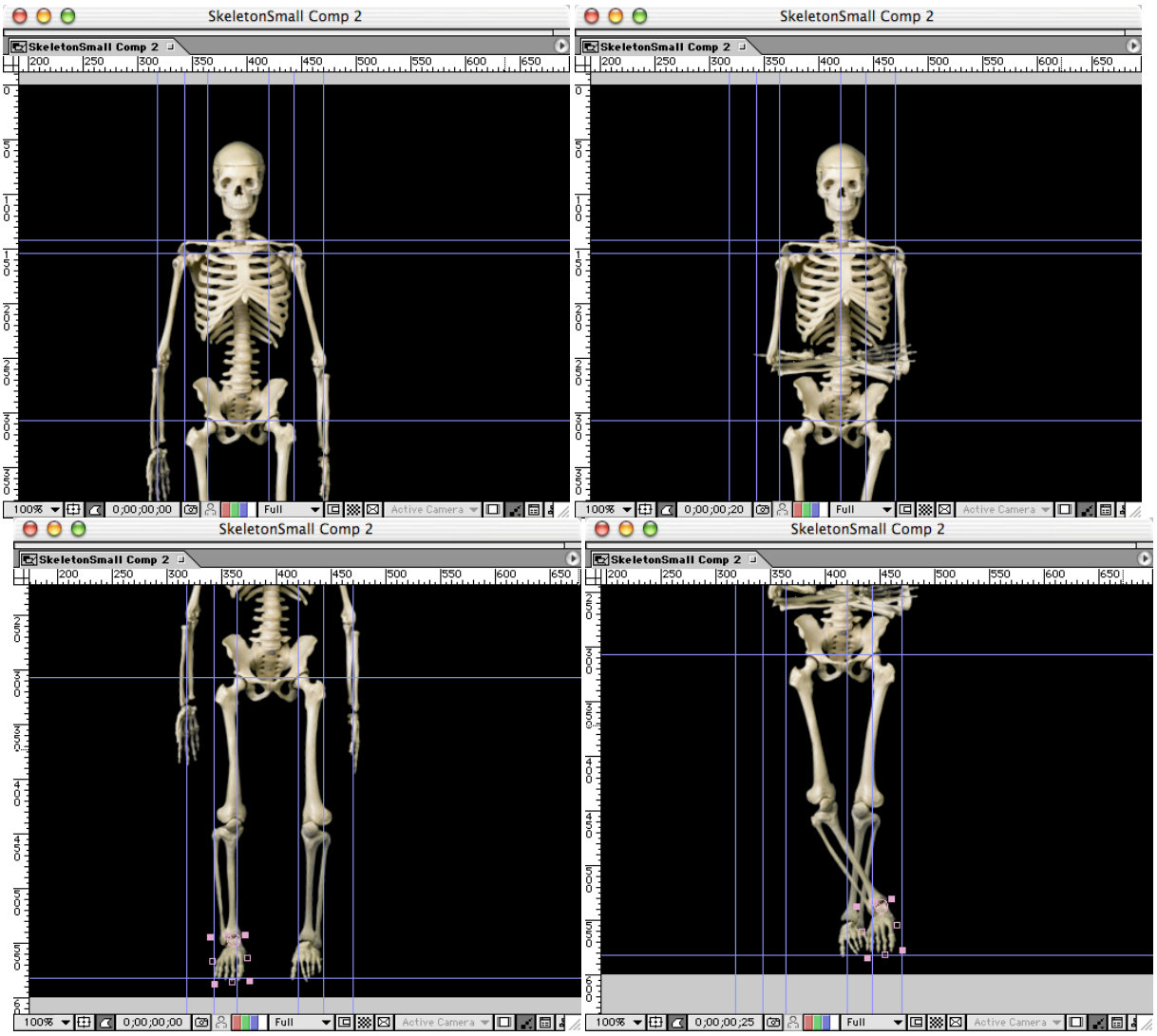


Figure 5.37: Using guides is very important to track your motion and make sure everything lines up correctly.