Station Identification

In this lesson, you'll look at techniques for creating more sophisticated animation, such as changing interpolations and adjusting velocity.

In this lesson, you will create a 15-second station identification for a children's network on television. The focus of this lesson is on motion. Your challenge is to create realistic motion for the bouncing pogo stick. You'll use a variety of motion controls to create up-and-down movement, side-to-side swing, and a squash effect at the bounce, and you'll see how to set the velocity to reflect the sharp acceleration at the bounce and the deceleration at the top of the bounce.

This lesson covers the following topics:

- Controlling temporal and spatial interpolation
- Creating squash, bounce, and peak effects
- Controlling velocity by using the speed graph
- Using folders to organize footage items
- Replacing artwork
- Nesting compositions
- Moving an anchor point
- Removing unused footage items

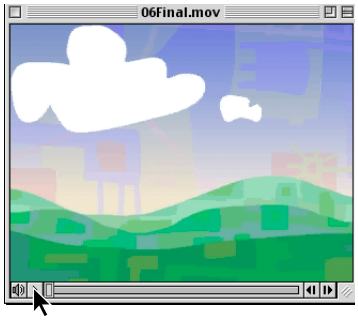
At the end of this lesson, you will have created a 15-second cartoon animation complete with sound.

It should take approximately 3 hours to complete this project.

Viewing the final project

Before you begin, take a look at the finished movie that you'll create in this lesson.

1 Double-click the 06Final.mov file in the 06Lesson folder to open the final QuickTime movie, and then click the Play button.



Most of the artwork that you see was drawn in Adobe Illustrator, and then imported and scaled in Adobe After Effects.

All of the cats on pogo sticks were actually created by using one animated composition with a variety of up, down, and side-to-side motions applied. The composition is duplicated, the artwork is replaced with the individual lettered cats, and the In points are staggered in the timeline.

2 When you are finished viewing, exit from the MoviePlayer application.

Getting started

1 To ensure that the tools and palettes function exactly as described in this lesson, delete or deactivate (by renaming) the After Effects preferences file. See "Restoring default preferences" on page 6.

2 Start the After Effects application. An untitled Project window appears.

3 Choose File > Save Project As, name the file **06Work.aep**, and save it in the Projects folder.

Designing and producing animation is a challenging and often time-consuming endeavor. It can take hours or days to produce just a few minutes. This lesson has been set up to give you a taste of cel animation, but it provides several shortcuts to help speed up the process.

Size and memory considerations

The final goal of this project is to create a full-screen video clip for television. However, for the sake of reducing disk space and memory requirements, the instructions are designed around a 320 x 240 format, at 30 frames per second.

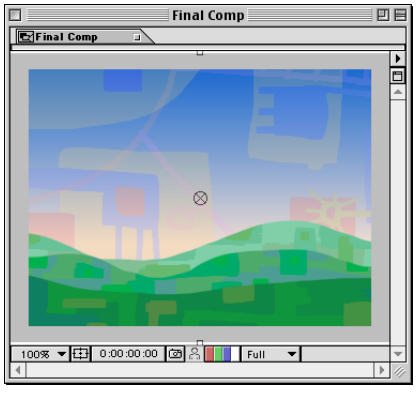
Animating the background

After importing the artwork, you'll start the project by creating the background scene of the final composition.

1 Use the context-sensitive menu to import two files: right-click (Windows) or Control-click (Mac OS) in the Project window and choose Import > Footage Files. Open the 06Lesson folder, select Bakgrd.psd, and click Open. Then select Clouds.ai, and click Open. Click Done when you are finished importing the footage.

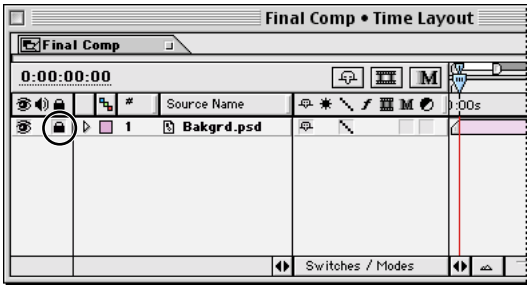
2 Create a new composition: click the new composition icon ( ) in the Project window, name it **Final Comp**, and then make sure that the Frame Size is set to **320** x **240**. Set the Frame Rate to **30** fps and the Duration to **15:00** (15 seconds). Click OK.

3 Drag the Bakgrd.psd footage item from the Project window into the Time Layout window. As you recall from other lessons, doing this automatically centers the item in the Composition window.



The background art was created in Illustrator, and then modified in Adobe Photoshop.

4 Select the Lock switch in the Time Layout window to lock the layer.

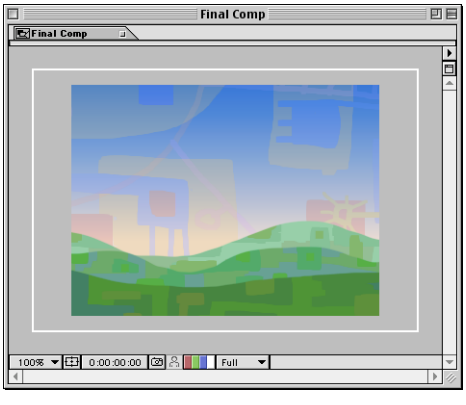


Lock switch

Animating the clouds

Now you'll animate the clouds by using simple horizontal motion.

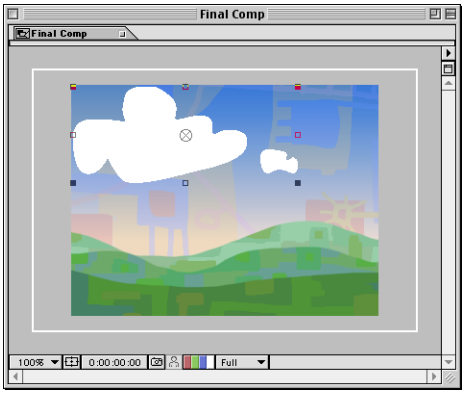
1 Resize the Composition window so you can see the gray pasteboard area around the composition stage.



2 In the Time Layout window, make sure the blue current-time marker is set to 00:00. Drag the Merged/Clouds.ai art from the Project window into the Composition window, and position it anywhere.

3 In the Time Layout window, click the triangle next to the name of the Merged/Clouds.ai layer to display the layer outline. Then click the triangle next to Transform to display the properties outline. Click the underlined Scale value, type **50**, and press Enter or Return.

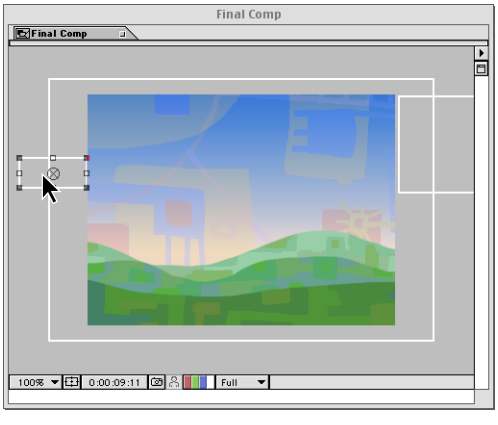
4 In the Composition window, position the clouds in the top left corner of the composition, aligning the left and top edges of the Cloud layer with the left and top edges of the frame. Set an initial Position keyframe by clicking the stopwatch in the Time Layout window.



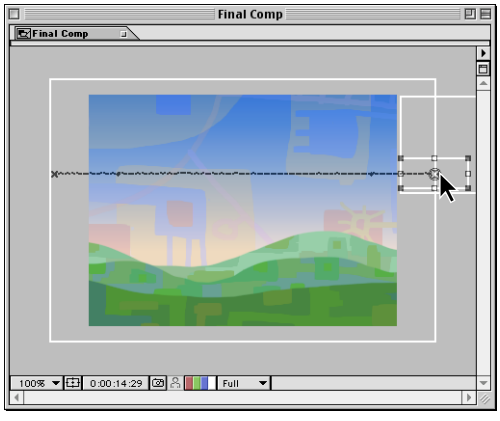
5 In the Composition window, set the current time to 07:16, and drag the clouds off the right edge of the frame, pressing the Shift key while dragging to constrain the movement. This creates a new keyframe. In the Time Layout window, collapse the layer outline by clicking the triangle next to the layer name.

6 Set the current time to 09:11, and then drag Merged/Clouds.ai from the Project window into the Composition window a second time, position it anywhere. In the Time Layout window, set the Scale value for this new layer to **15**.

7 In the Composition window, drag the clouds artwork outside the composition to the left, about one-third of the way down the composition. Then return to the Time Layout window and set an initial Position keyframe.



8 Go to the last frame of the composition by pressing the End key. In the Composition window, drag the clouds to the right side of the frame so that the right edge of the Cloud layer aligns with the left edge of the frame. Press Shift while dragging to constrain the movement.



9 In the Time Layout window, collapse the layer outline by clicking the triangle next to the layer name, and save the project.

10 Deselect all the layers, and preview the motion by pressing 0 on your numeric keypad.

11 Lock both Cloud layers.

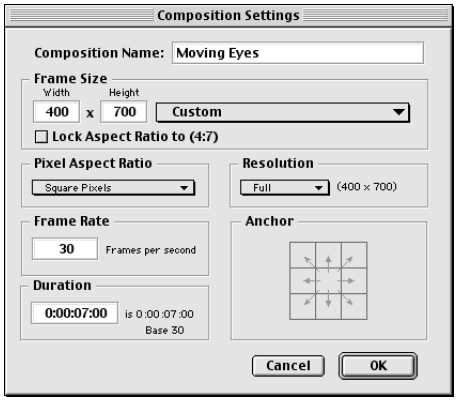
Animating a masked solid

Masks applied to solids can be used to create quick elements for animation, like the eyes for the first cat on a pogo stick that jumps into the frame at the beginning. You will design a separate composition that contains the eye animation.

1 Double-click in an open area of the Project window, select the CatPogo.ai file, and click Open. In the CatPogo.ai dialog box, leave Merged Layers selected and click OK.

2 Select the Merged/CatPogo.ai footage item in the Project window. As you can see by looking at the information beside the item's thumbnail, the item is 393 x 692 pixels in size. You will create a composition that is slightly larger than the artwork.

3 Create a new composition, name it **Moving Eyes**, set the Frame Size to **400** x **700**, set the Frame Rate to **30** fps, and set the Duration to **7:00** (7 seconds).

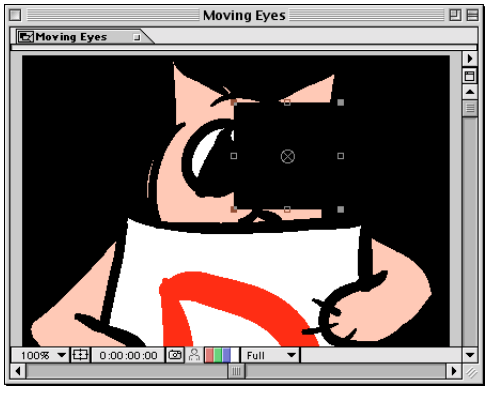


4 Drag the Merged/CatPogo.ai item from the Project window into the center of the Moving Eyes Composition window. Resize the Composition window so that you can see just the top half. If necessary to speed up screen redraw, choose Half from the Resolution menu at the bottom of the Composition window.

To animate the cat character's eyes, you will create a solid black rectangle, and then construct an oval mask that will function as the pupil for the right eye (the right eye as you are looking at the cat). After setting Position keyframes, you will duplicate the layer for the left eye.

5 Choose Layer > New Solid, type **Right Eye** for the name, set the size to **100** x **100** pixels, use the eyedropper to sample black for the color, and then click OK.

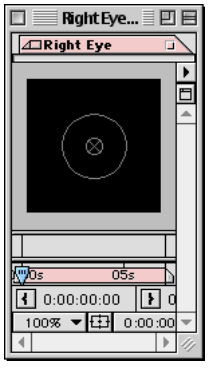
6 Scroll down to the center of the composition, locate the new solid, and then drag the solid over the eye on the right.



7 Open the Right Eye Layer window by double-clicking the solid. Drag the Layer window as close as you can to the Composition window.

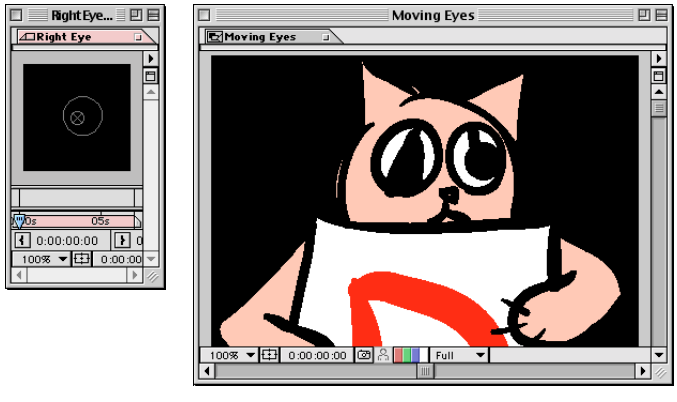
8 Make sure the Layer window is active, and click the oval tool in the toolbox.

9 Use the oval tool to draw a mask in the center of the Layer window. The mask allows you to turn a rectangular solid into an oval-shaped solid.



Once you create the initial shape, you can see the cat image beneath the solid in the Composition window. Use the Layer window to make adjustments to the mask. Don't worry about the exact size. The style of the illustration requires only a rough oval shape.

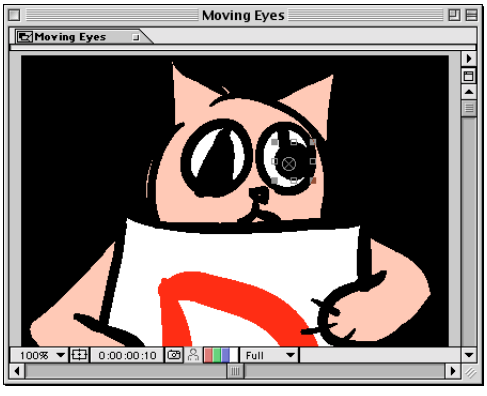
Note: *Be careful to resize the mask in the Layer window and not in the Composition window. If you resize the mask in the Composition window, you are actually changing the scale of the solid, instead of setting its initial size.*



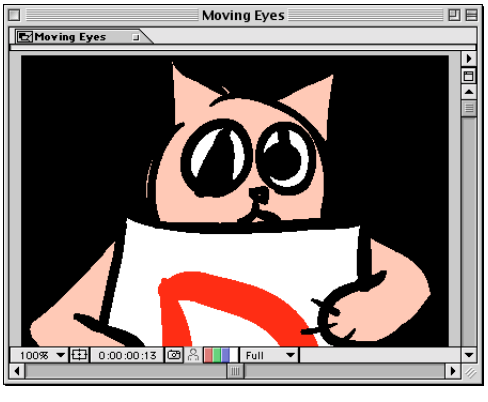
10 Position the oval in the Composition window so that it is on the right eye and the cat appears to be looking to your right.

11 Close the Layer window.

12 In the Time Layout window, set the current time to 00:10, press the P key to display the Position property, and then set an initial Position keyframe for the Right Eye layer.



13 Set the current time to 00:13. In the Composition window, reposition the eye oval so that it is still on the right eye but the cat now appears to be looking to the left.



Since the mask is not changing in size, but only in position, you do not need to set Mask Shape keyframes.

Copying and pasting keyframes

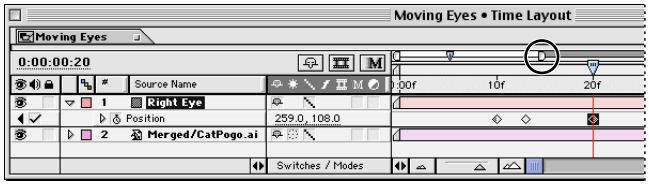
To create the look of the cat glancing left and right, you will copy and paste the two keyframes that you just created along various points in the time ruler. You can copy and paste property keyframes only one layer at a time.

Your first step is to copy the first keyframe of the Right Eye layer, where the right eye is looking to the right.

1 Select the Right Eye layer and click the first Position keyframe in the time ruler. (The eye is looking right.)

2 Choose Edit > Copy, move the current-time marker to 00:20, and choose Edit > Paste.

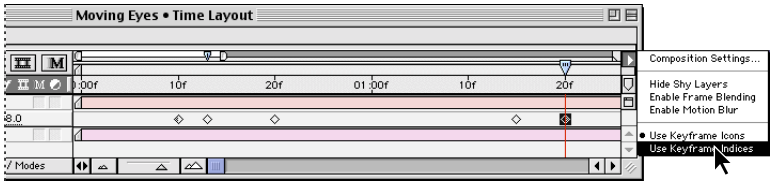
3 To see more space between keyframes, magnify your view of the time ruler by dragging the right viewing-area marker to the left until the time ruler is displayed in 10-frame increments.



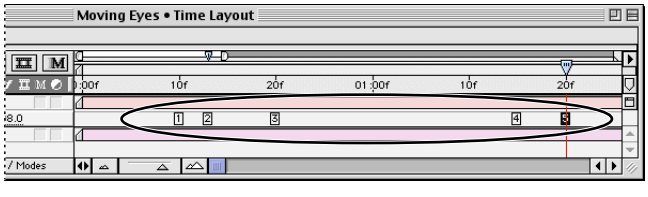
Right viewing-area marker

4 Set the current time to 01:15, and paste again. Paste one last keyframe at 01:20.

5 To keep track of keyframes, choose Use Keyframe Indices from the Time Layout window menu in the upper right corner. The keyframes are displayed with numbers in sequential order.



Time Layout window menu



Sequential keyframes

Next, you'll copy the second keyframe of the Right Eye layer (the right eye is looking to the left) and position it at points in between the other keyframes. (When you are finished editing, the pattern will be right-left-left-right, left-right-right-left.)

6 Set the current time to 00:13, select the second Position keyframe (the eye is looking left), and choose Edit > Copy.

7 Set the current time to 00:18, and paste. Then move the current-time marker to 01:12, and paste. Move the current-time marker to 01:22, and paste again.

You should have a total of eight keyframes.

8 Position the current-time marker at 02:00, and set the end of the work area by pressing the N key. Make sure the Right Eye layer is selected, and then press Alt+0 (Windows) or Option+0 (Mac OS) on your numeric keypad to see an alpha motion (wireframe) preview. When you are finished, press any key to stop the preview.

Changing Spatial Interpolation

Notice that the eye motion drifts slightly. To get crisp motion when the eyes change direction, you will change the spatial interpolation method to linear. Linear interpolation creates a straight motion path between keyframes.

1 To select all the keyframes for the Right Eye layer, click the word *Position* in the Time Layout window.

2 Choose Layer > Keyframe Interpolation. The Keyframe Interpolation dialog box appears.

3 Choose Linear from the Spatial Interpolation menu, and then click OK.

4 Press Alt+0 (Windows) or Option+0 (Mac OS) on your numeric keypad to see a wireframe preview.

Duplicating the layer and keyframes

To create parallel movement for the left eye, all you need to do is duplicate the Right Eye layer, and then adjust the position of the masked solids.

1 In the Time Layout window, select the Right Eye layer, and then choose Edit > Duplicate. A new layer appears at the top of the stack in the Time Layout window.

2 With the new layer still selected, press Enter (Windows) or Return (Mac OS), rename the layer **Left Eye**, and press Enter or Return again to apply the name.

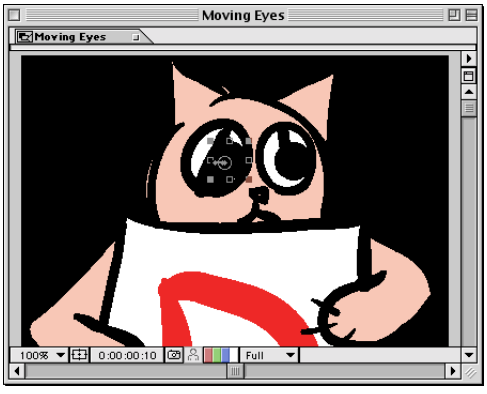
3 With the Left Eye layer still selected, press the P key to display the Position property.

The layer and all keyframes have been duplicated.

4 Set the current time to 00:10.

5 Click the word *Position* to select all the keyframes, and then drag the duplicated oval solid in the Composition window until the mask is positioned over the left eye. The left eye should be looking to your right.

Note: *It is critical that you select all the keyframes before you adjust the position.*



6 Deselect all layers by clicking in an open area of the Time Layout window, and then press Alt+0 (Windows) or Option+0 (Mac OS) on your numeric keypad to preview the motion.

If you need to make any adjustments, make sure to select all the keyframes again.

7 If necessary, set the Resolution back to Full in the Composition window. Save the project.

You might be curious as to how a designer knows where to position keyframes. Individual designers have different strategies, but to most it is simply a matter of trial and error, plus experience. They use motion previews and draft movies, making adjustments until they are satisfied.

Many designers use a stopwatch, and count out the motion or snap their fingers to get an idea of approximate timing.

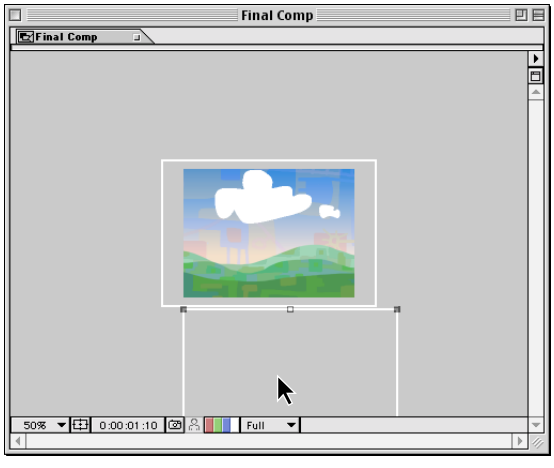
Animating the moving eyes composition

Now that you've completed the movement of the eyes, you're going to add the Moving Eyes composition to the Final Comp and create the effect of the cat bouncing into the frame of the Composition window. Putting one composition inside another is called *nesting*. For more information on nesting, see the After Effects User Guide.

1 At the top of the Time Layout window, click the Final Comp tab to display the composition. Set the current time to 01:10, and then drag the Moving Eyes composition from the Project window into the Final Comp, aligning the left edge of the graphic with the left edge of the frame.

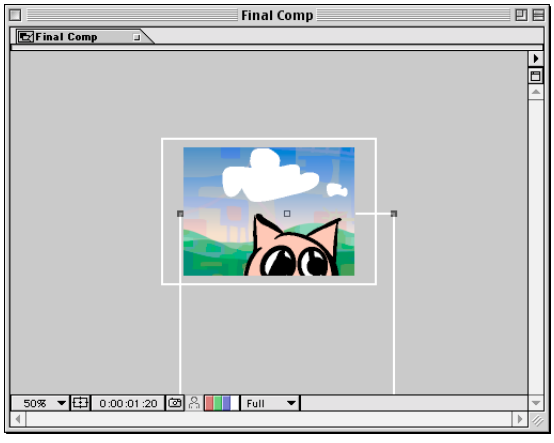
2 In the Composition window, set the Magnification to 50%.

3 Start dragging the Moving Eyes layer down, hold down the Shift key to constrain the movement vertically, and then continue dragging until the Moving Eyes layer is down below the visible area.



4 In the Time Layout window, set the current time to 01:14, press the P key to display the Position property, and set an initial Position keyframe.

5 Move the current-time marker to 01:20, and then in the Composition window, drag the Moving Eyes layer up until just the eyes show above the bottom edge of the frame.

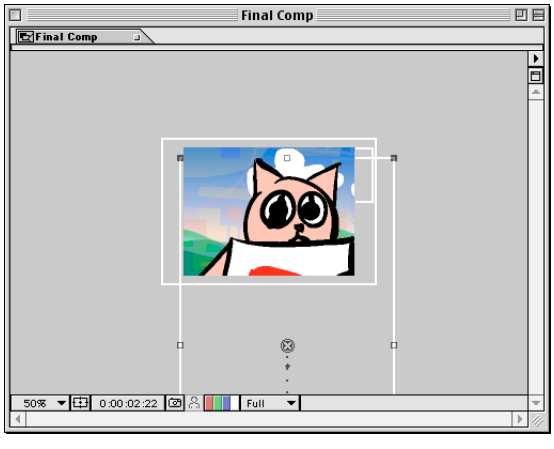


6 To hold the layer in this position for a few frames, move to 02:00, and then in the Time Layout window, select the keyframe navigator check box. This duplicates the position coordinates from the previous keyframe.

7 Move to 02:08, and in the Composition window, drag the Moving Eyes layer down (while pressing the Shift key) until the cat is out of the frame.

8 In the Time Layout window, move to 02:12, and select the keyframe navigator check box to set a duplicate keyframe.

9 In the Composition window, move to 02:22, and drag the cat up a little higher so that you can see the eyes and part of the sign.

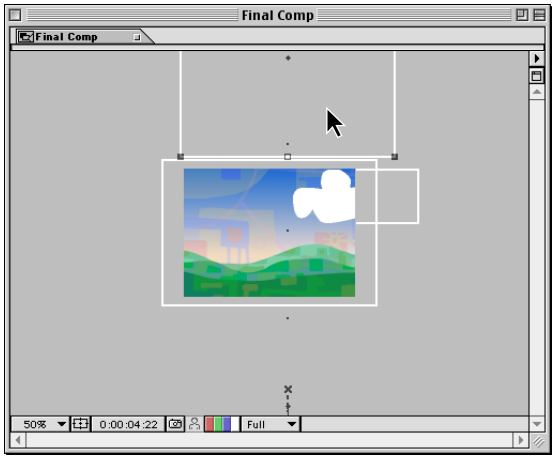


10 In the Time Layout window, move the current-time marker to 03:02, and then click the keyframe navigator check box to set a duplicate keyframe.

11 In the Composition window, move to 03:16, and drag the Moving Eyes layer down off the lower part of the frame.

12 In the Time Layout window, move the current-time marker to 04:16, and then click the keyframe navigator check box to set a duplicate keyframe.

13 Finally, move to 04:22, and in the Composition window, drag the Moving Eyes layer off the top of the frame. You may need to drag in several steps to get the layer all the way out of the composition.



14 In the Composition window, set the Magnification back to 100%.

15 In the Time Layout window, collapse the Moving Eyes layer outline. Save the project, press the Home key to return to the beginning of the composition, and then preview the motion by using the Jog control in the Time Controls palette.

16 Close the Composition window and the Time Layout window.

Now you're ready to animate the rest of the cats.

Creating the pogo stick motion

In this section, you'll create a new composition in which you set the pogo stick motion for the rest of the cats. You are going to create up-and-down motion, squash the layer dimensions to simulate bouncing, and change the velocity.

1 Create a new composition, type **Bounce Comp** for the name, and then set the Frame Size to **320** x **240**, the Frame Rate to **30** frames per second, and the Duration to **10:00** (10 seconds). Click OK.

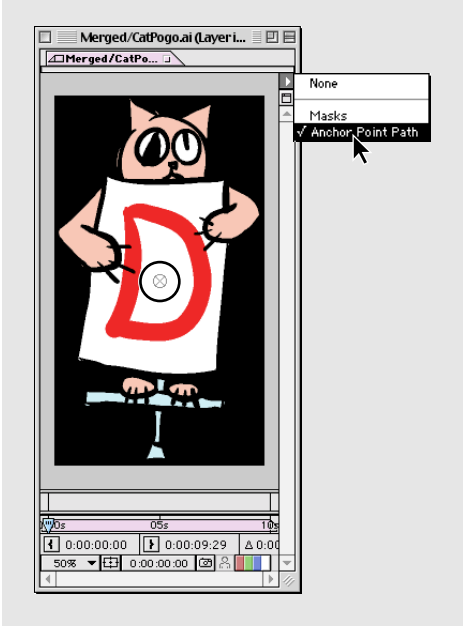
2 Drag the Merged/CatPogo.ai art from the Project window into the Time Layout window, and then display the Transform properties for the layer.

Moving the anchor point

Whenever you set a Position keyframe, the position is based on the anchor point of the layer. For this animation you're going to move the anchor point to the bottom of the pogo stick.

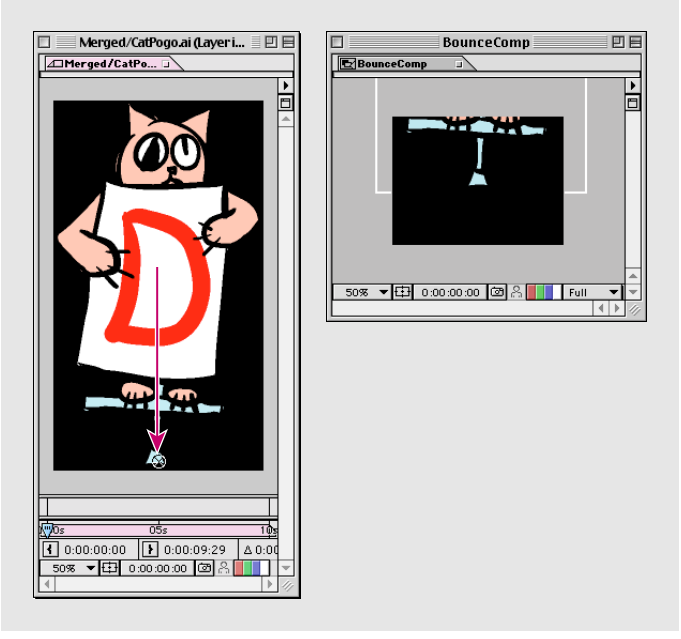
1 Double-click the Merged/CatPogo.ai image in either the Composition window or the Time Layout window to open the Layer window. In the Composition window, set the magnification to 50% so you can see more of the cat.

2 To see the anchor point, choose Anchor Point Path from the Layer window menu located in the upper right corner. The anchor point's default position is the center of the layer.



Anchor point and Layer window menu

3 Drag the anchor point to the bottom of the pogo stick, and then close the Layer window. Notice how the position of the layer has changed in the Composition window.



Dragging the Anchor point changes the position of the footage in the Composition window.

You can move the anchor point from the center of a layer to any other position, even outside of the layer.

Note: *It is important to change the anchor point position before you set other motion properties. If you don't, you may get surprising results, since changes in Scale, Position, and Rotation are based on the anchor point position.*

Creating a squash effect

To make the character bounce twice a second, you will specify up or down motion every seven frames. You'll modify the dimensions of the Merged/CatPogo.ai layer so that it changes from a normal scale ratio of 1:1 in the up position to a squashed ratio of 1:2 in the down position. Over time, the dimensions gradually change back toward 1:1 and the motion decreases, reflecting a shorter and slower bounce.

You'll set a full scaled keyframe one frame before impact so the squash doesn't occur before the actual bounce.

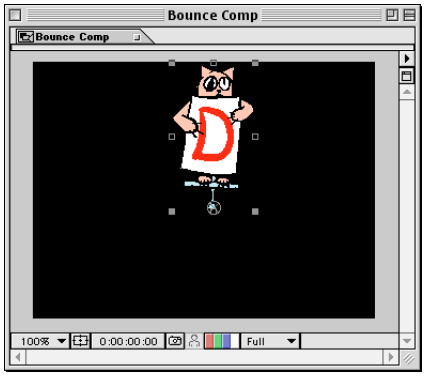
1 Make sure the current time is set to 00:00. Set the magnification to 100% in the Composition window, and resize the window so you can see as much of the Merged/CatPogo.ai layer as possible.

Since you are using the same Merged/CatPogo.ai artwork that you used for the first animation, you'll need to scale it down.

2 In the Time Layout window, set the Scale to **20**% for both width and height, and set an initial Scale keyframe.

3 In the Composition window, start dragging the layer up and then press and hold Shift. Keep dragging until the top of the cat is even with the top of the screen. Then set an initial Position keyframe in the Time Layout window.

Note: *You don't need to worry about keeping the image within the action-safe zone because you will be nesting this composition inside another composition.*

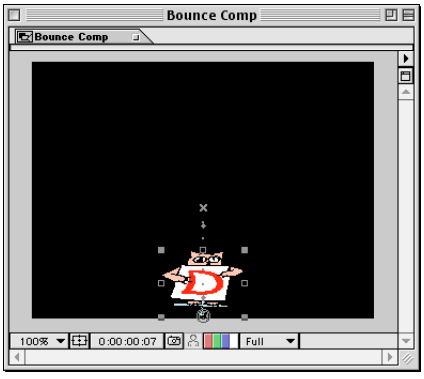


4 Press the U key to display all animating properties, and verify that you have both a Scale and Position keyframe set at 00:00.

5 In the Time Layout window, set the current time to 00:07. Click the Scale value. In the Scale dialog box, deselect Preserve Frame Aspect Ratio, leave width set to **20**, enter **9** for height, and click OK.

As you move the Merged/CatPogo.ai layer up and down, you'll want to avoid moving it from side to side. You'll use a keyboard shortcut to constrain the movement to the vertical axis.

6 In the Composition window, start dragging the layer down and then hold down Shift. Keep dragging until the bottom of the pogo stick is at the bottom of the screen.



7 In the Time Layout window, set the current time to 00:15, and then set the Scale for both width and height to **20**%. (Because width and scale are set to the same value, Preserve Frame Aspect Ratio is automatically selected when you click OK in the Scale dialog box.)

8 In the Composition window, start dragging the layer up and then hold down Shift, dragging the layer so that the cat's ears touch the top edge of the screen.

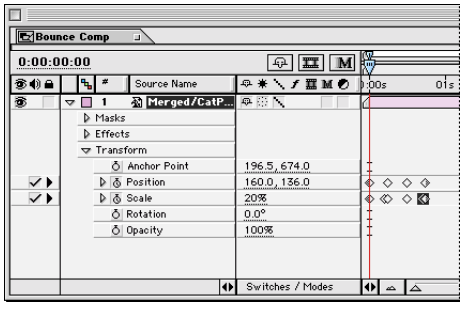
9 In the Time Layout window, move to 00:22, and in the Scale dialog box deselect Preserve Frame Aspect Ratio, leave the width at **20** and set the height to **9**. In the Composition window, start dragging down, hold down Shift, and then drag the artwork down so that the bottom of the pogo stick is even with the bottom of the screen.

10 Return to the beginning of the composition, and then press the 0 key on the numeric keypad to view what you have so far.

Now you will create a full-scale keyframe one frame before impact so the squash occurs only at the bounce, and not on the way down.

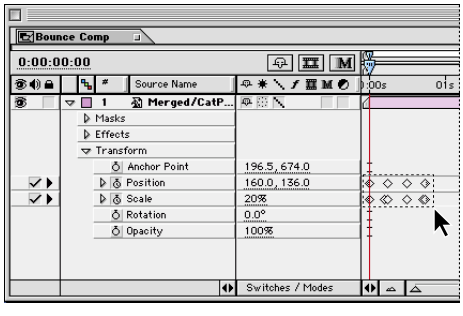
11 In the Time Layout window, move the current-time marker to 00:06. The height at this frame is 11%. Set the Scale value to **20**%, **20**%.

12 Copy the keyframe you just set, move to 00:21, and paste the keyframe. Now return to the beginning of the composition and play the composition again.



To have a few more keyframes to play with in the next section, you will copy and paste a second set of keyframes.

13 Position the pointer to the left and above the first Position keyframe, drag a selection marquee around all of the Position and Scale keyframes you have set so far, and then choose Edit > Copy.



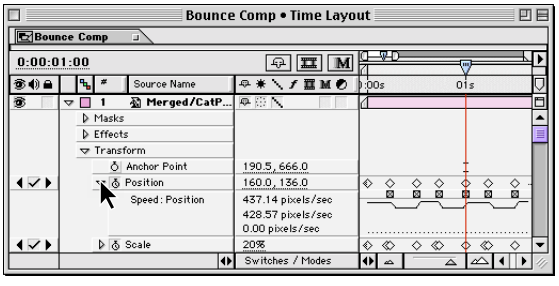
14 Set the current time to 01:00, and paste. All the keyframes are duplicated and positioned starting at the current-time marker.

15 Set the work area from 00:00 on the left to 2:00 on the right, and then press 0 on your numeric keypad to preview motion. Save the project.

Setting the interpolation and velocity

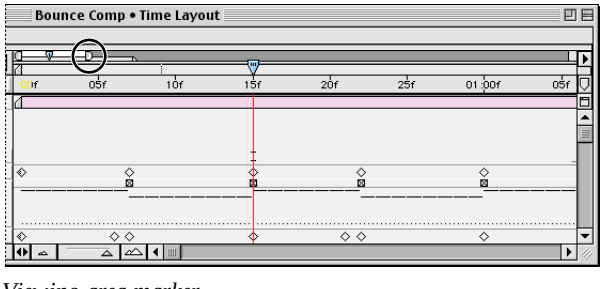
When creating certain types of motion, like the characters on the pogo sticks, you do not want the animation to progress at a constant rate of speed. The motion should reflect the bounce and peak of the pogo stick character. There should be acceleration on the descent, deceleration on the ascent, and a hold on the apex. To create these effects, you will change the interpolation and the velocity of the animation.

1 In the Time Layout window, click the triangle next to the Position property. The Speed graph appears. Yours may look slightly different than the one shown below.



When you create keyframes for any property, like the Position keyframes at 00:07 and 00:15, After Effects interpolates the positions of the layers in the frames between the two keyframes. The default temporal interpolation style is linear. With linear interpolation, the speed of the change between keyframes is uniform and constant and can result in sudden changes at the keyframe. Linear interpolation can give a mechanical and unnatural look to your animation. With Bezier interpolation, the velocity can be set to create a smooth rate of change through keyframes.

2 Drag the right viewing-area marker to the left until the time ruler is displayed in five-frame increments. If the speed graph is not visible, press the Home key to move to the beginning of the composition.



Viewing-area marker

As you can see from the graph, the segments mapping the change between keyframes are straight.

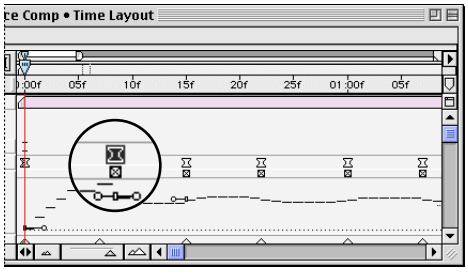
3 Press 0 on your numeric keypad to preview the motion with linear interpolation again.

The speed is constant in between keyframes, but changes abruptly when a keyframe is reached. Now you'll change the interpolation method to Continuous Bezier.

4 Click the word *Position* in the Time Layout window; all the Position keyframes are selected.

5 Choose Layer > Keyframe Interpolation. Choose Continuous Bezier from the Temporal Interpolation menu, and click OK.

Notice that the keyframe icon has changed from a diamond, which represents linear interpolation, to the Bezier interpolation icon. Bezier interpolation automatically creates a smooth rate of change through a keyframe. Notice that the graph curve has smoothed out.

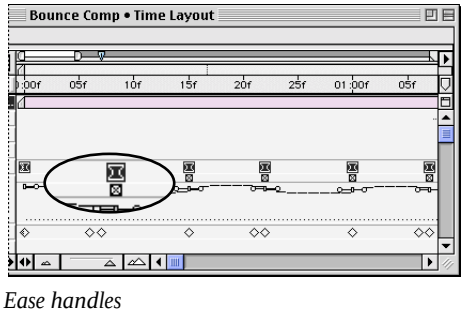


Continuous Bezier

6 Preview the motion by pressing 0 on the numeric keypad.

The motion should appear somewhat smoother than it did with the linear setting, especially at the top and bottom of the bounce.

The handles that appear on the graph are known as *ease handles* and allow you to fine-tune the velocity. You will see a pair of ease handles only for keyframes that are currently selected.



Ease handles

Factors affecting speed

After you create your keyframes and motion paths, you may want to make more precise adjustments to the way the spatial coordinates or speed of a moving layer changes through keyframes. You can fine-tune nearly all changes over time using the Speed graph or Velocity graph in the Time Layout window. The Speed graph provides complete information about and control of the value and rate of change for all spatial values, such as Position, at any frame in a composition. The Velocity graph provides complete information about and control of the value and rate of change for all non-spatial values, such as Rotation, at any frame in a composition.

The change of value or speed over time is affected by the following factors:

Time difference The time difference between keyframes in the Time Layout window. The shorter the time interval between keyframes, the more quickly the layer has to change before reaching the next keyframe value. If the interval is longer, the layer changes more slowly, since it must make the change over a longer period of time. You can use distance to adjust speed by moving keyframes forward or backward along the timeline.

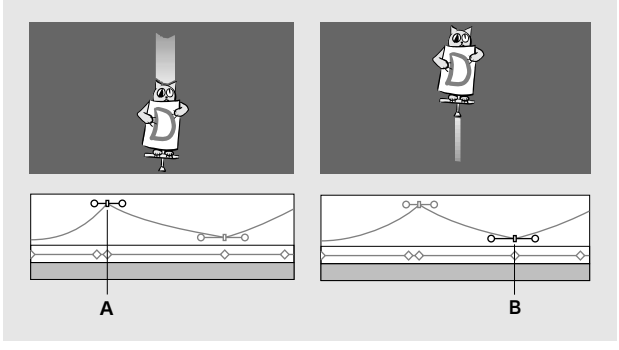
Value difference The difference between the values of adjacent keyframes. A large difference between keyframe values, such as the difference between 75% and 20% opacity, creates a faster rate of change than a smaller difference, such as the difference between 30% and 20% opacity. You can use value differences to adjust the rate of change by increasing or decreasing the value of a layer property at a keyframe.

Interpolation type The type of interpolation applied for a keyframe. For example, it is difficult to make a value change smoothly through a keyframe when the keyframe is set to Linear interpolation; but at any time, you can switch to Bezier interpolation, which supports a smooth change through a keyframe. If you use Bezier interpolation, you can adjust the rate of change even more precisely using ease handles.

Editing the speed graph

To enhance the bounce effect of the pogo stick, you want a quick change at the bounce point, where the character is near the bottom of the screen, and you want a slower, smoother change at the top of the jump.

In the speed graph, a rising line indicates acceleration, an increase in velocity; a falling line indicates deceleration, a decrease in velocity. To change the speed for the pogo stick animation, you want a graph that peaks at the keyframes where the pogo stick is at its lowest point and bottoms out where the pogo stick is at its highest point.



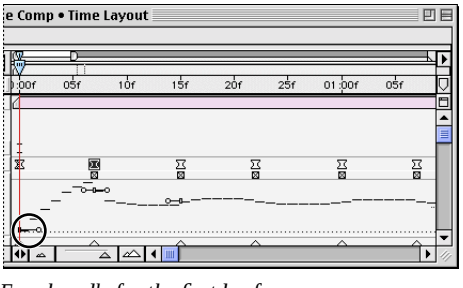
A. *The graph peaks at the keyframe where the pogo stick is at its lowest point and* ***B.*** *bottoms out where the pogo stick is at its highest point.*

The Speed graph reflects the maximum speed of the entire layer at the top of the graph and the minimum speed of the layer at the bottom of the graph. The middle value displayed in the Switches panel reflects the speed at the current-time marker.

1 In the Time Layout window, deselect all the keyframes, and set the current time to 00:00.

Note: *When selecting a keyframe, be sure to click the keyframe icon, not the roving keyframe option directly below it. If you accidentally click the roving keyframe option, choose Edit > Undo to turn the roving keyframe option back off again.*

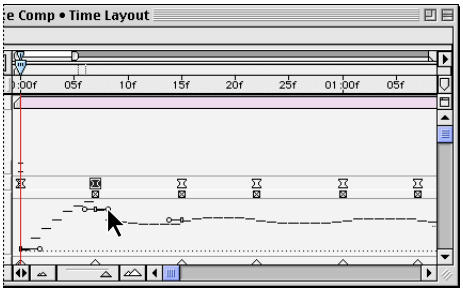
2 Select the Position keyframe at 00:00, when the character is at its highest position, and then drag the small round ease handle down so that the handle is near the bottom of the graph. (Be sure to grab the handle, which is on the right, and not the control point.) Try not to move the handle in or out.



Ease handle for the first keyframe

The current speed, which is displayed in the middle of the Switches panel, should be between 10 and 50 pixels per second.

3 Select the keyframe at 00:07, and drag one of the ease handles up to just under the top of the graph. Note that if you move the handle left or right, the shape of the curve changes. This is called *influence*, and it will be covered in the next part of the lesson.



4 Select the third keyframe, and drag the handle down near the bottom of the graph.

Where the Merged/CatPogo.ai layer is at its lowest point, the graph is at its peak speed; the graph is at its lowest speed when the Merged/CatPogo.ai layer is at its highest point.

5 Select the fourth keyframe, and then drag a handle slightly past the top line. Dragging past the top of the graph changes the range of the graph.

Notice how the graph resets itself. The maximum speed reflects the new range.

6 Press 0 on your numeric keypad to preview the motion.

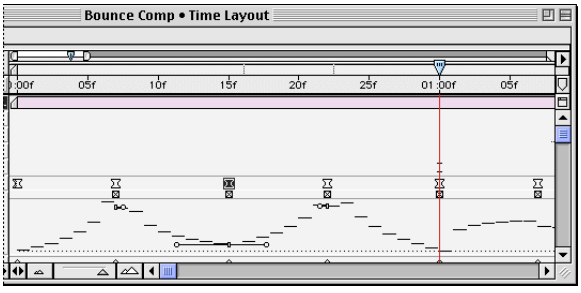
Changing the influence

Not only can you change the acceleration and deceleration by dragging up and down, you can also drag the ease handles left and right to change the *influence* of a keyframe. The influence determines how quickly the speed at the keyframe is reached.

1 To create a sharper change at the peak of the graph, select the keyframe at 00:07, and drag the ease handles in, one at a time.

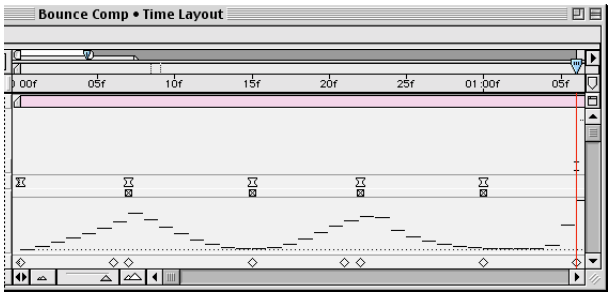
The graph reflects the sharp change of speed at the bounce of the character.

2 To create a more gradual change in speed, select the keyframe at 00:15, and then drag the ease handles out, smoothing the curve at the bottom of the graph, as shown below.



The ease handles represent the incoming and outgoing speeds.

3 Use ease handles to smooth out the bottom curve of the graph and to create a sharp peak at the top.



4 Continue selecting keyframes and changing the Speed graph to reflect the increase in speed as the character bounces up, and the decrease in speed as the character descends from the peak of the bounce.

Don't worry about getting the graph exactly the same as the illustration. The important thing is to get a feel for working with the ease handles.

Make sure to select the keyframe to control the ease handles on both sides.

5 Preview the motion by pressing 0 on your numeric keypad.

Changing the velocity values

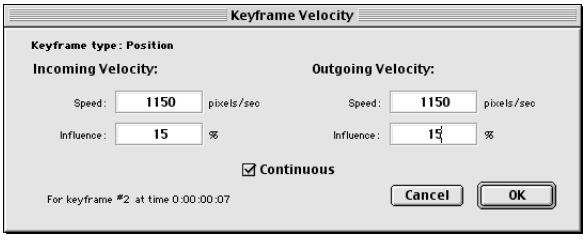
You can change the velocity by entering precise speeds in a dialog box.

1 Select the keyframe at 00:07, and then choose Layer > Keyframe Velocity. Enter a speed of **1150** pixels per second for the incoming velocity.

If the Continuous (Bezier) option is selected, both incoming and outgoing velocities stay the same.

You can also set a percentage of influence. The range of influence between keyframes is one-half the distance to the next keyframe. The higher the percentage of influence, the smoother the acceleration or deceleration. The lower the percentage of influence, the more abrupt the change in speed.

Set the Influence to **15** for both incoming and outgoing, and then click OK.



Adjust the ease handles for the keyframes at 00:22 and 01:07 so that they are near the top of the graph, and make any final adjustments to the other keyframes.

2 Drag the viewing-area markers out to display the entire time ruler.

3 Click the triangle next to Position to collapse the Speed graph.

Copying and pasting multiple keyframes

To repeat the bounce motion for the rest of the composition, you'll copy and paste multiple keyframes and edit the keyframes.

1 Drag a marquee to select all the Position and Scale keyframes that you have set so far, and then choose Edit > Copy.

2 Set the current time to 02:00, and paste.

3 Set the current time to 04:00, and paste.

4 Adjust the work area, and press 0 on the numeric keypad to preview the motion.

Editing the keyframes

To create the effect of bouncing less and less, change the squash amount and position of some of the keyframes.

1 Double-click the Scale keyframe at 04:07 to display the Scale dialog box, and then set the height of the Scale value to **13**, and click OK.

2 Use the following table to set the Height values for the rest of the Scale keyframes.

04:22	15
05:07	17
05:22	18

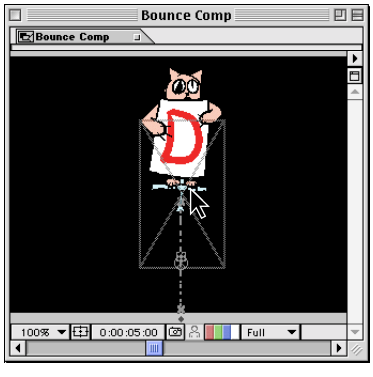
As a finishing touch, you will drag the Merged/CatPogo.ai layer down slightly so that the cat doesn't jump as high at the end of the composition.

3 Select the Position keyframe at 05:00, where the cat is at the top of the bounce.

You may need to adjust the viewing-area markers to see the area of the time ruler that you want to see.

To quickly find a keyframe at a specific time, move the current-time marker to that time; the marker will then be on top of the keyframe.

4 Shift-drag the layer down to about the middle of the frame so that the cat is bouncing only half as high.



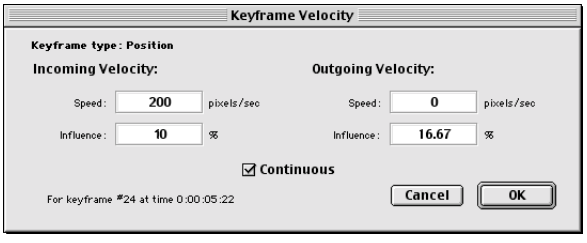
5 Set the current time to 05:15, and then drag the layer down to the middle of the frame.

Later, you'll adjust the top speed so it gets slower and slower.

6 Select the Position keyframe at 04:22, and choose Layer > Keyframe Velocity. Set the speed for Incoming Velocity to **700** pixels per second. Leave the Influence as is, and click OK.

7 Select the Position keyframe at 05:07, choose Layer > Keyframe Velocity, and set the speed for Incoming Velocity to **400**. Leave the Influence as is, and click OK.

8 Finally, select the Position keyframe at 05:22, choose Layer > Keyframe Velocity, and set the speed for Incoming Velocity to **200**. Click OK.



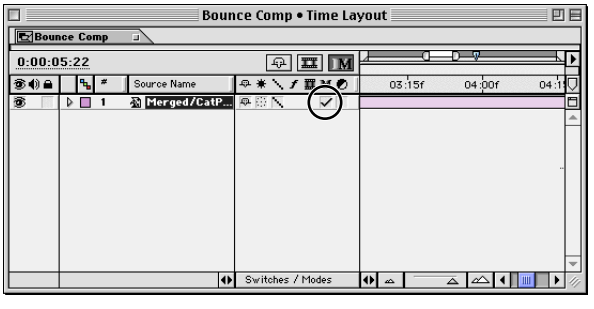
Finishing the Bounce Comp

In the final 4 seconds of the composition, the cat character is just slightly bouncing. You'll copy and paste the keyframes that start at 05:00.

1 To fill the rest of the composition with Position and Scale keyframes, select the four Position and six Scale keyframes starting at 05:00, and choose Edit > Copy.

2 Paste these keyframes at 06:00, 07:00, 08:00, and 09:00.

3 In the Switches panel, select the Motion Blur switch (under M) for the Merged/CatPogo.ai layer. You'll enable and set up Motion Blur later in this lesson.



Motion Blur switch

4 Return to the beginning of the composition, set the work area, preview the composition one last time. Collapse the outline for the Merged/CatPogo.ai layer and then save the project.

Replacing the artwork

As you have seen so far, creating this type of animation can be very time-consuming. It would take hours to create a separate animation for each of the letter cats. Luckily, you can use the Bounce composition motion for the rest of the cats by swapping out the Merged/CatPogo.ai artwork.

After duplicating the Bounce Comp four times, you'll replace the original illustration that was used in the Bounce composition with a new illustration for each letter in the word *Kids*. The animation for the word *Network* has already been prepared for you.

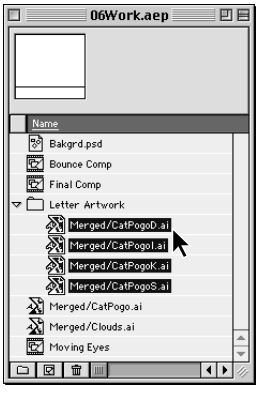
But first, you'll organize your Project window.

1 Click the create folder icon ( ) at the bottom of the Project window. Select the untitled folder, press Enter or Return, name the folder **Letter Artwork**, and then press Enter or Return again.

2 Right-click (Windows) or Control-click (Mac OS) in the Project window and choose Import > Footage Files.

3 Open the LetrCats folder in the 06Lesson folder, and then select and open the following files: Merged/CatPogoK.ai, Merged/CatPogoI.ai, and Merged/CatPogoS.ai. As a dialog box opens for each layer, click OK to choose Merged Layers. Click Done.

4 Drag all the new files into the Letter Artwork folder in the Project window. Close the LetrCats folder.



5 In the Project window, click the create folder icon ( ), press Enter or Return, name the new folder **Bounce Comps**, and press Enter or Return again.

6 Drag the Bounce Comp composition into the Bounce Comps folder.

7 Click the triangle next to the Bounce Comps folder to open it.

8 Select Bounce Comp in the Bounce Comps folder in the Project window, choose Edit > Duplicate, and then duplicate the Bounce composition two more times, for a total of four compositions.

9 Select any one of the Bounce Comp items, press Enter or Return, name the new composition **D/Bounce**, and press Enter or Return again.

10 Select each Bounce Comp and name each by using one of the following letters: K, I, or S, resulting in four compositions—K/Bounce, I/Bounce, D/Bounce, and S/Bounce.

You now have four identical compositions with new names.

Switching out the artwork

Next, you'll replace the original Merged/CatPogo.ai artwork with new letter illustrations.

1 In the Project window, double-click the K/Bounce composition to open its Time Layout window and Composition window, and then select the Merged/CatPogo.ai layer.

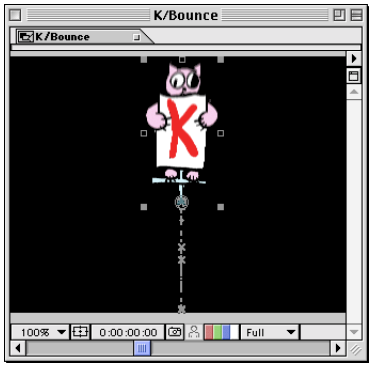
Because you'll be using some long filenames, you'll need to expand the Name field in the Project window and the Source Name in the Time Layout window.

2 In the Project window, drag the right edge of the Name heading to the right so that none of the filenames below it are cut off.

3 In the same way, expand the Source Name heading in the Time Layout window.

4 In the Project window, open the Letter Artwork folder and select Merged/CatPogoK.ai.

5 Hold down the Alt key (Windows) or Option key (Mac OS) and drag the Merged/CatPogoK.ai item into the Composition window (or Time Layout window).



The new art replaces the original, but all the properties and motion remain the same.

Note: *If you do not select the layer in the Time Layout window before dragging the footage item from the Project window, you will add the layer into the composition, instead of replacing the original file.*

6 Press Alt (Windows) or Option (Mac OS) and click the close box of the current Time Layout window or Composition window to close all the windows associated with the K/Bounce composition.

7 Double-click the I/Bounce composition to open its Time Layout window, and then select the Merged/CatPogo.ai layer.

8 Activate the Project window, and select Merged/CatPogoI.ai.

9 Alt-drag (Windows) or Option-drag (Mac OS) the Merged/CatPogoI.ai item into the Composition window (or Time Layout window).

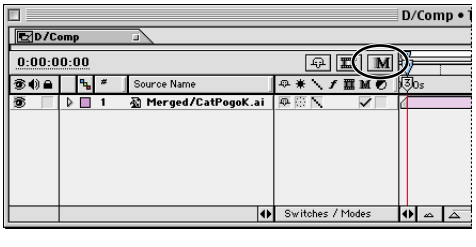
10 Close all the windows associated with the I/Bounce composition.

11 Repeat steps 7 through 10 for the S/Bounce composition. (The D/Bounce composition already contains the D letter cat.) Save the project.

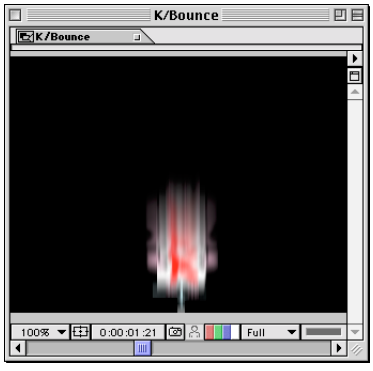
Enabling Motion Blur

Motion Blur allows layer motion to appear smoother and more realistic. When you view one frame of film or video, motion in the frame is often blurred. This is because a frame represents a sample of time, and in that time, a moving object is traveling across the frame so it cannot be shown as a sharp still object. The speed of a moving object affects how blurred it appears in each frame. Another factor in the degree of blur is the shutter angle of a motion-picture or video camera, which determines the effective exposure time of each frame. Without Motion Blur, a layer animation may produce a strobe-like effect of distinct steps. For more information on Motion Blur, see the After Effects User Guide.

1 Open any one of the letter comps, and select the Enable Motion Blur button.



2 Click the Play button on the Time Controls palette to preview the effect of the Motion Blur.



You can adjust the intensity of Motion Blur by setting the Shutter Angle preference.

3 Choose File > Preferences > General, set Shutter Angle to **90**, and then click OK.

The shutter angle is measured in degrees, simulating the exposure of a rotating shutter.

4 Play a few seconds of the composition. Notice that the Motion Blur effect is reduced with a smaller shutter angle setting.

5 Before going on with the lesson, deselect the Enable Motion Blur button, because Motion Blur can slow down screen redraw and affect performance. You can enable Motion Blur in the Render Queue when you are ready to render the movie.

6 Save the project.

Creating side-to-side motion

To add more interest and movement to the pogo stick animation, you will nest one of the Bounce compositions inside a new composition set with side-to-side motion. This motion is created by using the Rotate and Position properties.

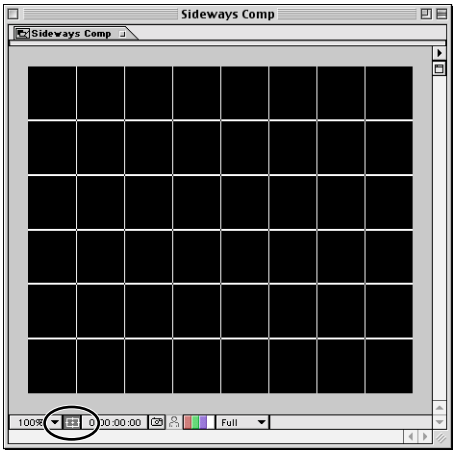
1 Create a new composition, type **Sideways Comp** for the name, set the Frame Size to **400** x **340**, the Frame Rate to **30** fps, and the Duration to **15:00**.

2 Drag the D/Bounce composition from the Project window into the Time Layout window.

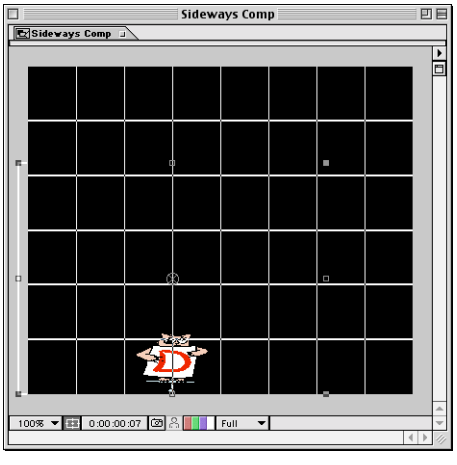
You will set Position keyframes and animate the left-right motion so it moves a larger distance at first and gradually moves back and forth less and less until it stops at 3 seconds. You'll set keyframes every 15 frames, which ensures that each keyframe corresponds to when the pogo stick is in the down position.

First, you'll display a proportional grid in the Composition window as an aid in positioning the layer.

3 Press Alt (Windows) or Option (Mac OS) and click the safe-zones icon at the bottom of the Composition window.



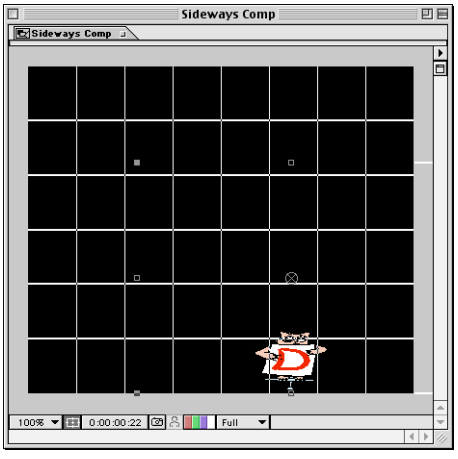
4 Set the current time to 00:07, and position the cat illustration centered at the third vertical grid line and aligned with the bottom of the screen. (The position coordinates for the layer, displayed at the bottom of the Info palette, are approximately 150, 220.)



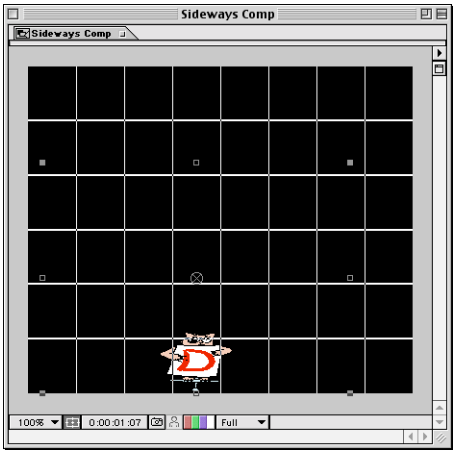
5 In the Time Layout window, set an initial Position keyframe.

You will now position the layer left or right of the center position, without changing the vertical position. To make this easier, you'll use a keyboard shortcut again to constrain movement, this time to the horizontal axis.

6 Move the current-time marker to 00:22. Start dragging horizontally, press and hold Shift, and then drag the illustration to the right between the fifth and sixth vertical lines on the grid. (Position coordinates are approximately 273, 220.)



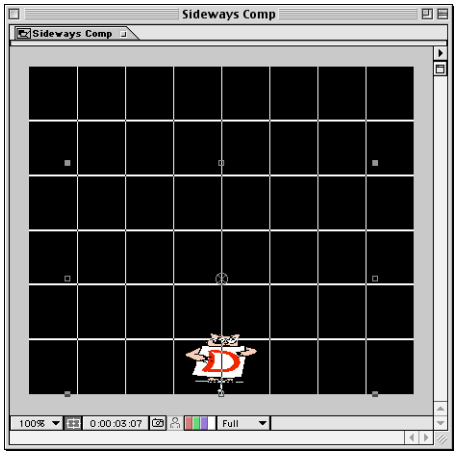
7 Move the current-time marker to 01:07. Start dragging horizontally, press and hold Shift, and then drag the illustration to the left between the third and fourth vertical lines on the grid (approximately 175, 220).



8 Move to 1:22. Start dragging horizontally, press and hold Shift, and then position the layer on top of the fifth vertical line (approximately 250, 220).

9 In the Time Layout window, select the keyframes at 01:07 and 01:22, copy them, and then move to frame 2:07, and paste.

10 Move to 3:07, and position the layer on the center line of the grid (approximately 200, 220).



11 Save the project. In the Time Layout window, drag the right work-area marker in to 04:00 seconds, and press Alt-0 (Windows) or Option-0 (Mac OS) to preview. Since this is a nested composition, you won't see the alpha outlines—you'll see a rectangular shape instead.

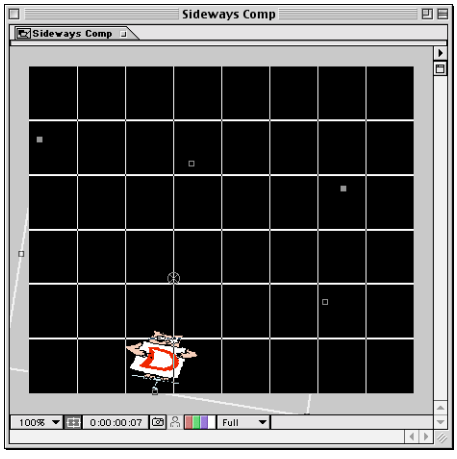
12 Select the Motion Blur switch for the layer, but do not select the Enable Motion Blur button above it.

Creating the swinging rotation

Now set up the rotation motion in the same composition.

1 In the Time Layout window, make sure that the outline is collapsed so that the transform properties are not displayed.

2 Move the current-time marker to 00:07, press R to display the Rotation property, set an initial Rotation keyframe, and then set the Rotation value to **9** degrees.



3 Move the current-time marker to 00:22, and set the Rotation to **–11**.

4 Continue moving the time marker and use the following table to enter Rotation values. Since there are keyframes already set up for the Position property, you can use the keyframe navigator or press the K key to move from keyframe to keyframe.

01:07	7°
01:22	-8°
02:07	4°
02:22	-9°
03:07	0°

5 Turn off the proportional grid by pressing Alt (Windows) or Option (Mac OS) and clicking the safe-zones icon in the Composition window.

6 Collapse the outline in the Time Layout window and save the project.

7 Preview the motion, and then close the Composition window and the Time Layout window.

Nesting the Bounce composition into the Sideways composition

Now you will exchange the letter comps with respective sideways comps. You'll end up with comps called K/Side, I/Side, D/Side, and S/Side.

1 In the Project window, click the create folder icon (🗀), name the new folder **Side Comps**, and then drag the Sideways composition into the new folder, and click the triangle to expand the folder.

2 Select the Sideways composition in the Project window, and choose Edit > Duplicate.

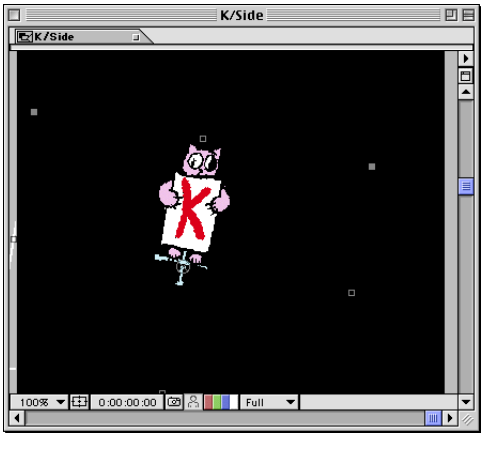
3 Duplicate two more times, until you have four Sideways compositions, one for each letter in *KIDS*.

4 Rename each of the four Sideways comps K/Side, I/Side, D/Side, and S/Side, respectively.

You will exchange the artwork with the appropriate letter composition, just as you did when creating the Bounce comps.

5 Open the K/Side composition, and in the Time Layout window, select the D/Bounce layer. In the Project window, open the Bounce Comps folder and select the K/Bounce composition.

6 Hold down the Alt key (Windows) or Option key (Mac OS) and drag the K/Bounce composition into the K/Side Composition window (or Time Layout window).



The new art replaces the original, but all the motion remains the same.

7 Close the K/Side Composition window and Time Layout window.

8 Open the I/Side composition, and in the Time Layout window, select the D/Bounce layer. In the Bounce Comps folder, select the I/Bounce composition.

9 Hold down the Alt key (Windows) or Option key (Mac OS) and drag the I/Bounce composition into the I/Side Composition window (or Time Layout window).

10 Close the I/Side Composition window and Time Layout window.

11 Repeat steps 8 through 10 to create the S/Side composition.

12 Save the project.

Staggering the animation

In this section, you will assemble the Side comps into the final composition, staggering the animated letters so they begin at different times and enter the frame from different angles.

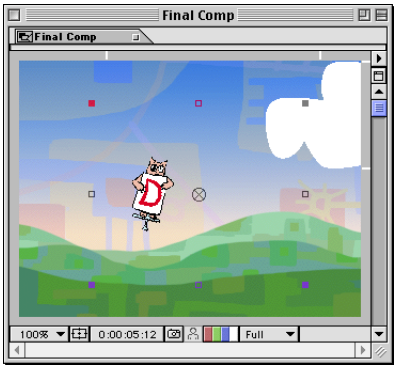
1 Double-click Final Comp in the Project window, and set the current time to 05:12.

2 Drag the Side Comps folder from the Project window into the Time Layout window. All the layers are stacked on top of each other in the Composition window, so you will see only the top layer until you move them.

Now you'll set scale and position keyframes for the layers you just added to Final Comp.

3 Make sure all the Side layers are selected in the Time Layout window, and press the S key to display the Scale property.

4 Click the Scale value for any one of the layers, enter **50** for Scale, and click OK.



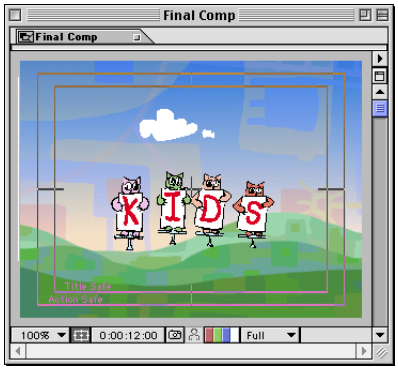
5 Press the P key to display the Position property, and then move the current-time marker to 12:00.

6 In the Composition window, click the safe-zones icon to show the action-safe and title-safe zones. Make sure to place the letters within the action-safe zone.

If you have a small monitor, reduce the Magnification to 50%. This will ensure that the letters stay in the composition.

7 Deselect all the layers, and then select the K/Side composition layer in the Time Layout window.

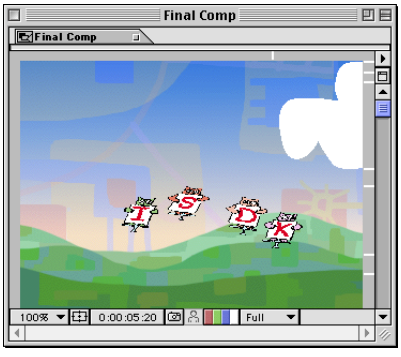
8 In the Composition window, start with the K/Side composition, and move the four Side comps to the positions where you want them to end up. Use the last frame of the final movie as a reference.



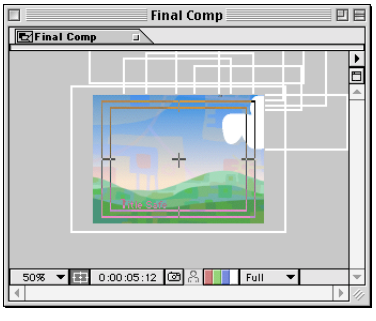
It's easier to select a layer in the Time Layout window and then move it in the Composition window.

9 In the Time Layout window, set Position keyframes for all the layers so that each has a fixed keyframe at 12:00, representing its final position.

10 In the Composition window, move the current-time marker to 5:20, which is where each character will first land. Position all the characters in slightly different positions from their ending positions. In this way, they will move around between this point and the end point.



11 In the Time Layout window, move the current-time marker to 05:12, and then deselect all the layers. In the Composition window, position each individual character outside of the frame (you may need to change the magnification) so that each appears to jump in from a different area.



Make sure that you have Position keyframes set for all four layers.

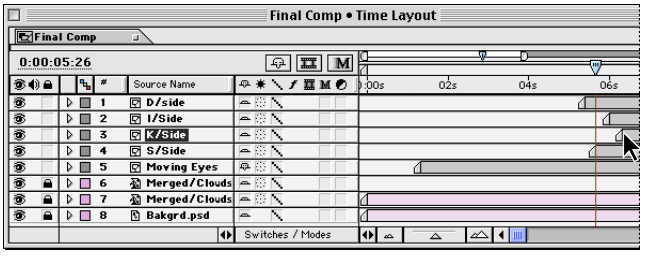
Staggering the In points

The D/Side composition starts seven frames after the big cat in the beginning jumps out of the frame. It should land and bounce twice before any of the other pogo jumpers appear.

1 Leave the D/Side composition In point positioned at 05:12, and then set the current time to 05:26.

2 Drag the I/Side layer duration bar so that it starts at 05:26. Be sure to drag inside the duration bar, not on the In- or Out-point handles.

3 Stagger the other letters by dragging the layer duration bars in the Time Layout window. Make sure that all the letters compositions (except for the D/Side composition) start after frame 05:26.



4 Set the current time to 12:00, and then align all the last keyframes at 12:00 so that the letters line up properly. (Drag a keyframe close to the current-time marker, and then press the Shift key to snap the keyframe into position at 12:00.)

5 Save the project. You may want to create a draft movie to preview your work.

Importing a movie

To complete the pogo stick cat animation, you will import a movie in which the animation for the rest of the letters (*Network*) has been created for you.

1 Activate the Project window and right-click (Windows) or Control-click (Mac OS) in an open area of the Project window. Choose Import > Footage File, and select NetCat.mov in the 06Lesson folder.

2 Position the current-time marker at 05:00, and then drag the NetCat.mov footage file into the Final Comp Time Layout window.

The NetCat.mov footage was created by setting up compositions like the compositions you just created. The final composition was rendered with an alpha channel that makes the background transparent, allowing you to superimpose the QuickTime movie in the current composition.

3 Save the project.

Editing a motion path

Finally, you will place the blimp image and edit the motion path in the Composition window.

1 Activate the Project window and right-click (Windows) or Control-click (Mac OS) in an open area of the Project window. Choose Import > Footage File, and select the Blimp.ai file in the 06Lesson folder. In the Blimp.ai dialog box, leave Merged Layers selected and click OK.

2 Set the current-time marker to 08:08, and then drag the Merged/Blimp.ai footage item into the Final Comp window.

3 With the Merged/Blimp.ai layer selected in the Time Layout window, set the Scale to **20**.

4 In the Composition window, position the blimp off the left side of the screen, with the top of the graphic even with the top of the action-safe zone.

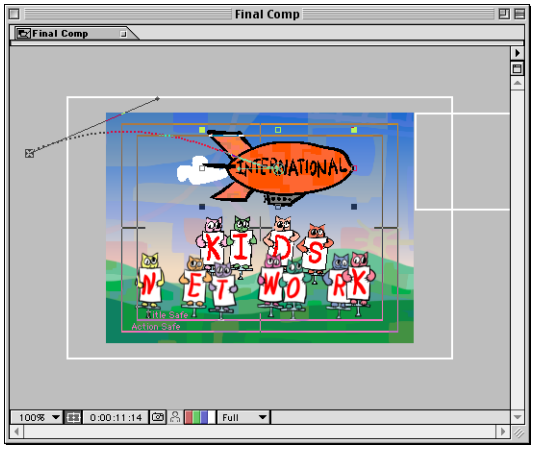
5 Set an initial Position keyframe in the Time Layout window.

6 Move the current-time marker to 11:14 and in the Composition window, position the blimp near the center of the screen. Another position keyframe is created.

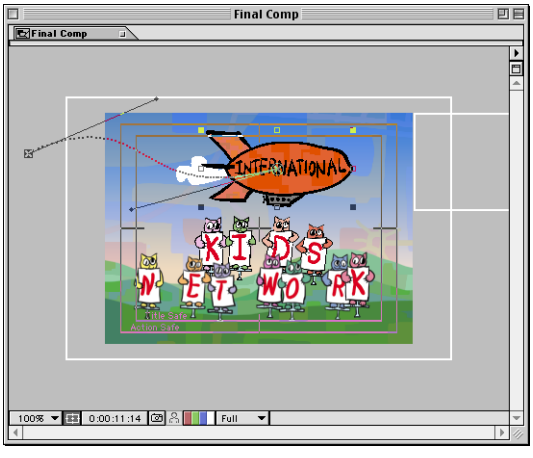
You'll edit the movement by using Bezier curves, making the blimp appear to float down into the position.

7 If necessary, choose 50% from the Magnification menu so you can see the whole motion path.

8 Locate the direction handle for the first motion keyframe and drag it up to create a gently rising curve (as shown in the following illustration).



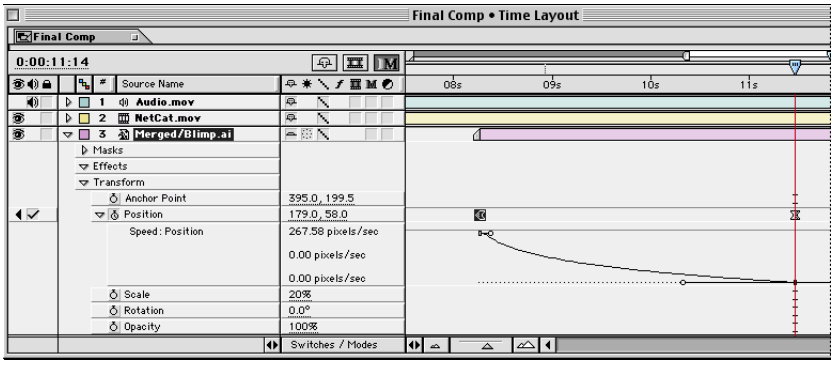
9 Now drag the direction handle for the final motion keyframe down to create a backward S curve.



10 If the current-time marker is not at 11:14 in the Time Layout window, move it there, and then select the Position keyframe at that time.

11 Choose Layer > Keyframe Interpolation, and choose Continuous Bezier from the Temporal Interpolation menu. Click OK.

12 In the Time Layout window, expand the Position outline for the Merged/Blimp.ai layer and drag the ease handles to create a smooth downward motion from the first keyframe to the second. This alters the velocity, so the blimp appears to gradually slow to a stop.



13 Click the triangle to collapse the Speed graph.

14 Save the project.

Importing the sound

The audio for the project consists of a combination of "boing" sounds created with a jew's-harp, plus giggles, and a cat's meow sound effect. Since the focus of this lesson is animation, you will import the completed sound track as a finishing touch.

1 Activate the Project window and right-click (Windows) or Control-click (Mac OS) in an open area of the Project window. Choose Import > Footage File, select the Audio.mov file, and click Open.

2 Set the current time to 00:00, and then drag the audio item from the Project window into the Final Comp window.

3 Save the project.

Rendering the final project

You have finished the animation and are now ready to render the final project.

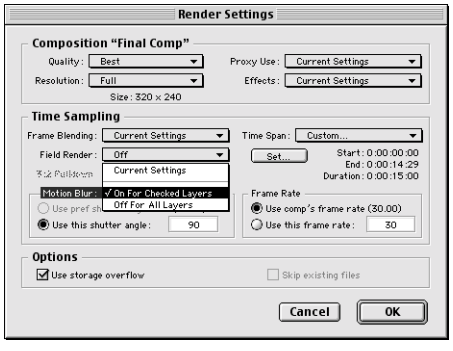
1 Close all windows except the Final Comp and Project windows.

Select Final Comp in the Project window. Choose Composition > Make Movie, type **06Movie.mov** for the name, and save it in your Projects folder.

2 In the Render Queue window, choose Custom for Render Settings.

3 Make sure the Quality is set to Best and the Resolution is set to Full.

If you prefer, render a draft movie.



4 For Motion Blur, choose On For Checked Layers. This will render the movie with the Motion Blur that you specified for the Merged/CatPogo.ai character.

5 For Time Span, choose Length of Comp. Leave all other settings at their defaults, and then click OK.

6 For Output Module, choose Custom. For Format, choose QuickTime Movie.

Note: *In a Mac OS, QuickTime Movie is the default format.*

7 In Windows, the QuickTime settings dialog box appears. Leave Compressor set to Animation, and click OK. In Mac OS, leave the Video Output options at their defaults.

8 Select Import into Project When Done.

9 Select Audio Output to include audio in the movie, and then choose 22.050 KHz for the sample rate, 8-bit for the sample depth, and mono for the playback format, and click OK.

10 Click Render.

11 When you are finished rendering the movie, open the footage file that appears in your Project window and play the movie.

12 After watching the movie, exit from After Effects.

Congratulations! Cats off to you! Completing this project is quite an achievement.