Interpolation Methods

The keyframe interpolation method determines how a property will change over time. In other words, the type of visual playback a property has (smooth flow, hold-then-change, move with a bouncy feel, ease in and out of changes, etc.) is dictated by the interpolation method. The interpolation method may be assigned to a keyframe or group of keyframes for any property that allows keyframes to be created.

There are two types of interpolation and a keyframeable property may be affected by one or both:

- **Temporal Interpolation** - between keyframe values for all properties over time
- **Spatial Interpolation** - between keyframe values for layer properties that involve movement (Position, Anchor Point, Effect Point), affecting the shape of a motion path

The motion path created when keyframing a Layer's Position attribute visually demonstrates both temporal interpolation and spatial interpolation. Manipulating the Position property of a layer is a good place to start learning how interpolation methods work. The dots that make up the line between points (or keyframes) on a motion path represent the temporal interpolation. The shape of the line along the motion path represents the spatial interpolation. (See image on next page.)

Within these two interpolation methods, various combinations of linear and/or bezier interpolation may be assigned. The following is a brief summary of the results of interpolation setting:

- Position Temporal Interpolation set to "Linear" = consistent speed (dots evenly spaced along Motion Path)
- Position Spatial Interpolation set to "Linear" = dots make a straight line from point to point
- Position Temporal Interpolation set to "Bezier" = acceleration or deceleration in speed (dots along Motion Path are not spaced evenly; dots closer together indicating slower speed and dots further apart indicating faster speed)
- Position Spatial Interpolation set to "Bezier" = dots make a curved line from point to point (may be smooth point or corner point)
- Position Temporal Interpolation set to "Hold" = no change until next keyframe (no dots from point to point)

*AE 5.5 Tip of the Day #21 discusses keyframe interpolation relative to the Motion Path created by animating a layer's position values.*
Choosing the right **Interpolation** is often best found by experimentation. With at least three keyframes, usually the best method can be determined (position is used in this example).

- **No Interpolation** - Default setting, with no keyframes present (the stopwatch is turned off). Setting value maintained throughout layer’s duration.

- **Linear Interpolation** - Causes the parameter to change at a uniform rate. Seen as straight visible lines in the motion path between each keyframe.

- **Auto Bezier Interpolation** - Creates a smooth rate of change through a keyframe based on the prior and next keyframe. If the direction points of the keyframe are adjusted manually, a "Continuous Bezier" is created.

- **Continuous Bezier Interpolation** - Similar to Auto Bezier in that a smooth rate of change is created, but this is adjusted by the user (behaves like a smooth point on a path in Illustrator in that the direction point—or handles—adjust together). After Effects creates a smooth transition by ensuring equal incoming and out going velocities.

- **Bezier Interpolation** - Shape of keyframe manually adjusted on both sides of the keyframe (most precise control, behaves like corner point on a path in Illustrator in that the direction points adjust independently of each other).

- **Hold Interpolation** - Changes property of layer over time without the gradual transition from keyframe to keyframe, creating an abrupt transition at keyframes.

**To change the interpolation method for a keyframe:**
1. Select the keyframe(s) you want to change from the Time Layout window.
2. Choose *Keyframe Interpolation...* (command option K, Mac, control alt K, Windows) from the *Animation* pulldown menu.
3. Select temporal and spatial setting from the pop-up menus.

"Rove Across Time" smooths the rate of change through the selected keyframes by automatically varying their position in time, based on the positions of then keyframes immediately before and after the selection.

"Lock to Time" keeps the selected keyframes at their current position in time (you would have to move them manually).
To quickly change the interpolation method, position the Pointer tool from the Tools Palette (V) over the keyframe to be changed in the Composition window and either control click, Mac or right click, Windows. This this reveals a pop-up menu allowing access to most keyframe interpolation options.

To mix interpolation methods:
1. Choose the keyframe to be changed from the Time Layout window.
2. Choose Keyframe Interpolation... from the Animation pulldown menu.
3. Change the method.
4. Fine tune the motion path in the Composition window.

To set the default Spatial Interpolation method to Linear:
1. Choose Edit > Preferences > General from the Edit pulldown menu.
2. Check the "Default Spatial Interpolation to Linear" option.
3. Click OK.

The most visible result of enabling this default will be in your motion paths as you keyframe a layer’s position attribute: your artwork will move from keyframe to keyframe along a direct line rather than a curved line. When this setting is off (unchecked), your artwork will move from keyframe to keyframe along a curved line based on the relative positions of the keyframes (in other words, Spatial Interpolation defaults to Auto Bezier Interpolation).

Markers

Composition–Time Markers - Use to mark points on the time ruler. Click and drag to add markers on the time ruler. Drag back to remove.

Layer–Time Markers - Use any number of time-markers per layer to mark important frames on layer.

To add a layer–time marker:
1. Select the layer.
2. Move the Current-Time Marker to the frame where you want to add one layer-time marker.
3. Choose Layer > Add Marker.

To name a layer-marker:
1. Double-click the layer-time marker (When renaming, be certain to double-click the marker, not the marker’s name.)
2. Enter a name, and then click OK.

To move a layer-time marker to a new time:
Drag the layer-time marker.

To remove a layer-time marker:
Press Command (Mac) as you click the layer-time marker.