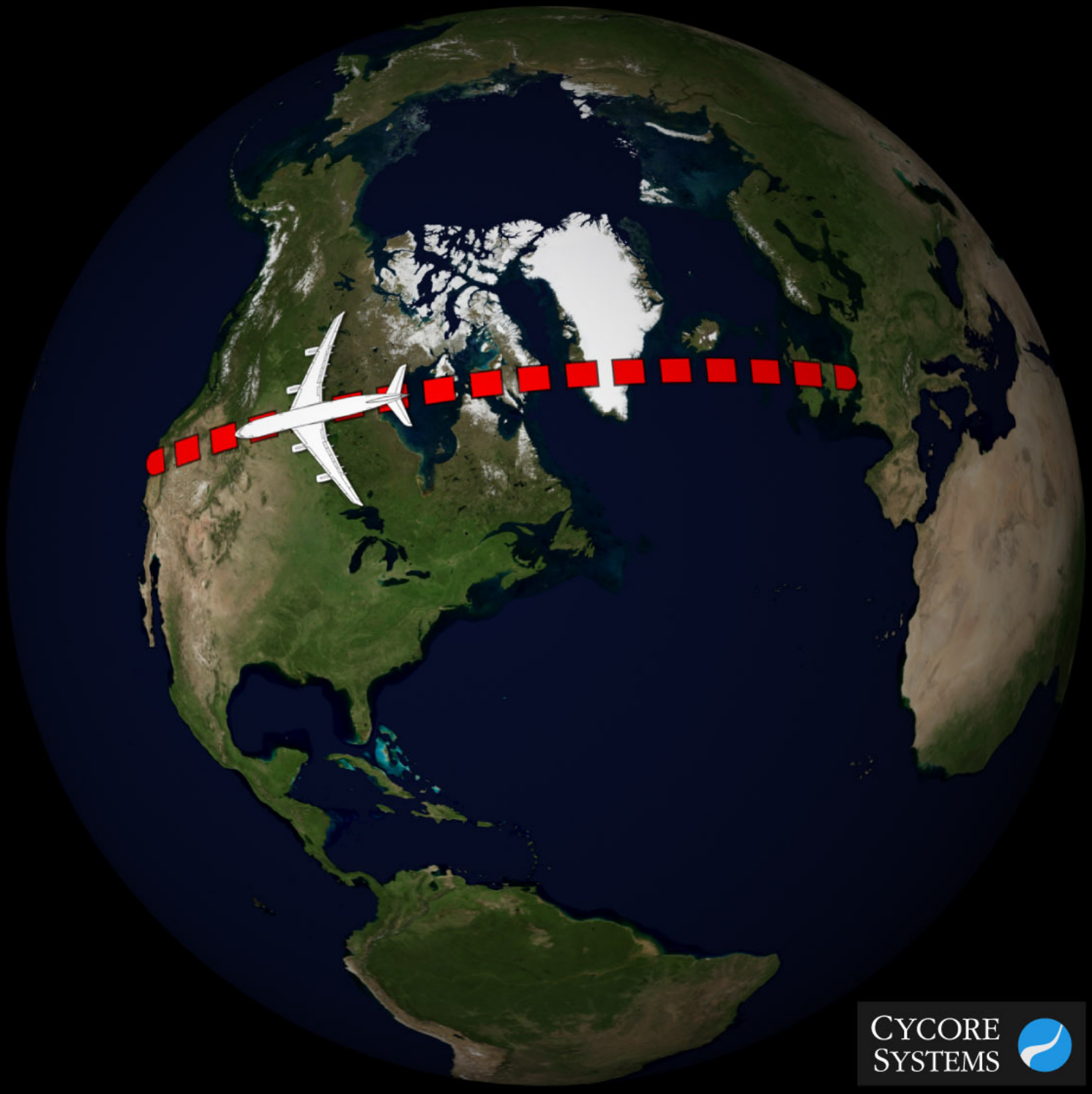
CycoreFX

Manual

Sphere Utilities



CYCORE SYSTEMS

Contents

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Sphere Utilities Introduction

Sphere Utilities is a set of plug-ins intended to be used to create, edit and animate spherical maps. A common example of a spherical map is a rectangular earth map used in computer graphics to texture a sphere to produce a terrestrial globe. Spherical maps created using Sphere Utilities can be used directly in After Effects with CC Sphere, or any other plug-in that supports spherical mapping, or as textures in your favorite 3D application. Spherical maps are also used as environment maps and for panoramic viewers, which are other sources where this kind of capability is important.

• **MapLine** is used to draw or animate lines on spherical maps.

• **Mappit** is used to place or animate any user-selected layer on spherical maps.

• **Remap** provides a unique ability to realign the coordinate system of spherical maps.

• **MapDots** generates a pattern of evenly distributed dots on a spherical map.

We have chosen to use “overview” sections in this manual to describe several controls in more detail and include graphics to further support written text where we thought it helpful. The reason behind this is that some of these controls are common for many of the control groups and we didn’t want to repeat text/graphics throughout the manual which instead would cause clutter, making it more difficult to get to control groups and individual controls, especially when you have learned how the plug-ins work and just need a quick “refresh” of which controls did what in a control group. There are also cases where we moved controls to an overview section because sometimes “a picture says more than a thousand words”.

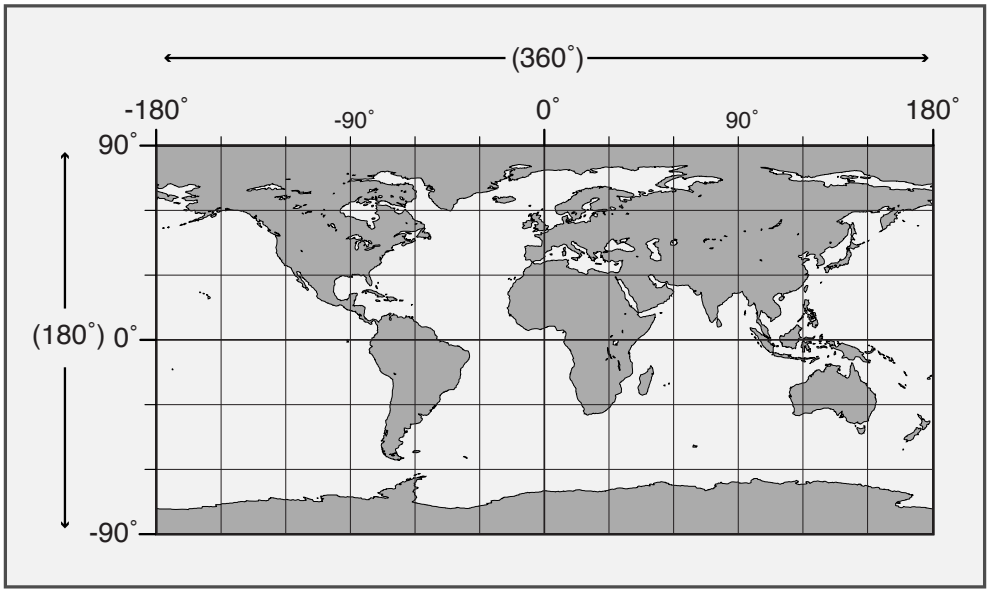
We strongly recommend that you download the available sample projects from our website and use as a companion to this manual.

If you feel that some part of this manual is incorrect or fails to explain a function or control properly, please send your feedback or ideas to us at: feedback@cycorefx.com.

We appreciate your opinions! (As long as they fall in line with ours)

:Spherical Map Overview:

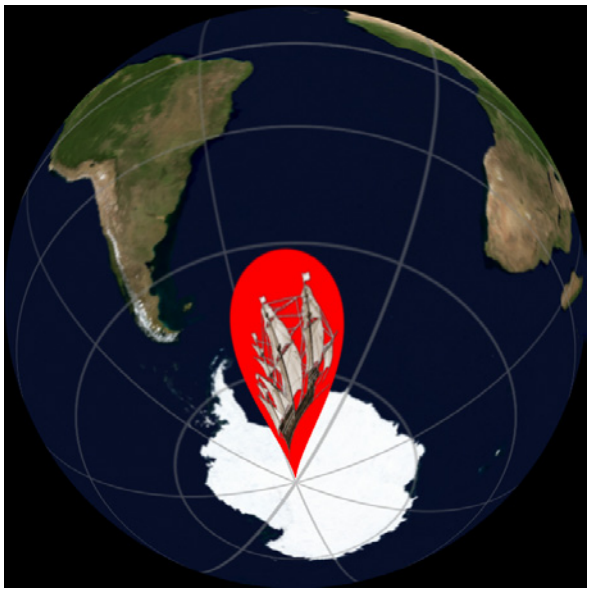
What is a spherical map? To make it a bit more complicated, at least the pronunciation, the correct name is equirectangular map but as we like to keep things simple we stick to calling it spherical map. A spherical map cover 360 degrees horizontally and 180 degrees vertically. To achieve even resolution it is important to try to maintain a 2:1 aspect of spherical maps, e.g., 4000 x 2000 pixels or 2048 x 1024 pixels and so on.



A spherical map.

Spherical maps use an angular coordinate system which is quite different from the “normal” cartesian coordinate system that we are used to in our everyday lives and graphics design. The advantages of using this angular coordinate system is the trivial connection between an image pixel and its geographic position. This connection makes processing of spherical maps in computer applications very fast and precise and has therefor become a de-facto standard for what is also called thematic mapping.

As spherical maps are rectangular and appear to be normal 2D images it is easy to think that it should be possible to edit them using traditional tools. This is not possible because angular and cartesian coordinate systems are in fact quite different. For example, positioning a ship at the South Pole in an image editing program might look fine on the spherical map but when rendered in 3D the ship will look distorted. This can be seen in the pictures below.



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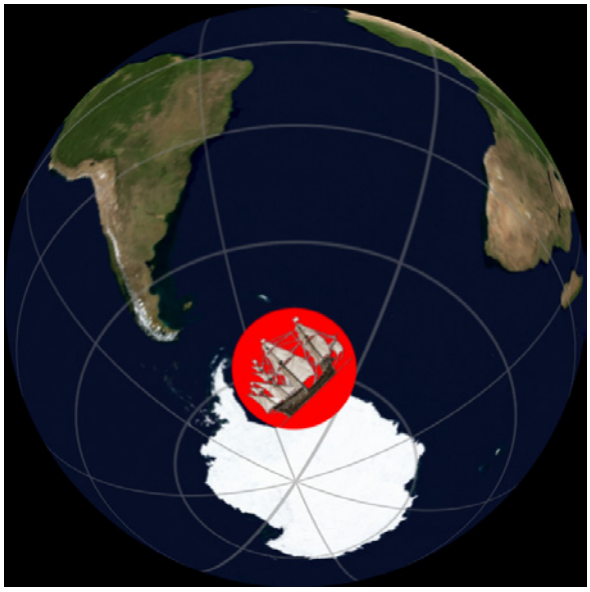
To get a correct looking non-distorted result when rendered in 3D the ship has to be positioned using the angular coordinate system which is shown in the pictures below.



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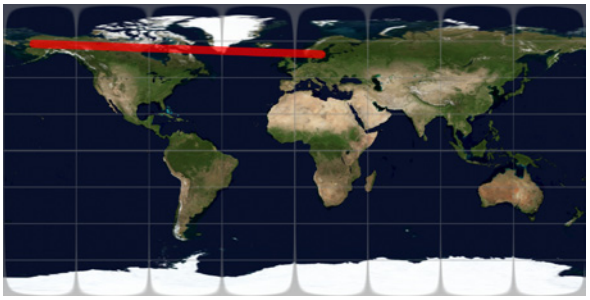
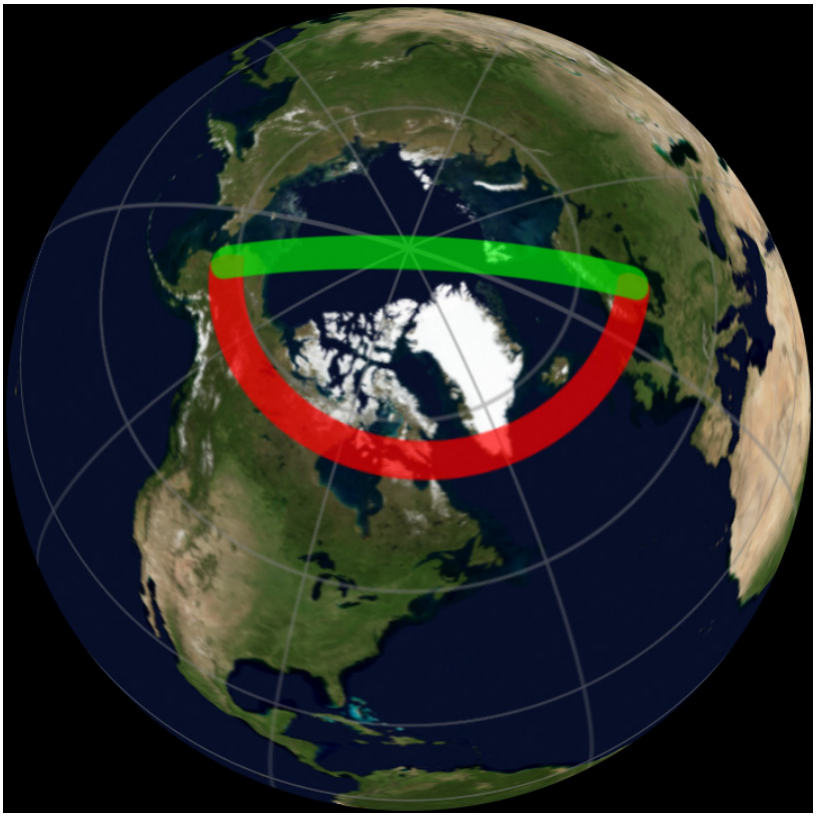
The same problem applies when animating an object, or drawing a line, between to positions on a spherical map. A real straight line between two points on a sphere will not look straight when looking at the spherical map.



Straight line using cartesian coordinates

Straight line using angular coordinates

The picture below shows the result rendered in 3D. The red line is “wrapped” around the sphere between the two points and is not straight, whereas the green line is drawn straight between the two points on the sphere.



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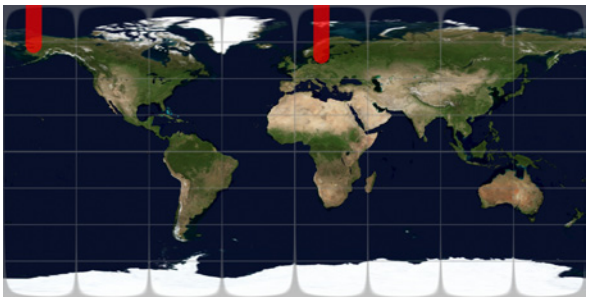
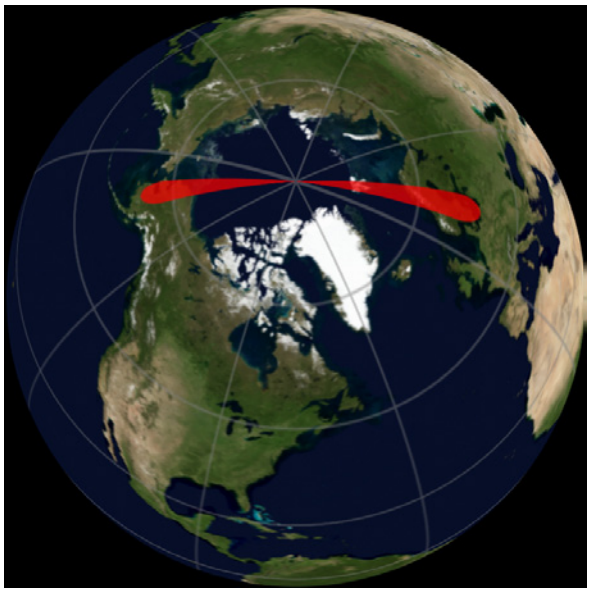
Knowing that the shortest way between Sweden to Alaska is to go over the north pole, you would obviously draw two lines on the spherical map, one going from Sweden to the north pole and one going from Alaska to the north pole, thinking that the line will be rendered correct in 3D but it is not. The line will be correctly positioned but it will be distorted, it will appear thinner at the poles and thicker at Sweden and Alaska. This can be seen in the pictures below.





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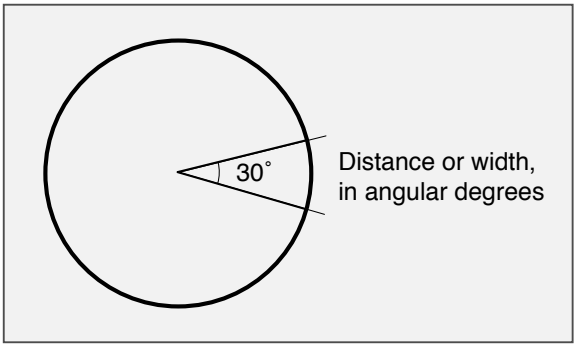
Sphere Utilities is specifically designed to deal with editing and animation in this angular coordinate system while integrated with a powerful image/video editing program.

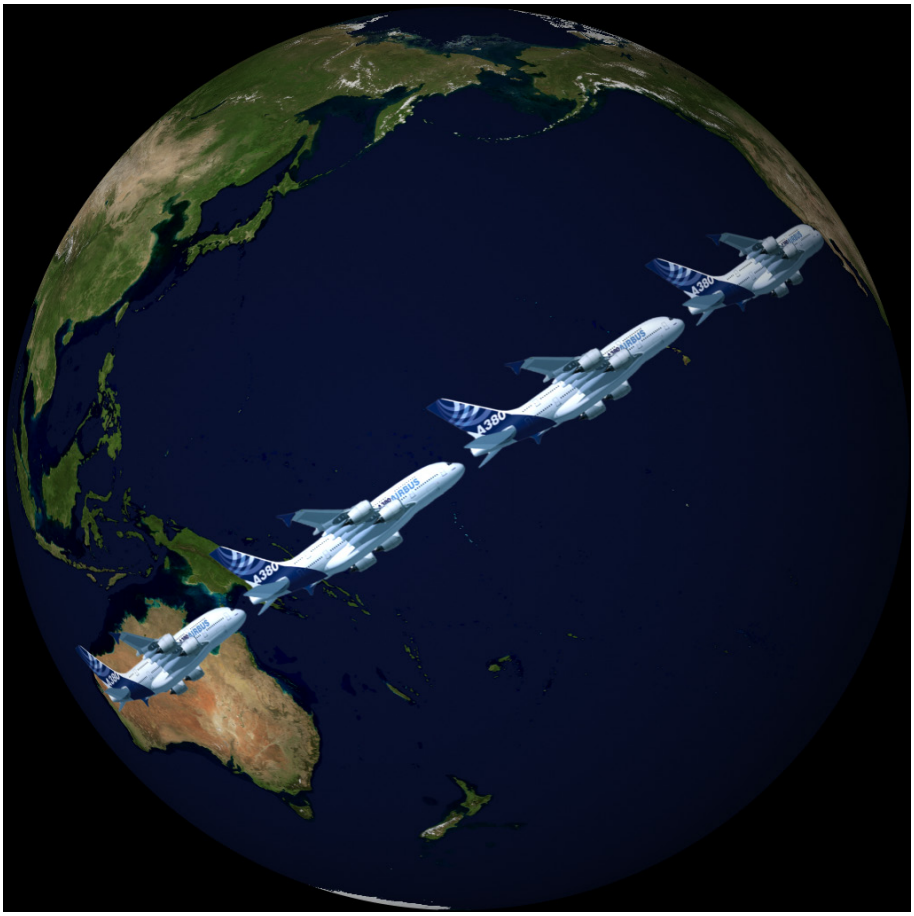
Angular degrees

Specifying size or length in pixels has no real meaning when working with spherical maps since pixels represent a different size depending on their position. For example on a 4000 x 2000 pixels map one degree would be about 11 pixels wide on the equator but it would be 4000 pixels wide on the North pole. This is the reason why we have chosen to specify size and length in degrees instead of pixels. One degree is approximately 111 km or 69 miles on Earths surface (anywhere).



CSU Mappit

This plug-in is used to place or animate any user-selected layer on spherical maps. E.g., animating an airplane flying from Melbourne to LA crossing the date line is a task that currently involves a lot of manual work in After Effects, duplication of the layer and hand-matching the motion, with Mappit this become as easy as moving a logo from left to right. Simply select the layer to use, pick start and end points, set size and animate the Travel property and the rest is done by Mappit. Animations created using Mappit can then be used directly in After Effects with CC Sphere, or any other plug-in that supports spherical mapping, or in your favorite 3D application. You have the option to stretch, tile or solo the selected layer between the start and end points as well as controlling opacity. There is also an option to apply advanced pre-filtering to achieve constant map resolution close to the poles.



Controls

Layer

Use this pop-up menu to select the layer you want to place and animate on the map. Normally, the selected layer should be turned off in the Timeline to not be visible in the composition.

Start Point and End Point

Use these controls to position the start and end points between which the selected layer shall be positioned. To animate the layer between these points use the Travel control (see below).

Layer Placement

Use this pop-up to select how the selected layer should be applied. The available options are:

Stretch

The layer is stretched between Start and End Points.

Tile

The layer is tiled (or repeated) between Start and End Points.

Solo

The layer is “soloed” (one instance) and is initially positioned at the Start Point.

Travel

Use this control to position the selected layer between start and end points. Travel behaves differently depending the selection in the Layer Placement control. The Stretch and Solo options can position the layer beyond Start and End points, whereas Tile is cut off at Start and End Points.

For example: Animating Travel from 0 to 100.

Stretch: The layer travels from Start Point to End Point. (stretched from the Start point to being stretched from end point).

Tile: The tiled layer travels one repetition towards the End Point.

Solo: The layer travels from Start Point to End Point.

Size (Degrees)

Use this control to determine the vertical size (or height) of the selected layer (see reference to angular degrees in Spherical Map Overview).

Spherical Filtering

Check this option to apply advanced pre-filtering to achieve constant map resolution of the selected layer wherever it is places. This is most noticeable close to the poles or when the layer is significantly scaled down.

Note. Using this option increase render time.

Opacity

Use this control to determine the transparency level of the selected layer. At 100%, the layer is completely opaque. At 0%, the layer is completely transparent.

Composite with Original

Check this option to composite the selected layer with the source layer.

CSU MapLine

This plug-in is used to draw or animate lines on spherical maps. E.g., animating a line going from Melbourne to LA crossing the date line is a task that currently involves a lot of manual work, duplication of the layer and hand-matching the motion. With MapLine this couldn't be easier, simply pick the Start and End Points. Control thickness, set color and opacity and MapLine takes care of the rest. To animate, use the Start % and End% controls to "draw" lines between the Start and End points. You can select line cap types and to use dashes. Dashes can be animated using the Phase control.

Controls

Start Point and End Point

Use these controls to position the start and end points for a line. To animate a line drawing from start to end point use the Start % and End % controls (see below).

Color

Use this control to select a line color.

Thickness (Degrees)

Use this control to determine the width of the line (see reference to angular degrees in Spherical Map Overview).

Hardness

Use this control to determine the softness, or feathering, of line edges. 100% produce the hardest edge and 0% the softest edge.

Opacity

Use this control to determine the line transparency.

Start At % and End At %

Use these controls to animate lines being drawn between the Start and End points. Values are a percentage of the distance between the Start and End points. Start At % and End At % values can overlap, i.e., end can be set before start and vise versa. These controls can also be used to define a segment between the Start and End points where a line is drawn.

Line Caps

Use this pop-up to select the cap type for line endings. Choose one of the following options:

Butt Cap

Cut off line at ends.

Projecting Cap

Extend line by line Thickness at ends.

Round Cap

Extend line by line Thickness radius at ends.

Dash (Group)

The controls in this group are used to create dashed lines and to animate these. Defined dashes and gaps are repeated to cover the entire distance between the Start and End points.

Length (Degrees)

Use this control to determine the length of dashes. Length includes gap as well.

Gap %

Use this control to determine the gap between dashes. The value is a percentage of the length set in the Length control. E.g., setting this to 50, dashes and gaps are equally long.

Phase

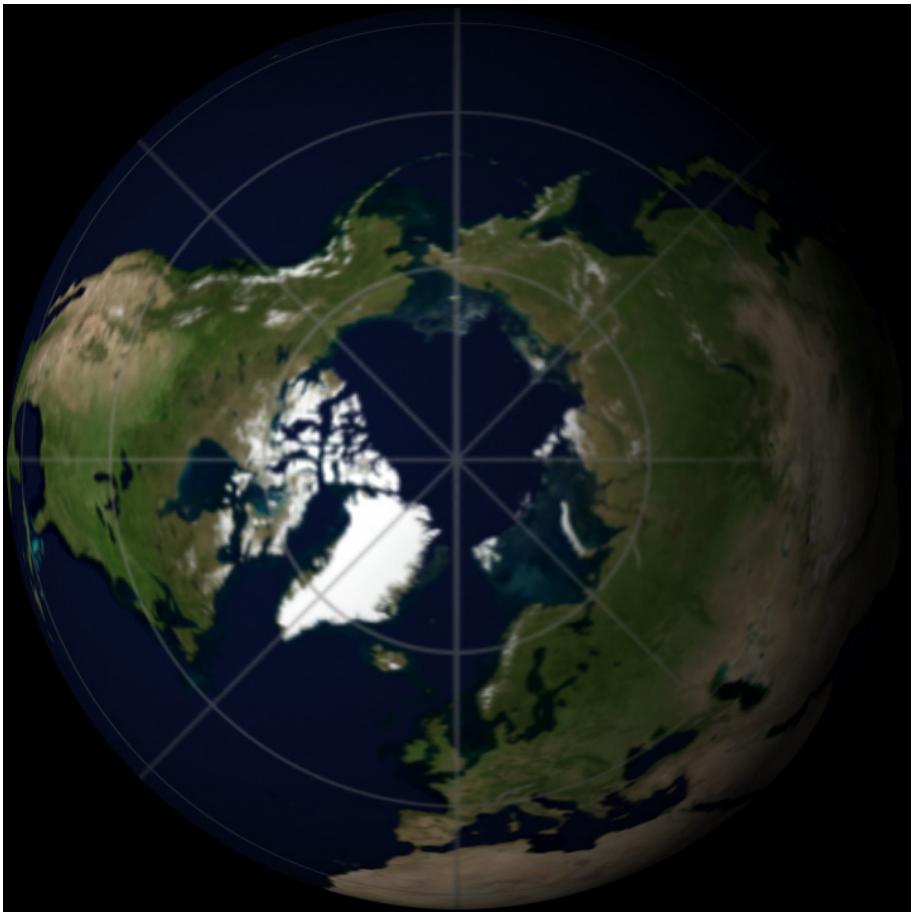
Use this control to adjust the phase of dashes. It is a percentage of Length (i.e., 0 will produce the same result as 100). This control can also be used to animate dashes between Start and End points.

Composite with Original

Check this option to composite the line with the source layer.

CSU Remap

This plug-in provides a unique ability to realign the coordinate system of spherical maps, similar to rotating a sphere. This makes it possible to adjust the position of the equator and poles on a map. Remap also provides an option to apply advanced pre-filtering to achieve constant map resolution close to the poles. The spherical coordinate transformation can also be used to produce unusual looking distortions of regular footage. There are two ways to realign the spherical map, either by using the point and angle controls or by using an active AE 3D camera. When using a camera, the realignment will match the orientation in 3D. This can also be used with 3D effects, such as CC Sphere, to match the orientation of an orbiting 3D camera.



Controls

Center

Use this control to position the center to which the spherical map will be re-aligned.

Rotate

Use this control to rotate the spherical map around the layer center point.

Spherical Pre-Filtering

Check this option to apply advanced pre-filtering to achieve constant map resolution close to the poles.

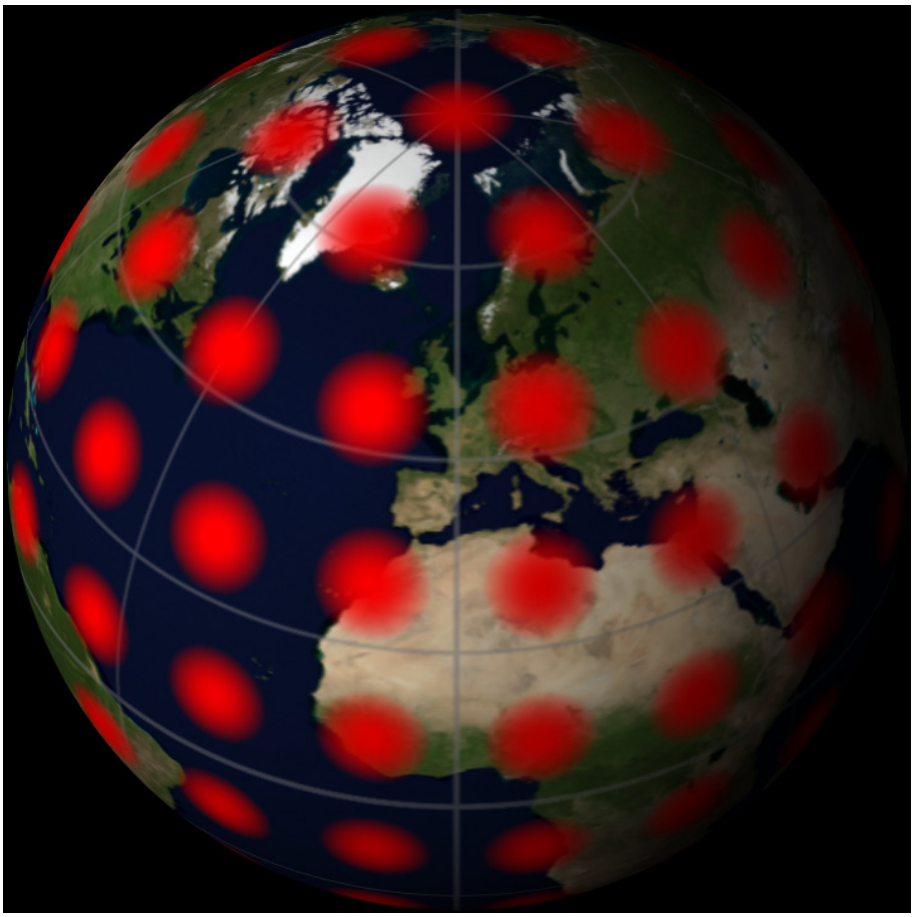
Use AE Camera

Check this option to use an AE Camera to realign the spherical map. This can also be used to rotate a map around a sphere to match camera orientation in 3D

Note. This option requires an active camera in the composition. The camera will then override the Center and Rotate controls.

CSU MapDots

This plug-in generates a pattern of evenly distributed dots on a spherical map.



Controls

Density

Use this control to determine the density of dots.

Size

Use this control to determine the size of dots.

Color

Use this control to select a color for dots.

Opacity

Use this control to determine dots transparency.

Composite with Original

Check this option to composite dots with the source layer.

CFX Sphere Utilities - Thanks To

Special thanks goes to:

Our beta testers

The CoSA After Effects Team

Jonatan Andersson and Johan Lindh

Gorgen Abrami

And last but not least, our families!