

# CANVAS STK

v 1.0 manual

## **What is Canvas STK?**

CANVAS STK meets the stereoscopic requirements of the VR medium allowing users to composite for their cinematic S3D360 films with confidence. Whether you are a creator, producer, stitcher or artist, these tools have the potential to greatly improve your workflow.

Canvas STK was developed for users that are serious about working in stereoscopic 360. It's also the only toolset that gives users the advantage of viewing a traditional stereoscopic 'Preview' to confidently manipulate elements in 3D space while verifying the accuracy on a 3D projector, 3D monitor or 3DTV.

All editing suites equipped for traditional 3D films can use their current setup with Canvas STK in the best way. Apart from being a perfect QC tool, Canvas STK is made to allow users to create an experience with depth, both technically and emotionally.

Why not simply use the headset to preview?

The human eyes are great performers and will "fuse" any bad stereoscopic footage, you will not be able to notice any missalignment through a headset. The only way to tell will be from eye discomfort and probably a bad headache after some minutes. When a 3D monitor is used you can see the missalignment (without wearing any glasses) and take action to prevent discomfort (important to avoid hurting your audience). Canvas STK also offers an Anaglyph 3D preview for those without a 3D monitor.

Canvas STK is not the 'new version' of Canvas 360 which continues to evolve and is specific to monoscopic 360 footage. Monoscopic 360 footage can be viewed on a tablet and on your computer screen without a headset while S3D360 footage requires a headset. Stereoscopic 360 can not be comfortably treated in post-production without the use of Canvas STK.

Proper stereoscopic 360 is difficult to make and requires great discipline as well as patience on set and in post. The final results will justify the extra effort.

## Requirements:

- PC or Mac
- Adobe After Effects CC 2018
- Optional but recommended is a secondary monitor (preferably a 3D monitor or 3DTV)
- Headset for final viewing

## Installation:

Follow the readme file provided with the download and copy the necessary files to the "ScriptsUI Panels" directory inside your After Effects directory.

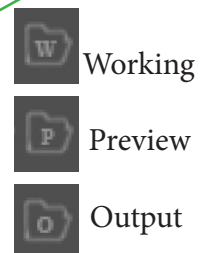
## First Launch:

To open the Canvas STK interface go at the bottom of the "Window" menu of After Effects and select 'Canvas STK'. Once opened, you can dock the Canvas panel anywhere in After Effects.

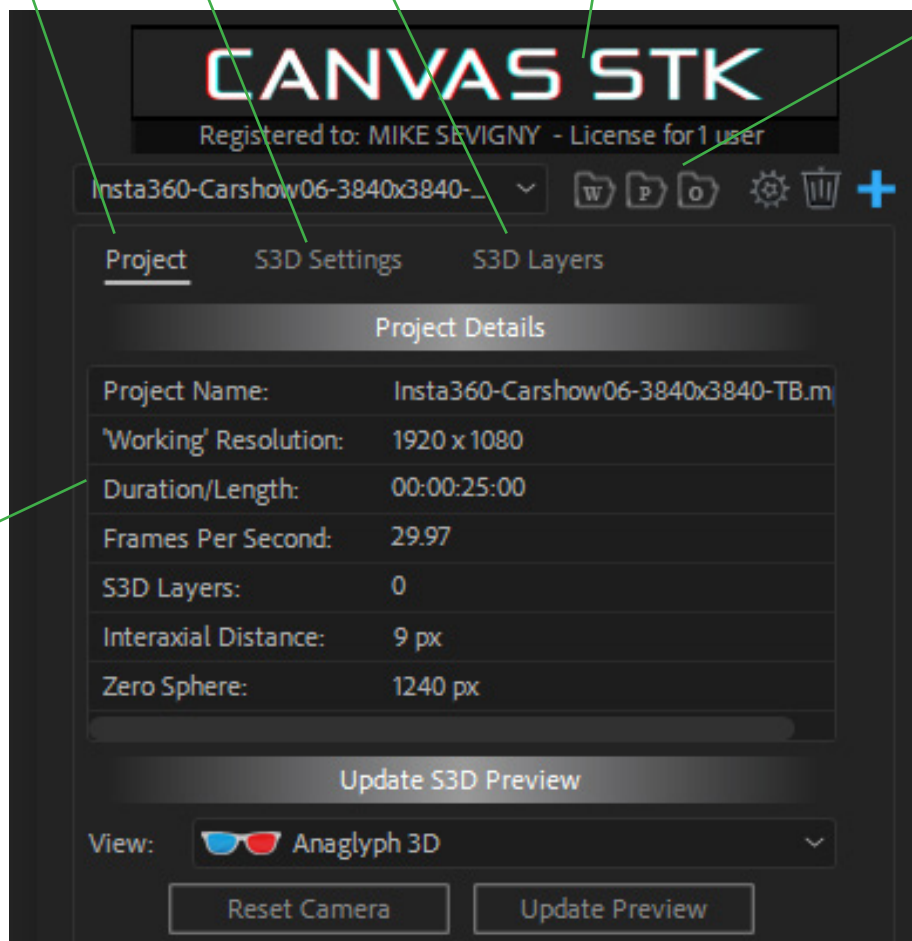
3 main tabs : Project, S3D Settings, S3D Layers

Clicking the Logo will refresh the Preview.  
Same as clicking 'Update Preview'

shortcut icons

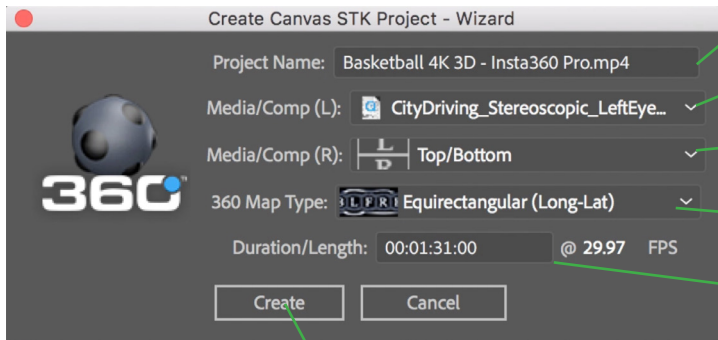


Project Information



## Create a Canvas STK project: +

To start a project hit the “+” icon or select “[New Project]” from the dropdown at the top of the interface. The Create a Project window will popup (see below)



! Take a few seconds to choose your project name. You won't be able to rename your project later !

Select your S3D360 footage or Composition

Select the stereoscopic type for 360 or separate Right Eye

Select the 360 map type of your footage

Select the desired duration. The frame rate is determined by your selected media

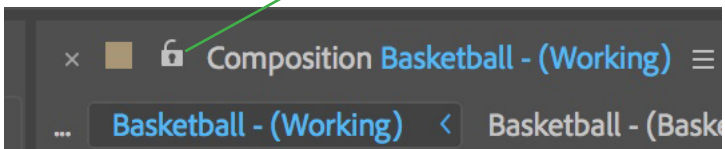
Give a little thought about your project name before clicking 'Create'

**NB:** You can also use monoscopic footage and add layers in 3D space in front of it: choose the same footage for Left and Right Media/Comp.

## Setup your After Effect interface.

When you start a new project you'll have to reorganize your workspace depending on your system and the number of monitors.

lock your working composition window

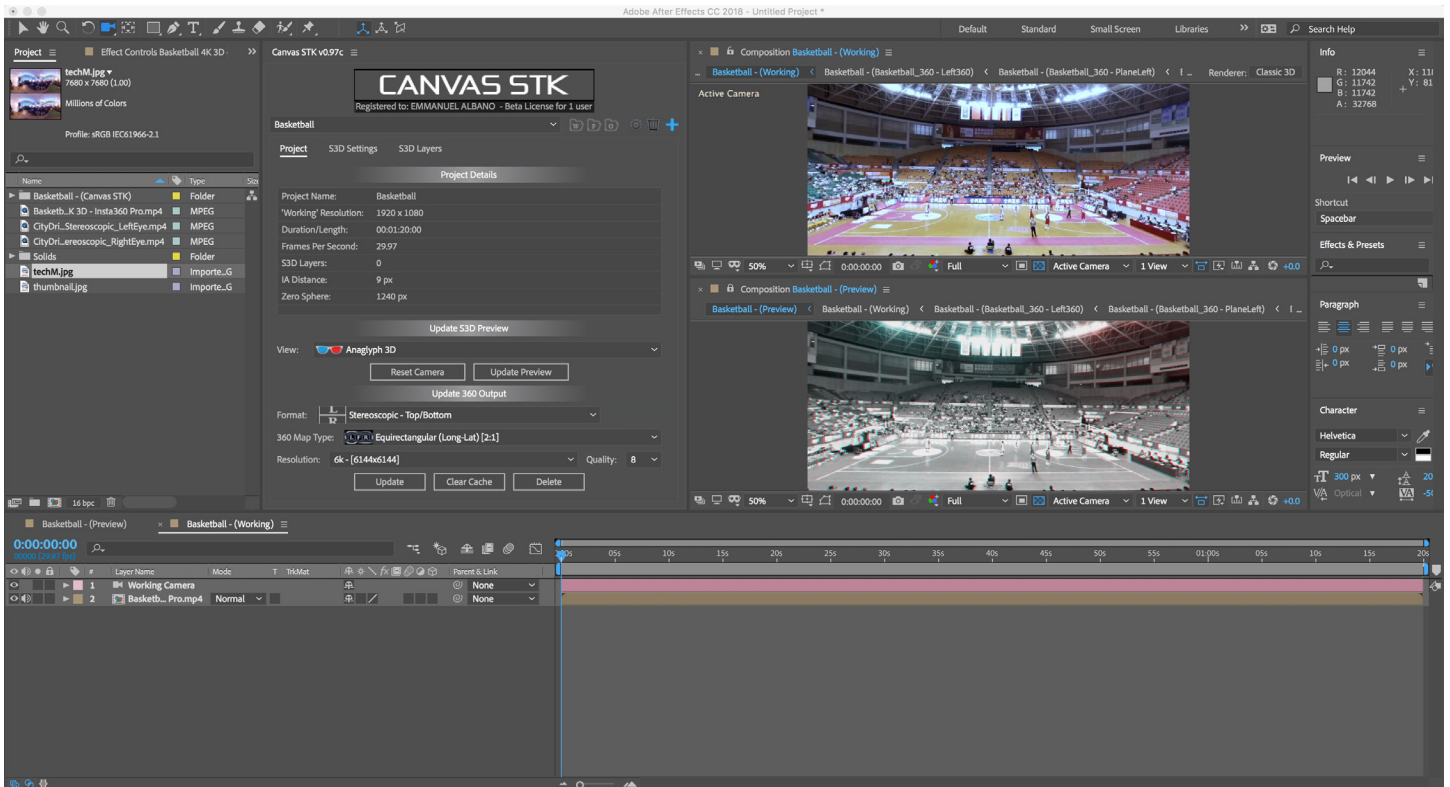


We recommend to use a secondary monitor, if possible and for the best results is to use a 3D monitor or 3DTV

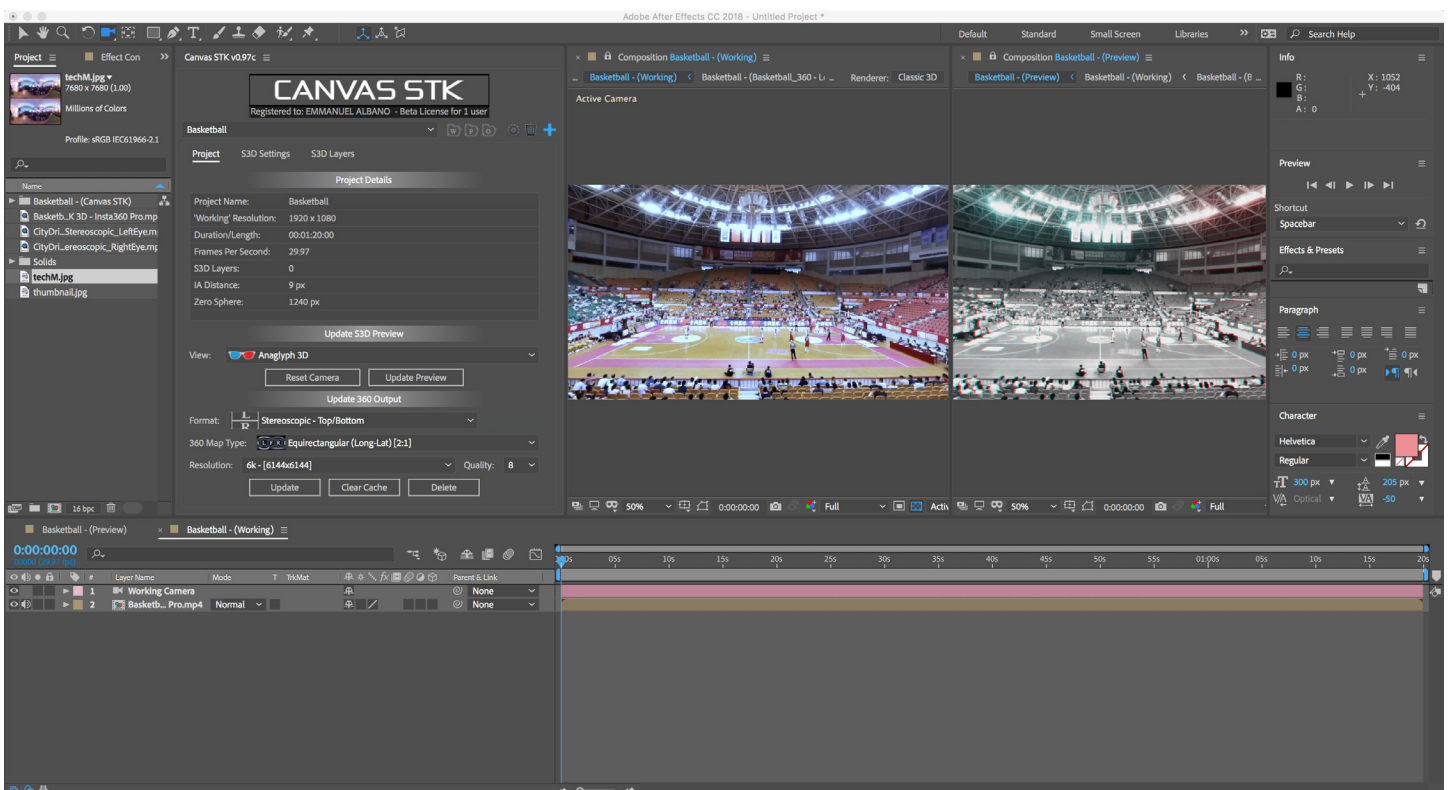
Select this icon in your 'Preview' composition window to output to your secondary monitor. Also go to the AE preferences under 'Video Preview...' to verify that Mercury Transmit is enabled and that your monitor is selected as the secondary output. Make sure you make the correct 'Preview' selection in the Canvas STK interface as well (Top/Bottom or Side by Side for 3D monitors/TVs).



At TorusMediaLabs we use various different 3D viewing devices: a 3D projector, 3D professional monitor, passive 3dtvs and all the way to cheap 3dmonitor (active). We suggest a passive system.



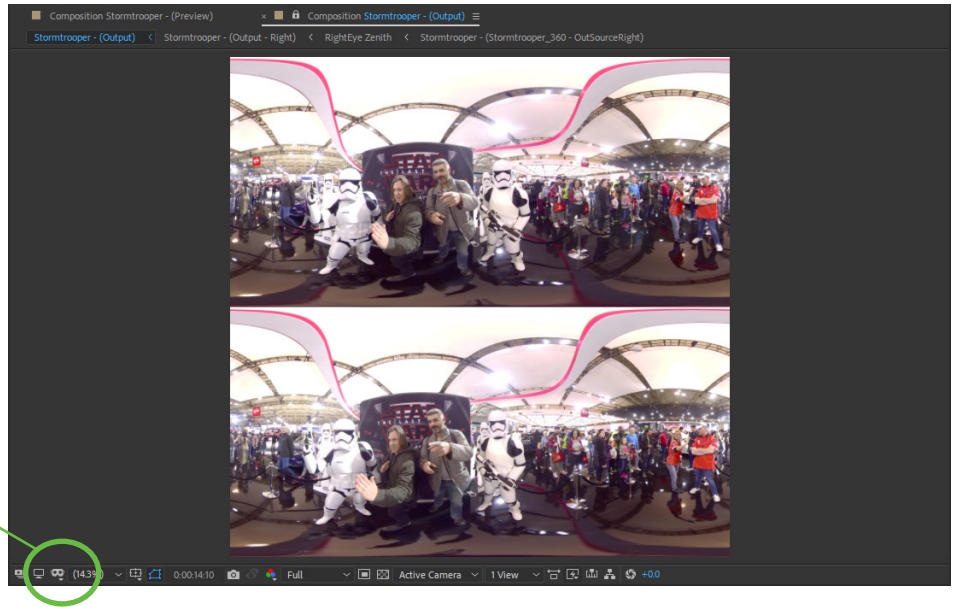
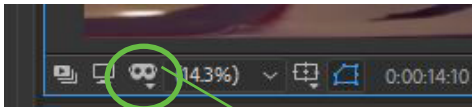
Rearrange your windows at will. If you're using a secondary monitor (a 3D monitor is the best choice) you'll be able to reduce the preview window to its minimum size. Below is an example of a workspace without a 3D monitor. When the 3D monitor is on, you can shrink the 'Preview' composition window and use the 'Working' composition window as big as possible.





Link your headset only to the output composition window which can be generated from the bottom of the 'Project' tab by clicking the 'Update' button. Please remember that you will not be able to check your stereoscopic accuracy through the headset, use it just to check the effectiveness of your work in 360.

At the moment the most common S3D360 format provided by the camera makers is equirectangular Top/Bottom (left eye on top).

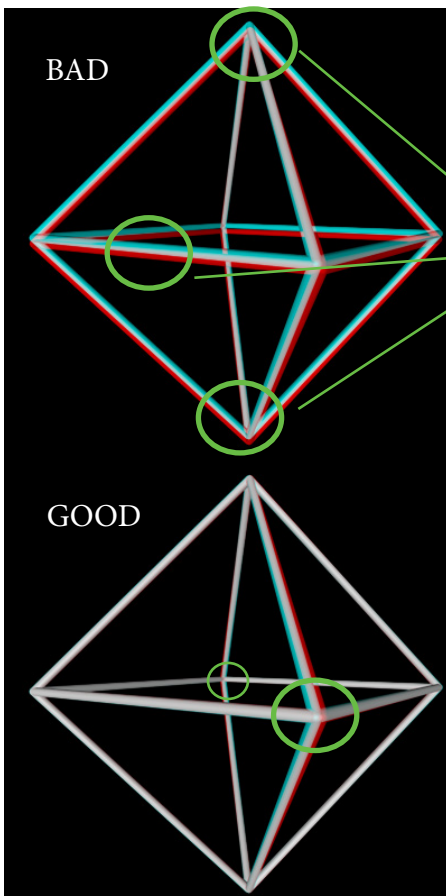
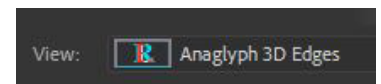
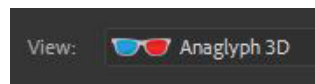


**Now that you have your system setup, you are ready to start:**

With your project created you can now QC (quality control) your stereoscopic footage.

An effective way of checking your alignment is to orient the camera towards the area of interest and use

- 'Anaglyph 3D'
- 'Anaglyph 3D Edges'



**EXAMPLE**

In this example we are using an object to make it easier to understand but what you want to check is that your 360 footage is properly aligned.

Vertical misalignment noticeable all over, easier to notice on the top and bottom part of the object of interest. You'll need to evaluate if that misalignment is negligible or if your footage needs a new stitch.

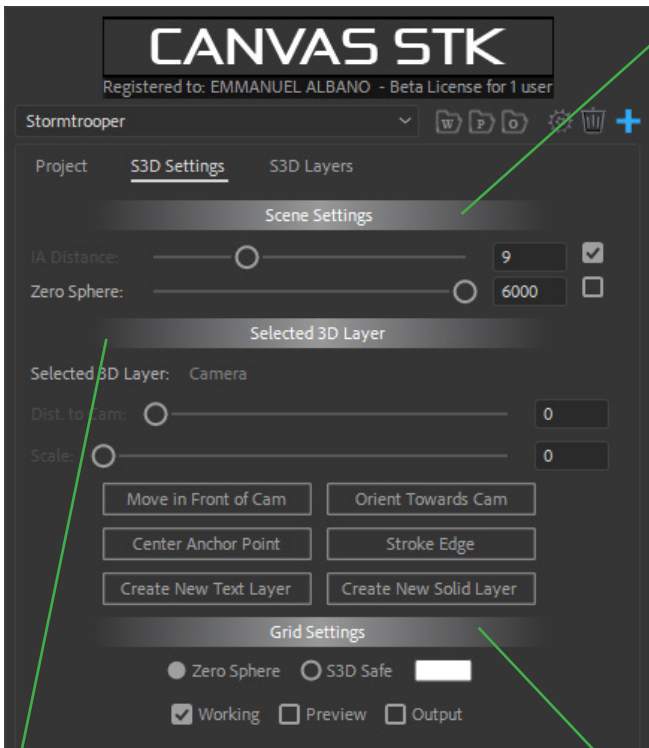
This octahedron is properly aligned.

The horizontal difference between Left and Right are not an error of stitching and are proportional to the distance of the object from the VR camera used.

In this case the front part is in what is called the "negative space" and the back is slightly in the "positive space".

For your 3D monitor "negative" means outside and "positive" means inside your monitor frame.

The majority of stereoscopic images for VR are mostly in the negative space. For this reason, it is preferable to center the area of interest in frame by orienting the 'Working Camera' to face it.



### Th S3D Settings tab:

These settings affect the entire project and all of the layers. Adjust these settings at the beginning and keep them unchanged after that.

**IA Distance** controls the camera separation of your After Effects project. This can be considered as the global pixel separation for all the elements added to the project (except the S3D360 media).

**Zero Sphere** is the point in space where your left and right images overlap perfectly and where the stereoscopic effect disappears. It's usually quite far from the camera.

If the Zero Sphere is very far back in the scene, you may want to increase this value to something closer to 6000. It all depends on your stitched images.

*finding the zero-sphere (NB next page)*

### Selected 3D layers:

When you add a 3D layer in your 'Working' composition such as a text or logo, you'll be able to move it in space with the two sliders: '**Distance to Camera**' and '**Scale**'.

Some handy buttons are :

All the buttons are quite self explanatory and the ones you'll be using the most are :

- **Move in front of the camera**
- **Orient towards camera**

When those two buttons are selected you'll be able to move your logo around the sphere and it will

### Grid Settings:

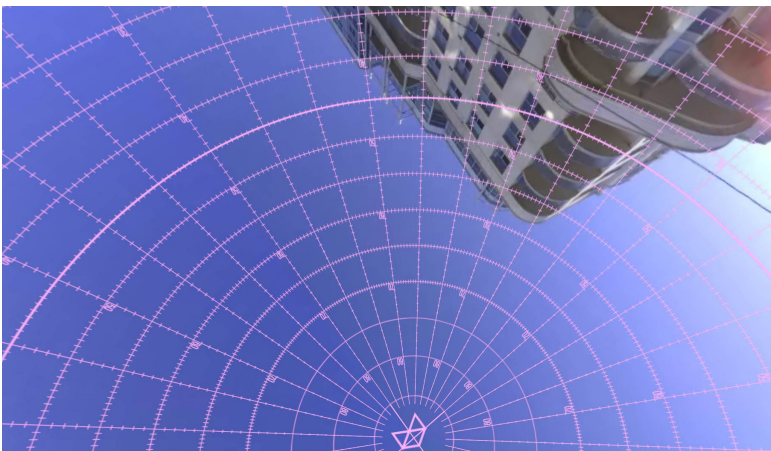
The Zenith and Nadir are monoscopic on all 360 cameras but the progression from S3D to the monoscopic poles varies from one camera to another and can be modified in the stitching process.

We provide two grids:

- **Zero Sphere**
- **S3D Safe**

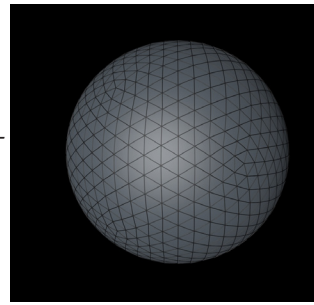
These allow you to place your compositing with precision and within the S3D Safe area (where the image is still stereoscopic). Check boxes allow the grids to be visualized in your compositions. You can also change the grid color for ease of use .

**NB:** Don't forget to unselect "output" before rendering the final output.

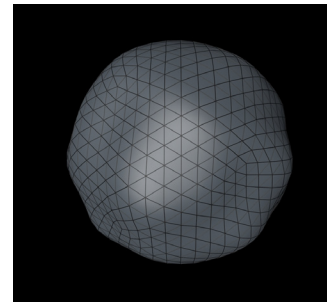


*Zero Sphere Grid*

**NB:** the Zero Sphere of your footage should ideally be a perfect sphere but you'll quickly notice that the Zero Sphere changes even if the distance to the object is the same. Stitching generates the stereoscopic image by analyzing the objects in the scene (without knowing their exact distance) and creating the Zero Sphere based on its best estimation. The result is a shape closer to a bubble than to a perfect sphere. This is not a bad thing as the sticher's estimation allows for comfortable viewing most of the time. Errors are made mostly during the filming phase and we highly suggest to follow camera makers suggestions about the minimum distance to the camera.



CGI Zero Sphere that represent also the ideal one



Approximation of the shape of the Zero Sphere from footage

### Finding your footage Zero Sphere

When you create a text layer using the button from the S3D settings tab and click on orient towards camera button, your text will be positioned on the Zero Sphere (Left and Right eye match perfectly)

Using the distance from camera value you can move it in front or behind that Zero Sphere. Don't forget to check around your footage as you want to find the furthest point of the Zero Sphere. As we explained above the Zero Sphere is not a perfect sphere.

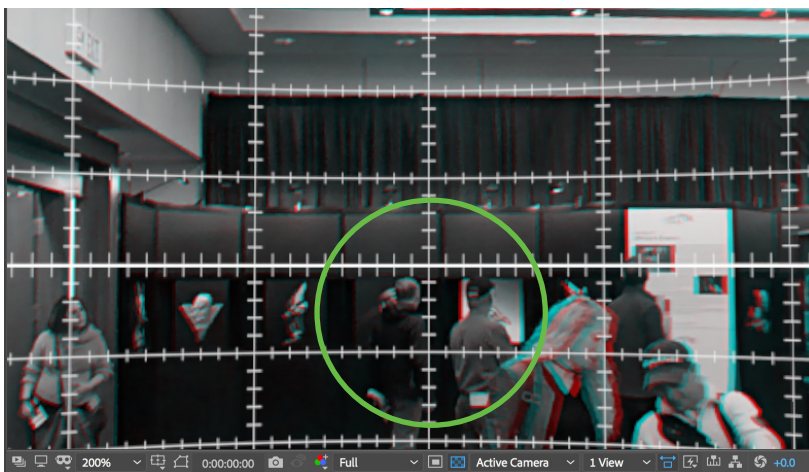
Finding the Zero Sphere when you start your project allows you to safely create layers and you'll never hit that uncomfortable misplacement in space. After that you can simply use the grid as a reference.



text layer placed exactly at Zero Sphere

If you want more real estate for your distance from camera slider just increase the Zero Sphere value and match that value in your distance to camera to again have your text at the Zero Sphere.

For example in this image we have the "Canvas STK" text at the Zero Sphere and if you want to composite something on the black monitors you'll have to place your element behind the Zero Sphere at the same distance as the monitors as we did it here with the "monitor"



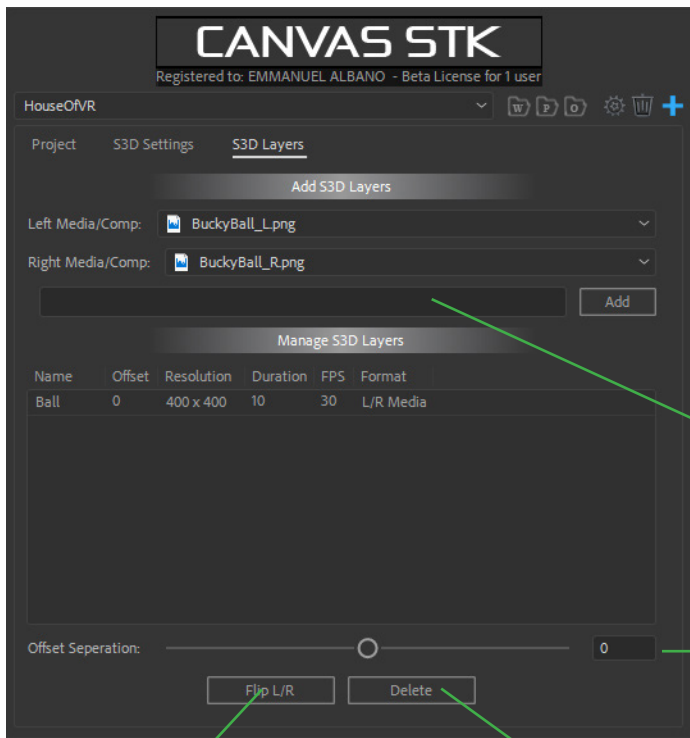
Both grids sit always at the Zero Sphere

Another way of easily see where your Zero Sphere is is by using one of the grids. The grid is positioned at the Zero Sphere all around.

Notice that we zoomed in on the image to have a better view.

The Zero Sphere from this view is between the two gentlemen in the green circle





### S3D Layers tab:

S3D layers are stereoscopic layers that can be created from the Canvas STK interface.

These layers are formed by omni-directional stereoscopic images to be composited with your S3D360 footage.

It could be a logo, a green screen subject or a rendered 3D model, as long as it has a Left and Right eye. Monoscopic media can also be imported by simply selecting the Left eye again in the Right Eye dropdown.

Name your layer and click Add, the layer will appear under “Manage S3D layers”

### Offset Separation button:

Every S3D layer generated from the S3D Layers tab has an extra parameter available to further adjust its depth in the scene.

### Flip Left / Right button:

In the event that the Left and Right eye source media was mislabeled, you can click this button to flip them and correct the problem without having to recreate the S3D Layer.

### Delete button:

Only the layer that you have selected inside the “Manage S3D layers” listbox. The layer will automatically be deleted from your working composition as well.

### Note for users familiar with Stereoscopic films

If you edited in the recent past some 3D movies filmed natively, you are familiar with the Stereoscopic images, workflow and used to preview on a 3D monitor.

You'll easily understand that the Zero Sphere is comparable to your traditional Zero Plane .

Canvas STK preview to a 3D monitor will allow you to work identically as on a 3D movie..

The big difference is that in S3D360 most of the scene happens in negative space compared to film where everything is mostly in positive (with the exception of Imax movies).

For accuracy reasons we highly suggest to place your object of interest in the center of your 3D monitor in order to appreciate its effective positioning in depth and its roundness.



## Placing your S3D layer in space:

The most effective and accurate way of properly placing your S3D layer in space is to use the S3D Settings tab “**Distance to Camera**” and “**Scale**” values.

Remember to select the layer you want move in space in your ‘Working’ composition timeline.

## Using a 3D monitor or a 3DTV for this fundamental task will give you the most accurate results.

From the Project tab, change your ‘Preview’ to Side by Side (squeezed), a common format from the S3D movies compatible with 3DTVs, 3D monitors and 3D projectors.

Placing objects in space in your stereoscopic 360 scene using a 3D monitor is not only the most accurate, but also the fastest and the most comfortable way for your eyes.

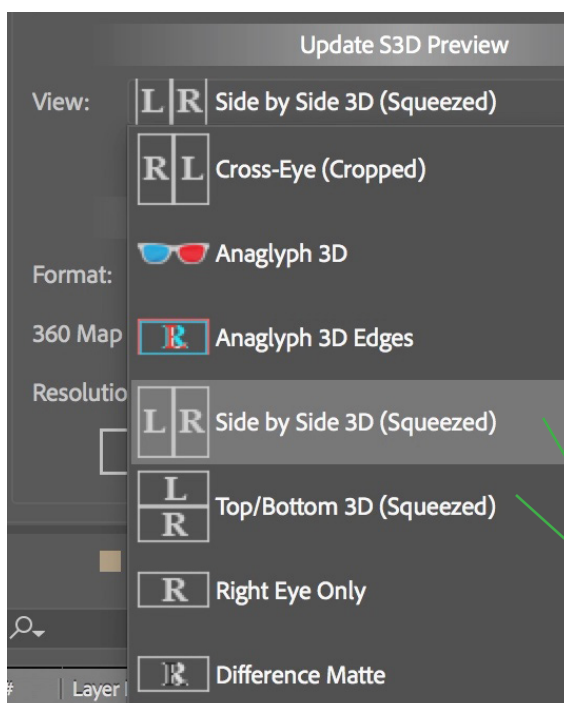
A pair of 3D glasses (passive are the best) are like a pair of sunglasses, they are light, you can see your depth in the **3D monitor** and don’t need to remove them to see your keyboard and your main screen at the same time.

Your second option is to use the **Anaglyph 3D** preview, it will take a bit longer to get the same depth accuracy than with a 3D monitor and it’s less comfortable for the eyes, you want to lift your anaglyph glasses to look at your keyboard or your computer monitor.

We offer also a quick **Cross-eye** preview that can be handy to quickly check when no glasses or headset of any kind are next to you. This method is also handy to export and share your progress with your client.

A VR headset is the last option to use as your eyes will attempt to correct the image for you, resulting in eye-strain. The other disadvantages of using the headset for preview are the continuous change of light (VR to room), the weight of it, the cable being tangled and the frequent need to restart your computer to make it work.

You still want to keep your headset close-by for checking important steps in your work and your final output. If you are working in stereoscopic 360 it’s to create a film that will be watched almost exclusively through a headset, the way the viewer will experience your S3D360 film.



Most professional 3D monitors use SDI inputs. In late 2017 Blackmagic released a new very useful HDMI to SDI converter gently priced around 50\$ USD.

This or similar converters will allow you to have your 3D output from your computer HDMI output straight into SDI .

these two settings are for 3D monitors and 3DTVs.

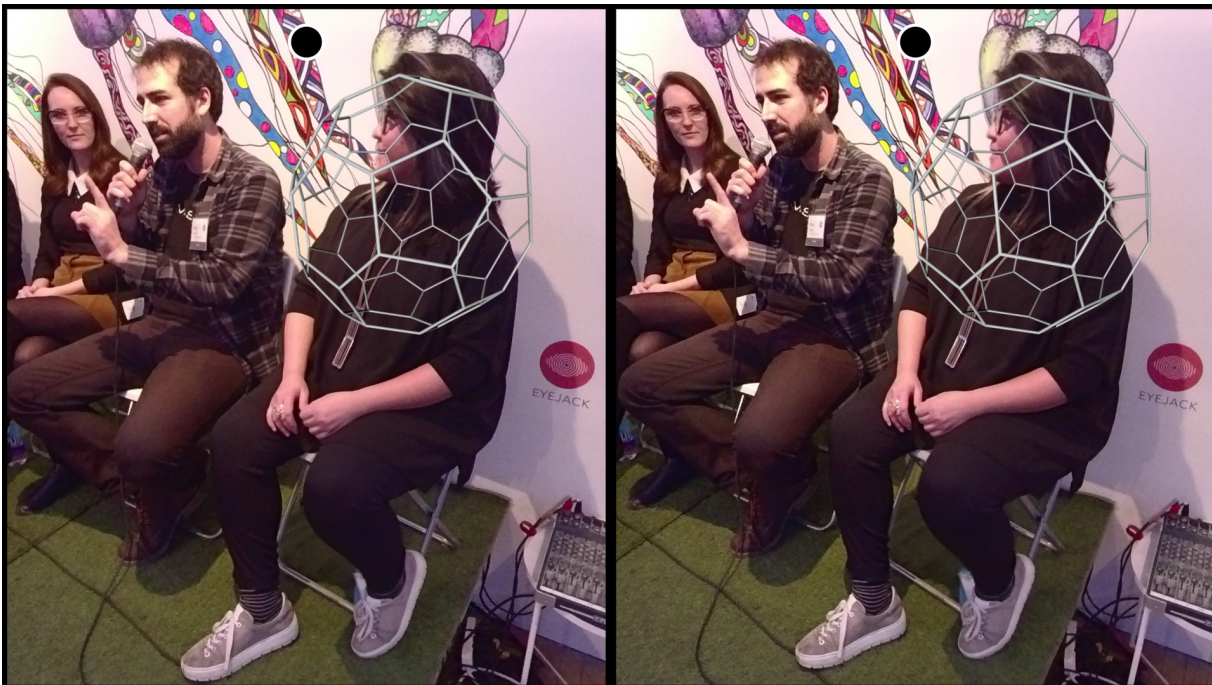
By using the **Cross-Eye** method you can have an immediate preview without any glasses and preserving colors (cross your eyes and fuse the black dots into one and you'll see the stereoscopic image).  
The Cross-Eye method works well but don't abuse it, use it only a few seconds at the time as quick checking tool.

Here is an example of a bad placement in space followed by the proper one.  
Canvas STK allows you to place this stereoscopic object correctly in space in a matter of seconds using a 3d monitor and a little longer using the anaglyph preview. This simple operation can take you much longer if your only viewing tool is a headset.

The following example is a S3D360 still exported from Canvas STK using the cross-eye preview option  
*We thank our friend Ana Serrano for allowing us to misplace our cgi object right on her face.*



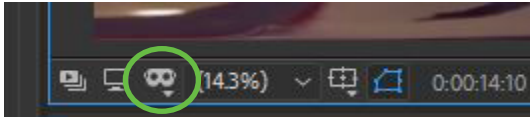
*Bad depth positioning - the ball's volume range in space from the same depth to behind Ana's face.*



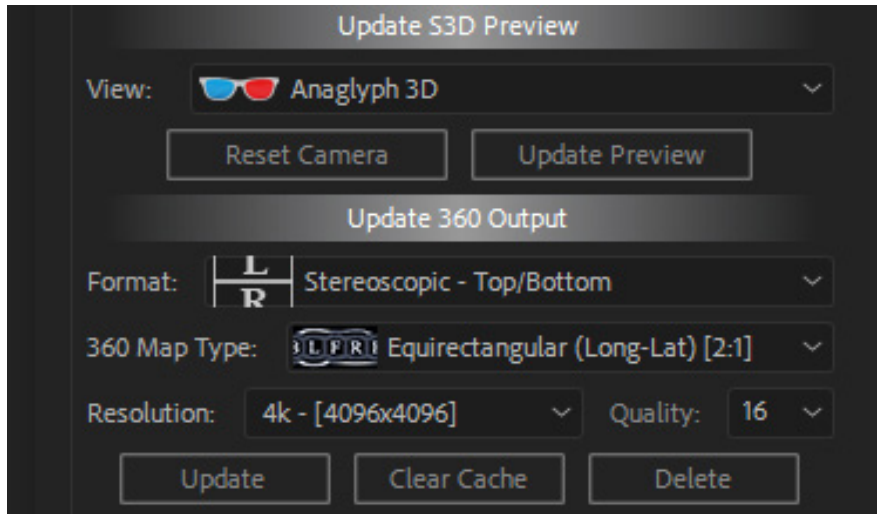
*Good depth positioning - the ball has same size but is correctly positioned between the camera and Ana's face*

## OUTPUT:

Final output. We suggested all along to work without your headset but now it's the moment. It's time to check your work on a viewing device similar to the one your audience will experience your VR film. For viewing on your headset you'll choose Top/Bottom in the output format dropdown menu. We also allow you to export in various formats (not all of them will be compatible with your headset). Canvas STK was developed using the two most popular VR headsets.



Turn on the headset preview in your Output comp window.



Delete your output comp if you want

Shortcut to clear your AE cache. If you notice that your Output does not look correct, click this button to clear the cache.

Update your output when you change anything in your project

## Quality:

This is a setting for the stereoscopic quality of the output composition: Create your output and view it with your headset.

If you notice some vertical splits in your composited images, this could happen when your s3d layers are too close to the camera, you can turn the quality setting to higher values.

The preset value should work just fine for most situations.

Please be aware that this setting will not fix any issues from your background stereoscopic 360 footage, it applies only to the layers you've added to the project.



## **Conclusion:**

For more informations about Canvas STK , follow our newsletter and postings on facebook.

Canvas STK was developed to provide you the same compositing accuracy available for S3D movies . For that reason it allows you to use that same professional equipment in post-production to reach that level of detail that is specific to cinema.

Many post-production houses have several 3D monitors in their suites, probably most of them are used rarely for their 3D functionality. With Canvas STK you'll be able to use them again for what they are intended for and with S3D360 video you'll have a chance to use them more than you ever did.

The VR medium is stereoscopic by nature, the coming 6DOF is stereoscopic the same way as it lives inside the same VR medium.

Humans have two eyes and until our eyes will be replaced by bionic super-eyes we'll always percieve depth through our stereoscopic vision.

The language and subtleties of stereoscopic imaging are still being explored by University researchers and artists all over the world. We can enjoy this great wealth of knowledge and research available to increase our own knowledge and apply it in an artistic and meaningfull way.

Please remember to preserve the audience's eyes as much as yours . To achieve good 3D you'll have to view bad 3D and make it better. To allow you to work for extended periods of time you will want to preview your s3d360 footage, we highly suggest you use a 3d monitor or 3d tv, passive if possible.

A big thank you to our friends and partners for allowing us to experiment and deeply research into this fascinating S3D360 format in the creation of Canvas STK:

DJ Woods rentals for providing us with a perfect insta360pro kit.

Robin Frigeri for providing us a studio for our camera tests.

Ana Serrano from CFC (Canadian Film Center ) for her support and kindness.

InVR (Germany) for S3D360 test footage.

ZCam

Kandao

insta360