

BLENDY DOME VJ QUICK START GUIDE

So, you chose Blendy Dome VJ.

Thank you!

Blendy Dome VJ is designed to be a powerful Fulldome project simulator and the best manual Dome mapping software, solving all real life necessities.

This is the easy road.

United VJs

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1. BLENDY BASICS

Blendy Dome VJ works with a **Default Project**. That means if you edit your project, save it and close BDVJ, next time you open it up the project will be there. Save using **CMD+S** and load using **CMD+L**. Or from The **FILE** tab.

*Save often, there's no Undo!
On every improvement you make, Save it.*

For traditional file-based workflow, use **Export** and **Import**.

CMD+R is for Reset, will get everything back to original settings. Be ware, danger!

Snapshots give you additional default saves, you can save and load your current state on different slots. For example, the project's good, but I would try a different distort approach. I can save **Snapshot 1**, reset distortion, make a brand new one and save it to **Snapshot 2**. Now I can load each one and compare which one is best.

But the best way to start is by choosing a **Template** (more on this soon).

On the interface, when the mouse pointer is over some control, you'll see it highlighted. At that point you can control it by keyboard:

- **Left** or **Down** arrow: Step down 1 unit.
- **Right** or **Up** arrow: Step up 1 unit.
- **SHIFT** + **Left** or **Down** arrow: Step down 10 units.
- **SHIFT** + **Right** or **Up** arrow: Step up 10 units.
- **R** key: Reset this control to default.

On the right of the screen you can see the channels' **previews**. When the mouse is over, it will be identified on the interface and on the output. Click on any of them to see the full frame.

*When we say **Channel**, think **Projector**.*

*When we say **Zenith**, think Projector Aiming **The Top**.*

*When we say **Azimuth**, think the **angles** that appear on the dome horizon, on the edge of the **Domemaster**.*

2. PLAN

We use Blendo Dome VJ on all stages of any event. You can input all the dome specifications to test setups and choose which one is better for each event. Feel free to play around to understand all the variables that you'll need to input. Usually we get to the venue with all the details already confirmed and ready to setup, just by playing around with the software and trying different setups.

The first step is to decide how many projectors and **which lenses you need**. On the FILE tab you find the Templates, starting point for the most common configurations.

Choose one template and take a look at the **PROJECTORS** tab. You will see which lenses you'll need for that setup. What you see in LENS is the **Throw Ratio** of the projector. This is very important. A Throw Ratio of 0.5 means that the projector needs 0.5 meters to make a 1 meter wide image on a wall. **The lower the lens number, the wider the projection will be.**

Stick with the 2 Ch 16:9 or 4 Ch 16:9 if you can, those are the easiest to map with the most common setups.

The **2 Channel 16:9** template is great for the MacBook Pro Touch Bar or top Mac Pro, using two 4K projectors, with no additional hardware. You will be able to play a 4K domemaster! On the PROJECTORS tab, you can maximum throw ratio is 0.45.

The **4 Channel 16:9** template is perfect to use with an older MacBook Pro Retina or basic Mac Pro, but you need a Datapath FX-4 card to split one 4K output into four 1080p projectors. Or similar equipment. On the **PROJECTORS** tab, you can maximum throw ratio is 0.7, but use 0.5 if you can, mapping will be easier.

There's a very important fact that is fairly unknown about the current Mac architecture. Anything built before the MacBook Pro Touch Bar (like the Retina and Mac Pro trashcan) can only handle two digital video outputs. I know the Mac Pro has seven, but they are not meant to be plugged to several displays, unless you use active adaptors on them all (not recommended). Take a look at [this paper](#).

*Make sure all the projectors are of the same brand and model, and if possible the same age.
If you can, put new lamps on them all*

Do not plug any video cables yet!

Leave Blendy Dome VJ for a while

3. LAYOUT

Let's say you'll start with the **4 Channel 16:9** template, the most common setup. Before even attaching any projector, please complete this checklist.

You want to do this on EVERY PROJECTOR...

- Do not plug to the server yet.
- Turn it ON, put on the floor in front of a flat wall.
- **RESET it to factory settings.** Who knows how the last person to use it was doing? Maybe it's zoom or trapeze is all messed up and mapping it all together will be hell.
- The vertical shift usually is usually all the way up (+50%). With the projector on the floor, it will make a nice square image on the wall. If this is not the case and the projector has lens shift, shift it up. If not, no problem, but you will need to input that later in the PROJECTORS settings.
- If some projectors will be placed upside down, shift the lens all the way down (-50%) and flip vertically.
- Blendy Dome VJ will need all the projectors to be on the same resolution.
- Turn it OFF and put aside.
- Add a blank sticker to write down each one's number later if you like.
- **Reset the Datapath** to factory settings too! We want the default settings, which is one 4K input and four 1080p outputs.

With all the projectors configured, you can now attach them to the dome. We recommend to use a **Camera Ball Head** on each one.

The projectos need to be **equally distributed**, making a perfect triangle (4 channels), square (5 channels) or facing each other (2 channels). Measure and make marks with a tape on the dome ring to keep the exact positions as reference. Those marks need to be aligned with the projectors LENSES.

When you have one projector doing the **Zenith** (top of the dome), like the 4 and 5 channel templates, the remaining projector can be anywhere, but we recommend to place it on your back, from where you will be sitting doing the mapping.

Turn ON all projectors. The ones doing the ring (both of 2 channels, 3 out of 4 channels and 4 out of 5 channels) need to have their base aligned to the dome. Adjust the ball head of each one and lock. The zenith projector need to be pointing up, at the intersection of the others.

NOW you can now plug the video cables.

4. OUTPUT

Back to Blendy Dome VJ

On the **FILE** tab, select your **Template**.

On the **OUTPUT** tab, set the correct **Aspect Ratio**, **Resolution** and **Number of Channels**.

The Distribution is already set by the template. But it's how we organize the channels. 99% of the cases use **Single Ring** (no Zenith) or **Single Ring + Zenith**.

Still in **OUTPUT**, **Ordering** is how our projectors are ordered in the system's **Display Settings**. On the background you will see an exact copy of the **Display Settings** in cyan. All the projectors must lay on the right of the monitor (M). In Yellow is how Blendy Dome VJ is ordering our channels. Cyan and Yellow must match perfectly! In the case of a **Datapath FX-4**, you can select **Dual Rows**, so the channels can fit in it's 4K frame.

*Enable the **OUTPUT** by clicking the black square on the side. That's how you enable/disable features.*

You must see all the projectors by now. If you see only the first, go to **System Preferences, Mission Control**, and turn **OFF Displays have separate Spaces**. Restart.

On **OUTPUT**, enable the **Testcard**, and **Invert** it. Now it's time to check if your physical projectors layout is correct. Go inside the dome and marvel on all those beautiful confusing lines. They must be as symmetrical as possible! If the projectors are equidistant, and on the same level, all their shapes must be equally distributed. If not, please reposition the projectors by moving the Ball Heads until they are all symmetrical. This is your last chance to touch each one.

You can also check if the **projectors numbering** are correct. Usually we have a table inside the dome to work, and the projectors start from left to right, just like the way we read. From your table, looking to your left, you'll see projector 1. Moving right is projector 2 and 3 (on your back). Projector 4 is up, making the Zenith.

For unconventional resolutions not available on **OUTPUT**, select **Aspect Ratio: Custom**, go to **FILE** and **Export Config**. Open the .bdvj file in a text editor and edit **PROJ_DEFAULT_RES_WIDTH** and **PROJ_DEFAULT_RES_HEIGHT** to your crazy resolution. Save it and import in BDVJ (you can just drop it on the background). Go to **OUTPUT** and you can check if your resolution is correct. If it does not work, and you edited the file using **TextEdit**, go back to the **TextEdit**, **Format**, **Make Plain Text** and save again.

Turn off the Testcard and SAVE

5. MAP

Blendy Dome VJ works by creating a virtual representation of your physical dome, then calculates the deformation needed for each projector to wrap that dome. For that to work the virtual dome must be as loyal as possible to the real world.

On the **DOME** tab, enter the exact **Diameter** of the dome.

If the dome is elevated, enter the **Dome To Floor** distance.

If it's not a perfect sphere, try the **Z-Scale**.

If the dome is not 180 degrees, set the correct **Horizon**.

You can see all the calculated dimensions in green to check with your real dome

*Inside the Dome, things may seem a little crazy and desperate, but don't panic! It's because we're seeing a lot of projectors area that will be cut out with the blend, so we can now cheat a little and cut them off right now. Go to **BLEND**, turn it ON (black square), and set **Edit Mode** to **Crop**. Much better, right? What you see right now is exactly what needs to be mapped, nothing more.*

Go to **PROJECTORS**. Each channel has its own settings, with several parameter needed to mimic the real world. The easiest way to start is to use Channel 1 as a master and let all

the others copy it's parameters. So turn on the option **Lock To Projector** on Channel 2 until the last. Now anything you edit in Channel 1 will be copied to the other channels.

Enter your projectors **Distance** and **Height**, this is the position of the lenses relative to the dome ring.

Enter your correct **Lens** and **Lens Shift** (usually it's the default). The important thing here is to have all the **Azimuth angles** on the bottom aligned. By changing all the projectors **Lenses** together, you'll see they come apart or closer. No need to be perfect now, just get them all close to each other.

With all set, let's commit what we did on Channel 1 to the others. From Channel 2 until the last, click on **Import Params** and then disable **Lock to Projector**.

For some extra visual help, go to **COLOR**, turn it ON, set **Channel 1 Add Color** to **Red**, **Channel 2 Add Color** to **Green**, **Channel 3 Add Color** to **Blue**, and **Channel 4 Add Color** to anything else. Now each projector has it's own colors, making it easier to identify and edit each one.

Double check. All the channels should be more or less aligned. The better we have them now will save time later. We can tweak specific projectors **positions** and **lenses** to make a better alignment.

You can also play with **Z-Scale** in **DOME** and see if it gets better (I know it makes no sense but it's often helpful). Save!

6. WARP

From our experience, we concluded that it's impossible to manually measure and enter the exact real world variables into the virtual dome. We need to cheat.

Go to the **DISTORT** tab and turn it ON. Each projector has a **dual bezier mesh** to warp and match perfectly. Select the current projector with the **Select** button or by clicking on it on the **previews**.

There's one **bezier mesh** on the left and one on the right. The **big circles** are the boundaries of the bezier meshes, the **small circles** are the control points of each one. Both meshes share some points on the center.

You need to make sure the edge between the meshes does not form a hard angle, it must always be curved. Adjust that by pulling their neighbouring control points.

Don't ask for more control points, for a spherical surface this is enough, thrust us.

*If you **click on a control point**,
it can be moved with the **arrow keys**.*

Start with the boundary controls then go to the smaller.
Distort freely until all the channels are aligned.

Try to **distribute the distortion** on several points. If you pull one point too far and the others not so much, the image will be distorted in a bad way. Instead, bring the far point back and the other points closer to it. The end result will be much better better.

First align the channels on the ring and when it is ok go for the Zenith. The Zenith is a little harder, the dual mesh is not exactly perfect for it, you can try choosing **Single** mesh for it if you want.

If you can't match the Zenith perfectly perfectly, don't spend too much time on it. Bring it as close as possible to the ring then go back to the lower channels and match them to the Zenith.

For fine tuning, go to the **SOURCE** tab and select some of the **DOME_grid** templates, at the the same resolution as your medias.

Take your time

*Reset all the projector's distortions and
start over if things gets too crazy*

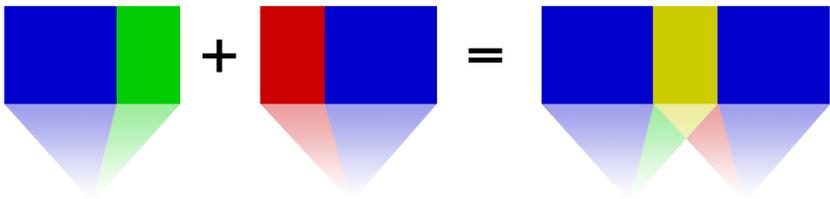
7. BLEND

All aligned? Turn off the **COLOR** tab.

Go to **BLEND**, and set **Blend Mode** to **Azimuthal**. Everything should be blue and yellow now.

The templates come pre-blended, there's not much we need to do. ;)

But the theory is, each channel has a left and right **azimuth range**, defining its **blending area**. The left range is painted **Red**, the right range is painted **Green**. When one projector's left matches another channel's right, Red and Green light becomes **Yellow**. With a perfect blend you will not see any Red or Green on the screen, only Yellow.



The Blendy Blues

Now change **Edit Mode** to **Zenith**. The concept is the same, but the Zenith blend area is Red and the ring channels Green. You can tweak the Up and Down Altitude angles that define that blend area.

To finish, change **Edit Mode** to **Gamma Correction**. Everything will get white, and you probably can see a shadow on the blends. Tweak the GAMMA value to diminish the shadow visually.

Turn **EDIT MODE OFF**, and...

It... is... done.

8. PLAYBACK

When you are ready for the show, turn on the **LOCKED** tab. It will minimize the app resources for a better performance. It will also lock all the mapping options so no one can mess around.

On the **SOURCE** tab, choose your input media format, that can be **Domemaster** or **360 Panorama** (Equirectangular). For videos downloaded from YouTube, check the EAC option. For stereo medias, select the suitable **Stereo Mode**.

Now select your **SYPHON** source. This comes from the app that is playing your content. We recommend Resolume, Modul8, VDMX, MadMapper, CoGe, Video Slave, Vidue Stack (free) or any other professional video mixer that has Syphon output. **VLCSyphon** is a free open source option, included with Blendy Dome VJ installation, but recommended only for testing. It is not very stable and the controls are not good for performance.

Try to turn on the **LIGHTS** tab. It will give the service lights of a planetarium, fading out the content. This is great for pre and post show, when people are entering or leaving the dome.

Turn off the lights

Turn on the sound

Call everybody in

Start the show!

PRO TIPS

*Are you on desktop or laptop? On the VIEW tab, you can switch interface interaction between **Mouse and Trackpad**.
Using the right mode will improve your usability*

*I can see only the first projector, the others are black!
Go to **System Preferences, Mission Control**,
and turn OFF **Displays have separate Spaces**.
Restart*

*If you are using a monitor, link to it using a VGA cable
for better performance*

*Make your renders with
[Blendy 360 Cam](#) for Cinema 4D.*

*Make Real Time experiences with
[Fulldome Camera for Unity](#).*

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