EOS Augment3d
Quick Start Guide

Getting Started

Augment3d is an Eos tool that allows you to configure and focus virtual representations of your fixtures in a 3D environment, as well as program and visualize looks.

To get started, you will need to:

- Launch Augment3d on your Eos console or computer
  - See *Running Augment3d (below)*
- Familiarize yourself with the Augment3d user interface
  - See *Augment3d Edit Mode Layout (on page 7)*
- Add your fixtures to focus and control them
  - See *Fixtures in Augment3d (on page 16)*

Hardware and Software Requirements

Console

Augment3d on Eos Family consoles requires Eos Family Software v3.0 or greater, and a console with at least one DisplayPort connector.

PC / Mac

For the most up-to-date specifications for Augment3d on PC or Mac, please visit etcconnect.com/etcnomad/performance/.

iOS / Android

Augment3d includes a feature inside of the iRFR and aRFR mobile apps. iRFR requires iOS 11 or later. aRFR requires Android OS 7.0 (Nougat, sdk 24) or later.

> **Note:** *Focus wand also requires ARKit/ARCore functionality. Check your device's specifications to ensure compatibility, or reference the Augment3d Reality Support field in the app's About menu.*

Running Augment3d

Console / PC / Mac

Eos Family consoles and computers that meet the hardware and software requirements can run Augment3d natively (see *Hardware and Software Requirements (above)*).
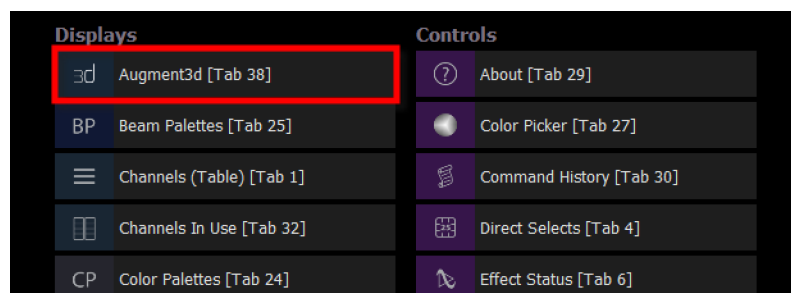
Either open a new tab and select {Augment3d} from the Displays list, or hold down [Tab] and type [38].

> ⓘ ***Note:*** *In console implementation, Augment3d render quality is limited to Low or Medium.*

PC / Mac (Tether Mode)

You can also run Augment3d on a separate computer, connected to a console using tether mode. Augment3d tether is an extension of the console it is connected to, rather than a standalone client.

The setup for this mode is identical to that of an ETCnomad client computer in a networked system of consoles. An ETCnomad dongle is not required for Augment3d tether.

> ⓘ ***Note:*** *ETCnomad Puck is considered a console, and is subject to the console restrictions above.*

1. Ensure the computer is running the version of ETCnomad that matches the software version installed on the connected console.
2. On the console, enable Augment3d for your user number. In the CIA, navigate to **Setup > System Settings > Users**.
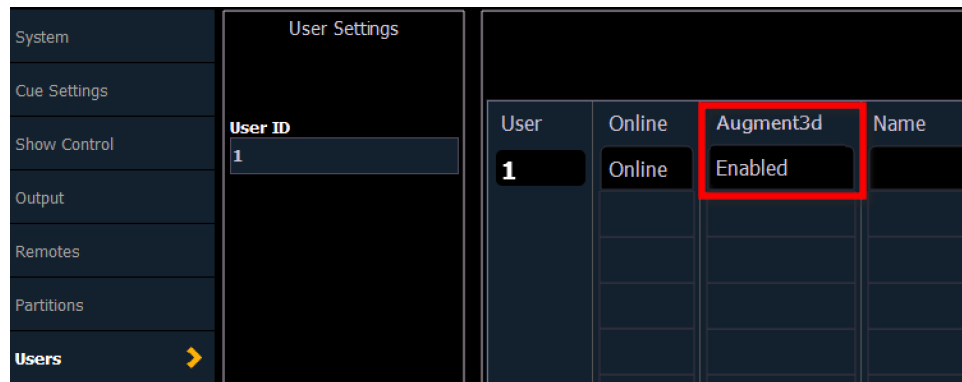
3. Connect your computer using an Ethernet cable through a network switch. Ensure that the computer's network information is in a compatible range with the console.
4. Launch ETCnomad and select {**Augment3d Tether**}. Augment3d will launch in its own window, and try to connect to the console.
5. Choose the correct tether device on the console (see *Augment3d (on page 1)*).

To exit tether mode, click the {**X**} in the corner. To exit when in Edit mode, choose **File > Exit**.

Tether Command Line

A command line can be displayed on the tethered device, which will mirror the command line on the connected console.

With the keyboard button toggled on, both Eos and Augment3d commands will be sent from the tether to the console. When toggled off, only Augment3d commands will be sent.

Click the {X} to disable the tether command line entirely, or toggle it from **Window > Command Line**.

Standalone ETCnomad

Augment3d can be run on a PC or Mac in a local tab as part of ETCnomad v3.0.0+ and used without a connected Eos Family console. Once ETCnomad v3.0.0+ is installed, no additional installation is necessary.

Key Terms

Click-To-Focus

Clicking or touching a point in the Augment3d model to perform XYZ programming on that point.

Control Mode

The default display mode of Augment3d. Allows for visualization and navigation of your model, fixtures, and objects.

Edit Mode

An alternate Augment3d mode. Allows for editing and configuration of your model, fixtures, and objects.

Find Me

Using aRFR/iRFR to perform XYZ programming aimed at the mobile device.

Focus Wand

Using aRFR/iRFR to perform click-to-focus.

FPE

Fixture Pose Estimation. Estimates the physical locations of fixtures based on fixture profile information and user-provided focus palettes.

Origin

A known location in your space, represented as the intersection of the XYZ axes (0,0,0), that acts as a reference point for the measurements of the rest of your Augment3d model.

Pan / Tilt Kinematics

An aspect of a fixture profile that turns DMX values into a direction the beam is pointing.

Model

The Augment3d virtual 3D space.

XYZ Programming

Telling the console to aim a fixture's beam through a particular point in virtual space.

Control and Edit Modes

Control Mode

The primary Augment3d view allows you to navigate around your model, focus and program fixtures, and visualize cues or effects.

Certain tools to assist with this are available in the toolbar on the right. For more information, see *Augment3d Toolbar (on page 10)*.
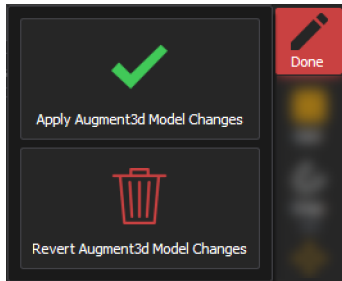

Edit Mode

The secondary Augment3d view allows you to edit and configure your model, fixtures, and objects. Additional tools become available in this mode. For more information, see *Edit Mode-Only Tools (on page 15)*.
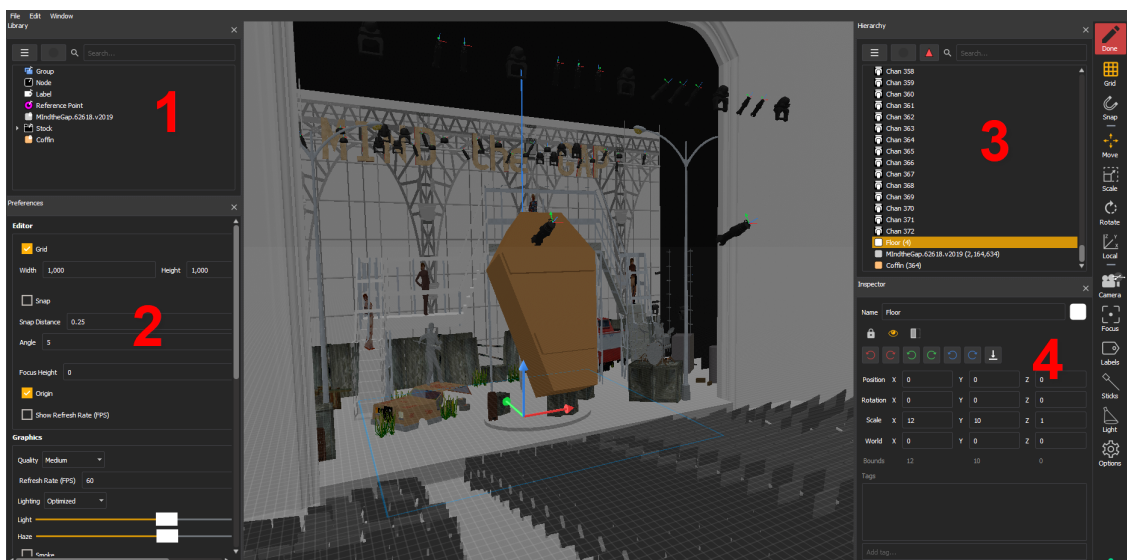
To enter Edit Mode, press the {Edit} button in the upper-right corner.

To exit Edit Mode, select {Done}. Choose whether to apply the changes you have made to the Augment3d model, or revert them and exit without saving changes.

Augment3d Edit Mode Layout

Model

The Augment3d virtual programming environment is referred to as the model. All fixtures and objects must be added to the model in order to be configured and used.

In Edit Mode (see *Control and Edit Modes (on the previous page)*), four primary windows appear to assist in fixture and object manipulation. These windows can be freely dragged, rearranged, re-sized, and closed.

(1) Library

The Library contains all of the non-fixture objects that can be added to an Augment3d project and comes preloaded with a large number of stock objects for your convenience. Additional objects can be imported into Augment3d. Drag objects to add them from the Library into your model.

(2) Preferences

The Preferences contains all the settings for your Augment3d model. Many of these options can also be changed with Toolbar tools. For more information, see *Augment3d Toolbar (on page 10)*.

(3) Hierarchy

The Hierarchy lists the objects and fixtures currently in your Augment3d model. This includes all objects that have been manually added and all fixtures automatically added via Patch.

(4) Inspector

The Inspector contains a variety of controls for modification of any selected objects, including renaming, locking, setting visibility, rotating, and moving. You can also manually enter position, rotation, and scale data for objects.

XYZ & Origin

In Edit Mode, Augment3d models are arranged around three axes; horizontal X (red) and Y (green), and vertical Z (blue).
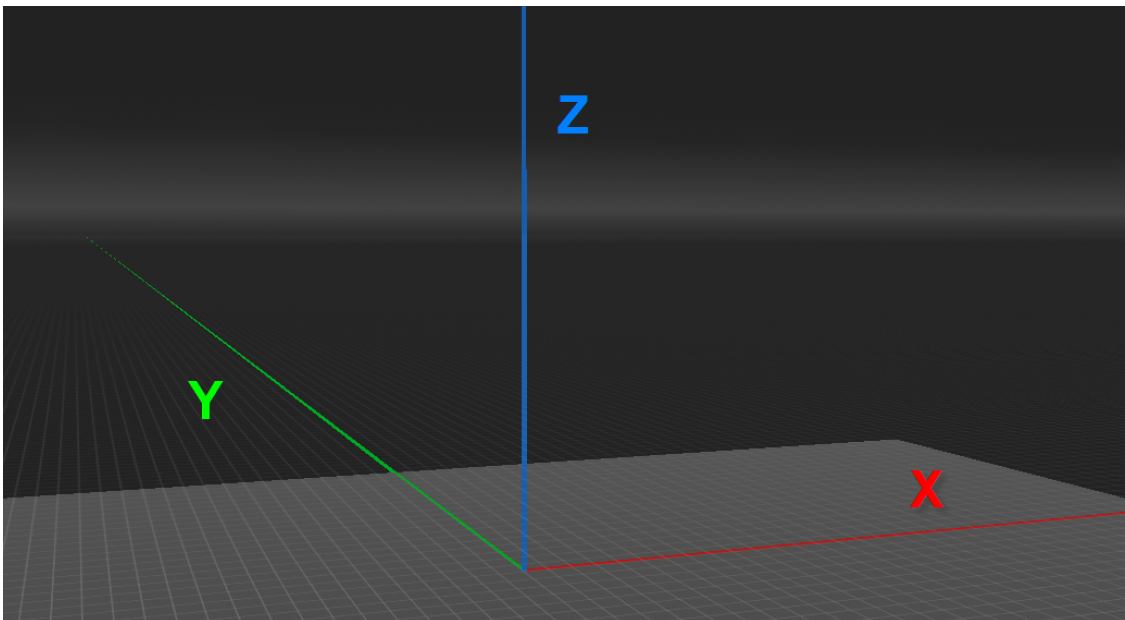

The point at the intersection of these axes (0,0,0) is the origin. This virtual point in Augment3d must correspond to a real point in your space, ideally on the floor. This could be in the center of your stage, in a corner, or any convenient point.

All other measurements in Augment3d reference the origin. To improve the accuracy of your model, choose a physical point that is easily accessible for measurements.

Units

By default, Augment3d measures distance in metric (meters). This can be changed in **Setup > System Settings > Augment3d**.
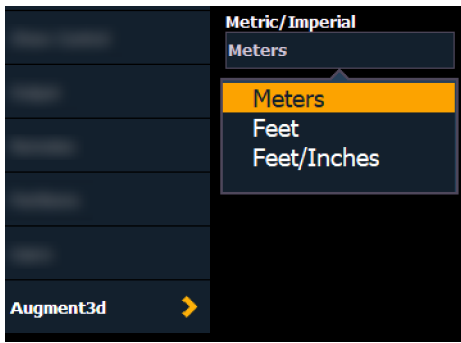
Available options are meters, decimal feet, or feet and inches.

Augment3d Toolbar

The toolbar contains different options for altering Augment3d fixtures and objects.

> **Note:** *Certain tools are only available in Edit Mode. See Edit Mode-Only Tools (on page 15).*

Camera Tool

Camera provides several options to change your view and position in Augment3d. Reset all options to default by clicking **Restore Camera Mode Defaults**.

> **Note:** *In a multi-console system, the Augment3d camera view is synced between devices assigned to the same user ID. All other Augment3d settings are set and adjusted per-device.*
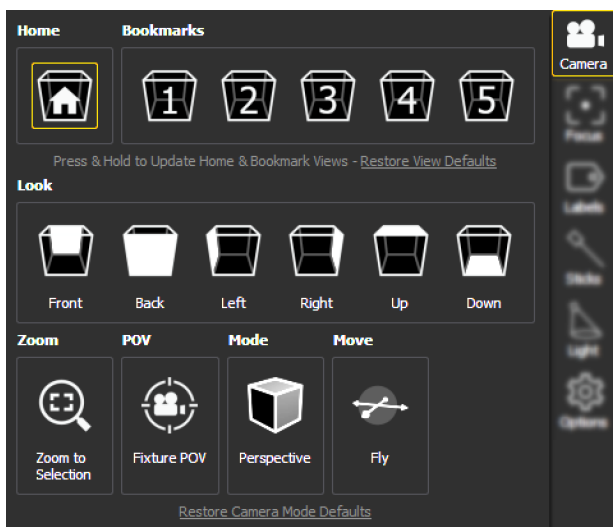
Home

Returns you to the default camera position. This can be updated to the current position by holding down the Home bookmark, or reset by clicking **Restore View Defaults**.

Bookmarks

You can record up to five custom camera positions as bookmarks. Like Home, these can be updated by holding, or reset by clicking **Restore View Defaults**. Updated bookmarks can be stored and recalled using Eos Snapshots that include the Augment3d tab or tether (see *About Snapshots (on page 1)*).

Look

The Look buttons provide shortcuts to different camera positions, oriented around the current camera position.

Zoom

Zooms the camera view to whatever fixtures or objects are currently selected in Augment3d.

Fixture POV

Positions the camera from the point of view (POV) of the gate of the first selected fixture. Exiting POV mode returns the camera to its previous position. When enabled, a Fixture POV symbol will overlay the **Camera** icon. Also available in **Preferences**.

Mode

Toggles between Perspective and Orthographic camera modes. In Perspective mode, objects that are further away are smaller than nearby objects. In Orthographic mode, all objects are the same scale. Also available in **Preferences**.

Move

Toggles between Fly and Orbit camera modes. In Fly mode (indicated by a Fly symbol overlaying the **Camera** icon), the mouse alters the angle of the camera. In Orbit mode (indicated by an Orbit symbol overlaying the **Camera** icon), the mouse moves the camera around a center point. Movement is still possible via keyboard controls in either mode. Hold ALT to temporarily reverse the behavior.

Focus Tool
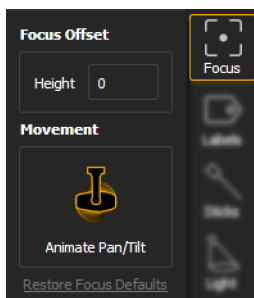
Provides options to edit the Focus Offset height and toggle automated fixture animation on or off. LEFT MOUSE + CENTER WHEEL will also adjust the height. Also available in **Preferences**.

Labels Tool

Labels provides options to toggle various informational overlays on or off. Reset all options to default by clicking **Restore Label Defaults**. All label options are also available in **Preferences**.
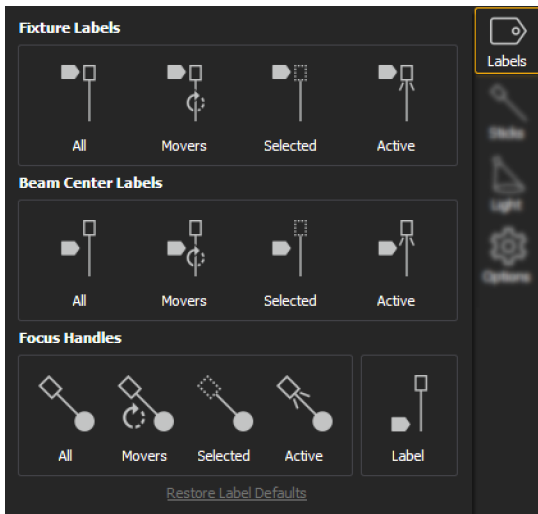
Fixture Labels

Toggles labels overlaying fixture bodies for all, automated, selected, and / or active fixtures.

Beam Center Labels

Toggles labels overlaying fixture beams for all, automated, selected, and / or active fixtures.

Focus Handles

Toggles focus handles for all, automated, selected, and / or active fixtures. Spherical handles may be moved to proportionally refocus automated fixtures. Cubic handles indicate a conventional fixture, but cannot be used to refocus. Labels overlaying focus handles can also be toggled.

Sticks Tool

Stick beams can be toggled to see where a fixture is pointed (even if it is not currently outputting), or for differentiating between multiple fixtures focused on the same location.
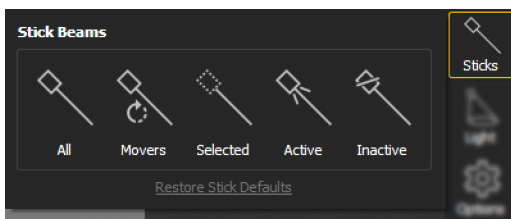
Toggle stick beams for all, moving, selected, active, or inactive fixtures. Reset all options to default by clicking **Restore Stick Defaults**. Also available in **Preferences**.

Light Tool

Provides options to configure the simulated light in an Augment3d model. Reset all options to default by clicking **Restore Beam Defaults**. All light options are also available in **Preferences**.
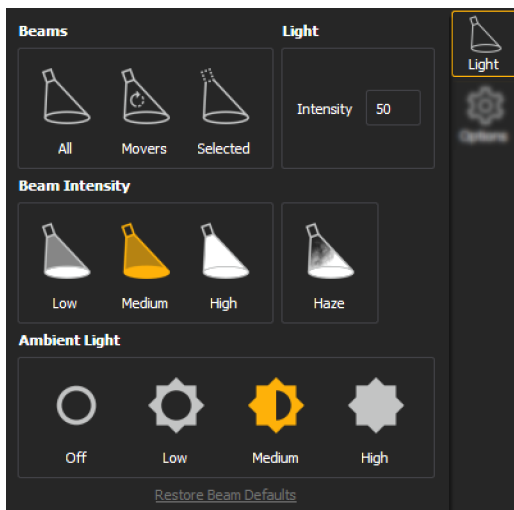
Beams

Toggles simulated light beams for all, moving, or selected fixtures.

Light

Adjusts the overall intensity of the simulated light.

ℹ️ **Note:** *This only affects the intensity of the simulated light beams in Augment3d, not the intensity values of the fixtures themselves.*

Beam Intensity

Toggles between low, medium, and high intensity simulated beams. Toggle Haze on to increase the realism of the beams.
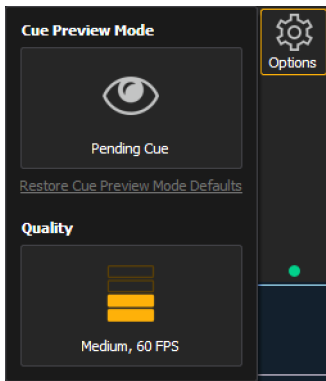
Ambient Light

Toggles between no, low, medium, and high overall ambient light levels in the Augment3d model.
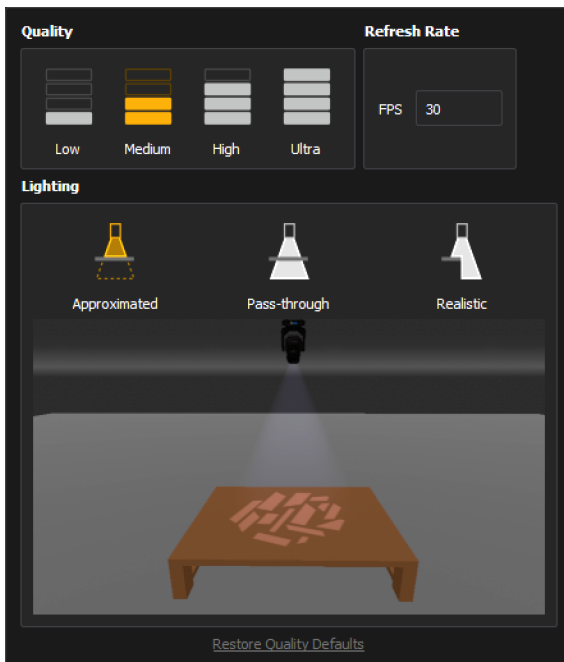
Options Tool

Pending Cue Mode

This mode allows Augment3d to display a virtual preview of the look used in the next upcoming cue.

Reset Cue Preview by clicking **Cue Preview Mode Defaults**. An eye will appear on the **Options** icon when in Cue Preview mode. Also available in **Preferences**.

Quality

Allows you to adjust the quality of the Augment3d render, the FPS, and the Lighting mode. Also available in **Preferences**.

> **Note:** *Augment3d render quality on consoles is limited to Low or Medium.*

> **Note:** *When using Augment3d on a Mac running ETCnomad, an additional option for Resolution Scale will appear in the Quality menu.*

Edit Mode-Only Tools

Grid Tool

Toggles the grid on or off. Also available in **Preferences**.

Snap Tool

Toggles object snapping to the grid on or off. Also available in **Preferences**.

Move Tool

Allows you to move objects along the X/Y/Z axes. Handles have conical ends.

Scale Tool

Allows you to resize objects along the X/Y/Z axes. Handles have cubic ends. Use the center handle to resize all dimensions proportionally.
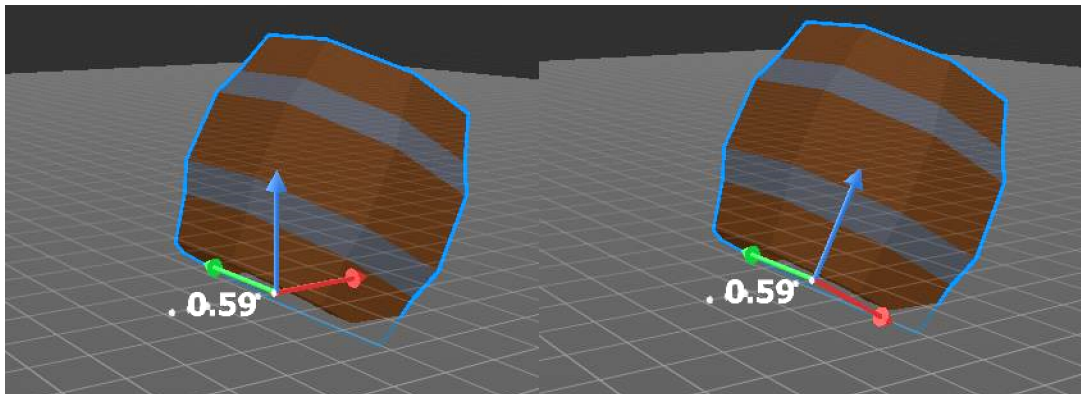
Rotate Tool

Allows you to rotate objects around the X/Y/Z axes.

Local Tool

Toggles Move and Rotate object tools between global XYZ orientation and object XYZ orientation. Scale is always performed relative to the object's Local XYZ orientation.

- On the left barrel, Local is toggled off, so the Move tool orients itself based on the Augment3d model.
- On the right, Local is toggled on, so the Move tool orients itself relative to the position of the barrel itself.

Fixtures in Augment3d

Fixtures must be patched in Eos and then added to an Augment3d model before they can be displayed and controlled.

Adding Fixtures Manually

If fixture position and orientation data is already known, fixtures can be manually added via the Augment3d tab in the Eos Patch screen.

For more information, see *Manually Adding Fixtures (below)*

Adding Fixtures Automatically

Alternatively, if fixture position data is not available, Augment3d can calculate the rotation and XYZ position of fixtures using calibrated points placed at known locations throughout your space.

For more information, see *Fixture Position Estimation (FPE) (on page 1)*.

Adding Fixtures from Vectorworks

Finally, fixtures can be imported into an Augment3d model from a Vectorworks file. For more information, see *Vectorworks Plug-in Overview (on page 1)*.

Manually Adding Fixtures

If you already know the position and orientation of your fixtures, you can manually add them to Augment3d through the Eos Patch screen on a channel-by-channel basis.

In Patch, certain fixtures will appear with the Augment3d "3d" logo next to them. This symbol indicates profiles with an Augment3d model.

> *Note:* *Fixtures requiring a profile update will display with an asterisk (*). For more information, see* *Update Profile (on page 1)*.

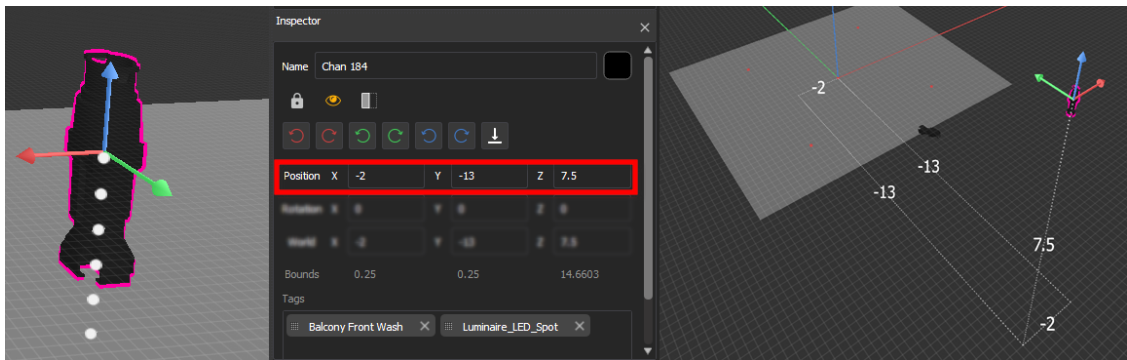> *Note:* *Moving Mirror fixtures are not currently supported.*

Position and Orientation Data

Position

Position data is either local or world. For more information, see *Inspector (on page 1)*.
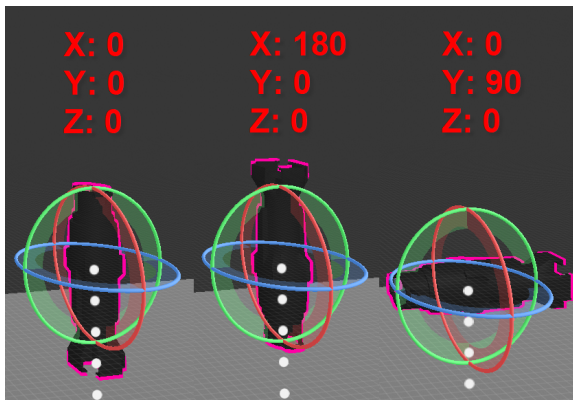
In the above example, the fixture patched to Channel 184 is -2 meters offset on the X axis, -13 meters offset on the Y axis, and 7.5 meters offset on the Z axis.

Orientation

Orientation data reflects how the fixture is rotated. The values for X, Y, and Z represent a rotation in degrees around that axis in relation to the global XYZ axes.

The above left example shows the default orientation of 0/0/0, or pointing straight down. The center shows a rotation of 180° about the X axis, pointing the fixture straight up. The final example shows a rotation of 90° about the Y axis, pointing the fixture to the side.

Adding Fixtures Manually

Under the Augment3d section in Patch, fixtures have fields for XYZ Position & Orientation. You can also enter information for Beam Angle, Shutters, and Gobo Rotation.

Entering Fixture Position & Orientation Data

Select the channel of a fixture for which you have position and orientation data, and navigate to the Position & Orientation section of the Augment3d tab in Patch. Selecting one of the position or orientation fields opens a keypad to input specific values.

Alternatively, keyboard syntax can be used. Use **[/]** to separate X, Y, and Z when typing in multiple values, and **[Thru]** to enter information for multiple fixtures at once.

- **[Chan] [1] [Select] [5] [/] [5] [/] [5] [Enter]** sets the position of Channel 1 to 5,5,5.
- **[Chan] [1] [Select] [/] [2] [/] [Enter]** sets the Y coordinate of Channel 1 to 2. No changes are made to the X and Z coordinates.
- **[Chan] [1] [Select] [+] [3] [/] [/] [Enter]** adds 3 to the current X coordinate of Channel 1. No changes are made to the Y and Z coordinates.
- **[Chan] [1] [Select] [+] [/] [1] [/] [-] [5] [Enter]** adds 1 to the current Y coordinate of Channel 1, and subtracts 5 from the Z coordinate. No change is made to the X coordinate.
- **[Chan] [1] [Thru] [5] [Select] [0] [/] [0] [/] [5] [Thru] [10] [/] [10] [/] [5] [Enter]** sets the position of Channel 1 to 0,0,5 and the position of Channel 5 to 10,10,5. The positions of Channels 2, 3, and 4 are evenly distributed between the two.
- **[Group] [10] [Select] [5] [/] [/] [Thru] [10] [/] [/] [Enter]** distributes the X coordinate of all channels in Group 10 between 5 and 10. No changes are made to the Y and Z coordinates.

All trailing slashes are optional. **[Chan] [1] [Thru] [10] Position [5] [Thru]** auto-completes to **[Chan] [1] [Thru] [10] Position [5] [/] [*] [/] [*] [Thru]**.

The corresponding fixture is automatically added to the Augment3d model. Repeat the process for any additional channels or fixtures, or edit fixture position and rotation using tools available in the toolbar or the Inspector.

Position [@] [Enter] will remove the position of the selection. **Orientation [@] [Enter]** will reset the orientation of the selection to (0,0,0).

Editing Fixture Position and Rotation

Fixture position and rotation can also be edited in *Augment3d Edit Mode (on page 1)* using tools available in the toolbar or in the Inspector.

Any changes made to fixture position in Augment3d will automatically update the values in Patch. Similarly, any change made via Patch will automatically update the fixtures in Augment3d.

Setting Orientation for Conventional Fixtures in Patch

The Orientation property for conventional (non-automated) fixtures is used to aim static lighting fixture at the correct point.

1. Navigate to **[Patch] > Augment3d > Position & Orientation**.

2. Select conventional fixtures via the command line, or by selecting them in Augment3d. The fixtures will light up to indicate their selection.

> **Note:** *You do not need to enter Augment3d Edit Mode to select fixtures.*

3. Aim the fixtures at their intended target using a long selection, or SHIFT + left mouse.

Automatically Configuring Fixtures

Eos can automatically configure the location and orientation of automated fixtures in Augment3d using a process called Fixture Position Estimation (FPE).

Setting up FPE

FPE associates four or more points in your space with corresponding Focus Palettes in order to estimate the location and rotation of your automated fixtures.

If you are setting up your fixtures for the first time, it is generally easier to choose FPE points first, and then record Focus Palettes for each one. However, if you have existing Focus Palettes it may be possible to use those focus locations for your FPE points instead.

FPE Points

1. Choose four or more points on the floor, ideally in a rectangle that encloses the majority of the space you are lighting. While four points is the minimum requirement, additional points may increase FPE accuracy.
2. Determine the X and Y coordinates of these points by measuring outwards from your origin point. Matching Z coordinate values provide the best FPE performance.

3. Once you have your points chosen and measured, enter the coordinates for each point by navigating to the Eos Patch screen.
4. Click the Augment3d tab and select the FPE section.
5. Enter the measured coordinates of each point. Augment3d will automatically place an FPE Point at each location.

Updating XYZ coordinates in Patch will alter the FPE Point's location in the Augment3d model.

Focus Palettes

Once you have chosen, measured, and entered the coordinates of your points, associate each point with a Focus Palette.

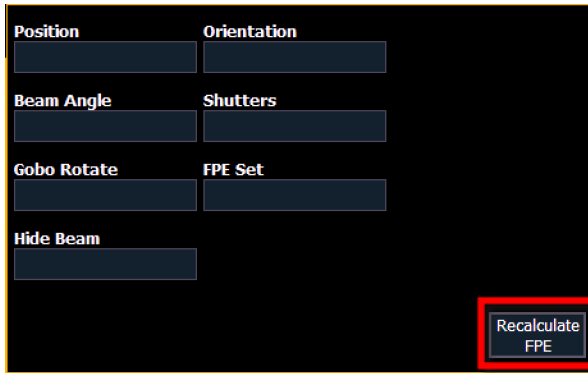1. Focus your fixtures at one of your FPE points and record a Focus Palette.

> **Note:** *Fixture beams must be centered on the FPE point. Focusing fixtures one at a time, sharpening the beam edge, and narrowing the iris to create a smaller-sized beam may help you center the beam. Using a gobo with an easily-identifiable center point (such as a crosshair) may also help.*

2. In Patch, enter the Focus Palette number into the "FP#" column that corresponds with the point on which you focused.
3. Repeat this process until all your FPE points have associated Focus Palettes.

Calculating FPE

Once you have at least four FPE Points matched to Focus Palettes, you are ready to calculate FPE.

Press **Realculate FPE** , then **Confirm FPE** to commit your changes.

A window will appear summarizing any FPE changes and / or a table of errors.

Note: *Any errors must be resolved before proceeding. It is not possible to undo an FPE calculation.*

Press **Accept FPE Changes** to proceed.

If calculating FPE for the first time, this will automatically generate fixtures in your Augment3d model. You can also make subsequent FPE edits or recalculations the same way.

Selective FPE

With nothing selected in the command line, FPE will recalculate positions for all patched fixtures in a show file. If specific fixtures or ranges of fixtures are selected, the FPE calculation will only affect the selection.

Troubleshooting FPE

If fixture response is inaccurate or if fixtures are not generated correctly in Augment3d, check the following:

- Ensure your fixture profiles are up-to-date, and update if not (see *Update Profile (on page 1)*).

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- • This is likely to fix the problem if fixtures of one type respond accurately and fixtures of another type do not.
- Ensure the measured ground points in your space match how they were entered in Eos, and that the X and Y coordinates were not accidentally swapped.
- Verify you are using the correct units of measurement.
- Replay your Focus Palettes.
  - Did they record correctly?
  - Were they assigned to the correct Reference Point?
  - Do any of the fixtures pan more than 180 degrees? If so, press {Flip} and re-record (or update) the Focus Palette
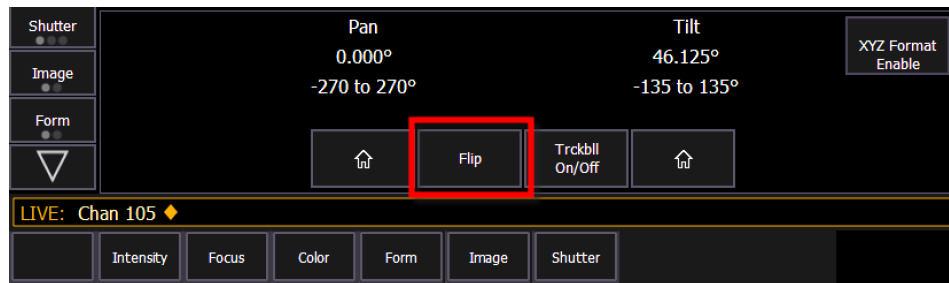
- Add an additional FPE Reference Point and Focus Palette and recalculate FPE. Is the fixture response more accurate?

Working with Fixtures

Once fixtures are added to your model, you can begin using Augment3d to focus and control them. There are a variety of tools available to help with this.

Fixture Selection & Focus

Selecting Fixtures

To select fixtures in Augment3d, either select them via the Eos command line or use a mouse. Click on a fixture to select it. You can also drag, or hold shift to select multiple fixtures.

There are three colors used for selection:

- Gold - fixtures selected in Eos
- Blue - fixtures selected in Augment3d Edit Mode
- Pink - fixtures selected in both Eos and Augment3d

Focusing with Click-To-Focus

Selecting and holding on an object or plane in your Augment3d model will focus the selected fixture on that spot. Pressing SHIFT + LEFT MOUSE will also activate Click-To-Focus. You can also drag around the model to move the fixtures. Fixtures without pan / tilt parameters must be selected while in Patch for Click-to-Focus to work.

Other Useful Tools

Labels Tool
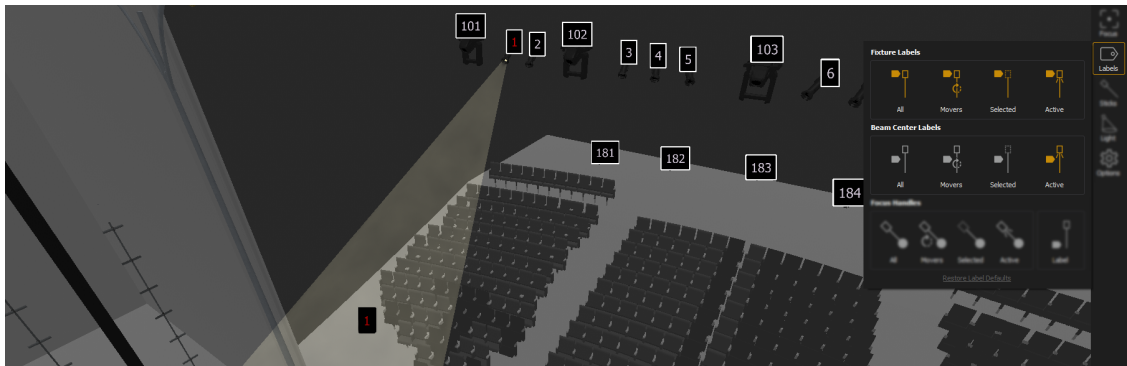
Fixture Labels display the channel number of the fixture. This can be useful in identifying which fixture is creating a particular beam of light.
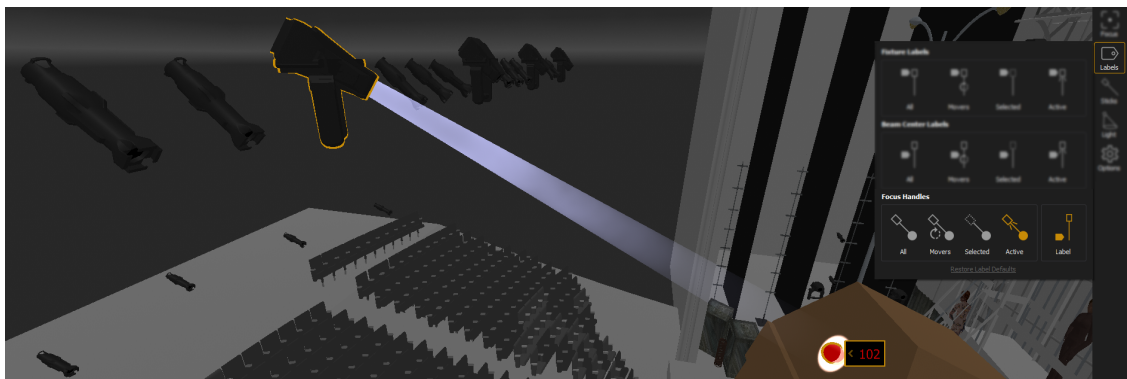
Focus Handles create a controllable point at the end of the beam of an automated fixture, which can be dragged to focus a single fixture, or multiple fixtures together while maintaining their spatial relationships.

For more information, see *Labels Tool (on page 11)*.

Sticks Tool
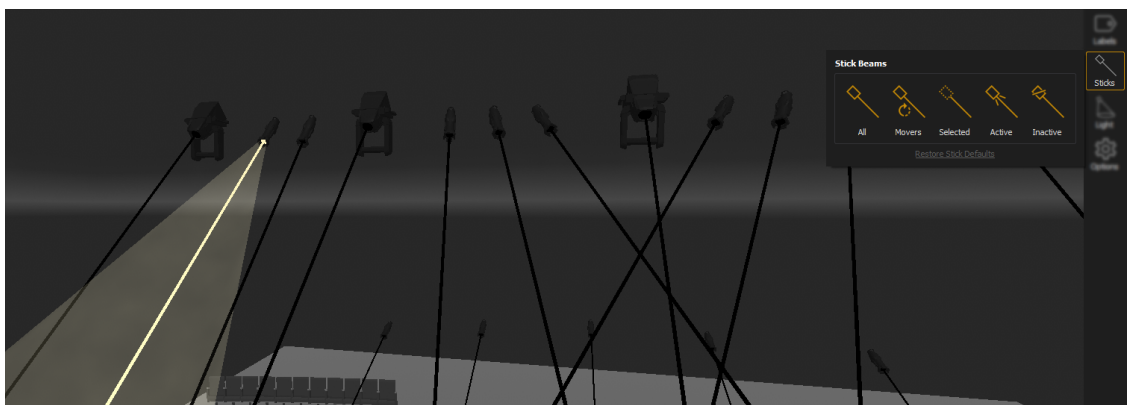
Stick Beams draws a line from the fixture to wherever the beam lands. Stick Beams do not require intensity and can be used to focus a fixture that is not currently outputting.

For more information, see *Sticks Tool (on page 12)*.

Focus Tool

Use the Focus Height feature to set a vertical offset from the location that is being focused on, in order to adjust focus to an actor's chest or face, instead of on the floor where they are standing.

For more information, see *Focus Tool (on page 11)*.

Augment3d Objects

Objects are any non-fixture element of your Augment3d model.

Adding Objects

There are two ways to add an object to the Augment3d model.

From the Library

Objects can be dragged from the *Library (on page 1)* and placed into the model. You can also right-click, select **Create**, and choose the object you wish to add.

> **Note:** *Objects are created with a (0,0,0) position on the XYZ axes when added to the model.*

From the Hierarchy

To add objects from within the Hierarchy, right-click, select **Create**, and choose the object you wish to add.

Modifying Augment3d Objects

The Position, Scale, and Rotation of any object in an Augment3d model can be modified using one of the associated tools in the toolbar (see *Edit Mode-Only Tools (on page 15)*).

Selecting one of the modification tools from the toolbar puts the selected object or objects into the corresponding modification mode (Move, Scale, and Rotation, as seen left-to-right below).
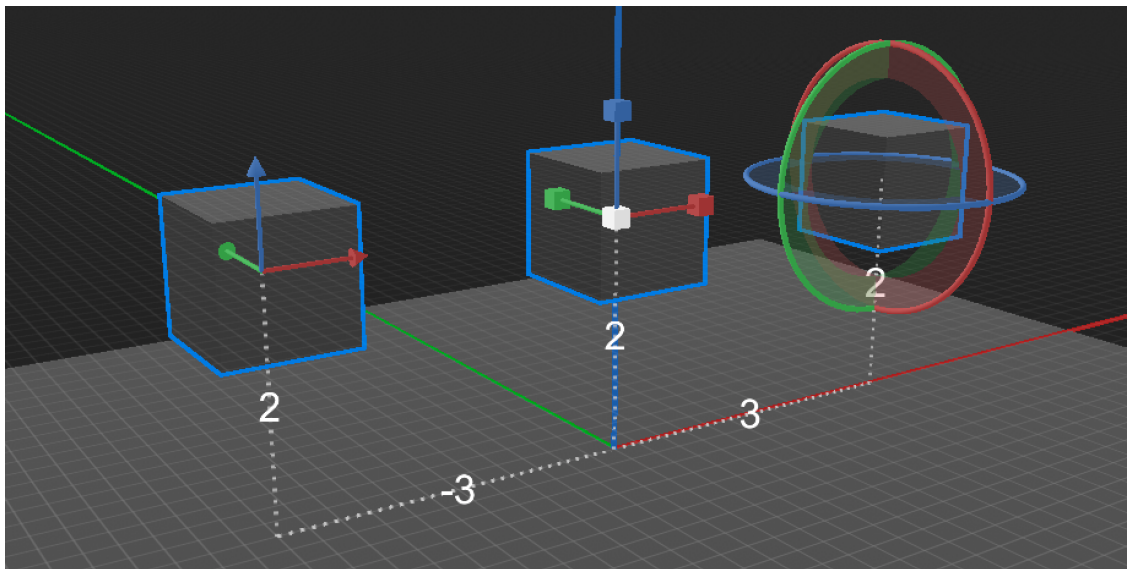
These parameters can also be modified using the quick buttons in the *Inspector (on page 1)*.

Position

Select the Move tool. Drag on any of the X/Y/Z axes to move the object in that direction. Objects that have been moved away from their 0,0,0 default position will display a trail and distance measurement back to the Origin.

Scale

Select the Scale tool. Drag on any of the X/Y/Z axes to enlarge the object in that direction. Drag on the white center box to scale all dimensions proportionally.

Rotation

Select the Rotate tool. Drag on any of the X/Y/Z axes to rotate the object in that direction.