PEGASUS

By Procedural Worlds

Pegasus is a system that enables the creation of fly throughs and cut scenes.

Version 2.5.0 – June 2018

Contents

Installation

Installing Pegasus will create the following folder structure:

Pegasus:

Animation: Sample animation assets

Demo: A simple demo scene

Documentation: Pegasus documentation

Formations: Sample formations

Prefabs: Pegasus reticule prefab

Scripts: Pegasus source code

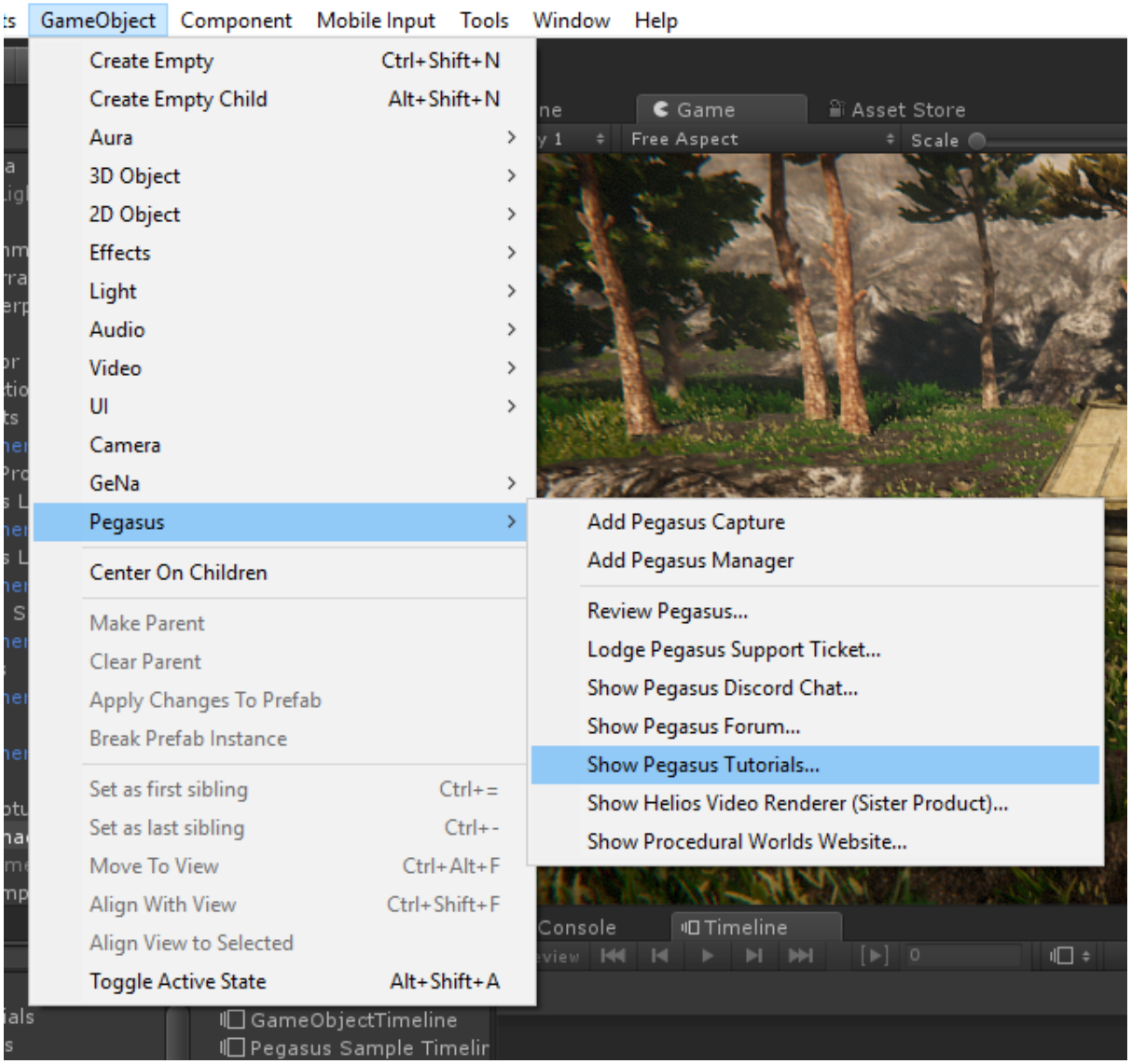
Textures: Pegasus reticule texture

Tutorials & Support

In general Pegasus is self documenting – to understand a control just hover over it and a help message will appear.

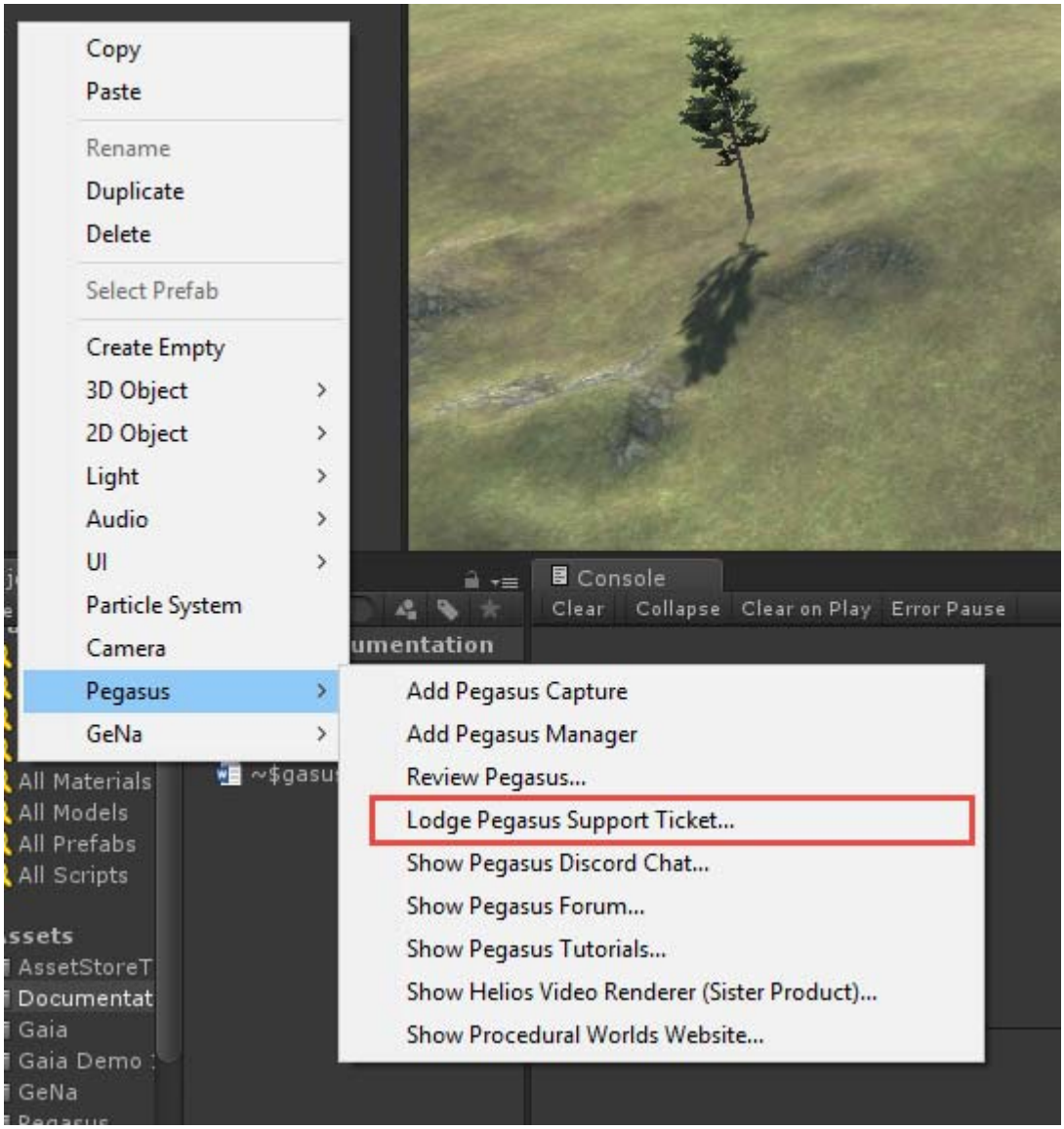
However, sometimes you need more, and to get a better sense of how to use Pegasus we have created a bunch of great video tutorials. To access them click on the following link of show them from the Pegasus Menu:

http://www.procedural-worlds.com/pegasus/?section=tutorials



If you are still stumped, then please lodge a support ticket. All tickets are tracked and will get an answer, usually within 48 hours.

To lodge a support request please select GameObject -> Pegasus -> Lodge Pegasus Support Ticket... or click on this link:
https://proceduralworlds.freshdesk.com/support/home



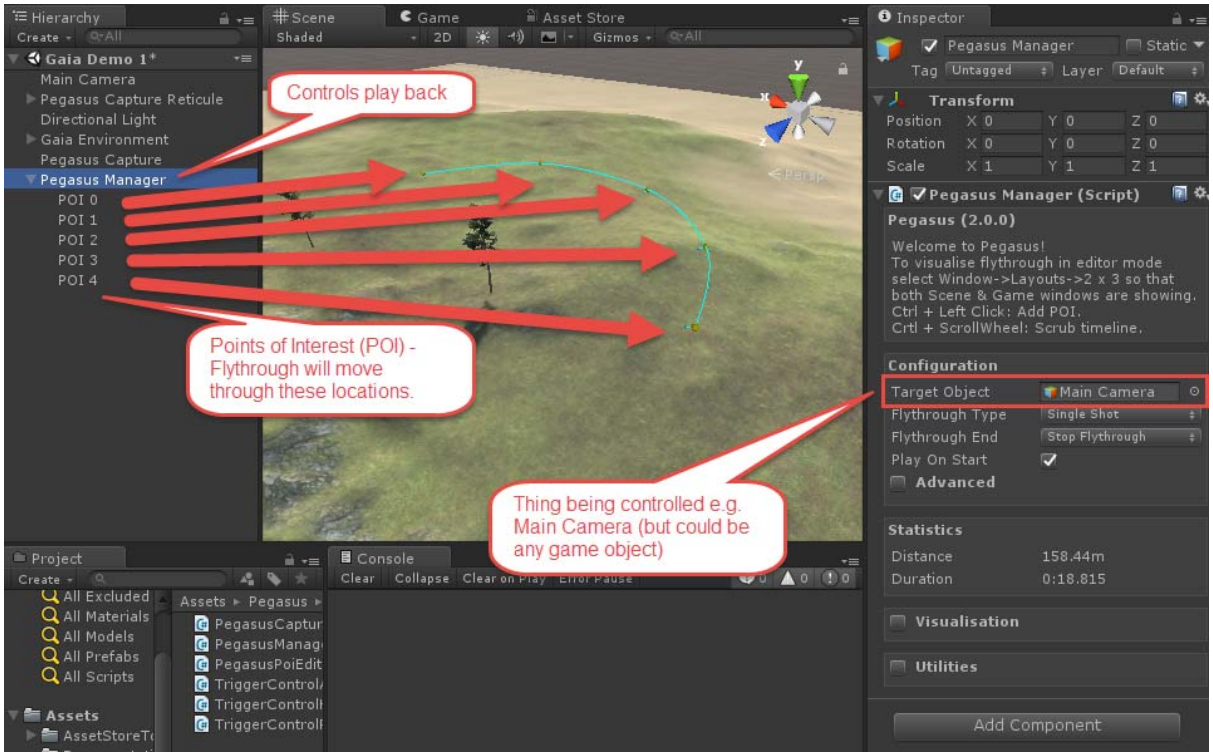
Alternatively, if you have a quick question then it's often just quicker to connect for a chat to our Discord channel. It's a great way to also meet the rest of the community.

https://discord.gg/rtKn8rw

Concepts

Pegasus allows any object to be driven through a scene and provides fine grained control of its speed, location and rotation.

While Pegasus was designed to create fly throughs and cut scenes, it can drive any object that you drop into its Target Object slot.



The main Pegasus components are:

Pegasus Capture – Pegasus capture allows you to capture your position and orientation as you move through your scene at runtime. You can then turn this into a Pegasus manager after you have stopped playing your scene.

Pegasus Manager – Pegasus manager controls the position, location and direction of an object over time within the scene.

Pegasus POI – Pegasus POI or points of interest are the locations that the flythrough will pass through as it is executed.

Pegasus Animator – A component that will animate a character being driven by Pegasus, based on its speed. Only Mecanim animation is supported.

Pegasus Follow – A component that will cause a character to follow a target. Generally used in conjunction with formations.

Workflow

Framerate

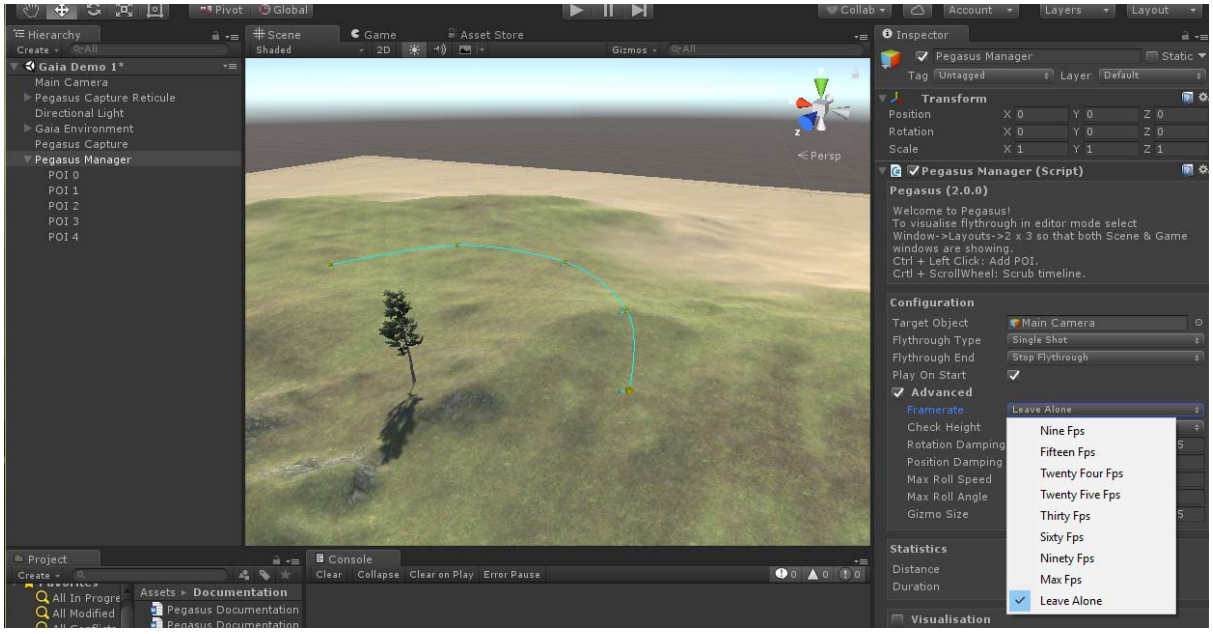
An important consideration when using Pegasus is the framerate setting.

This setting controls the framerate that Unity tries to render your scene at, however the actual frame rate you get will depend on the complexity of your scene and the power of your computer.

Additionally, if you are panning across wide areas of your scene, you will often get dropped frames. This is usually caused by Unity culling and is part of the reality of using Unity and can be improved by optimizing your scene.

If you want the best possible output then use Pegasus with your favourite offline video rendering Utility such as Helios, and this will ensure that you get a perfect render with no dropped frames.

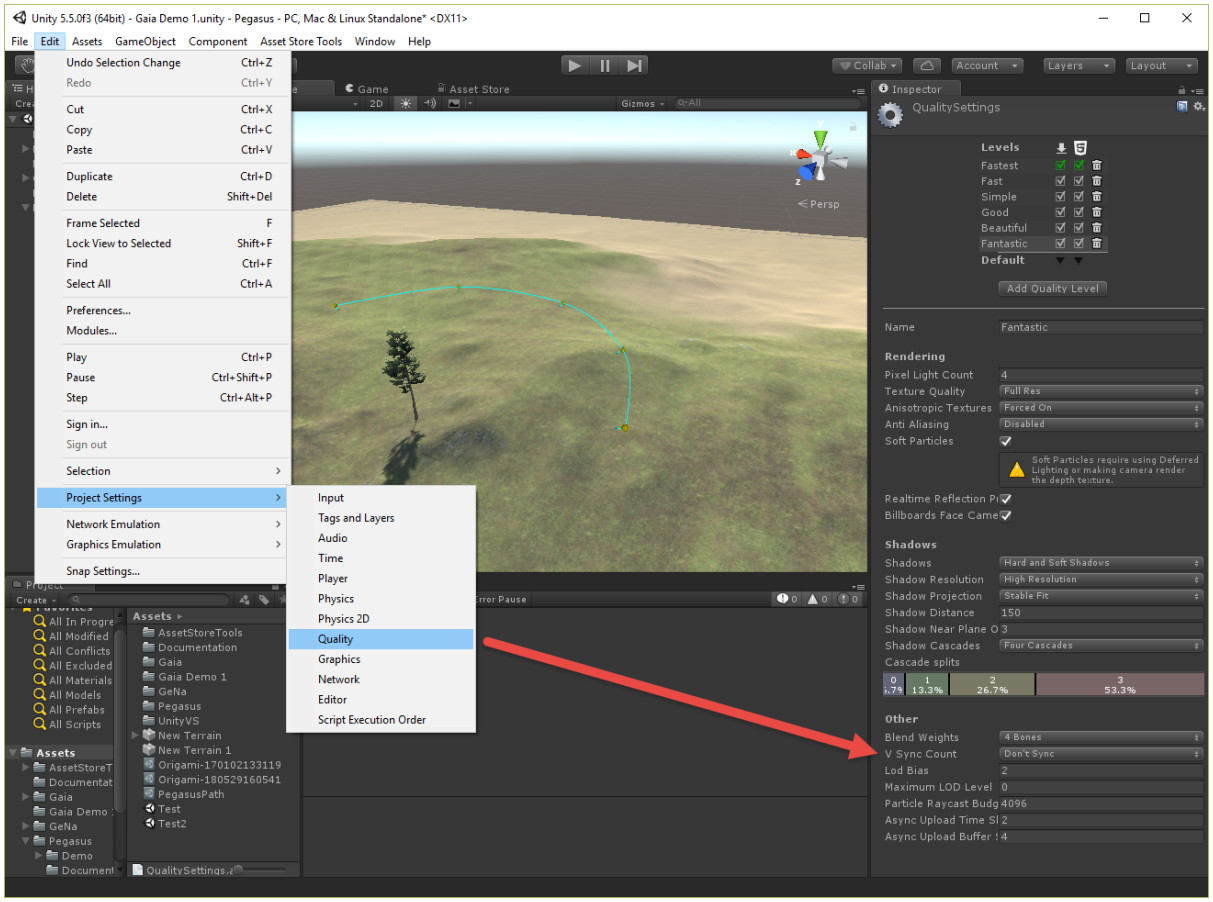
It is important to ensure that all the Pegasus Managers in your scene have the same settings.



Another important setting is your Quality Settings. Your V Sync Count will impact the overall frame rate.

I usually disable V-Sync, and then let Pegasus control the framerate, or alternatively, select Leave Alone in Pegasus and let your VSync and other applications control the frame rate.

If you are getting excessive frame drops then experiment with these settings and the flythrough itself. By minimising the rate of change from frame to frame you will also minimise dropped frames.

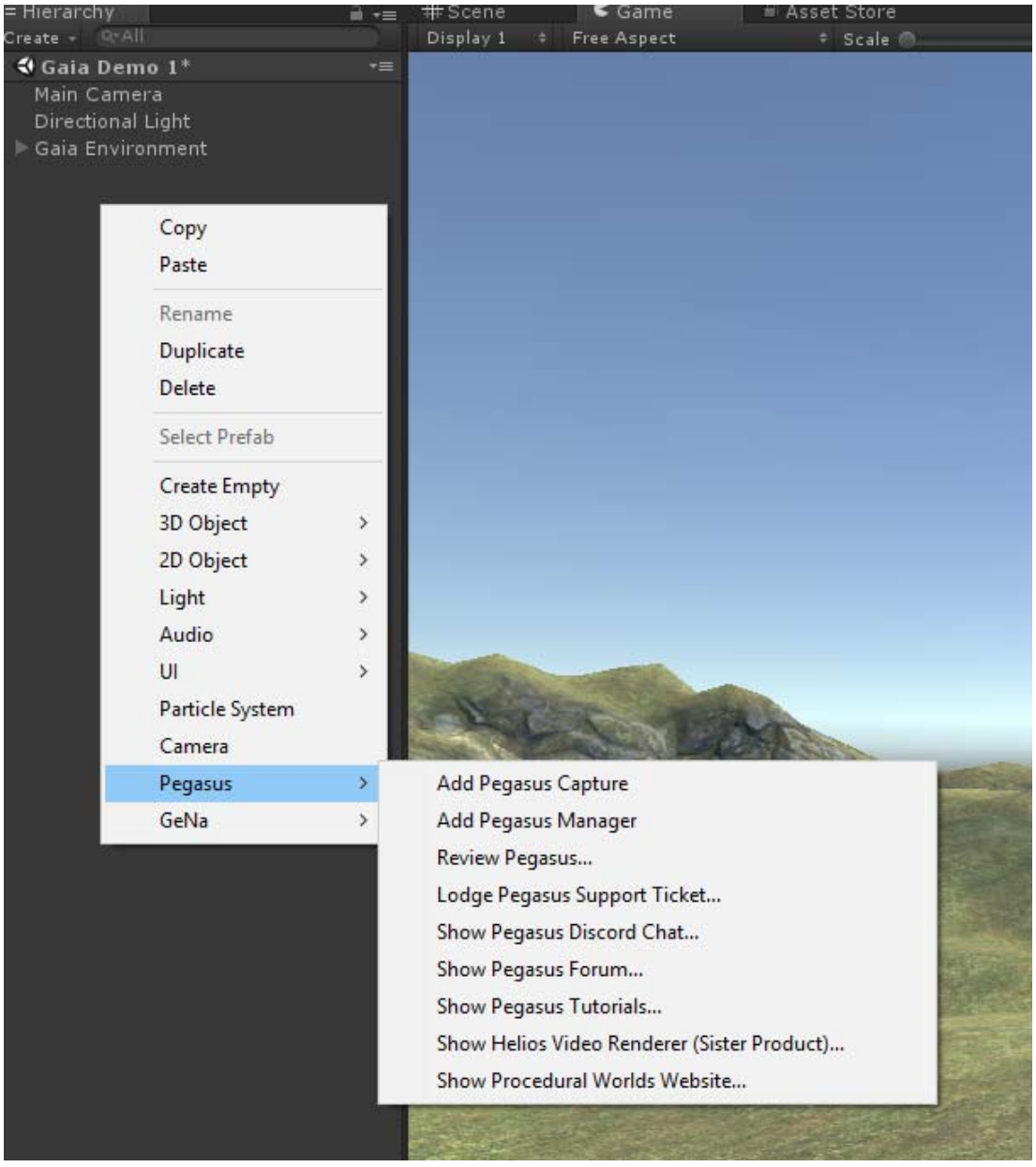


In-game Pegasus Creation

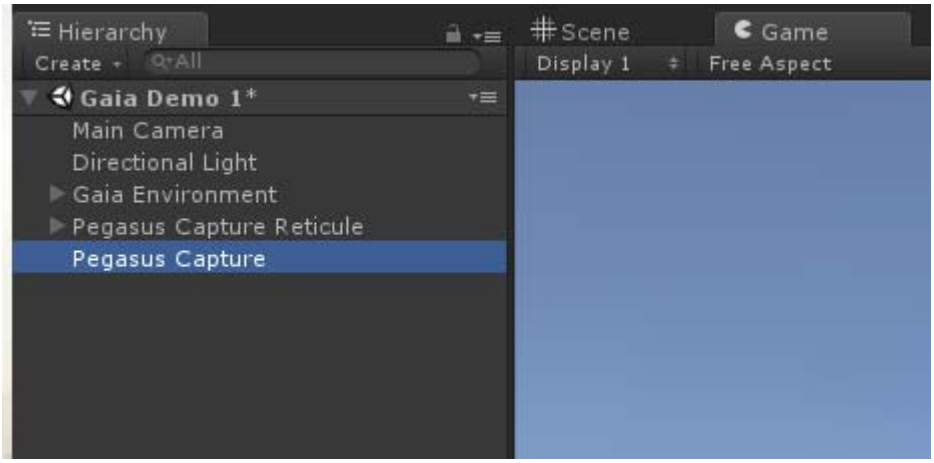
In-game capture is a great way to create accurate Pegasus flythroughs, as you capture the location and view of the camera as you play your scene back.

To create a Pegasus Capture select GameObject -> Pegasus -> Add Pegasus Capture.

Alternatively, right click on your hierarchy window to show it and then Add Pegasus Capture.



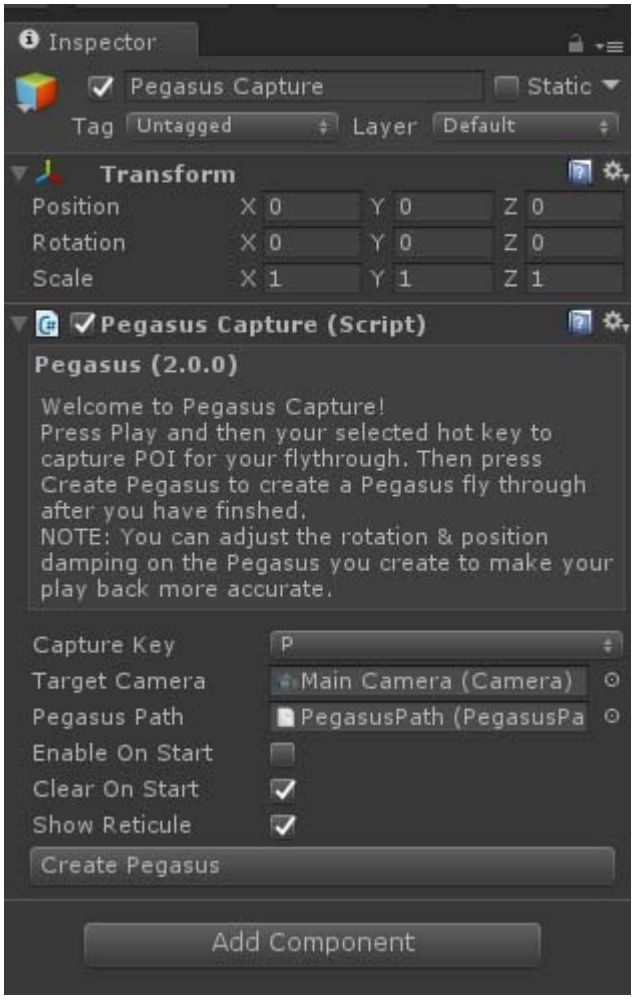
This will create a Pegasus Capture, and a Pegasus Capture Reticule in your scene and set it up ready to go.



Then all you need to do is Play your scene, use your targeting reticule to aim your camera, and press P to capture a new POI.

Press P multiple times from different locations to add more POI to your capture.

When you have finished, stop your scene playback and then press the Create Pegasus button to create your new Pegasus Manager. Please note that doing this will disable “Enable on Start” and hide your reticule. You need to reenable this if you want to capture another path.

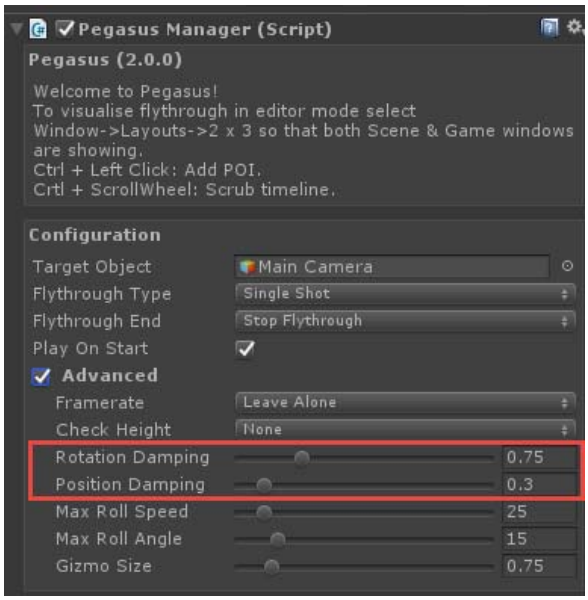


You can build a path up over multiple executions by disabling “Clear on Start”, otherwise the default behaviour will be to remove the points you captured on the last session so that they don’t mess up the next one.

NOTES:

1. Pegasus will also display a sphere at runtime when enabled to allow you to see where you have been when in capture mode.

2. Pegasus will smooth both the rotation and the position of the flythrough. If you would like a less smooth, but more accurate playback then reduce the rotation and position damping in your Pegasus Manager.



Manual Pegasus Creation

To get the quickest workflow with Pegasus update your screen so that you can see both the Scene and Game windows at the same time. Pegasus will update Game view in real time so that you can see how the camera view changes as you make changes to POI and their LookAt targets. This allows you to compose your shots. One way to do this is to select Windows->Layouts->2x3.

1. Add a Pegasus Manager to your scene by selecting GameObject->Pegasus->Add Pegasus Manager.

2. Drag your camera or target object into the Target Object slot on the Pegasus Manager – this is the thing that will be controlled by Pegasus when Play is pressed.

3. Add Pegasus POI to your scene by clicking Ctrl + Left Mouse Button at each location you would like your target to pass through.

   You will see a Gizmo place at every location on which you click, and when you place two or more, they will be joined up by a path visualisation spline.

   The path visualisation spline allows you to visualise where Pegasus will drive your target.

4. Press Play to start your scene. Pegasus will start playback when you start your scene.

From here:

- Change the settings in your manager to change the way the overall flythrough operates.

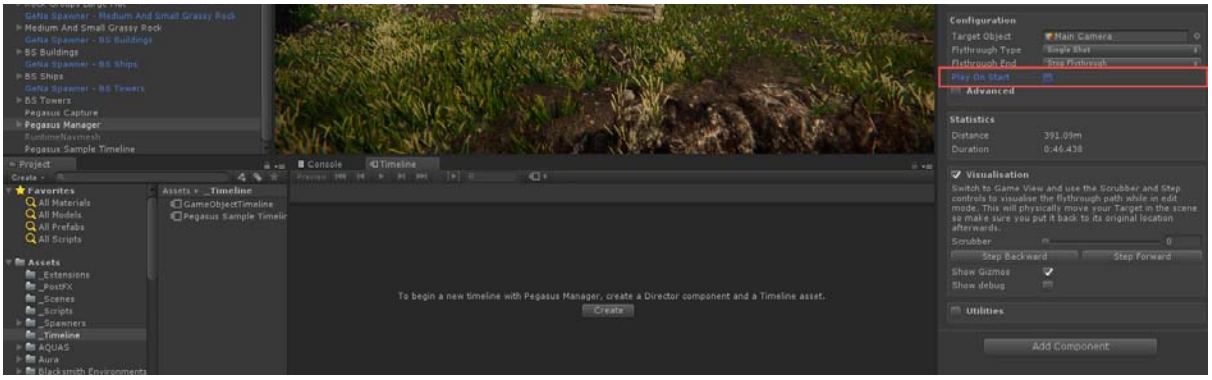
- Customise individual POI segments to change the way the flythrough operates thought that POI segment.

Control via Timeline

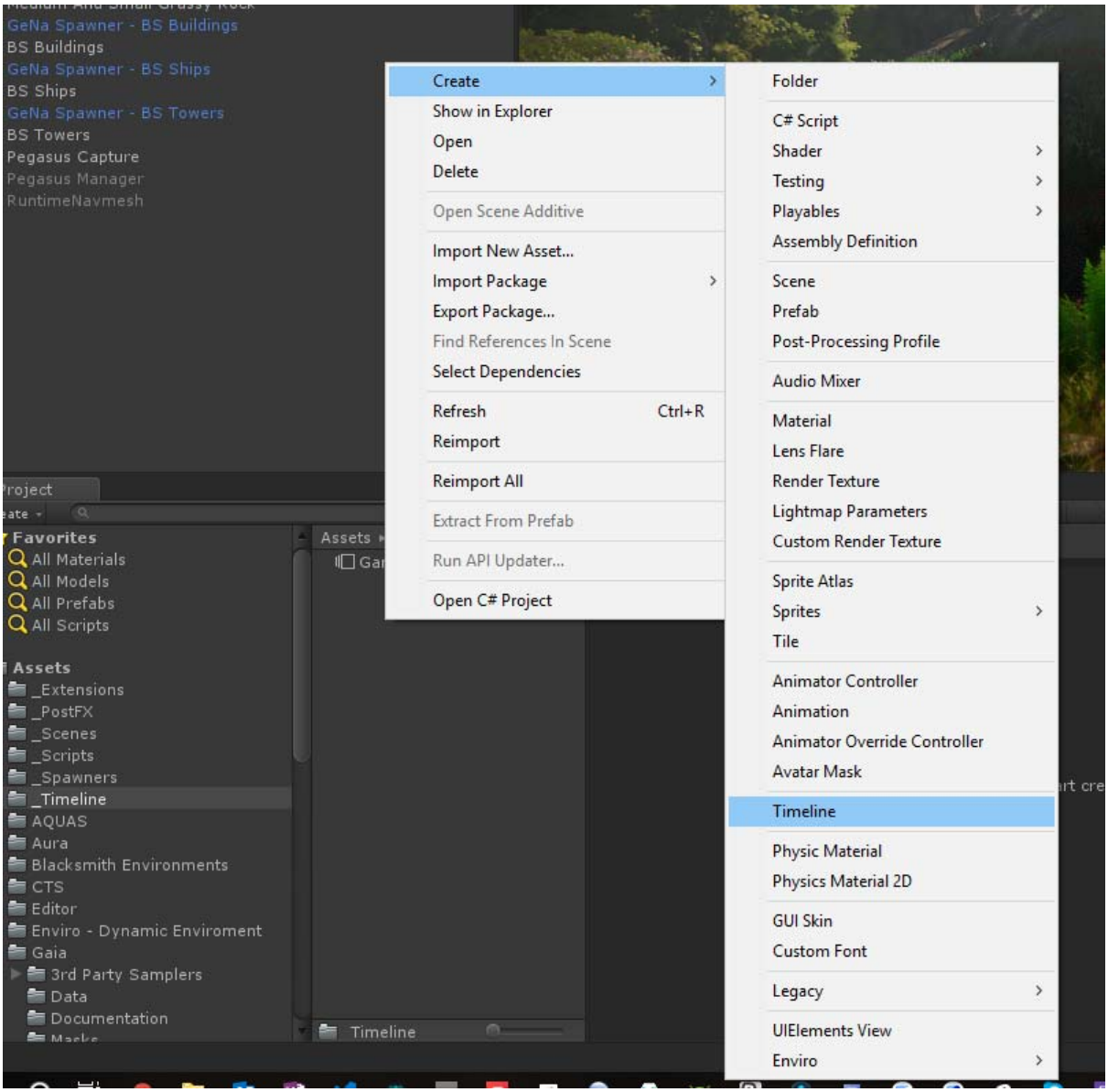
Once you have created a Pegasus it can be controlled by Unity Timeline.

This has the benefit of allowing precise Pegasus playback over the given time frame, but because timeline is controlling the speed rather than Pegasus, you lose the accurate speed that Pegasus gives by itself.

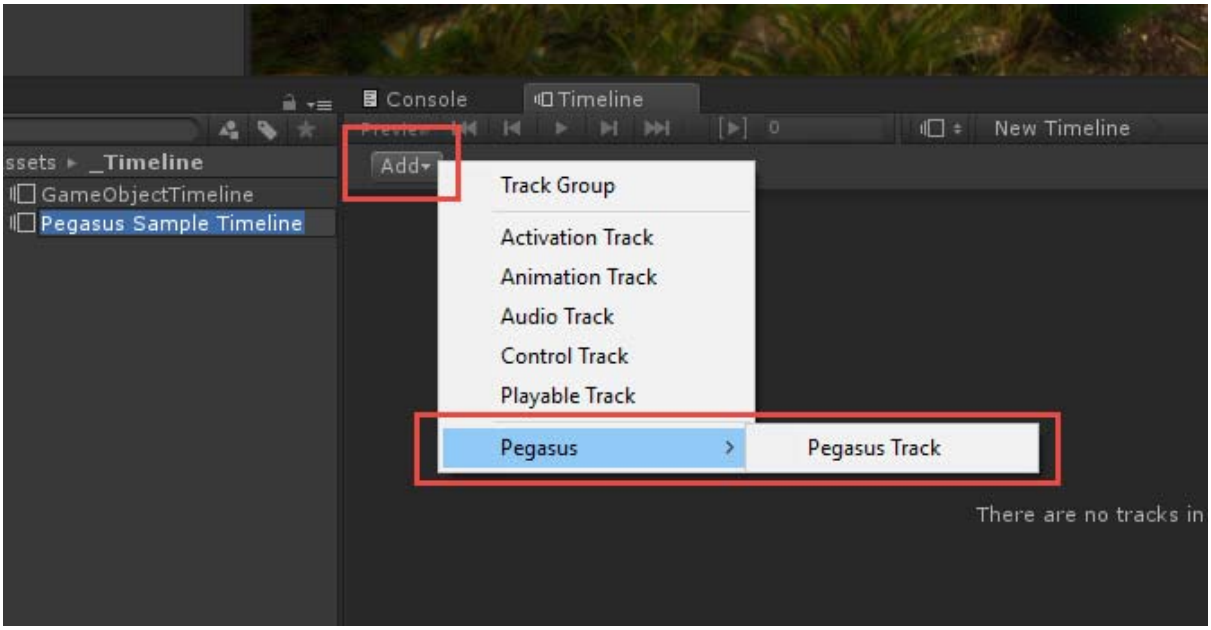
1. Disable Play on Start in your Pegasus Manager:



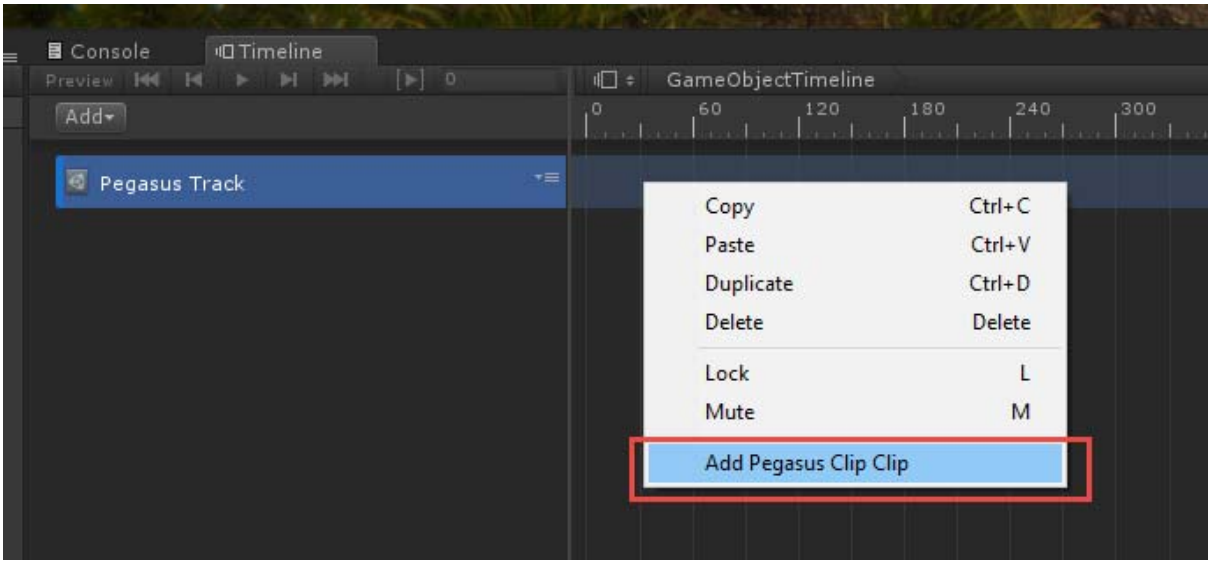
2. Create a new timeline object by right clicking in the directory you want it to be created, and then selecting Timeline.



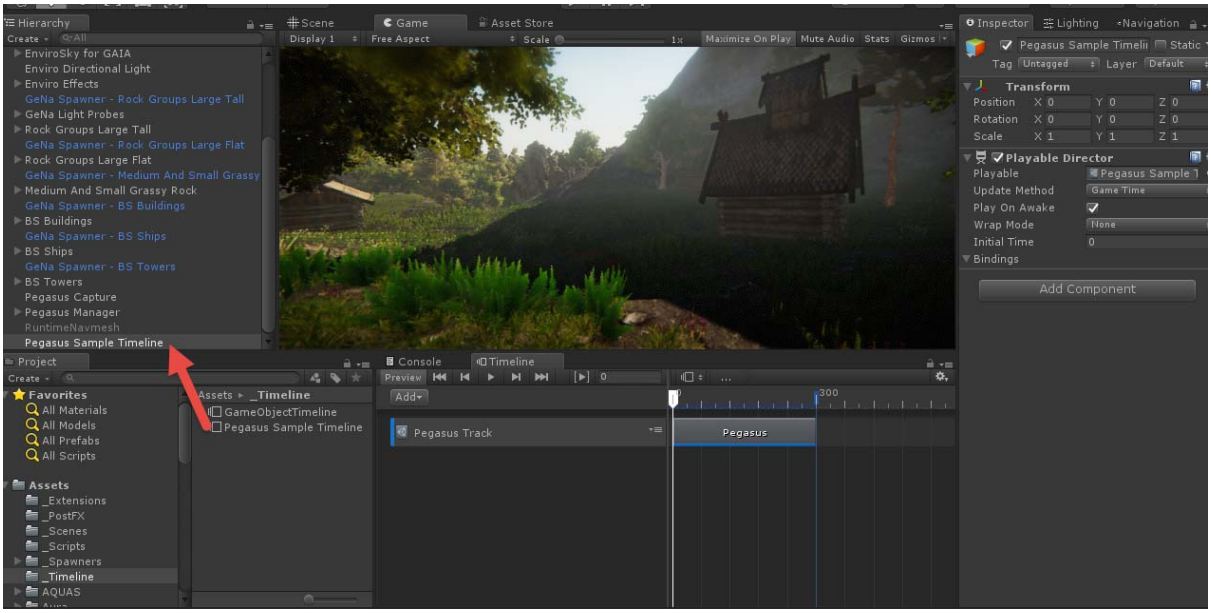
3. Then add a Pegasus Track to it:



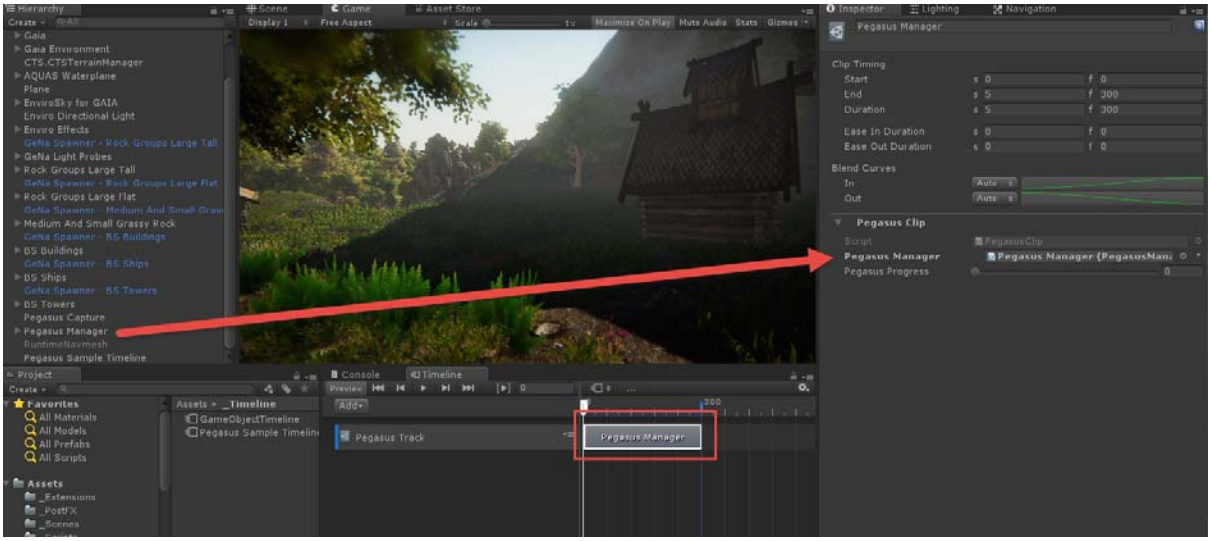
4. Then add a Pegasus Clip to it:



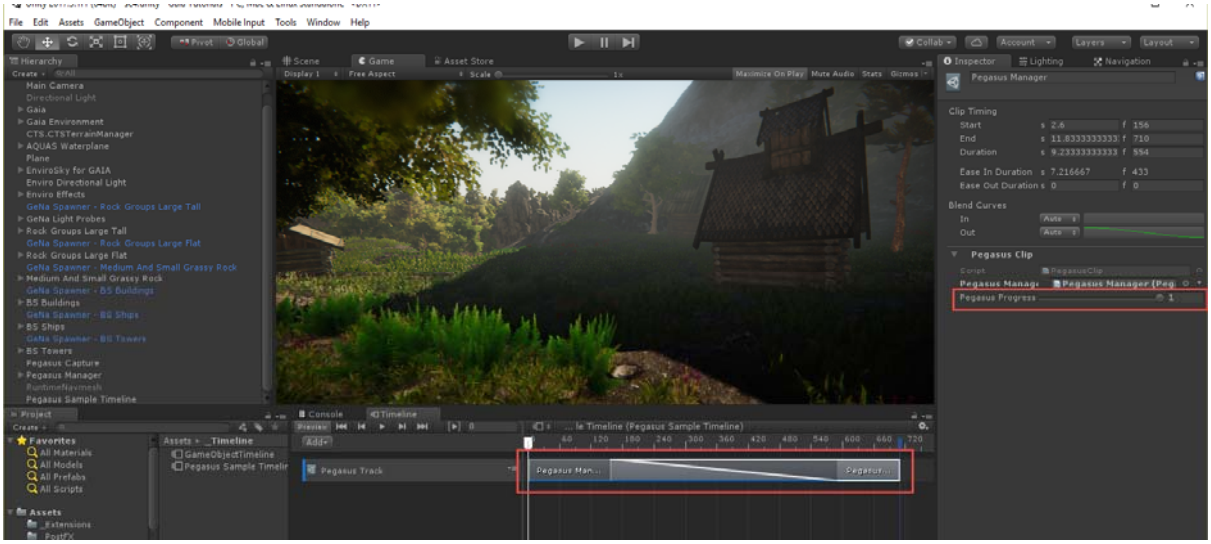
5. Drag the timeline into your hierarchy:



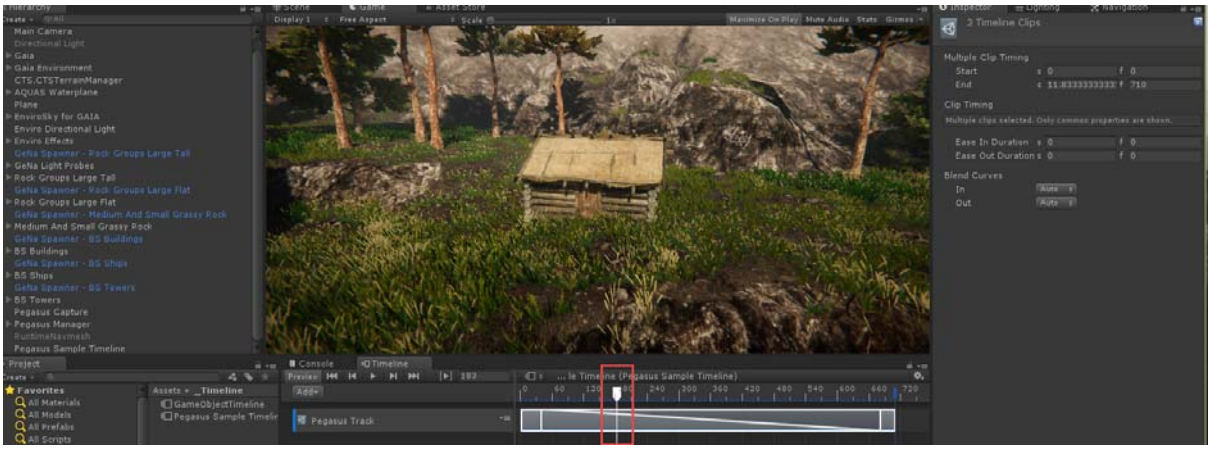
6. Select your clip, and then drag the Pegasus Manager you want to control onto it. Note that progress is set to 0.



7. Add another clip and blend them together. Set the Progress to 1.



8. You can now scrub through the timeline and have Pegasus run its course and all the usual timeline related functionality now applies.



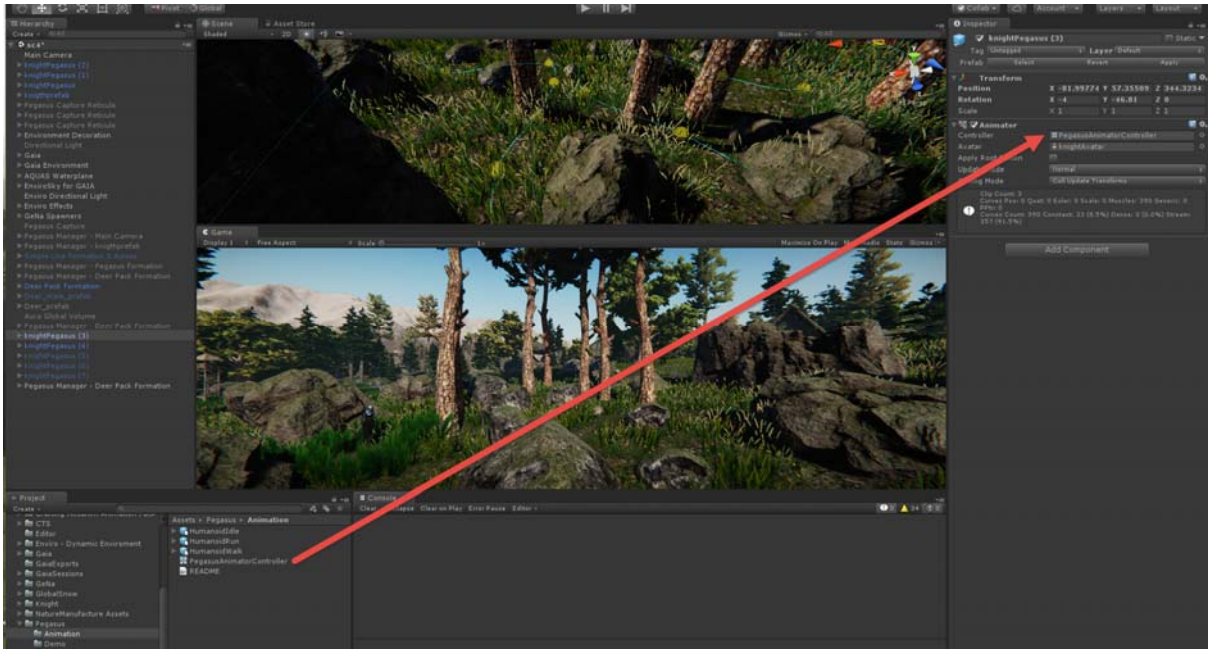
Character Animation

Pegasus can animate Mecanim based characters based on their speed.

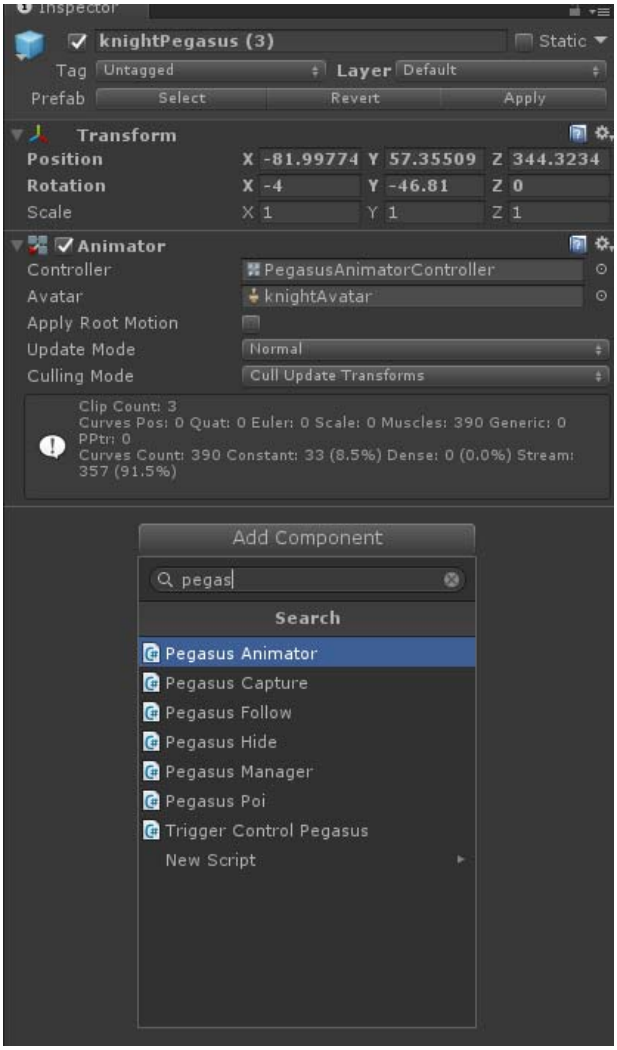
To set your character up follow this Process:

1. Place your character into your scene.

2. Drag the PegasusAnimationController and drop it into the Controller slot on the Animator attached to your character.



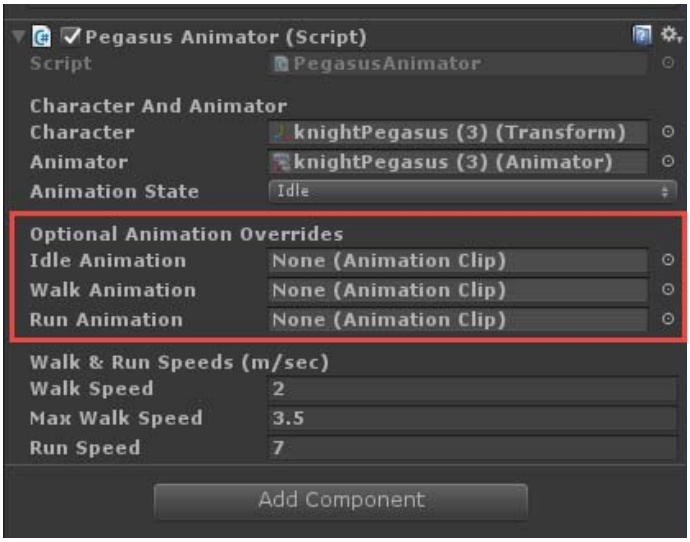
3. Add the Pegasus Animator component onto your character.



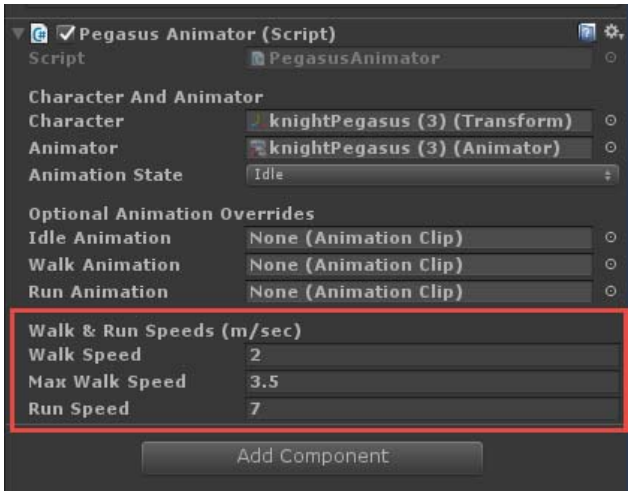
4. Set up the character and animator components. This is an optional step and Pegasus will set them up automatically if you leave it.

5. Choose your initial animation state.

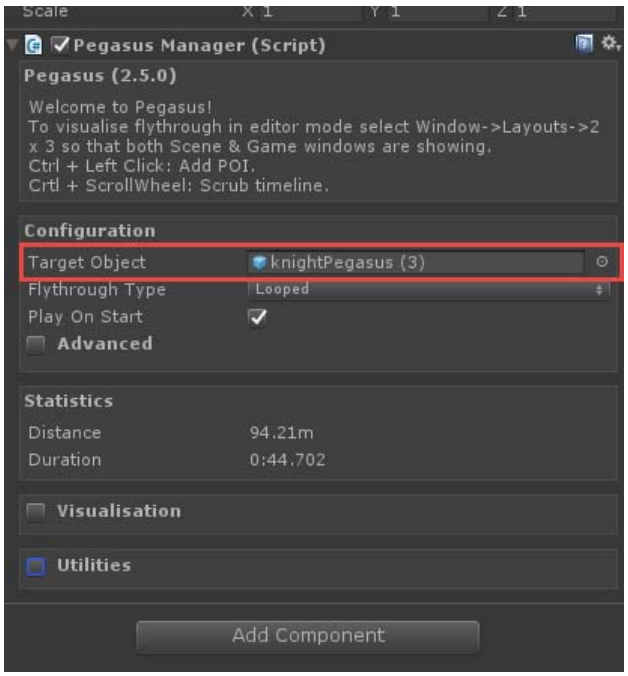
6. If you have your own animations, then drag and drop them animations into the animation override slots. Default animations have been supplied if you don't have any.



7. Choose your default walk, max walk, and run speeds.

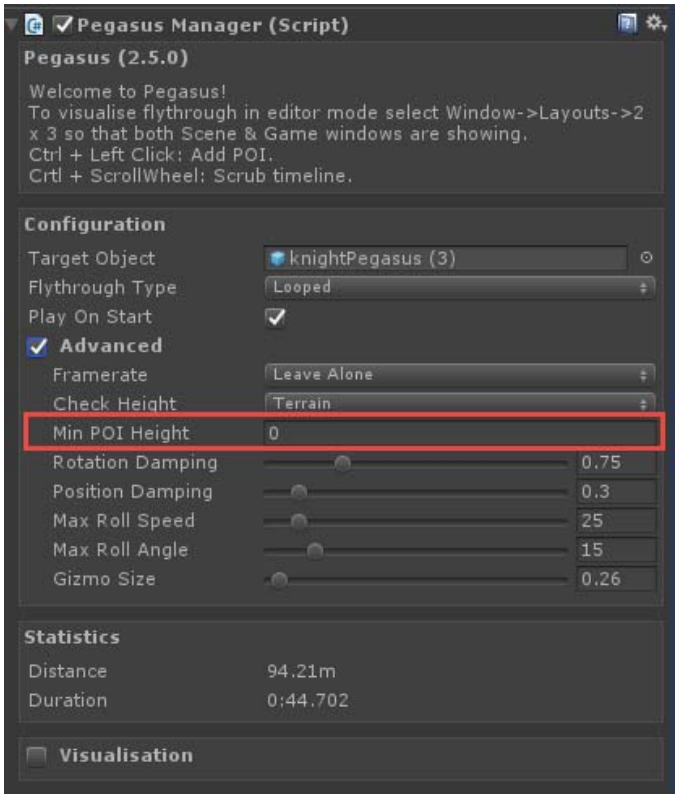


8. Then create your Pegasus as normal and drag this Character onto the Pegasus.

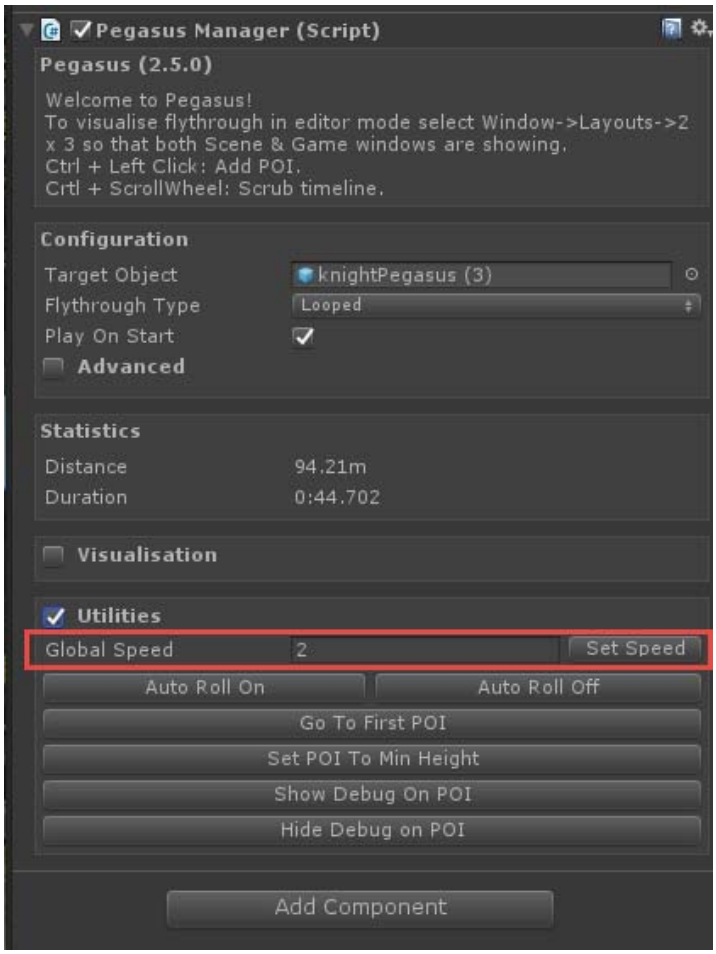


You can now press Play, and Pegasus will drive this character through your scene and animate it based on the speed it is travelling. You need to ensure that the speeds on your Pegasus POI make sense in comparison to the walk and runs speeds on your character.

TIP 1: To have Pegasus automatically place your POI at ground level when you are creating the path, go into Advanced settings and set the Min POI Height to 0.



TIP 2: Use the Utilities Set Speed function on the manager to set the Pegasus up at the right speed – setting it at 2 for example will mean that your character will walk through the scene (or whatever the walk speed was that you set your character up at).

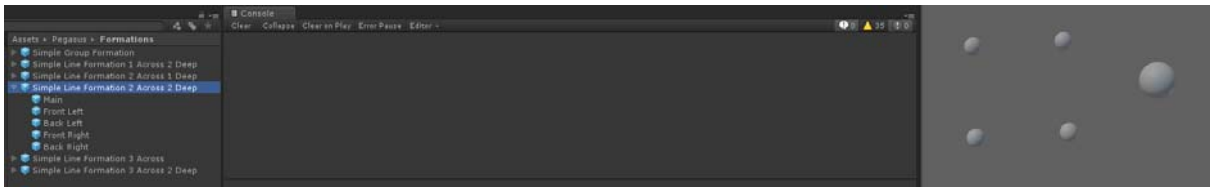


Character Follow & Formations

Pegasus includes a sophisticated follow script, that can be used to follow objects through your scene.

A great use of this capability is to create a formation, use Pegasus to drive that formation through your scene, and then have your characters follow individual sub objects from your formation.

A formation is simple a collection of objects that have been added to a parent. Their purpose is purely to provide separation between whatever you get to follow each of the sub objects.

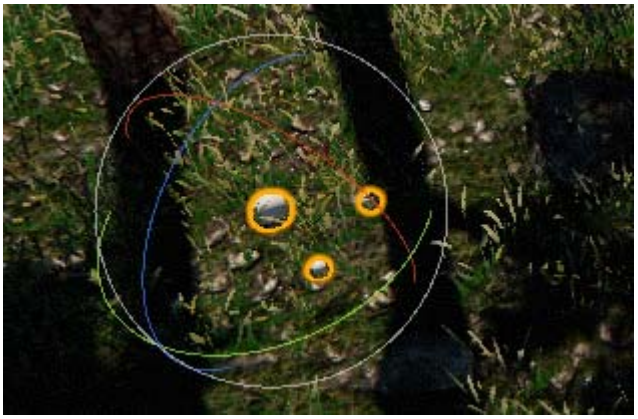


In the example above, I laid some spheres out to create a simple 2 x 2 formation with a leader. You can set up any type of formation you want.

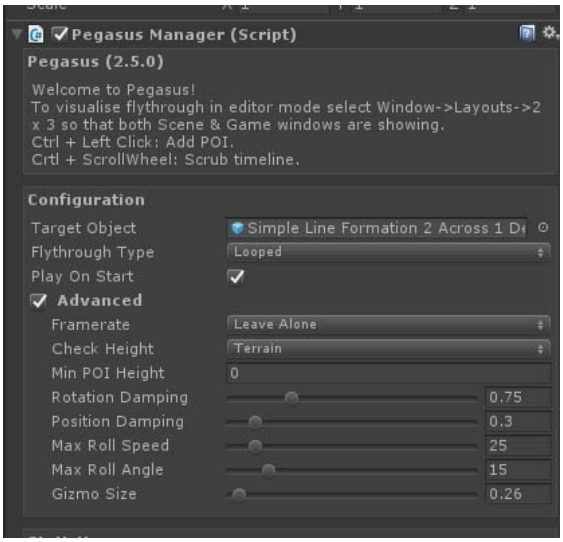
To set up a formation follow this Process:

1. Set up your character and have Pegasus animate your character by following the steps in the last section.

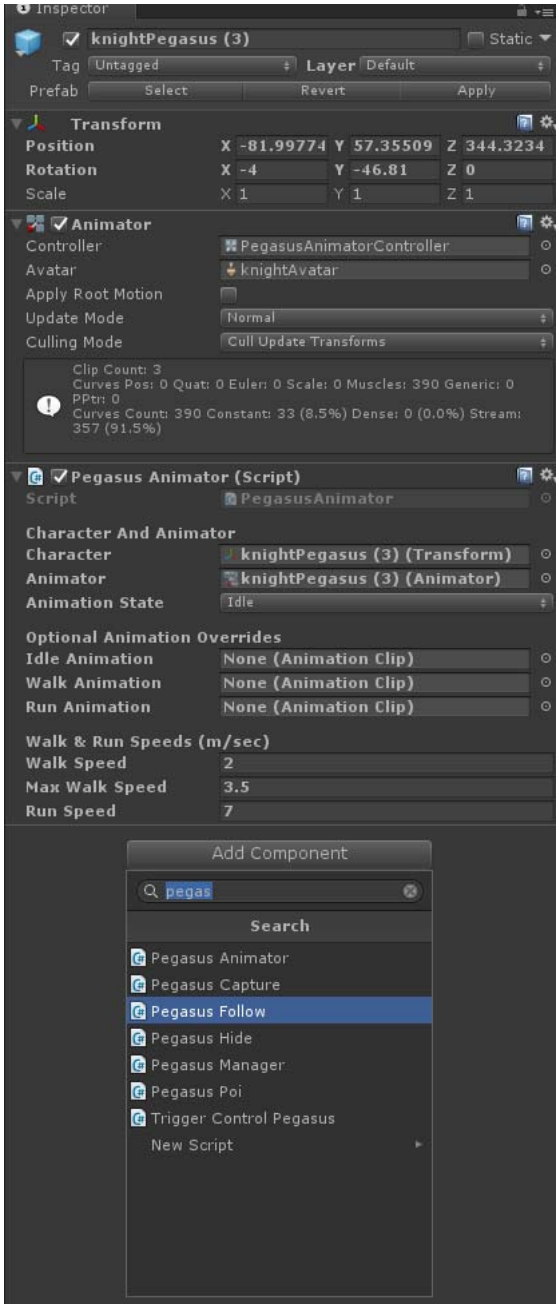
2. Drag and drop a formation object into your scene or create your own. Have a look at the sample formations in the Formations folder to get a sense of how to set them up.



3. Assign the formation to your Pegasus so that Pegasus will drive it through your scene.

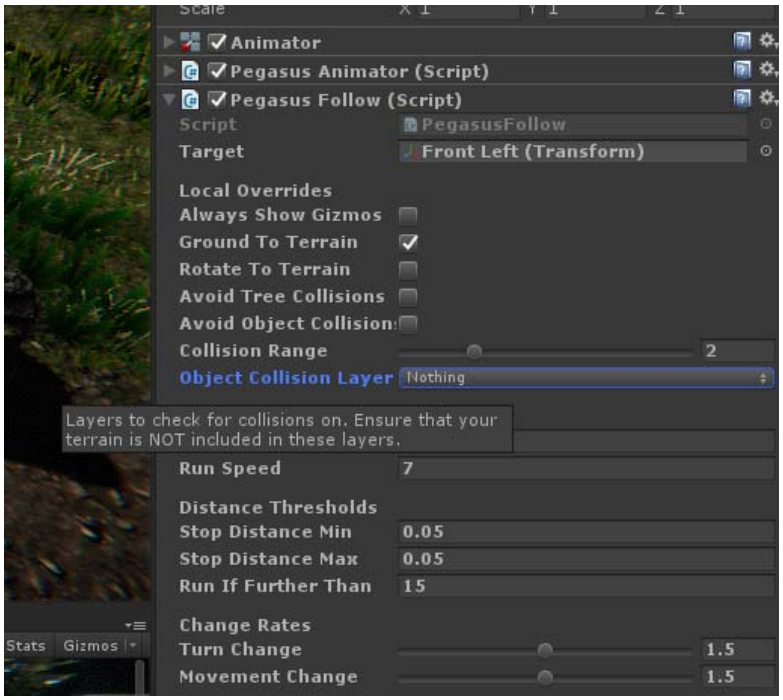


4. Add the Pegasus Follow script to your character



5. Set the target of the follow script to be one of the child objects of your formation. This is the thing that will be followed by your character at runtime.

6. Mouse over the various options to see what they do, and then configure them appropriately.



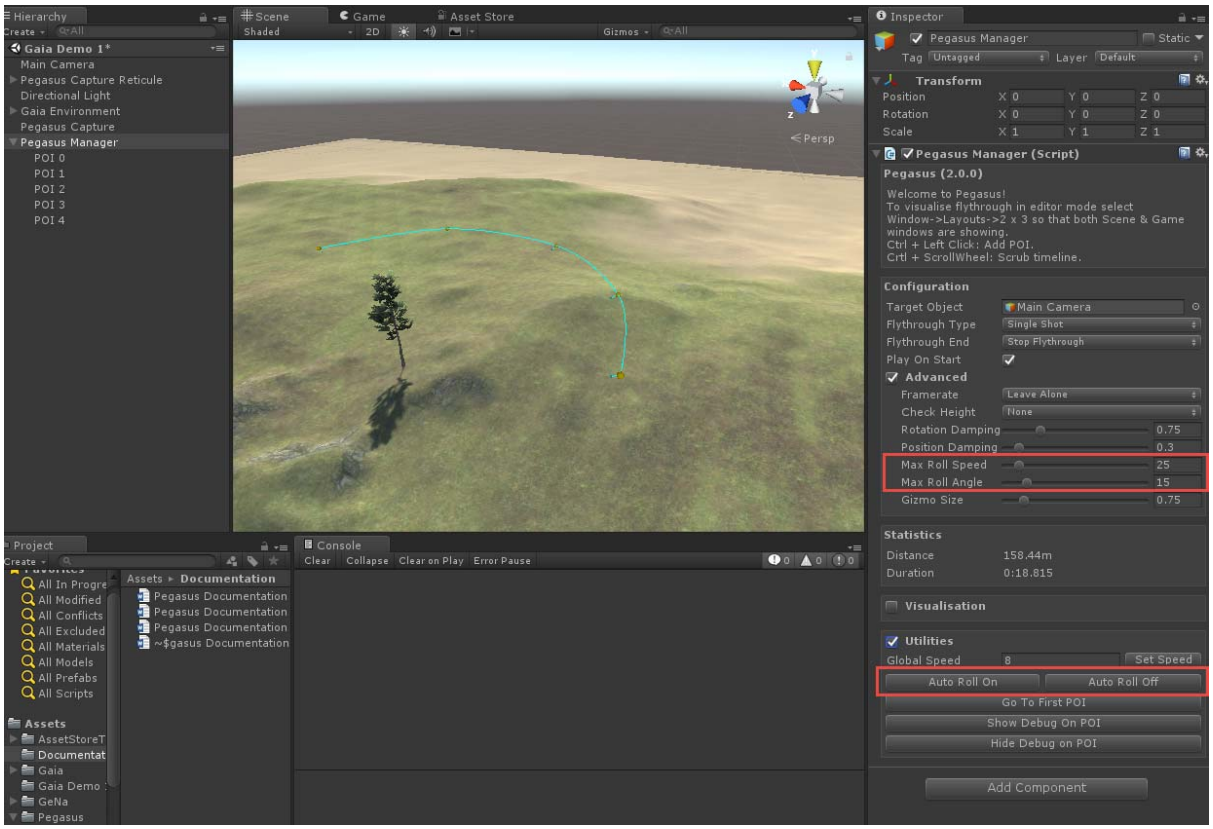
Press Play – your character will now follow the formation sub object through your scene.. and because the formation object is being driven by Pegasus, what you now have is a very cool formation / character controller system for set dressing in your game.

To see an in-depth tutorial on the nuances of configuration and operation of the follow script please check out our online tutorials here: http://www.procedural-worlds.com/pegasus/?section=tutorials

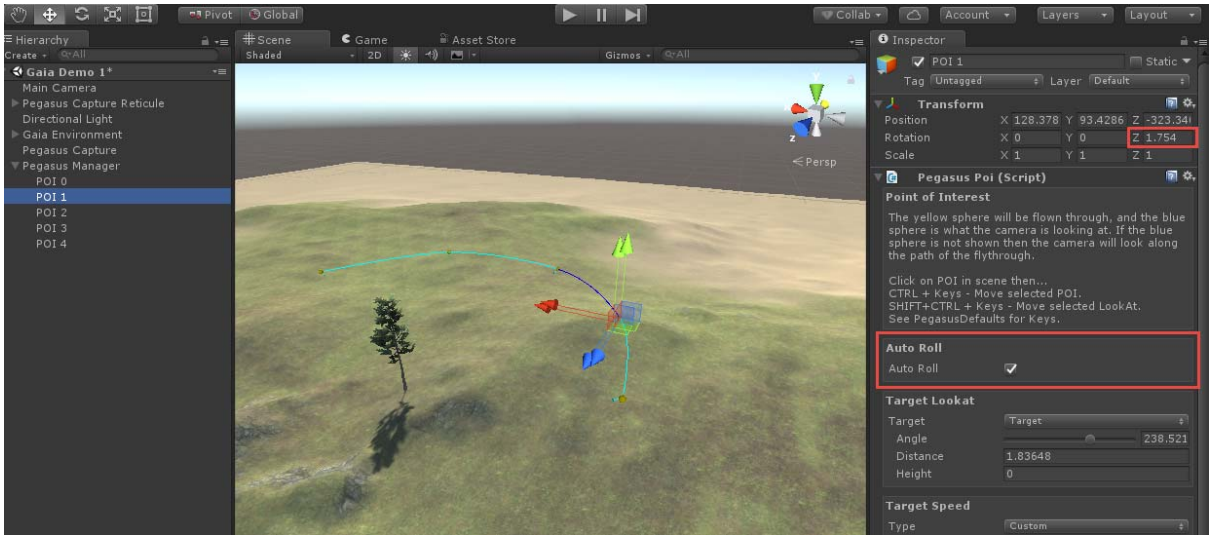
Handy Tips & Features

Auto Roll

Auto Roll allows you to simulate leaning into a corner at speed. It can be used to add a sense of speed to your fly through.

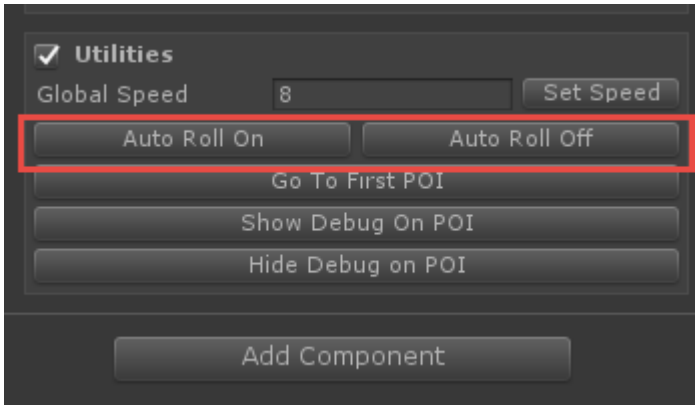


You set your angle and speed globally per Pegasus, and this then influences the calculations made on each POI.



This will then set the auto roll flag per POI, and when the calculation is applied you will seel the z value change on the rotation.

To enable and disable Auto Roll for your entire flythrough hit the Auto Roll On / Off buttons. These will cause your Pegasus Manager to simulate roll during cornering and can be quite a cool effect.

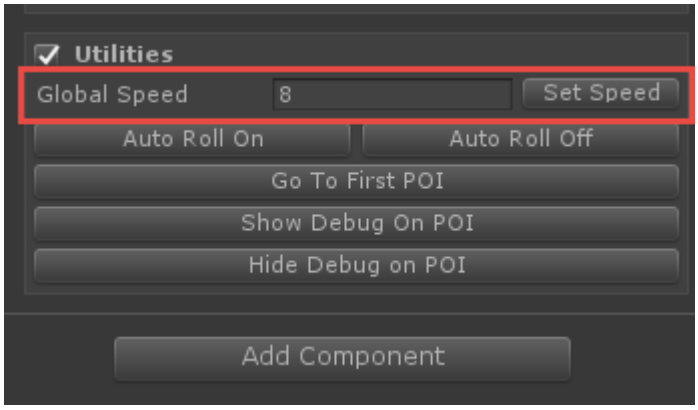


While the Auto Roll feature works well for 95% of the use cases, sometimes the effect still seems a little un-natural, and in these scenarios you can change the rotation manually on the individual POI, and this will disable auto-roll for that POI.

Global Speed Changes

While you can change the speed per POI, sometimes you want to change the speed of all POI at once.

Open up the Utilities section in your Pegasus Manager and and hit the Set Speed Button.



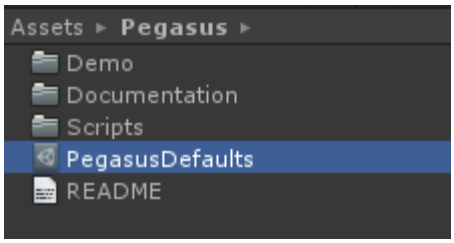
Bad GameObject Rotations

Sometimes you have a game object that does not have the rotation configured properly. You through each POI and update the rotation at that point to correct it. Pegasus lerps rotation through each POI, so this can be used to counteract the issue.

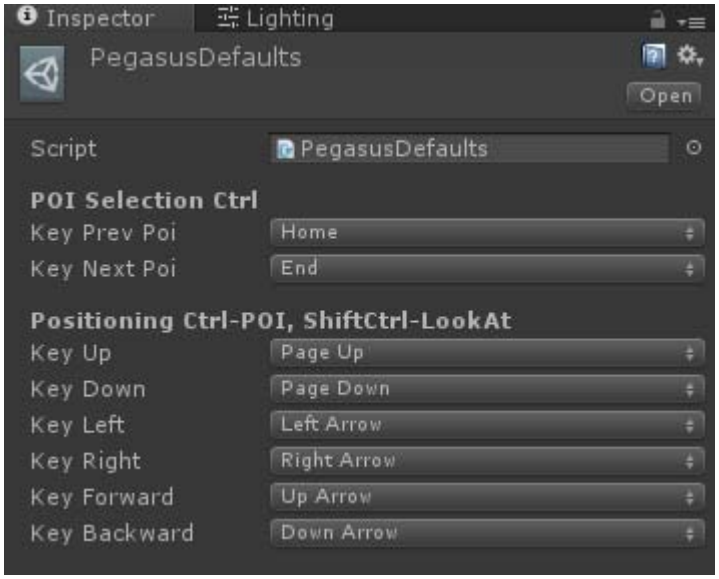
KeyBoard Shortcuts

The keyboard shortcut system allows you to fine tune and visualise your flythrough. If you take the time to master it (it's not that hard), it will provide a massive speedup to your workflow and very precise control of the flythrough.

These shortcuts are editable, and are stored in the "PegasusDefaults.asset" file in your Pegasus directory in the hierarchy window.



When you select and view it, you can the edit the keypresses that Pegasus listens for:



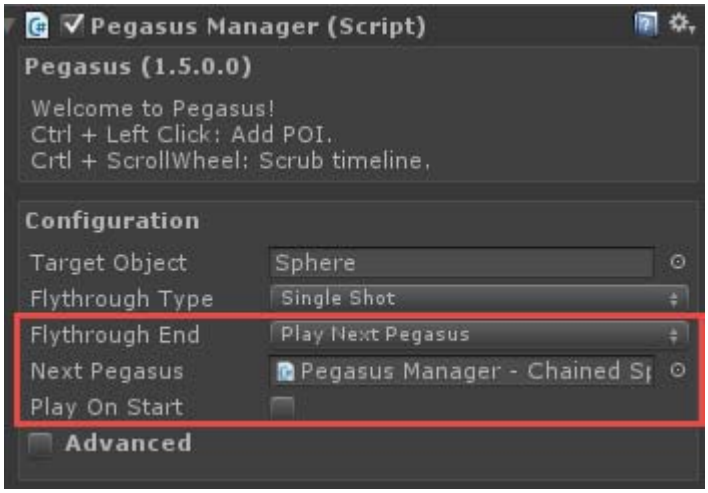
To physically use them double click on a POI, and then physically click on it in your scene editor window. Hitting CTRL and one of the key clicks will move the POI, and SHIFT+CTRL and one of the key clicks will move the Lookat Target.

If you are driving a Camera with Pegasus a nice trick is to open both the Scene and the Game window side by side. You can visualise the impact of these settings as the player would see them in the Game window and it's a great way of quickly and accurately composing your screens:

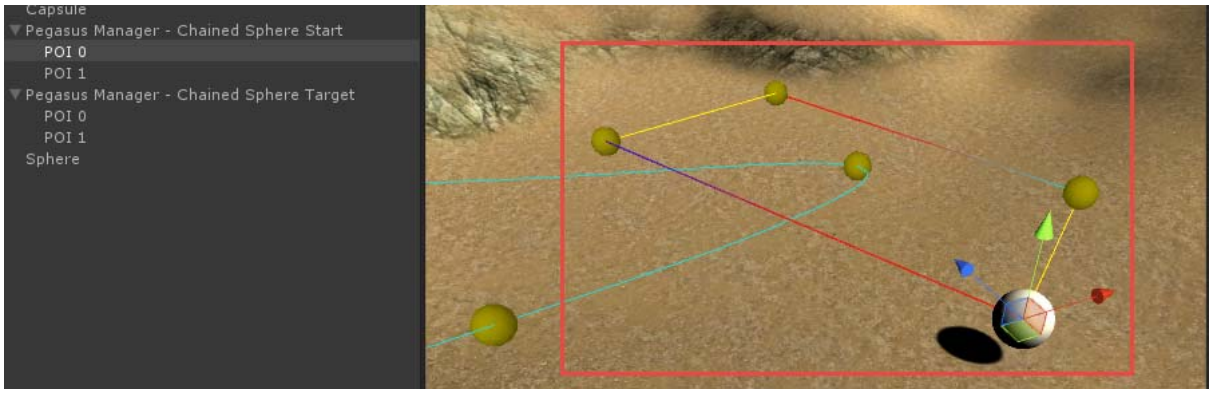
Chaining Pegasus

Often when you are creating a fly through, you will want to change the camera angle as if to show off a new perspective, or just to start a radical new motion. This can be done by chaining multiple Pegasus together.

Set each Pegasus up as a Single Shot Pegasus, and then chain them together. Make sure that the child / dependent Pegasus do not have “Play on Start” selected, as they will play when the scene is started instead of when the Previous Pegasus has been completed.



Take a look at the demo scene for an example of chained Pegasus. The yellow line shows the linkage between the two Pegasus. In the example below the Pegasus have been chained together to form an infinite loop.



Pegasus Triggers & Extensions

Pegasus has a trigger and extension system that allows you to use Pegasus as a way to trigger location and time based behaviours in your scene. You can add as many triggers as you want to a POI, all will get executed at run time.

Triggers are derived from the TriggerBase class and attached as GameObjects to your POI's. Pegasus calls 3 key methods on the trigger script over the duration of the segment playback to allow you to create sophisticated behaviour.

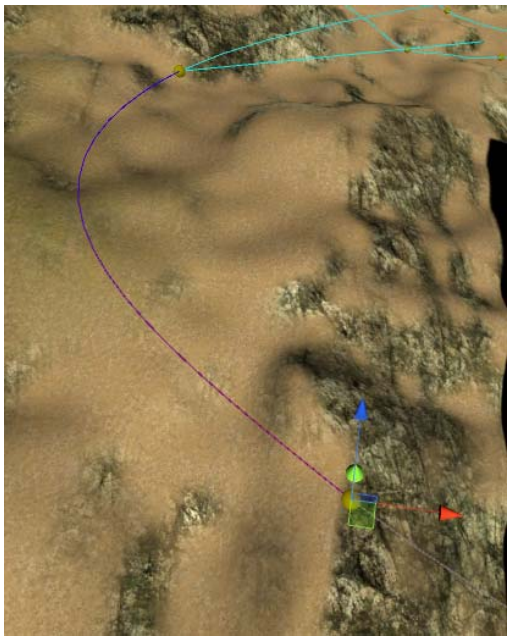
The trigger events are:

On Start: Called as soon as playback starts on the POI segment. Used to do things at the start of the segment playback.

On Update: Called every frame of the playback, and passed the progress through the segment. Used to do things during playback.

On End: Called when playback ends on the POI segment. Used to do things at the end of the segment playback.

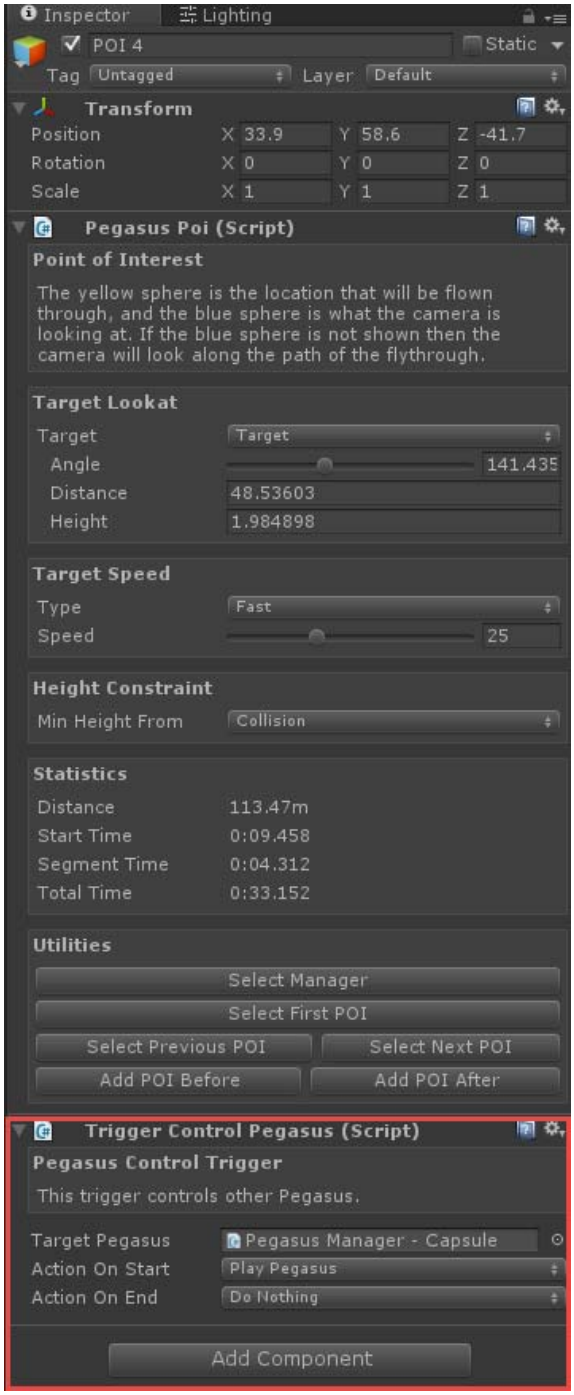
Have a look at the code in the demonstration triggers provided to get a sense of how you could use triggers to extend the capability of Pegasus.



NOTE: When you select a POI, the segment it controls is shown in a different colour so that you can visualise its trajectory.

Control Pegasus Trigger

This trigger is attached to a POI and can be used to control the playback of other Pegasus when the segment is active.



Control Animation Trigger

This trigger is attached to a POI on a Pegasus that is controlling something that can be animated such as a person or animal. It can be used to control animation over that segment.

Control Helios Fade Trigger

This trigger is attached to a POI on a Pegasus that is controlling a Helios camera, and can be used to control playback fades to and from a colour e.g. dip to black. It's a great way to visually join chained Pegasus together, and can be used to to export video that needs minimal post processing.

Pegasus Manager Settings

The Pegasus Manager orchestrates and controls a Pegasus flythrough. You can have as many managers as you like in your scene.

These settings can be viewed by hovering over the setting in the editor.

NOTE: Make sure that each Pegasus manager has the correct framerate setting selected and that all of them are the same. If you are using Pegasus with Helios please also make sure that these settings is in alignment with the frame rate settings for Helios.

Target Object: The object that will be controlled by Pegasus manager. You would typically drop a game object with a camera attached to it – but this could just as easily be any game object you wanted to drive through the scene.

Flythrough Type: The type of flythrough - a single shot or a connected loop.

Flythrough End: What to do at the end of the flythrough. Stop - Stop the flythough. Quit application playback or Play the Next Pegasus - to start another Pegasus flythrough (great for changing camera angles).

> *Next Pegasus*: Plays the next Pegasus flythrough then this one has ended, only available when Play Next Pegasus has been selected.

Play on Start: Plays the flythrough on start up when selected.

Advanced: Shows advanced options when selected.

> *Framerate*: The framerate that the game will be controlled at. Set V Sync Count to Don't Sync in your project Quality settings or Unity will ignore this setting.
>
> *Check Height*: Used to control how poi, lookat target and flythrough path heights are constrained. Collision - use whatever it collides with, Terrain - use the terrain height, None - don't constrain.
>
> *Min POI Height*: The minimum height that POI and collisions will be tested for.
>
> *Rotation Offset*: An offset that will be applied to all rotations. Used to fine tune rotation on objects being driven, and quite useful for fixing broken rotations on game objects.
>
> *Rotation Damping*: The amount of damping or smoothing to apply to the rotation of the target. Larger values mean slower rotations.
>
> *Position Damping*: The amount of damping or smoothing to apply to the position of the target. Larger values will do smoother flythroughs, but with less precision through POIs so it should be used with care.
>
> *Max Roll Speed*: The speed at which the maximum roll angle kicks in for POI where auto roll is enabled.
>
> *Max Roll Angle*: The maximum roll angle that is allowed for POI where auto roll is enabled.

Gizmo Size: The size of the Gizmos. Larger Gizmos are easier to see.

Statistics: Handy statistics about the current flythrough.

Distance: The distance of the flythrough.

Duration: The duration of one loop of the flythrough.

Visualisation: Allows the trajectory of the flythrough to be visualised in editor. If using a target object that has a camera then click on the game view to see what the camera looks at and how it progresses through the scene.

Scrubber: Drag this control to move the target along the timeline - designed for edit mode visualisation. Select the Game View to get the best effect.

Step Backward: Step backwards through the flythrough.

Step Forward: Step forwards through the flythrough.

Show Debug: Show flythrough debug messages.

Utilities: Some simple and handy utilities to aid in flythrough creation and visualisation.

Global Speed: Set the speed of all POI to this value when the Set Speed button is clicked.

Auto Roll On: Enable auto roll on all POI.

Auto Roll Off: Disable auto roll on all POI and reset the z rotation to zero.

Go To First POI: Select the first POI in the scene editor.

Set POI To Min Height: Sets all POI to the Min POI Height shown in the editor.

Show Debug on POI: Displays a cross centred on the POI.

Hide Debug on POI: Hides the cross centred on the POI.

Pegasus POI Settings

The Pegasus POI controls where and how the target will travel through the segment controlled by the POI.

When selected in the editor, the segment changes colour so that you can see its path.

These settings can also be viewed by hovering over the setting in the editor.

Auto Roll: Enable or disable auto roll calculations. See Pegasus Manager for auto roll settings.

Target Lookat: These settings control what the target will look at when passing through this segment.

Target: Where the target should look. Path - the target will look along the path of the flythrough. Target - the target will look at a custom target.

Angle: The angle from the POI to the camera target.

Distance: The distance from the POI to the camera target.

Height: The height of the POI above the terrain or collider at the target location.

Target Speed: These settings control how fast the target will travel along this segment.

Type: Change the flythrough speed in common units.

Speed: Manually control the flythrough speed.

Height Constraint: How the target will be height constrained. Stops the target from going under the things it shouldn't e.g. the terrain.

Min Height From: Used to control how poi, lookat target and flythrough path heights are constrained. Manager - use the managers settings, collision - use whatever it collides with, terrain - use the terrain height, none - don't constrain.

Statistics: Handy statistics about the current POI's segment.

Distance: The distance of the segment.

Start Time: The time after the start of the playback that this segment will start.

End Time: The time after the start of the playback that this segment will end.

Total Time: The duration of one loop of the flythrough.

Utilities: Some simple and handy utilities to aid in flythrough creation and visualisation.

Select Manager: Selects the POI manager in the scene editor.

Select First POI: Select the first POI in the scene editor.

Select Previous POI: Select the previous POI in the scene editor.

Select Next POI: Select the next POI in the scene editor.

Add POI Before: Add a POI before this POI in the scene editor.

Add POI After: Add a POI after this POI in the scene editor.

Deleting POI can be done by simply deleting the POI object that has been parented under the Pegasus Manager object in the scene hierarchy. To complete the deletion, click on the Pegasus Manager.

Re-Ordering POI can be done by simply dragging the POI object to a different location underneath the Pegasus Manager object in the scene hierarchy. To complete the re-organisation just click on the Pegasus Manager.