

# TRAILS FX

kronnect

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## Introduction

Thank you for purchasing!

**Trails FX** is a simple yet powerful package for adding trails to your gameobjects and characters.

We hope you find the asset easy and fun to use. Feel free to contact us for any enquiry.

**Visit our Support Forum on <https://kronnect.com> for help and access to the latest beta releases.**

**Kronnect Technologies**

Email: [contact@kronnect.com](mailto:contact@kronnect.com)

Support Forum: <https://www.kronnect.com/support>

## Quick Start and Demo Scene

1. Import the asset into your project or create an empty project.
2. Go to Demo folder and run the demo scene to quickly test the asset effects.
3. Examine the Trails Effect component attached to the objects in the scene and experiment with different settings.

## How to use the asset in your project

### Add Trail Effect component to gameobject or character

For regular gameobjects, the object you add Trail Effect must have a MeshFilter component on it. For characters, make sure Trail FX is added to a Skinned Mesh Renderer.

These are the options exposed by Trail Effect component:

The image shows the Unity Inspector for the Trail Effect (Script) component. The interface is dark-themed and organized into sections. The 'Profile' is set to 'None (Trail Effect Profile)' with a 'Create' button. The 'Target' is 'PlasticSphere (Transform)'. 'Execute In Edit Mode' is unchecked. The 'Triggers' section includes 'Active' (checked), 'Ignore First Frames' (0), 'Continuous' (unchecked), 'World Position Change' (unchecked), 'Screen Position Change' (checked), 'Min Pixel Distance' (5), 'Camera' (None (Camera)), 'Smooth' (unchecked), 'Time Interval' (unchecked), and 'Collisions' (unchecked). The 'Appearance' section includes 'Trail Effect' (Color), 'Color Ramp' (unchecked), 'Color Sequence' (Fixed), 'Color' (a color picker showing white), 'Color Over Time' (a yellow-to-white gradient bar), 'Fade Out' (checked), 'Duration' (1.5), 'Max Steps Per Frame' (30), 'Steps Buffer Size' (1024), 'Draw Behind' (checked), 'Cull Mode' (Back), and 'SubMesh Mask' (-1). The 'Position' section includes 'Random Min' (X 0, Y 0, Z 0), 'Random Max' (X 0, Y 0, Z 0), and 'Ground' (unchecked). The 'Scale' section includes 'Uniform Scale' (unchecked), 'Base Scale' (X 1, Y 1, Z 1), 'Random Min' (X 1, Y 1, Z 1), 'Random Max' (X 1, Y 1, Z 1), and 'Scale Over Time' (a green-to-white gradient bar). The 'Skinned Mesh Only' section includes 'Use Last Animation' (unchecked), 'Max Batches' (15), 'Mesh Pool Size' (256), 'Interpolate' (unchecked), 'Animation States' (empty), and 'Animator' (None (Animator)).

Property	Value
Profile	None (Trail Effect Profile)
Target	PlasticSphere (Transform)
Execute In Edit Mode	<input type="checkbox"/>
<b>Triggers</b>	
Active	<input checked="" type="checkbox"/>
Ignore First Frames	0
Continuous	<input type="checkbox"/>
World Position Change	<input type="checkbox"/>
Screen Position Change	<input checked="" type="checkbox"/>
Min Pixel Distance	5
Camera	None (Camera)
Smooth	<input type="checkbox"/>
Time Interval	<input type="checkbox"/>
Collisions	<input type="checkbox"/>
<b>Appearance</b>	
Trail Effect	Color
Color Ramp	<input type="checkbox"/>
Color Sequence	Fixed
Color	[Color Picker]
Color Over Time	[Gradient Bar]
Fade Out	<input checked="" type="checkbox"/>
Duration	1.5
Max Steps Per Frame	30
Steps Buffer Size	1024
Draw Behind	<input checked="" type="checkbox"/>
Cull Mode	Back
SubMesh Mask	-1
<b>Position</b>	
Random Min	X 0 Y 0 Z 0
Random Max	X 0 Y 0 Z 0
Ground	<input type="checkbox"/>
<b>Scale</b>	
Uniform Scale	<input type="checkbox"/>
Base Scale	X 1 Y 1 Z 1
Random Min	X 1 Y 1 Z 1
Random Max	X 1 Y 1 Z 1
Scale Over Time	[Gradient Bar]
<b>Skinned Mesh Only</b>	
Use Last Animation	<input type="checkbox"/>
Max Batches	15
Mesh Pool Size	256
Interpolate	<input type="checkbox"/>
Animation States	
Animator	None (Animator)

## Trail Effect component settings

- **Profile:** you can create a profile asset with reusable settings for other Trail Effect instances in the scene. Click the “Create” button to automatically create a new profile asset and copy the current settings into it. Then you can just drag & drop the newly create profile asset into another Trail Effect component.
- **Target:** usually, Trail Effect effects are added to the same object to which it’s added but you can also specify a different target (gameobject) here.
- **Execute In Edit Mode:** enabling this setting will show the effects while not in play mode.

## Triggers

This section let you configure the moment where a “snapshot” or stamp is added to the trail. A snapshot captures the object position, rotation and scale (and in the case of skinned mesh renderers, their vertices as well).

- **Active:** means that the object is leaving trails.
- **Ignore First Frames:** avoids leaving trails during certain frames at the start (since Trail Effect component is enabled).
- **Continuous:** enable this option to add a snapshot every frame.
- **World Position Change:** enable this option to add a snapshot when the object moves certain distance in world space.
- **Screen Position Change:** enable this option to add a snapshot when the object moves certain pixels in the screen.
- **Time Interval:** enable this option to add a snapshot every certain time interval.
- **Collisions:** enable this option to add a snapshot when the object collides with other objects.

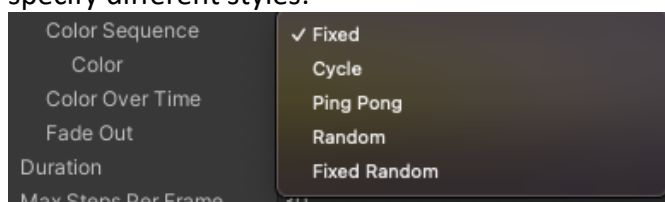
## Appearance

This is the most important section and let you customize the look of the effect:

- **Trail Effect:** selects the type of effect. Each type provides different look and options.
- **Color Ramp:** enable this section to customize the pattern of the trail in the Color type effect. Additional options include the color ramp texture and two anchors that define the axis along which the texture is mapped. This effect works great for swords: create two empty gameobjects as children of the sword. One of these gameobjects will represent the start of the blade and the other, the tip of the blade. The color ramp texture will map those colors to the edge of the sword.

You can find 2 sample color ramp textures in the SamplePresets folder.

- **Color Sequence:** specifies how or when the system will pick a color for the Color effect. You can specify different styles:



- **Color Over Time:** tints the color of the trail as it's generated. Note that colors combine with other colors. If you want to preserve the color over time value, keep the Color Sequence to Fixed and white color.
- **Fade Out:** fades (makes transparent) the trail as it's left behind. If disabled, the trail will keep it's alpha for the entire length.
- **Duration:** duration of the trail.
- **Max Steps Per Frame:** maximum number of interpolations per frame (or maximum number of snapshots per frame). Objects moving fast may require a higher value for this setting. Also check the "Interpolate" setting in the Skinned Mesh section.
- **Steps Buffer Size:** length of the snapshot buffer. Snapshots are stored in a circular buffer which should hold enough capacity so all snapshots generated during the "Duration" interval can be kept.
- **Draw Behind:** renders the trail behind the character. This technique uses stencil buffer.
- **Cull Mode:** culling mode of the snapshot rendering. Note that snapshots are copies of the geometry of the object or character.
- **SubMesh Mask:** in case of multi-mesh objects, which one should be used to render trails. The mask is compared with the submesh number in a bitwise fashion. For example, a mask value of 3 will include submeshes 1 and 2.
- **Position:** this section let you customize the offset for the snapshot location when it's generated (this value is added to the original object position).
- **Scale:** let you customize how the scale of the snapshot changes along the trail.

### Skinned Mesh Only

Options for skinned mesh renderers:

- **Use Last Animation:** enable this option to force all snapshots in the trail to use the same state of the animated vertices.
- **Max Batches:** maximum number of batches that can be sent to the GPU. Skinned objects require a different batch per snapshot unless the "Use Last Animation" option is enabled.
- **Interpolate:** this option interpolates vertices in the trail effect shaders to provide a smoother result. This option works best with "Continuous" option in the Appearance section. Use both to provide the smoothest trails for animated characters or skinned objects.
- **Animation States:** enter the name of the animation states for which you want the trails to appear. You can specify several names separated by comma, for example "Attack, Jump". Additionally, you can specify a time interval per each animation state to limit the trails to that time interval, example:

Attack(0.3-0.7). In this case, the trail will be generated only when the character is attacking and during the 0.3-0.7 seconds interval of the attack animation.

- **Animator**: reference to the animator component that drives the animation.

## URP (Universal Rendering Pipeline) special instructions

The “Space Distortion” effect requires Opaque Texture enabled in Universal Rendering Pipeline asset.

The demo scene is created for built-in pipeline. Please use the URP material converter to convert demo scene built-in materials to URP.

## Scripting Support

Trails FX is designed to be easy to use with the inspector.

If you need to add or change certain values at runtime you can use this code:

```
TrailsFX.TrailEffect trail = myGameObject.GetComponent<TrailsFX.TrailEffect>();
trail.Clear() : clears any existing trail and restarts the cycle.
trail.Restart() : restarts the trail cycle but keeps existing trail.
trail.xxxx = value; (you can change any property shown in the inspector). Check out the
TrailEffect code for a list of properties.
trail.UpdateMaterialProperties() : refresh material settings (call this after changing any
property using code)
```

## Hints

1) If target is moved using physics methods (eg. AddForce) and trails are not smooth enough, enable Rigidbody interpolation setting.

Also make sure physics methods are used in FixedUpdate().

2) If trails do not render correctly in deferred rendering path, call ClearStencilAfterLightingPass. See: <https://docs.unity3d.com/2019.3/Documentation/ScriptReference/Camera-clearStencilAfterLightingPass.html>