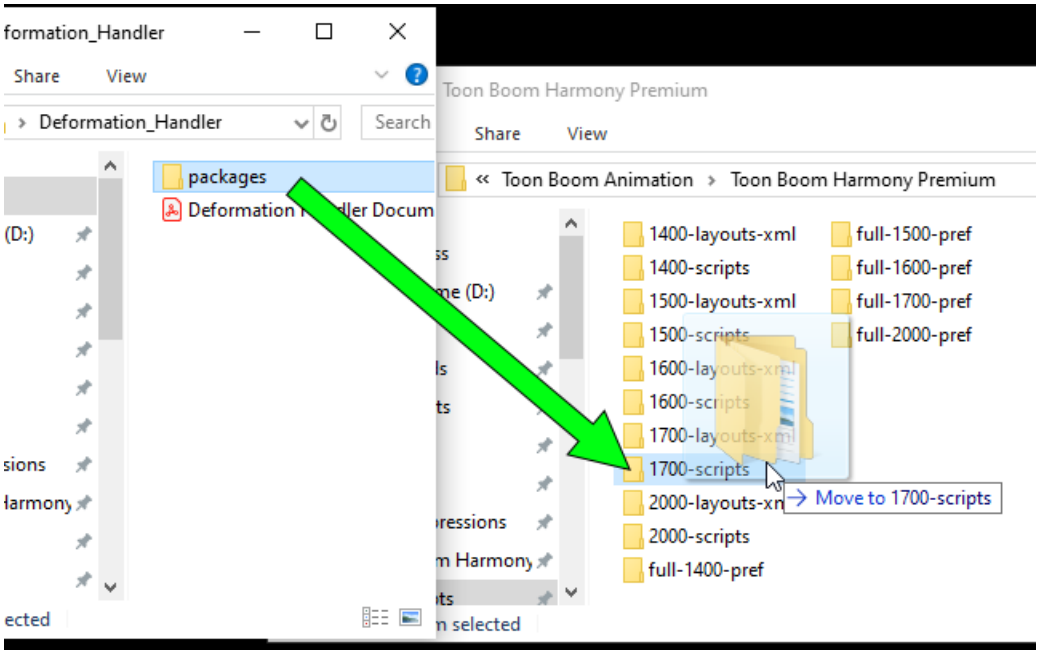
Introduction

Deformation Handler tool is designed to provide a gestural way of controlling a chain of curve deformers. With this tool, you can control and refine curvature of the deformers by drawing strokes. Because of the short rag between your mouse drag and the stroke being displayed, it might be easier if you use this tool with a pen tablet device.

Installation

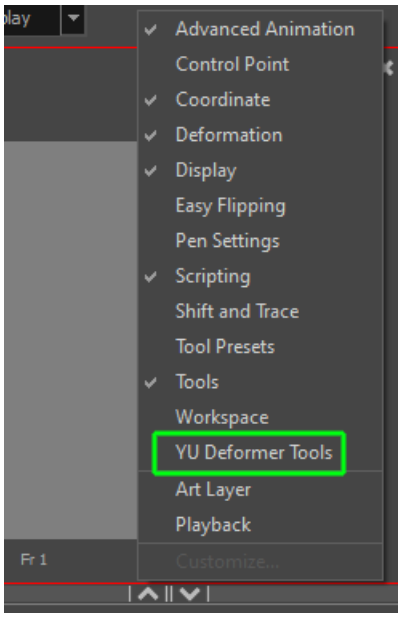
1. Locate to your user scripts folder for your Harmony version (a hidden folder): https://docs.toonboom.com/help/harmony-17/premium/scripting/import-script.html

2. Unarchive **Deformation_Handler.zip** then drag **packages** folder into the user scripts folder.



3. If Harmony program is already running, close it and restart.

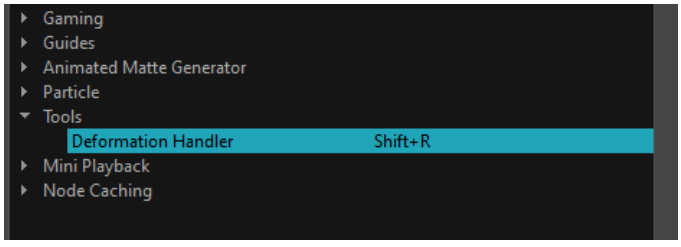
4. In Harmony, right click anywhere on the toolbar area. From the toolbar list, pick **YU Deform Tools**.



5. Now **Deformation Handler** tool is added as a part of YU Deform Tools toolbar and ready to be used.

Keyboard Shortcut Assignment

Go to **Edit** → **Keyboard Shortcuts** to open the Keyboard Shortcuts dialog. Select Deformation Handler in **Tools** category then assign the shortcut key of your choice.



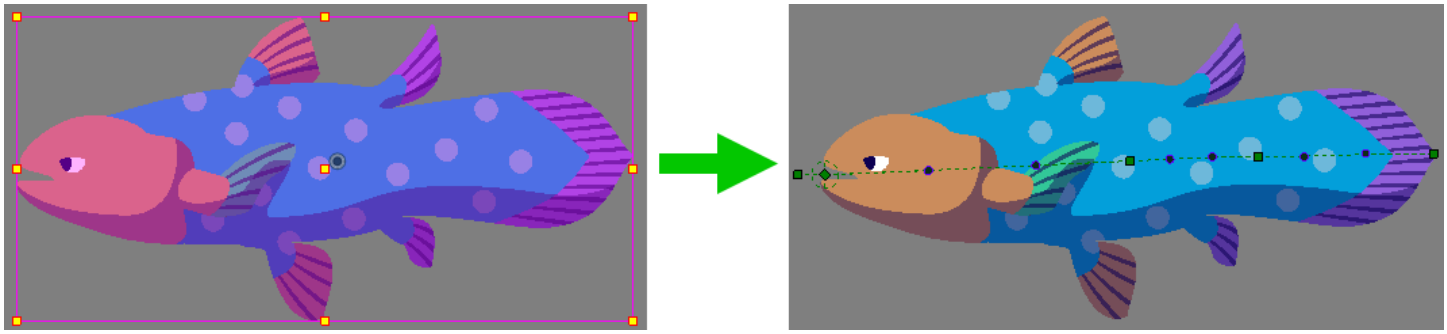
Modes

Deformation Handler has three modes you can switch between by using keystrokes.

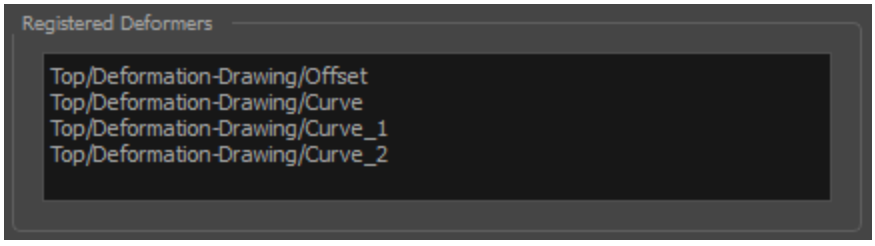
Drawing Selection Mode

Holding down **CTRL** key invokes Transform Tool.

When you select a new drawing while the Deformation Handler tool is selected, the tool automatically registers the chain of deformers that the new drawing is parented to. You can use the invoked Transform Tool to select a new drawing node in Camera view. After the deformers are registered successfully, the tool automatically turns on their manipulators. Alternatively you can select a new drawing node in Node or Timeline views.



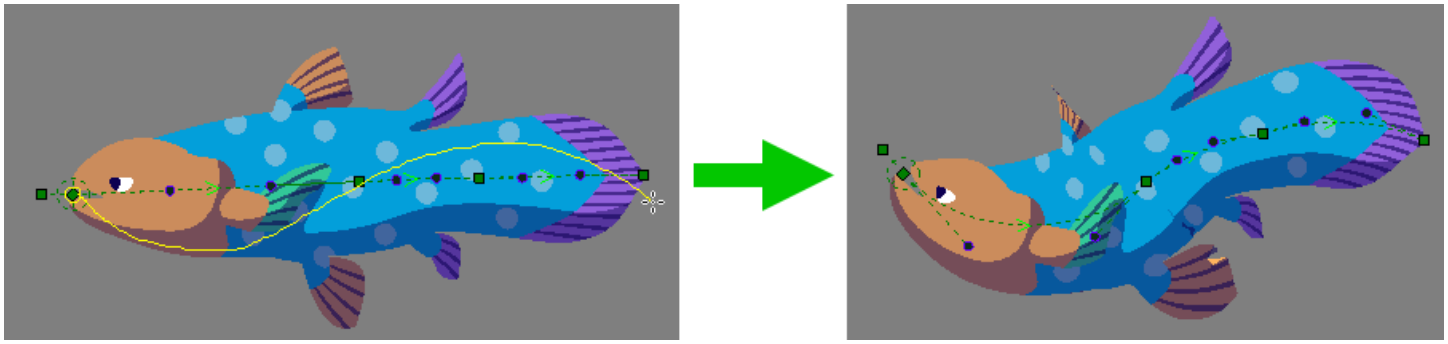
After deformers are being registered, the name of the nodes get listed on **Registered Deformers** box on Deformation Handler's tool properties.



Handler Mode

This is the main mode for manipulating the deformers registered to the tool.

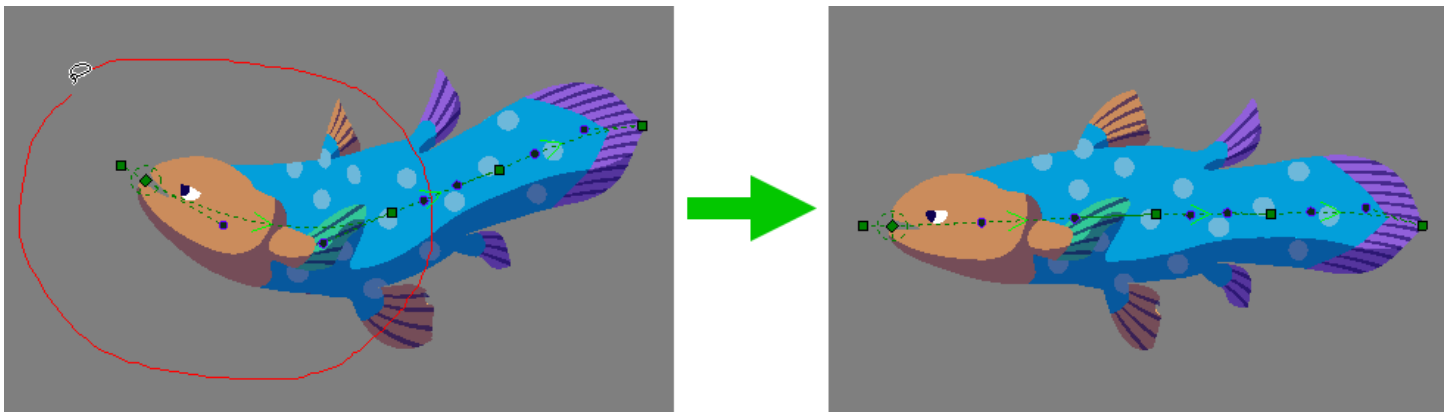
While you are in this mode, you can draw a yellow stroke. After you finish drawing the stroke, the tool automatically fits the deformers to the stroke.



Reset Mode

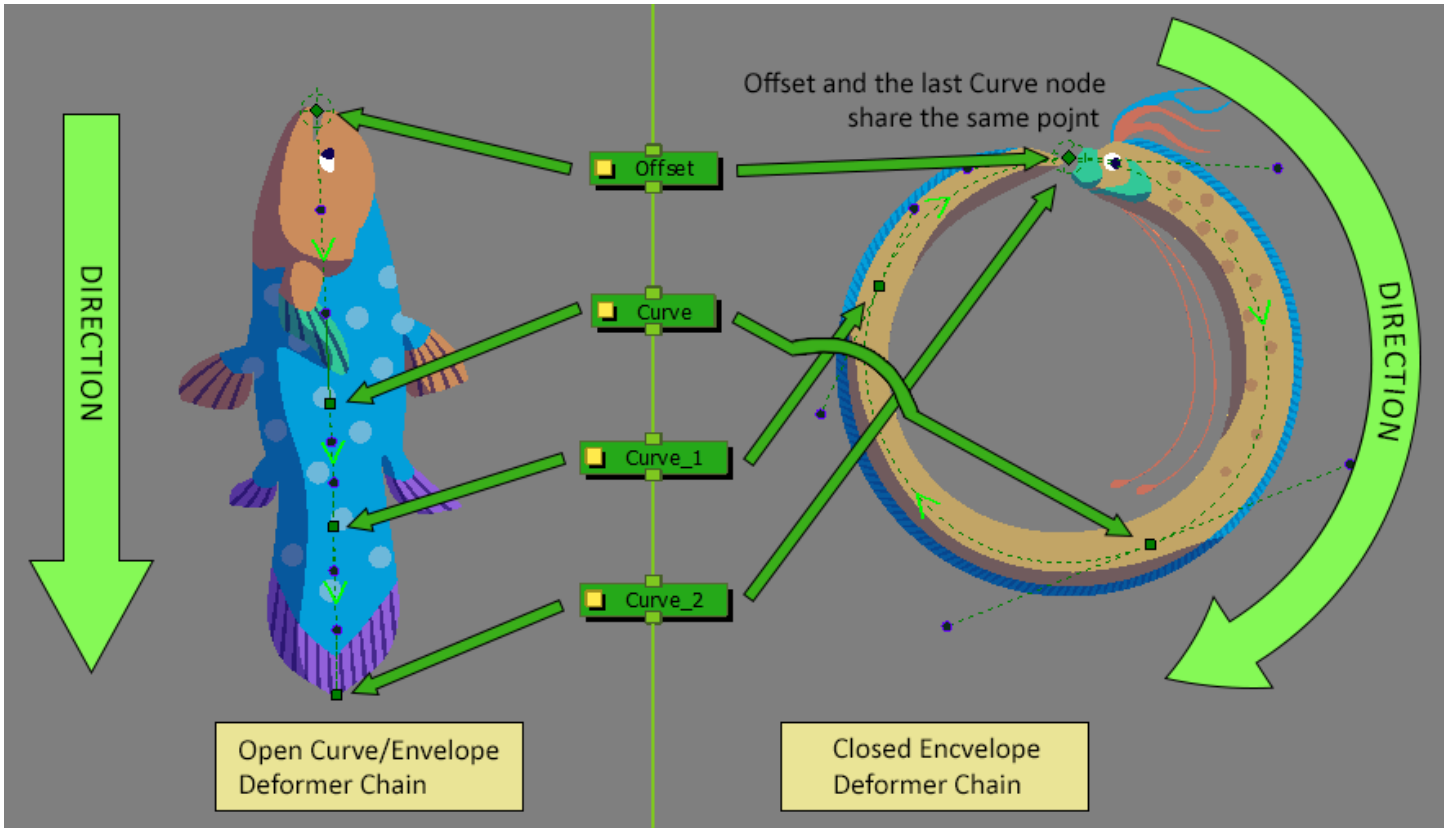
Pressing down **Shift + ALT key** while drawing a stroke switches the tool to Reset mode.

While you are in this mode, the color of the stroke you draw turns red.
This is a lasso selection tool that allows you to select control points of multiple deformers that have been registered to the tool.



Direction of a Deformation Chain

While you are in Handler Mode, the tool creates a green arrow ( ) on each deformer's bezier curve. These arrows indicate the direction of the deformer chain that starts from the Offset node then ends at the last Curve node in the chain. When you draw a stroke in Handler mode, the start and end points of your stroke will become these of the controlled chain. This means the direction you draw your stroke also determines the direction of the manipulated chain.

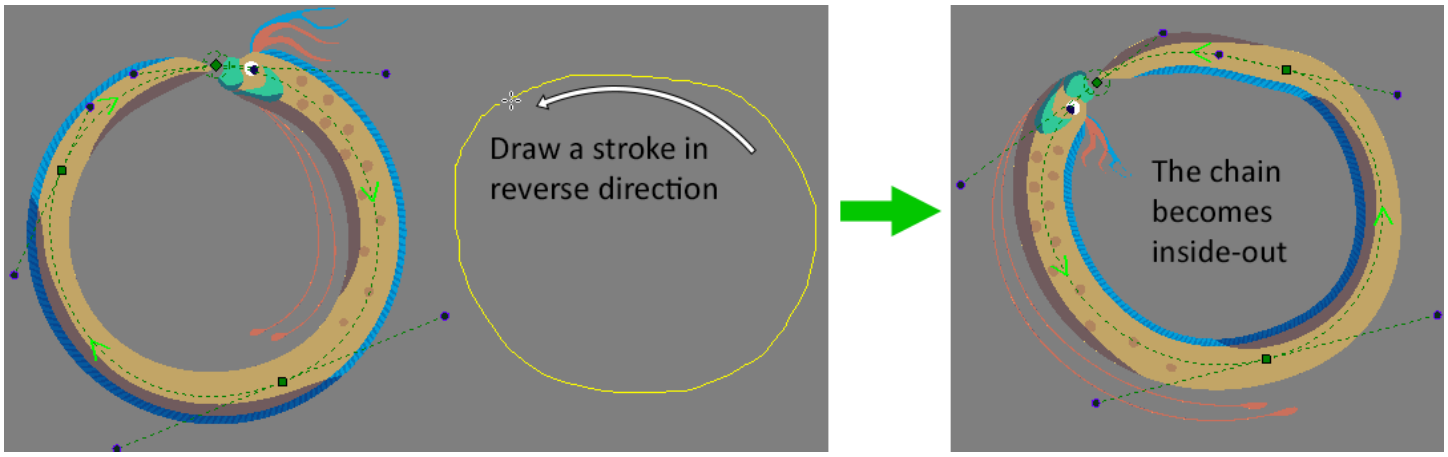


Please note that the green arrows will not appear right after you register a new chain of deformers. This is due to a technical limitation and might get fixed in the future. In the meanwhile, you can click anywhere in the camera view after the deformers are registered to display the arrows.

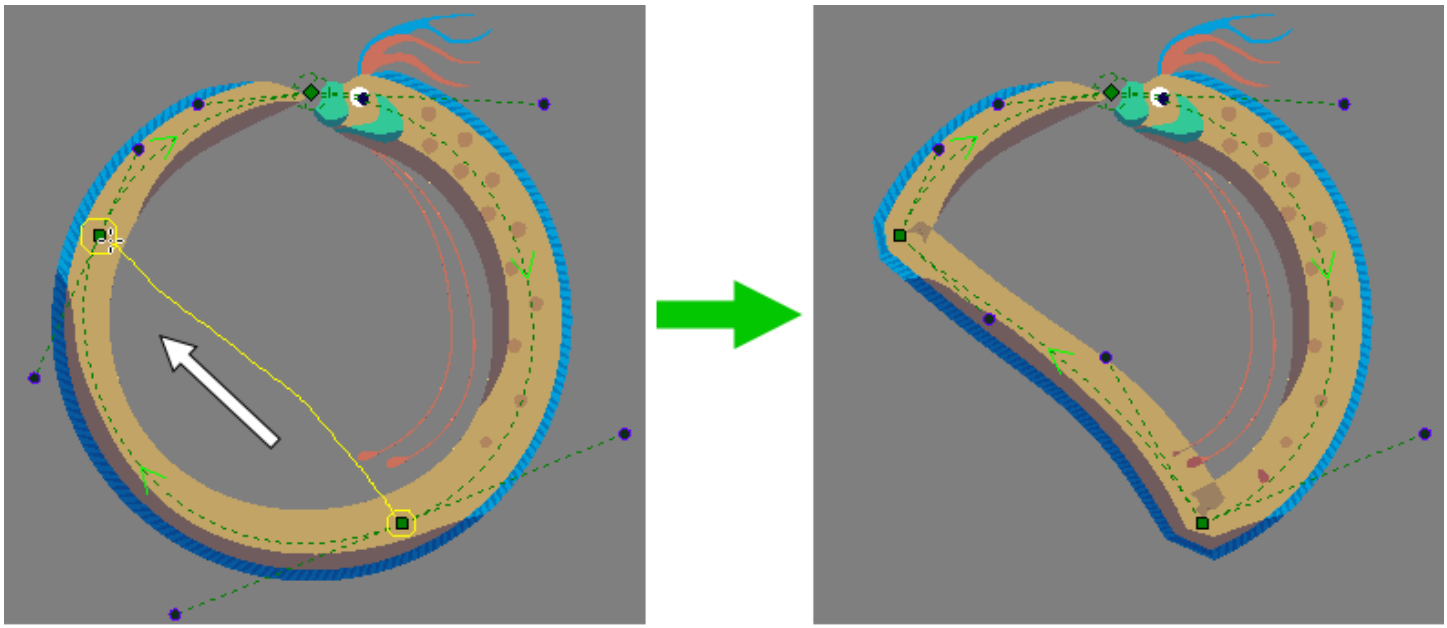
Direction of a Closed Envelope Chain

Each closed envelope chain has its own direction as shown in the diagram above. While you are using Deformation Handler on this type of chain, it is often important to determine which way you draw based on the direction.

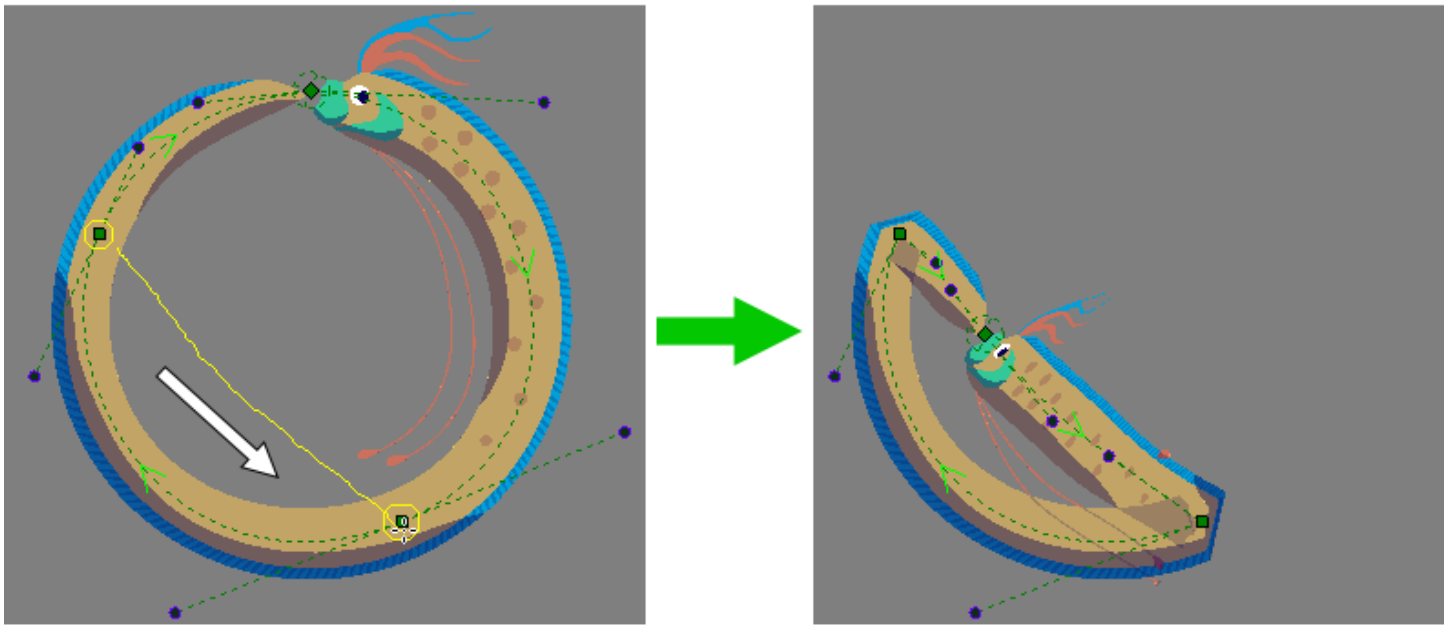
The instance, if you are editing a closed envelope chain that are facing clockwise direction, drawing your stroke counter clock will result in making the chain inside out.



When you draw a stroke while snapping its start and endpoints to deformer control points, the tool controls the bezier curve between the two snapped points. Since the two points are on a closed shape, the points can include two different bezier curve segments on the opposite sides of the shape. In this case, the tool chooses the segment that follows the direction of the stroke. As a result, the direction of your stroke changes the segment of the chain to be manipulated. We will learn the snapping feature on the next section.



Draw stroke along the direction

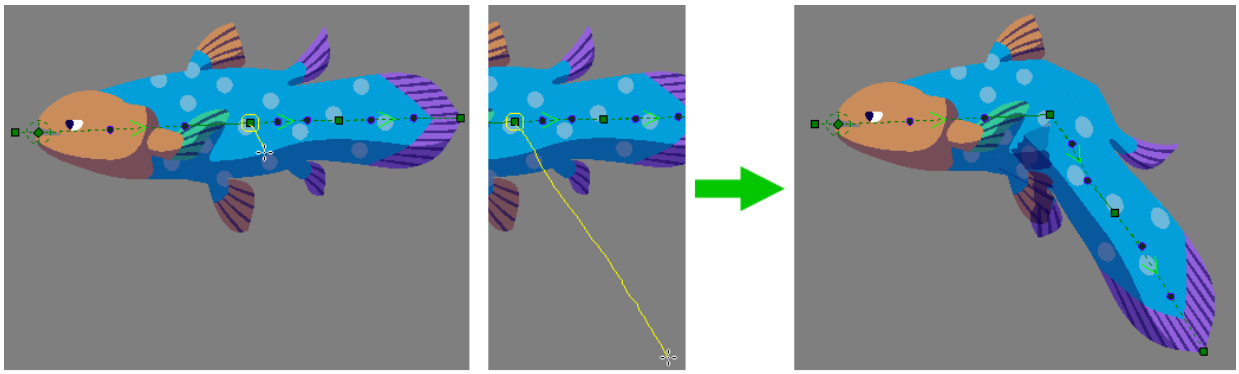


Draw stroke against the direction

Snapping

Snapping the Start Point (Single-point Snapping)

When you start drawing a stroke while a deformer's control point is within the maximum snap distance from the stroke's start point, a small yellow circle () appears around the control point to indicate that the start point is snapped to the control point. When the start point has been snapped, the tool only controls deformers after the snapped deformer.

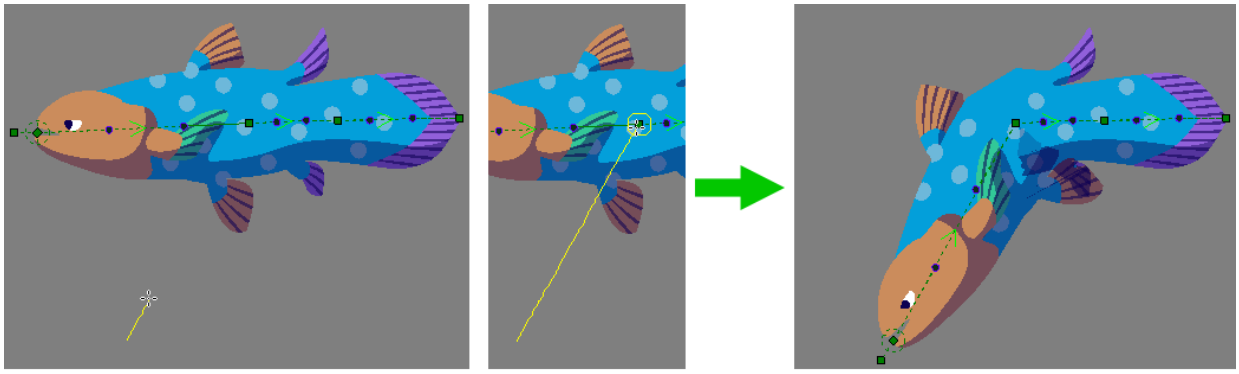


Start drawing a stroke near a control point then release it on an outside area.

Tool interprets this to manipulate the segment between the snapped point and the last point on the chain.

Snapping the End Point (Single-point Snapping)

When you stop drawing a stroke while a deformer's control point is within the maximum snap distance from the stroke's end point, a large yellow circle () appears around the control point to indicate that the end point is snapped to the control point. When the end point has been snapped, the tool only controls deformers from the start (Offset) to the snapped deformer.



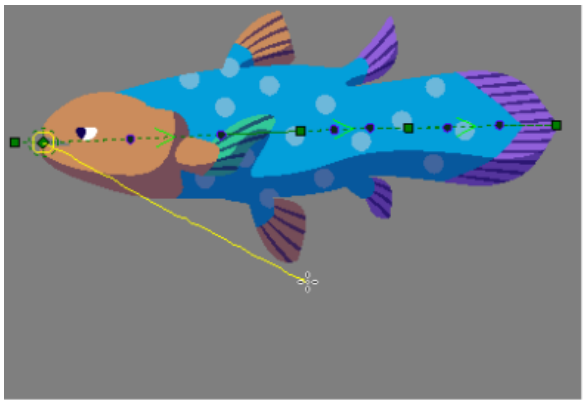
Start drawing a stroke from an outside area then snap it on a control point.

Tool interprets this to manipulate the segment between the Offset point and the snapped point.

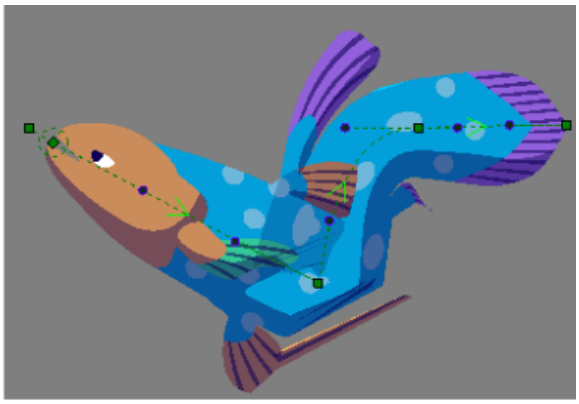
How the Point on the Other End Gets Determined on Single-point Snapping

By default, when only one point of your stroke is being snapped to a deformer's control point, the tool automatically picks another control point that is closest to the non-snapped start/end point of the stroke.The tool then manipulates the bezier curve segment between the two points. This feature is helpful since when we are manipulating a chain with a lot of points, we want to edit its shape partially rather than entirely.

Alternatively, you can hold down **SHIFT** key while drawing your stroke. This will force the tool to pick the farmost control point from the point that is snapped by the stroke. This is useful for the situation when you want to manipulate the entire chain of deformer rather than a segment of it.



Snapping only one side of the stroke.



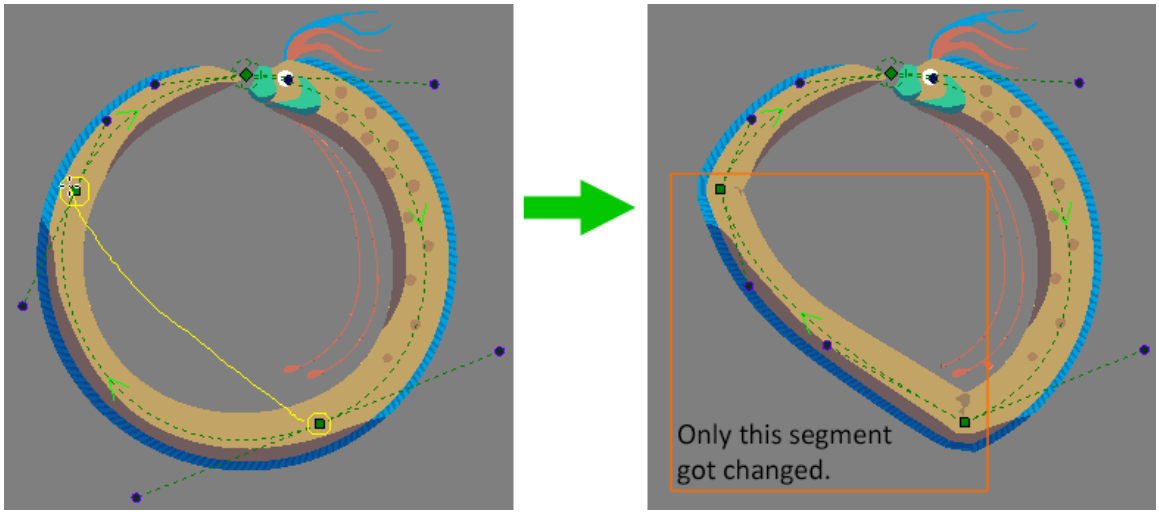
The tool fits the segment between the snapped point and the point closest to the snapped point.

With **SHIFT** key

The tool fits the segment between the snapped point and the last point on a corresponding side of the chain.

Snapping the Both Start and End Points (Double-point Snapping)

When you snap the both start and the end points of your strokes, the tool only controls deformers between the two snapped points. Snapping the both points also disables the **Constrain deformer length** option, which means the length of the deformer will be changed.



Snap Options

Snap start point to the closest point on deformer

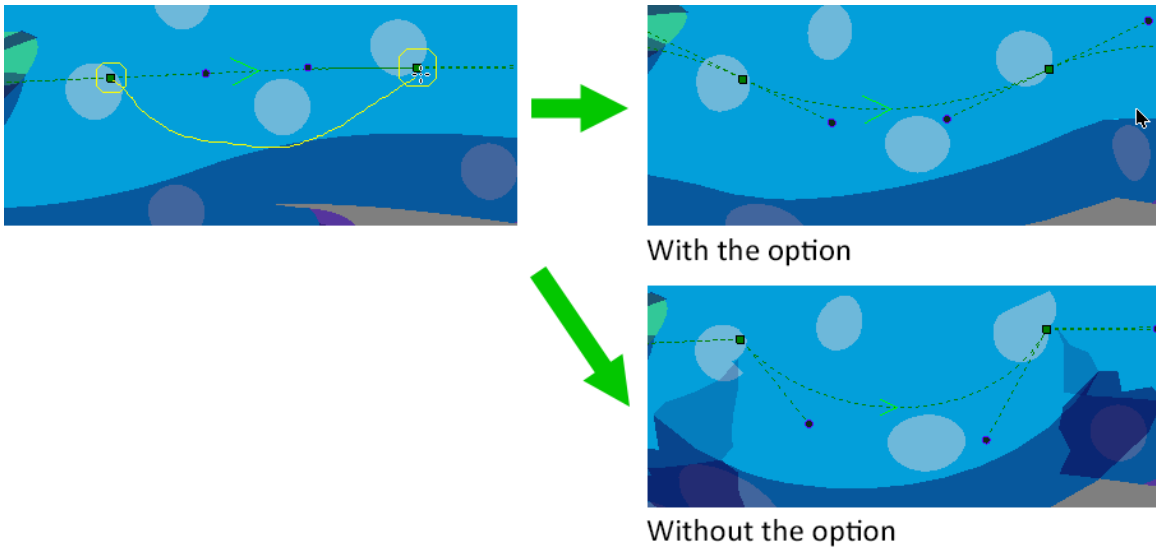
Enables snapping of the stroke's start point.

Snap end point to the closest point on deformer

Enables snapping of the stroke's end point.

Round corner of the snapped point

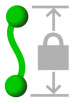
When this option is enabled, the corner of the snapped point will automatically get rounded if the inner angle of the corner is larger than the value specified using the **Round corner if over** option found on Deformation Handler Tool Options.



Maximum Snap Distance

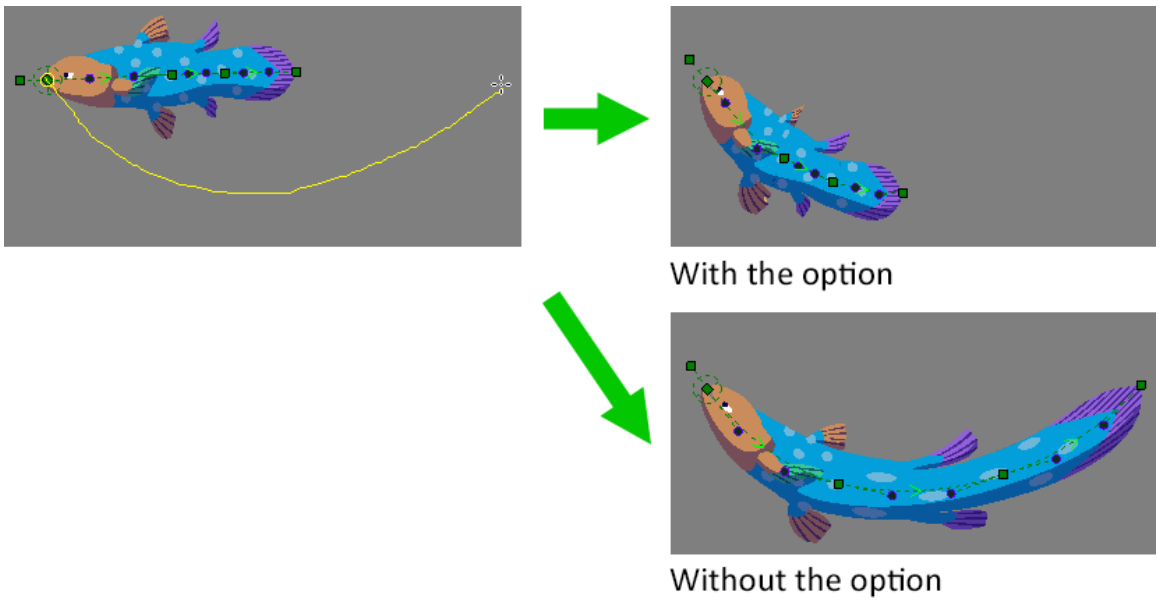
Use the slider or spinbox to specify the maximum distance allowed between the stroke's start/end points and that of the deformer that the stroke's points snap to.

Deformation Handler Tool Options



Constrain deformer length

When this option is enabled, the tool tries to maintain the length of the registered deformers while manipulating them.



This option produces different effects depending on whether you are manipulating open Curve/Envelope or closed Envelope deformers:

On open Curve/Envelope deformers

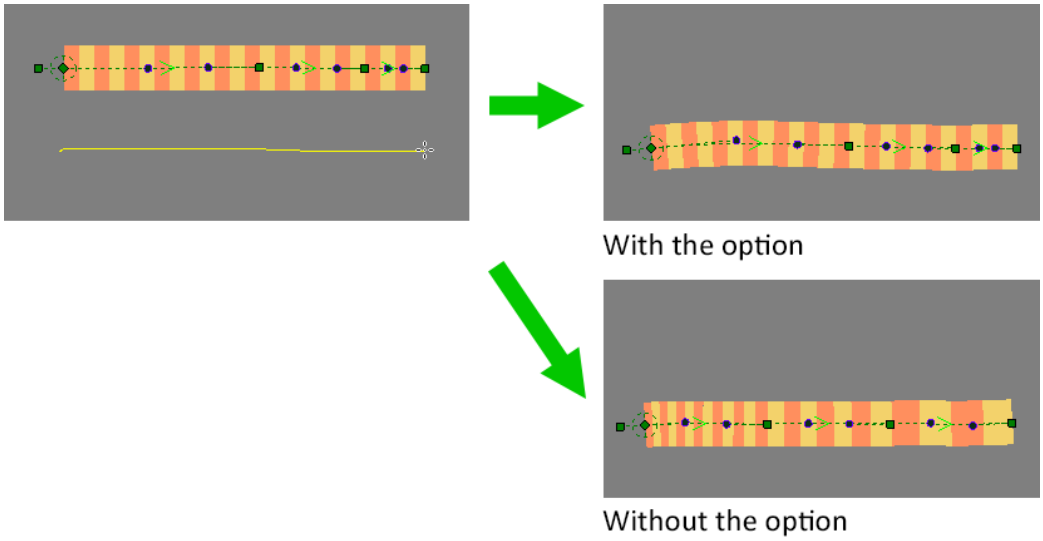
The tool tries to maintain each bezier curve's segment length. Although due to the algorithmic limitation, the length will be changed each time for a tiny amount. This option gets ignored on double-point snapping

On closed Envelope deformers

The tool tries to maintain the total length of the closed shape while length of each bezier curve segment will be modified. This option gets ignored on double-point snapping.

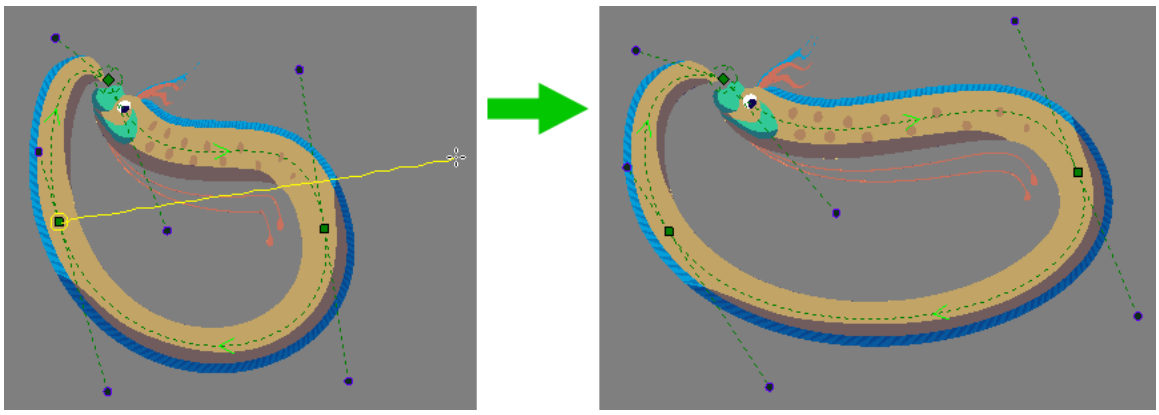
Maintain deformer and its handle lengths proportionally

When this option is enabled, the tool manipulates deformers while each bezier curve segment's length will be changed proportionally to the total length of the shape. Each handle length will also be changed proportionally to the length of the bezier curve the handles belong to. This option is useful when you are controlling deformers on character rigs.



Constrain deformer shape

When this option is enabled, the tool preserves the curvature of each deformes. This makes it possible to scale or rotate deformers while maintaining the entire shape.



By using this and **Constrain deformer length** options together, you can transform the shape while maintaining the length of the entire shape.

Lastly by using this, **Constrain deformer length** and **Maintain deformer and its handle lengths proportionally** options together, you can move and rotate the shape while maintaining the shape's scale and proportion.


Constrain Offset node's orientation

When this option is enabled, the tool will maintain the angle of the Offeset node. This option has no effects on Envelope deformers.


Place Joints On Corners

This option increases chances of deformers to have sharp corners after being manipulated.

When it is enabled, the tool detects corners on your stroke, and then tries to place joints between the bezier curve segments on them. The detected corners will have inner angles that are smaller than the value specified by the **Round corner if over** option.


Place Joints Avoiding Corners

This option reduces the chances of deformers to have sharp corners after being manipulated.

When it is enabled, the tool detects corners on your stroke, and then tries to **avoid** placing joints between bezier curve segments on them. The detected corners will have inner angles that are smaller than the value specified by the **Round corner if over** option.

Round corner if over…

Use the slider or spinbox to specify the minimum inner angle allowed for corners on joints between bezier curve segments. Any corners above this value will be rounded; therefore, the smaller the value is, the higher the chances of corners getting rounded.

This value also affects **Joint Placement** options and **Round corner of the snapped point** option of the snap options.