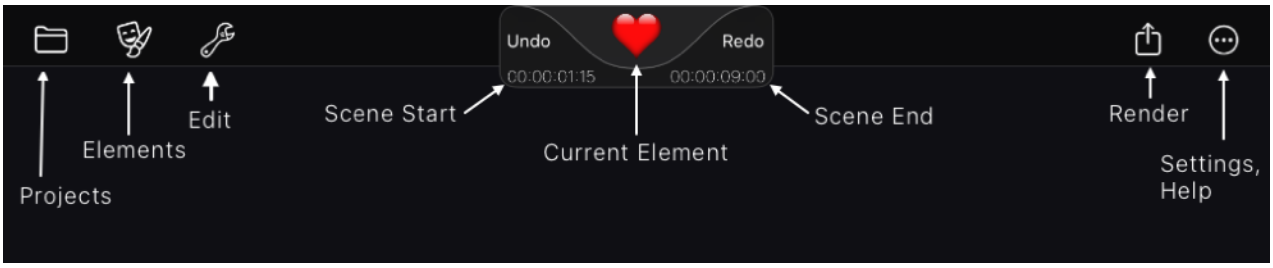
MotionGraphix

User Guide



Quick Start

- Create a Project
- Add Elements
- Position, scale and rotate the elements
- Change the time and reposition, scale and rotate the elements
- Change the time again, etc.
- Double click on an element to fine tune things such as shadow and style
- Open the adjust drawer to further fine tune element style and state
- Press the share button to render and save

Overview

MotionGraphix is a stereoscopic 2.5D animation system for iOS. It combines powerful, professional-level animation features like keyframing and algorithmic motions with a wide variety of graphic element types, from text or animated sprites to particle systems. MotionGraphix includes a set of ready-to-use motion templates, a variety of sprites, or cutout images, and some background images.

Glossary of Terms

2.5D Animation: The term 2.5D animation refers to the animation of flat (2D) graphic elements in a virtual 3D space. The illusion of depth in the 2D animation is created by applying a perspective transformation to all elements based on their associated 'Z' coordinate, which the animator can control and keyframe in coordination with usual the X and Y coordinates. The Z coordinate is also used for element layering, so nearer elements obscure those behind it. By using a stereoscopic perspective transform, elements can be rendered with depth-appropriate parallax into stereo pairs, and formatted for anaglyph, 3DTV, or VR display viewing. The perspective and stereo transforms are based on a user-adjustable camera model, allowing artists to approximate the camera used for background footage.

compositing: The manipulated combination of at least two source images to produce an integrated result

sprite: General term for a (usually small) 2D element that is animated within a larger scene.

sprite atlas: an image with a grid of figures representing the different frames of a short animation. Such animations are typically short loops, like a walk cycle, so combining the animated sprite with a simple motion can create the appearance of much more sophisticated animation

key frame: Any frame in which a particular aspect of an item (its size, location, color, etc.) is specifically defined. The frames that are not key frames will then contain interpolated values.

keyframe animation: The process of creating animation using key frames.

alpha channel: The portion of a four-channel image that is used to store transparency information.

anaglyph: A stereoscopic image that requires the use of anaglyph glasses to view properly

matte: An image used to define or control the transparency of another image

Z-depth compositing: Compositing images together with the use of a Z-buffer to determine their relative depths or distances from the camera

stereoscopic image: Imagery that is designed to send a different image to each observer's left and right eyes, thereby producing a sense of depth.

stereoscopic pair: A pair of images (one for each eye) that comprise a stereoscopic image.

spatial video: 3D stereoscopic file stored to MV-HEVC, for use with the Vision Pro headset.

Keying: keying is the general name for taking a part of an image and making it transparent. The transparent part of the image or video is chosen based on color, luminance, or sometimes a mask

Depth Data

Newer iPhones and iPads can take photos that include embedded depth data. When you load such an image as the background of the project, the edit parameters are available in the filter drawer on the right. Depending on the additional data you can get up to 3 images associated with the depth input.

The additional depth images are lower resolution than the photo, but a high quality scaling option is included. Some of the images also have an option to normalize the data, so the pixel values range from 0 to 1.0. You have up to three options for how the data will be presented:

Depth — The distance of each pixel in the photo from the camera, which gets lighter as you go farther back.

Disparity — The separation of the camera's two views at each pixel, which gets darker as you go farther back.

Matte — The Portrait Effects Matte added in iOS12 which uses machine learning to make a very clean mask for people in the foreground of the front camera on depth-capable devices.

2.5 D Workflow

The term 2.5D animation refers to the animation of flat (2D) graphic elements in a virtual 3D space. The illusion of depth in the 2D animation is created by applying a perspective transformation to all elements based on their associated 'Z' coordinate, which the animator can control and keyframe in coordination with usual the X and Y coordinates. The Z coordinate is also used for element layering, so nearer elements obscure those behind it. By using a stereoscopic perspective transform, elements can be rendered with depth-appropriate parallax into stereo pairs, and formatted for anaglyph, 3DTV, or VR display viewing. The perspective and stereo transforms are based on a user-adjustable camera model, allowing artists to approximate the camera used for background footage.

Projects

There are three types of projects in MotionGraphix: colored frame, still frame, and video. When you make a new project you can give it a name, a description and the length in seconds. The minimum length is 1 second and the maximum is 30 seconds for still frame projects. Video projects have no limit. You can also import stereoscopic stills and movies in side-by-side or top-and-bottom format as well as Spatial Stereo. MotionGraphix will automatically split the input and create stereo output pairs that will use the appropriate background when rendering. In the adjust drawer there is an input filter where you can set the stereo mode based on whether your image is mono ('Flatty') side-by-side or top-bottom.

Colored Frame Project

A colored frame project can be either a solid color or a gradient. The color or gradient is constant over time and cannot be animated.

Still Frame Project

Still frame projects can either come from the collection of images that come with MotionGraphix, or photos on your device. Imported photos include flatty, depth, or stereo. It is also possible to pull a still frame from a video and use that as a background. To do this simply open a video from the photo browser. You will be prompted to pick a frame.

Video Project

The video picker allows you to choose a start and end frame for your video, so you can use only a portion of a longer video if you want. MotionGraphix can handle both stereo and flatty video inputs.

File Picker

You can start a project using the file picker associated with the Files App. Files types such as movies, still images etc. can be opened from anywhere in the file system, and MotionGraphix will create a project of the correct type.

Files App Support

MotionGraphix supports the Files App. When you open the files app and select *On my iPad/MotionGraphix* you can see the MotionGraphix file structure. The file structure is made up of projects and additional data folders. The main reason to support the Files App is to allow you to import images, videos and files that are located there. Please try to avoid deleting important project files. You can make your project unusable if you are not careful.

Projects

Each project has 2 files and one folder associated with it. All have the same base name. If your project is called *MyProject*, the project will be called *MyProject.mgfx*, the folder will be called *MyProject* and the thumbnail will be called *MyProject.jpg*.

The most important project file is the **.mgfx** file. It describes the project, elements, filters, parameter settings etc. If you delete this file, your project will be broken and will not load anymore. If the project was current when you start the app again, Bricolage will simply pick one of the other available projects to load. If the app was only in the background, and becomes active again after the **.mgfx** was deleted, it will attempt to re-save the **.mgfx** from the current settings.

Projects also have a thumbnail jpg image. If you delete this file, it will eventually be generated again.

The project folder contains important image data, still images etc. If you delete the folder, it will be generated again eventually, but the image data will be lost, resulting in missing video or missing images in your project. If you delete the source for a Cutout Element or a GreenScreen Element, you will have little recourse other than adding a new element.

Additional Data

There are numerous data folders: Scenes, Looks, ParticlePresets, CustomParticles, MyStages, MySprites, Animations, Files, VectorGraphics and LUTs. These contain mostly data you store when using MotionGraphix. For instance if you add a look to an element, and store it for later use, it will be stored in the Looks folder.

There are numerous ways to import files through the FilesApp into MotionGraphix. You can copy the files into the correct folder
, you can also select a file that MotionGraphix knows. You can also use openIn on supported file types. The file will be copied into the correct folder in MotionGraphix while being imported.

The Files folder contains all images or videos which are loaded from the Files App into MotionGraphix. MotionGraphix must make a copy of the files locally for you to work with them.

All accessible files in MotionGraphix can be shared with others.

The Looks folder contains all the looks you save or add through the Files App. You can add new looks from the Files App with copy/paste or by simply selecting a .**look** file in the Files App.

The Scenes folder contains all the scene elements files you save from MotionGraphix. You can add new scenes from the Files App with copy/paste or by simply selecting an .**elems** file in the Files App.

The Animations folder contains all the element animation files you save from MotionGraphix. You can add new animation files from the Files App with copy/paste or by by simply selecting an .**anim** file in the Files App.

The VectorGraphics folder contains all SVG files you add through the Files App. SVG files can be added with copy/paste or by simply selecting an SVG file from the FilesApp. You can also use openIn to add a new vector graphic to the current project.

LUTs contain all LUTS used by the Color LUT node. LUT files can be added with copy/paste or by simply selecting a LUT file from the FilesApp. You can also use openIn to add a new LUT to the current project.

Export Project

You can zip the entire project into one file using the "Export Project" item in the Project's popover. This will zip the .mgfx file, the project thumbnail and the project data directory into one sharable file. Once the archive has been made, the FilesApp is presented and you can choose where to send the file. Once the file has been saved you can copy or move it, or share it with AirDrop or even messages.

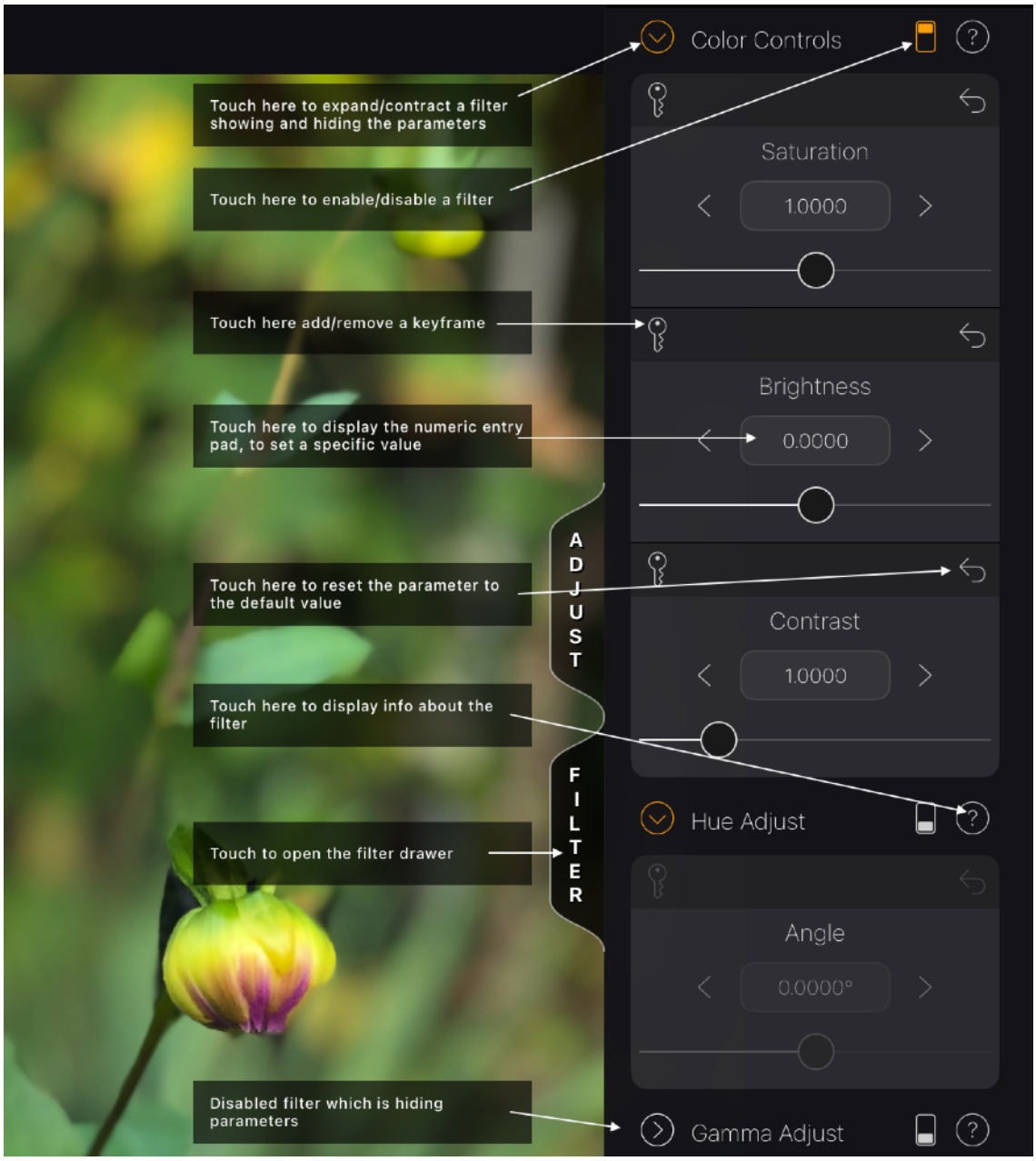
To import a zipped archive file (.**mgz**), open the FilesApp, find the .**mgz** file and either tap on it or long tap on it. Single tapping will open the file and present a share button in the upper right. Press on the share button and then select MotionGraphix from the app list. If you long press on the .mgz file, you will be presented with a menu. The share button is at the bottom. Open share and press on the MotionGraphix app. Both actions will import the project. If you already had a project of the same name, an additional 001 or 002 will be appended onto the project files.

Very Important: Please don't change the name of the project zip file when you export, it will make the file unusable, since important project name information is stored in the zip file.

Background Filtering

High-performance image filters can be applied to the background video providing keyframe-animated color correction and artistic stylization options. The controls for background filtering are found in the last section of the Adjust drawer.

To date, the available filters are input controls, saturation, brightness, contrast, gamma, curves, gloom, bloom and photo effects. The filters are off by default. To use a filter, first press the on/off switch to turn in on, then change the slider values to achieve the look you are after. Pressing the key button will add a keyframe. Once you add a keyframe all future changes will cause that channel to be animated. You can turn off a filter at any time by toggling the ON/OFF button. To hide the parameters but leave the filter active, select the expand/contract button.

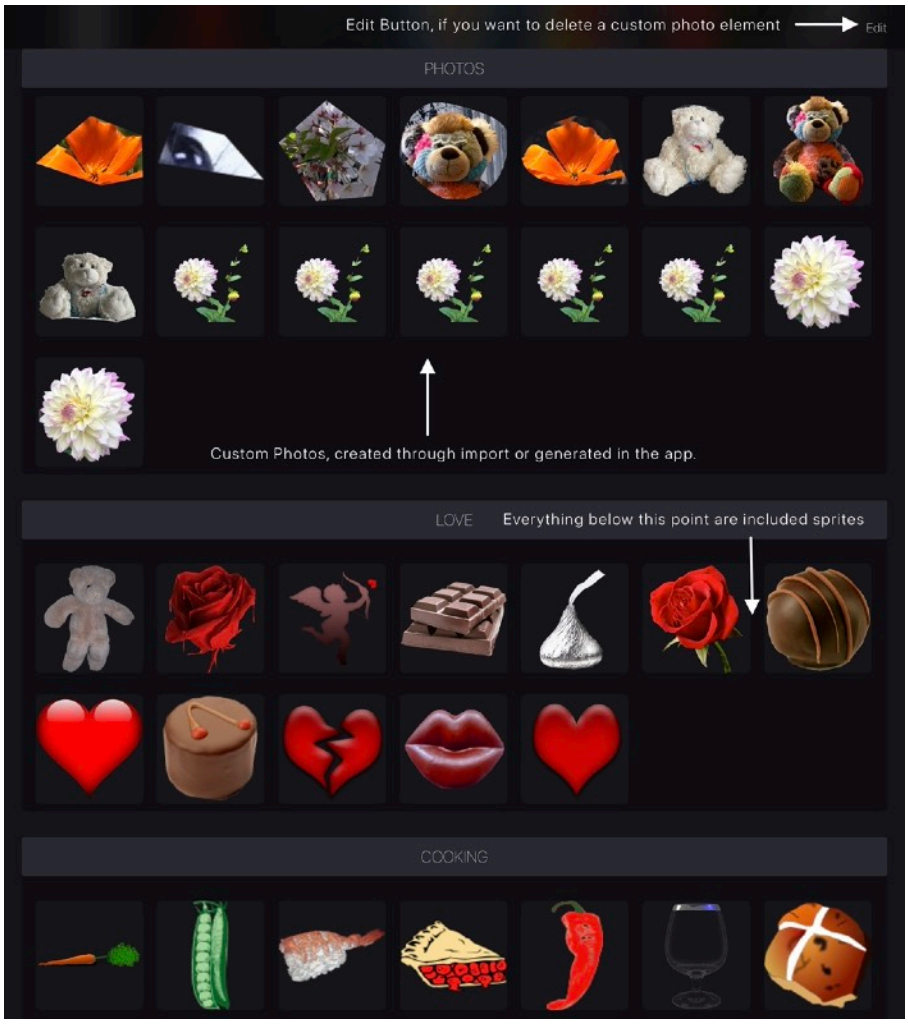


Elements

There are several types of elements that can be added to and animated in a MotionGraphix scene. Many element types have separate editors for initial creation and editing. All elements can have their position, zPosition, scale, rotation, opacity and shadow animated. When an element is added to the scene, it gets one keyframe added for the current position. This keyframe will always be added on the frame you are currently on. If you want to make sure all the initial keyframes are on the first frame, make sure to goto start when you add elements.

Image Element

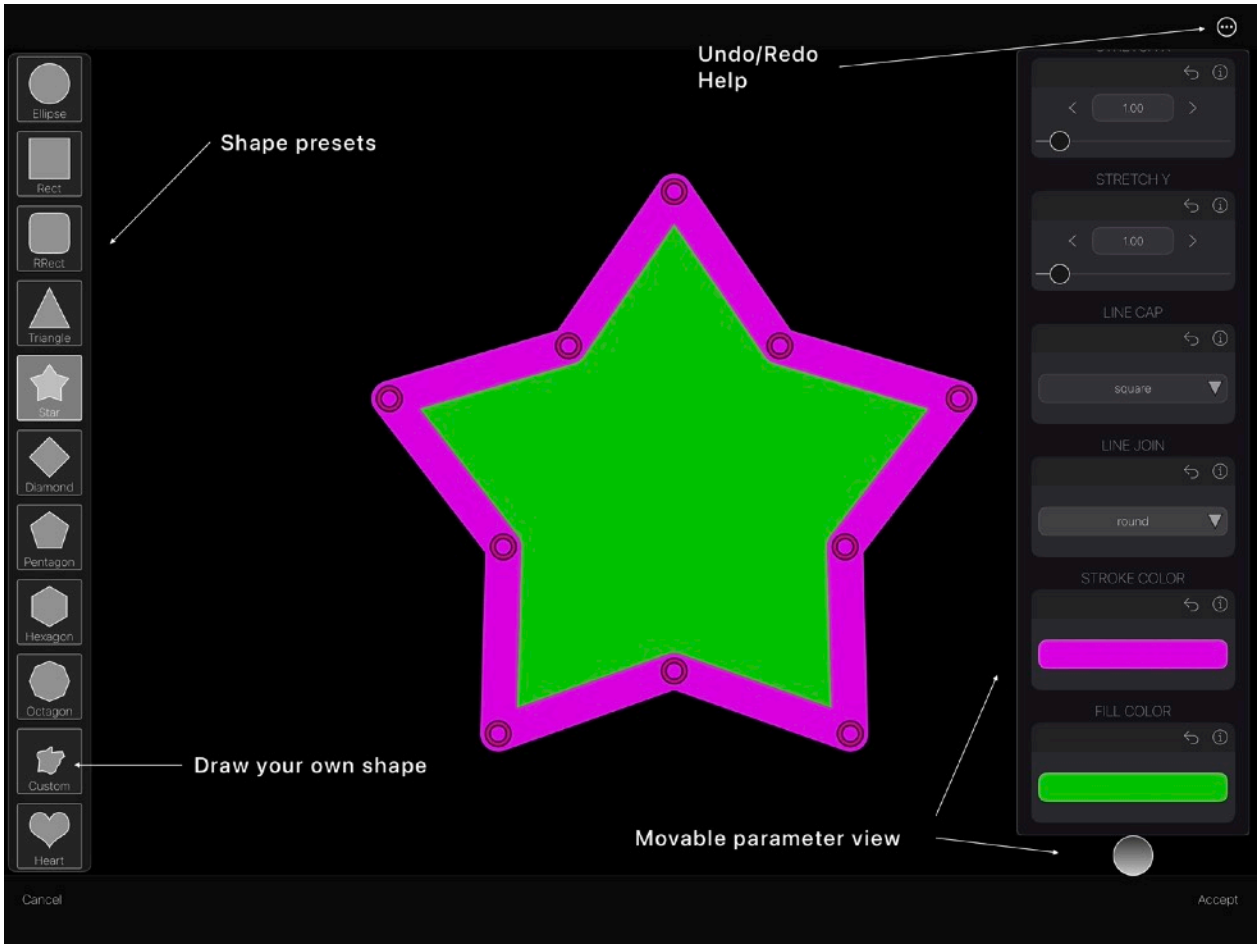
MotionGraphix includes a library of both animated and small still images with a transparent background. You can also import your own images from photos. When you create images for elements such as green-screen, depth-key, fg-mask, cutout, the image is optionally saved into your custom sprites folder. The setting for enablingdisabling this feature is in the ellipsis/settings popover. Animated sprites are either animated GIF-format images, or static 'sprite atlas' images.



Shape Element

You can can choose from a variety of shapes or draw your your own. All shapes have bezier handles for editing, as well as fill, gradient and outlines.

You can stretch a shape using the stretchX and stretchY sliders. This will stretch the shape separately in X and Y. If you move a contour point after stretching, the stretch value will be set back to 1.0 for both directions. Stretching is not the same as scaling, it simply resizes the shape and moves the points. Stretching is not animatable.



Parameters for Shape Editor

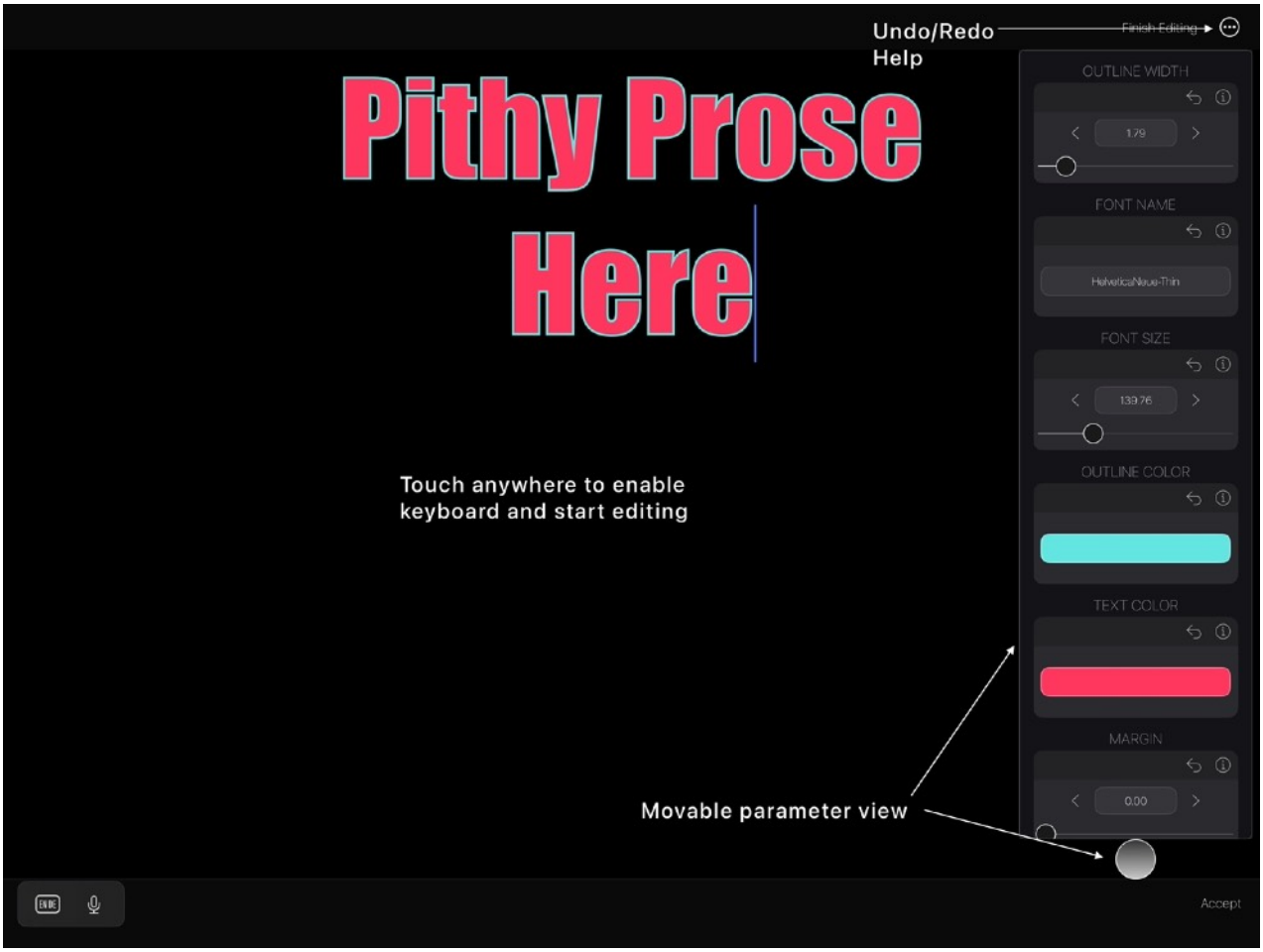
Line Width - The width of the shape outline.
Stretch X - The horizontal stretch of the shape.
StretchY - The vertical stretch of the shape.
Line Cap - The endpoint style, either round, square or butt of the stroke or strokes.
Line Join - The shape of the joints between segments of the stroke: miter, round or bevel.
Stroke Color - The outline color
Fill Color - The shape color
Gradient - When gradient is selected, settings for customizing the gradient are made visible.

Text Element

Text elements have editable font, alignment, outline and color. To begin editing touch the text field and the keyboard will appear. Text elements can be used to animate titles, to combine with speech bubbles or simply to add a pithy statement to your project.

The keyboard can be nuisance at times especially when you are working on a small device. Writing the text with a small font and only resizing it when you are done can help. Putting the device into portrait mode can also help when you are on an iPhone.

Select 'Finish Editing' to hide the keyboard.



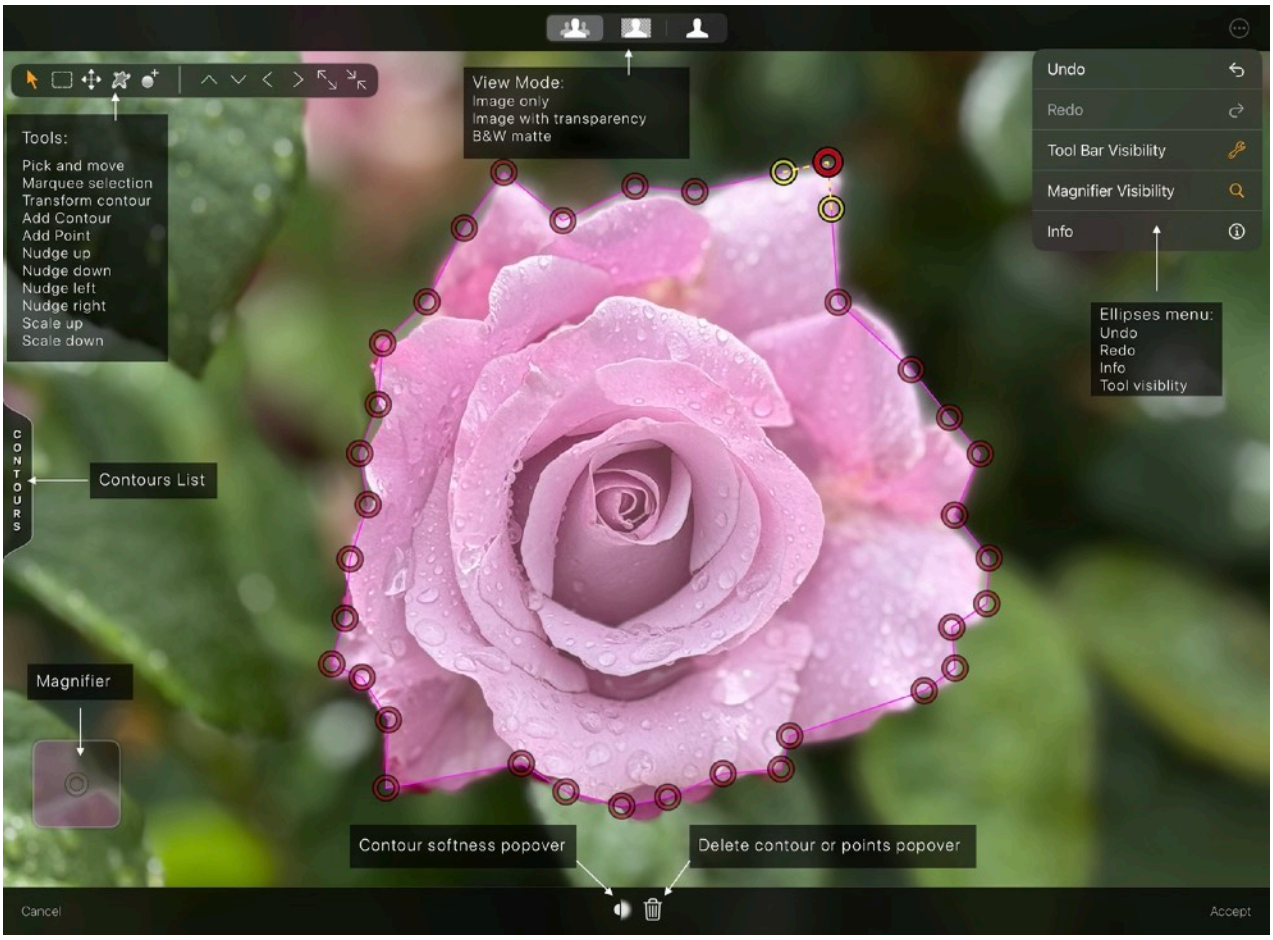
Parameters for Text Editor

Outline Width - The width of the text outline in pixels.
Font Name - The name, weight and attributes (bold, italic) of the font.
Font Size - The size in points of the font.
Outline Color - The color of the text outline.
Text Color - The color of the text. It can contain transparency.
Margin - Space around the text in pixels.
Text Alignment - The alignment of the text: left, center, right or justified.

CUTOUT ELEMENT

You can cut your own elements out of an image. Import any image from your photos and draw one or more contours to define the area of the image you want to keep. MotionGraphix will create an element with alpha for you to animate in your scene. MotionGraphix will by default save the image into the user sprites folder, so it will show up in the "Add Image Element" collection view under photos. If you don't want this behavior, you can turn in off in the main ellipsis / Settings popover.

The contour list shows you all contours in the cutout scene. The table view allows you to rearrange the order, lock a contour so it can't be edited anymore and also to delete contours.



Procedural Element

Procedural elements are animated particle systems. There are two sections to the procedural editor: Presets and Creator. In the presets section you select included or custom presets and add the element to your scene. In the creator section, you make your own presets and save them.

Presets Editor

The Presets editor contains all the included and custom procedural presets. You can manipulate parameters before adding an element to the main view. The parameters remain editable once in the main view. Particles are by their nature animatable, therefore only some of the parameters are keyframable. Because of the animated nature of particles, parameter changes can take time so become evident. Jumping to the start frame is an easy way to update all parameter changes

You can expand the keyframe view from the ellipsis menu. When expanded, all keyframes will be displayed. Each channel has a separate track. Keyframing behaves a bit differently in the procedural editor. The auto-keying behavior in MotionGraphix is disabled. This is done so unwanted keyframes aren't added every time you make a change while creating and editing presets. You will need to select the Add-Keyframe button when you want to introduce a new keyframe. Once the keyframe editor is open, you can add, delete, move and change timing of keyframes by selecting the buttons above the keyframe editor

The emitter area and shape can be displayed by enabling the emitter area visibility button. This is only for information, it will not affect the output in any way.

Creator Editor

The Creator editor is where you can design custom particle systems and save them. Saved presets are available in the Presets Editor as custom presets. Only some parameters remain editable in the presets editor and main view.

The file popover contains all the functions for loading, saving, overwriting and duplicating custom presets. You can also reset your preset to default settings.

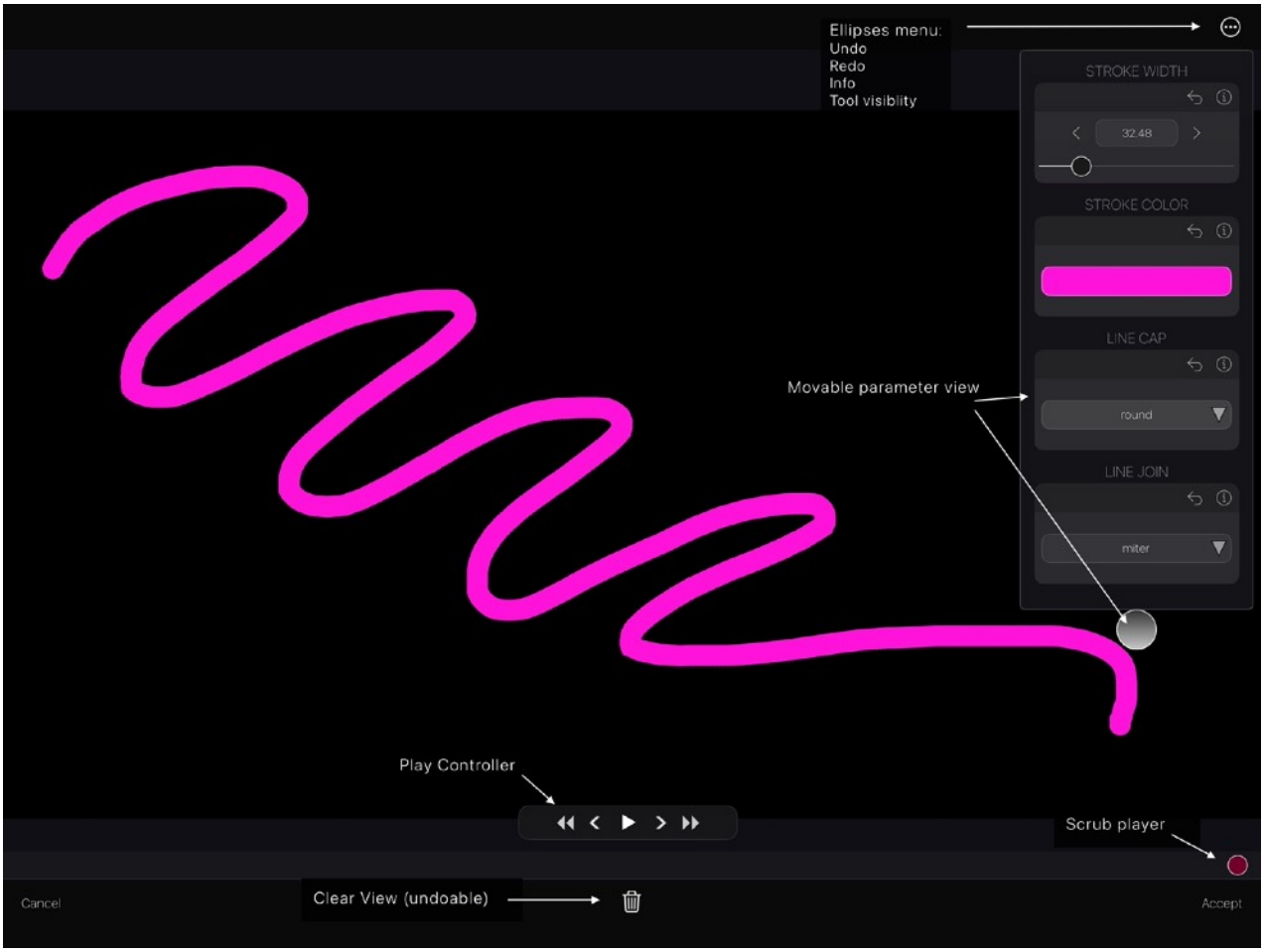
You can expand the keyframe view from the ellipsis menu. When expanded, all keyframes will be displayed. Each channel has a separate track. Keyframing behaves a bit differently in the procedural editor. The auto-keying behavior in MotionGraphix is disabled. This is done so unwanted keyframes aren't added every time you make a change while creating and editing presets. You will need to select the Add-Keyframe button when you want to introduce and new keyframe. Once the keyframe editor is open, you can add, delete, move and change timing of keyframes by selecting the buttons above the keyframe editor.

The editor popover enables emitter position and size editing. When 'No Editor' is selected, emitter position and size are not editable in the parameters view. When you select position, a circle and crosshair with a fuschia colored outline defining the area of the emitter is displayed. Touch the crosshair and move to the desired position in the view. You can also change position using the position sliders. When you edit size, the outline turns aqua and displays the area of the emitter. If the emitter is a point emitter the size parameter sliders remain disabled, since a point has no size. Selecting any other emitter shape will enable the size sliders. The only way to change the size of the emitter is with sliders.

Draw-on Element

With the draw on element, you can draw a stroke or strokes and have them animate on over time.

All strokes in the element will be affected by parameter changes. If you want strokes with different looks in your scene, make separate elements.



Parameters for Draw-On Element

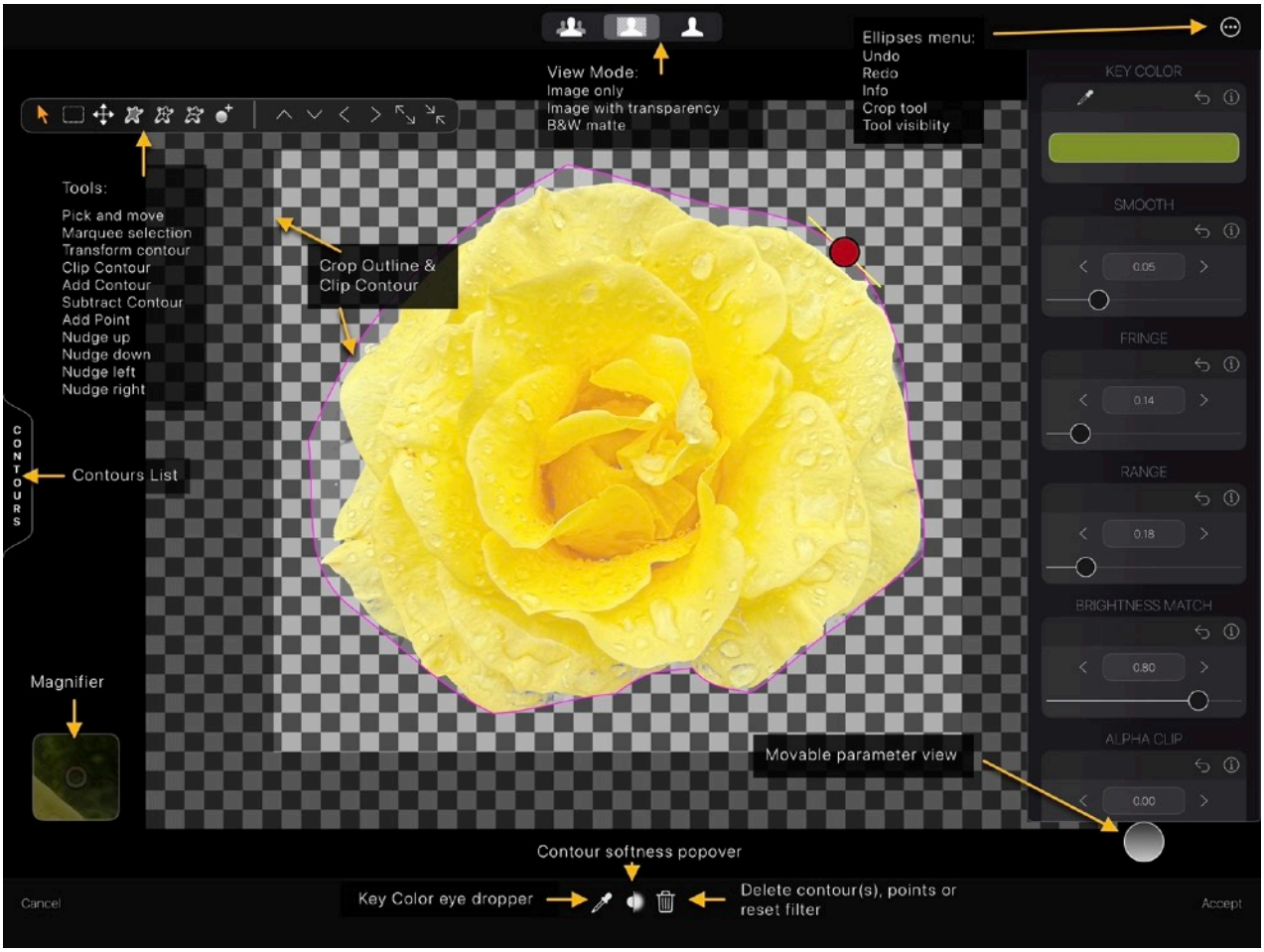
Stroke Width - The width of the stroke or strokes.
Color - The color of the stroke or strokes.
Line Cap - The endpoint style, either round, square or butt of the stroke or strokes.
Line Join - The shape of the joints between segments of the stroke, either miter, round or bevel.

Green-Screen Element

The green screen element is created from an image that has a solid color background, generally green, and a distinct foreground you would like to separate out. The parts of the image described by the key color are removed and result in transparent alpha. The editor offers a color picker and 3 views to aid in the keying process. You use the color picker to pick the key color and then refine the mask with the various view modes. Once you have created a mask it is often necessary to clean up either inside or outside the mask using the contours as garbage masks. You can add or subtract areas using the add mask or the subtract mask. Using the Clip contour you can cut away everything outside the contour. Additionally, you can add a crop outline, to remove unwanted image area.

MotionGraphix will by default save the image into the user sprites folder, so it will show up in the "Add Image Element" collection view under photos. If you don't want this behavior, you can turn in off in the main ellipsis / Settings popover.

The contour list shows you all contours in the green-screen scene. The table view allows you to rearrange the order, lock a contour so it can't be edited anymore and also to delete contours.



Parameters for Green Screen Removal

Key Color - The color to remove from the image. You can select the color by tapping on the color swatch and opening the color sliders, or by tapping on the eye dropper to pick a color from the image.

Color Range - the range around that color to remove. The higher the range, the more will be removed from the image.

Edge Smoothing - softens the transition at the edges.

Fringe - removes some of the edge spill that can come from the surrounding background color reflecting on the foreground object.

Alpha Clip - cuts out the almost transparent parts of the key (removes grey and turns it black).

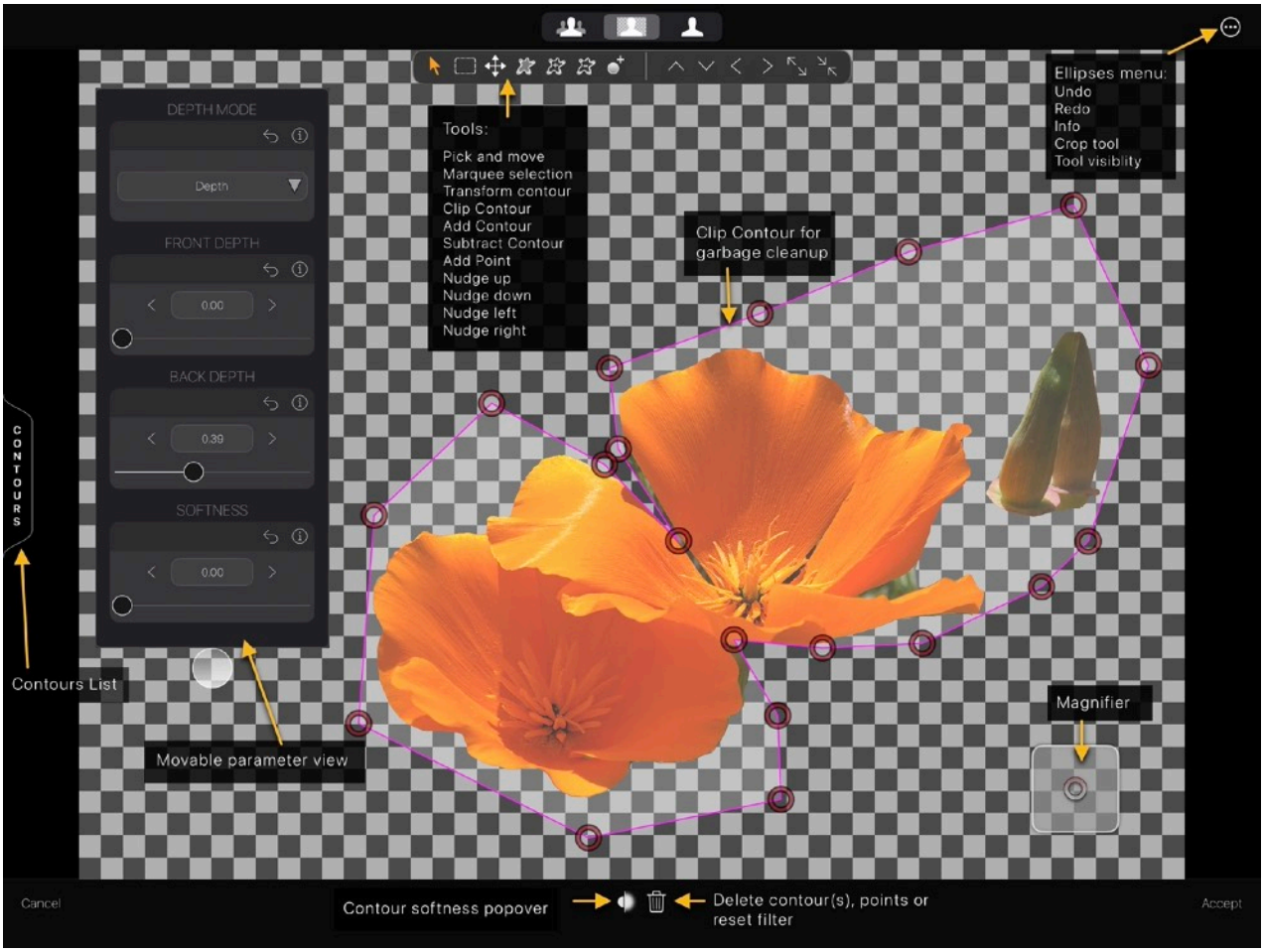
Brightness Match - cuts out the almost transparent parts of the key (removes grey and turns it black).

Depth Key Element

When you take a portrait shot with your camera, depth data is stored which can be used to perform a key. There are 3 possible mattes: Depth, Disparity and Matte. The Portrait Effects Matte is a high quality mask for isolating people (or plush-bears) in the foreground. Once you have created a mask it is often necessary to clean up either inside or outside the mask using the contours as garbage masks. You can add or subtract areas using the add mask or the subtract mask. Using the Clip contour you can cut away everything outside the contour. Additionally, you can add a crop outline, to remove unwanted image area.

The View Mode at the top of the editor allows you to switch between 3 modes: The original RGB image, the RGB image with alpha, the B&W mask with alpha.

All contours are displayed in list form in the Contours table. You can select/delete and lock them. A locked contour can no longer be edited by mistake



Parameters for Depth Key

Depth Mode - Choose which mask to use for the image cutout, depending on availability in the image: Depth, Disparity or mask.

Front Depth - changes the minimum visible depth, anything closer than minimum gets clipped.

Back Depth - changes the maximum visible depth, anything farther than maximum gets clipped.

Softness - smooths the edges of the mask.

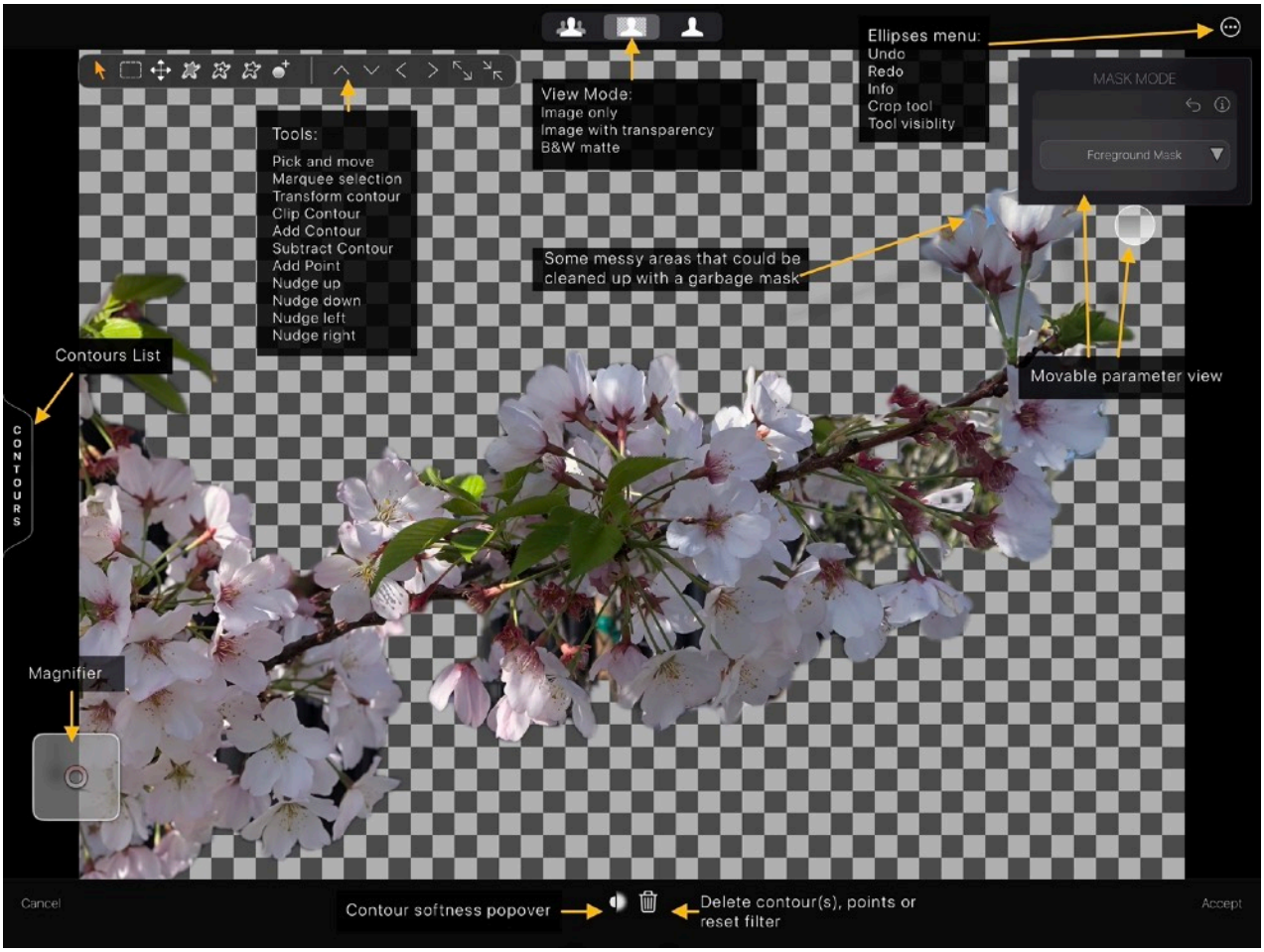
FOREGROUND MASK

The foreground mask element is created by detecting and masks=ing foreground elements using Vision. There are two mask modes: general foreground and person mask. It is worthwhile trying both, even if your foreground is person. The output is an element with transparency in the areas of image that are masked out.

View Mode at the top of the editor allows you to switch between 3 modes: The original RGB image, the RGB image with alpha, the B&W mask with alpha

You can add garbage masks to clean up areas of the image you still want to remove after the algorithm is done. All contours are displayed in list form in the Contours table. You can select/delete and lock them. A locked contour can no longer be edited by mistake.

There is also a crop tool for cropping unnecessary image data from your element. The crop tool can be enabled from the ellipsis menu.



Video Element

Video elements behave pretty much the same as all other elements.

Video elements always have a black background in the main view. This is due to the video player. When you add a look that creates alpha in the video, the main viewer will display black. When you are editing the look and when you render, the black will be replaced with transparent alpha.

Video elements do not loop at the moment. When your video is done, you can choose to either hold on the last frame or make the video invisible.

Each element in MotionGraphix displays its duration in the keyframe bar at the bottom. All elements are transparent after their duration has been reached. If you want the video to hold on the last frame, set the end behavior to hold.

The start frame can be changed, but not the duration. If you change your start frame and cause your element to run out of frames, it will simply hold on the last frame.

Vector Graphics Element

MotionGraphix ships with a handful of included vector graphics and you can add your own. The supported file format is SVG. SVGs with gradients are not supported at the moment. If you attempt to import an SVG file with gradients, they will be converted to a white color.

Every once in a while an SVG file is non-standard. When a file can't be parsed, the thumbnail will display "SVG File Error".

To add your own SVG Files to MotionGraphix:

- Open the FilesApp on your iPhone or iPad
  - Navigate to the SVG file you would like to import
  - Select the file
    - This action will either import the file to MotionGraphix directly
    - Or, it will display the file and then you need to press the share button at the top and select "Open-In".
    - All custom SVG files are stored in the folder VectorGraphics.
- Open the "Add Element Popover"
  - Choose "Add element from Files", all the way at the bottom
  - Navigate to the desired file in the FilesApp
  - The element will be added to your scene and the SVG file will be copied to the VectorGraphics files.

To remove an SVG file from MotionGraphix:

1. Open the FilesApp on your iPhone or iPad.
2. Select "On my iPad" and navigate to MotionGraphix.
3. Find the VectorGraphics folder
4. Long press on the file you want to delete and select delete.

Paint Element

The paint editor enables you to paint an element using pencilKit. You can paint with your finger or an apple pencil. You have 3 options for creating a paint element: paint freeform with no background, paint with an image for registration which will not be saved into the final element, paint with an image for registration which will be composited behind the drawing in the final element.

Tapping on the stroke button (upper left) opens the strokes list. Selecting a stroke will visually select that stroke. Pressing on the settings button opens the editable settings for the stroke. Selecting the color swatch will open the color picker. You can select edit up at the top right to delete strokes

MASK / SHAPE TOOLS

Tools for editing shapes and masks are available for numerous elements: Shape, Green-Screen element, Depth-key element, Draw-on element, as well as for the element path. Not all elements have all the tools.

Pick Tool. This tool is the default tool. Select it to pick or edit a contour, move vertices, or break tangents.

Transform Tool. This tool lets you move contours around in the scene.

Marquee Selection Tool. This tool allows you to select / deselect multiple or single points at the same time. It is not possible to zoom or pan the workspace when in Marquee tool mode.

Clip Contour Tool. The Clip contour defines the outline of the sprite(s). This tool must be selected in order to add a new contour. Once the tool is active any touch in the workspace will add a new point. A simple tap will add a point which has broken tangent handles. A tap and short hold will add a point and let you pull its tangent handles right away. To finish adding a contour either double tap for the last point, or tap on (or very close to) the initial point. Once the contour is finished the tool will automatically switch to the pick tool.

Add Contour Tool. Add Contour adds the area under the contour to the end result. It is most commonly used in conjunction with Color or Depth Cutter as a garbage mask. It will keep the semi transparent areas under the contour completely white. The workflow for creating an “Add Contour” is identical to the adding a “Clip Contour”.

Subtract Contour Tool. A “Subtract Contour” erases the area under the contour from the end result. It is most commonly used in conjunction with Color or Depth Cutter as a ‘garbage mask’. It will keep the semi transparent areas under the contour completely black. The workflow for creating a “Subtract Contour” is identical to the adding a “Clip Contour”.

Add Point Tool. This tool allows you to add a point to a contour. Tap and hold near the red contour line of a selected contour. An large aqua point will become visible under your finger, which can be pulled along the contour line. Once the point is where you want it, let go and a new point will be added.

Once a point has successfully been added, the tool automatically switches to the pick tool.

Nudge Up Button. Pressing this button will nudge the selected contour up by one pixel.

Nudge Down Button. Pressing this button will nudge the selected contour down by one pixel.

Nudge Left Button. Pressing this button will nudge the selected contour left by one pixel.

Nudge Right Button. Pressing this button will nudge the selected contour right by one pixel.

Scale Up Button. Pressing this button will increase the size of the selected contour by a small increment.

Scale Down Button. Pressing this button will decrease the size of the selected contour by a small increment.

Keyframe Animation

Elements

MotionGraphix has a highly intuitive 'automatic keyframe' system for animating elements. Every change that is made to an element creates a keyframe. To animate the position for instance, move an element, adjust the time, move the element and so on. Non-positional parameters (i.e. opacity) are also automatically keyframed when adjusted from parameter editors.

Background Filters

Background filters can be animated as well, but changes do not automatically add keyframes until you have added at least one. The background filter editor is in the adjust drawer. Once the keyframe button is pressed for one of the filter channels, it turns on auto-keyframing, and any additional change at a different time will add a keyframe. To remove a keyframe, simply press on the red key button. The key button turns red on frames where a keyframe is present.

Procedural Animation

Keyframing behaves a bit differently in the procedural editor. The auto-keying behavior in MotionGraphix is disabled. This is done so unwanted keyframes aren't added every time you make a change while creating and editing presets. You will need to select the 'Add Keyframe' button when you want to introduce a new keyframe.

Path Animation

Path animation is an additional type of animation for position. A path animation has no keyframes, but simply a single procedural path. The only additional editing you can do to a path animation is to move it around your view. The way to create a path animation is to add a motion that is procedural, like the spiral or sine wave motions, or to draw a custom path.

Digital Tracking

Digital tracking is a fun feature which allows you to quickly animate complex motions. The movement of your finger (digit) is recorded into position keyframes as the movie is playing. To start digital tracking, click the digital tracking button (the paw in the play controls), tap and hold anywhere in the main view, and then move your digit where you would like to see your element move. It helps if you are on the first frame of your animation, but you don't have to be. Nothing will happen if you are on the last frame. When you lift your finger, the tracking is finished. The player will stop and a default element will show up at the end of your new animation curve. Simply open the element editor to change the element image. To apply this animation to an element type other

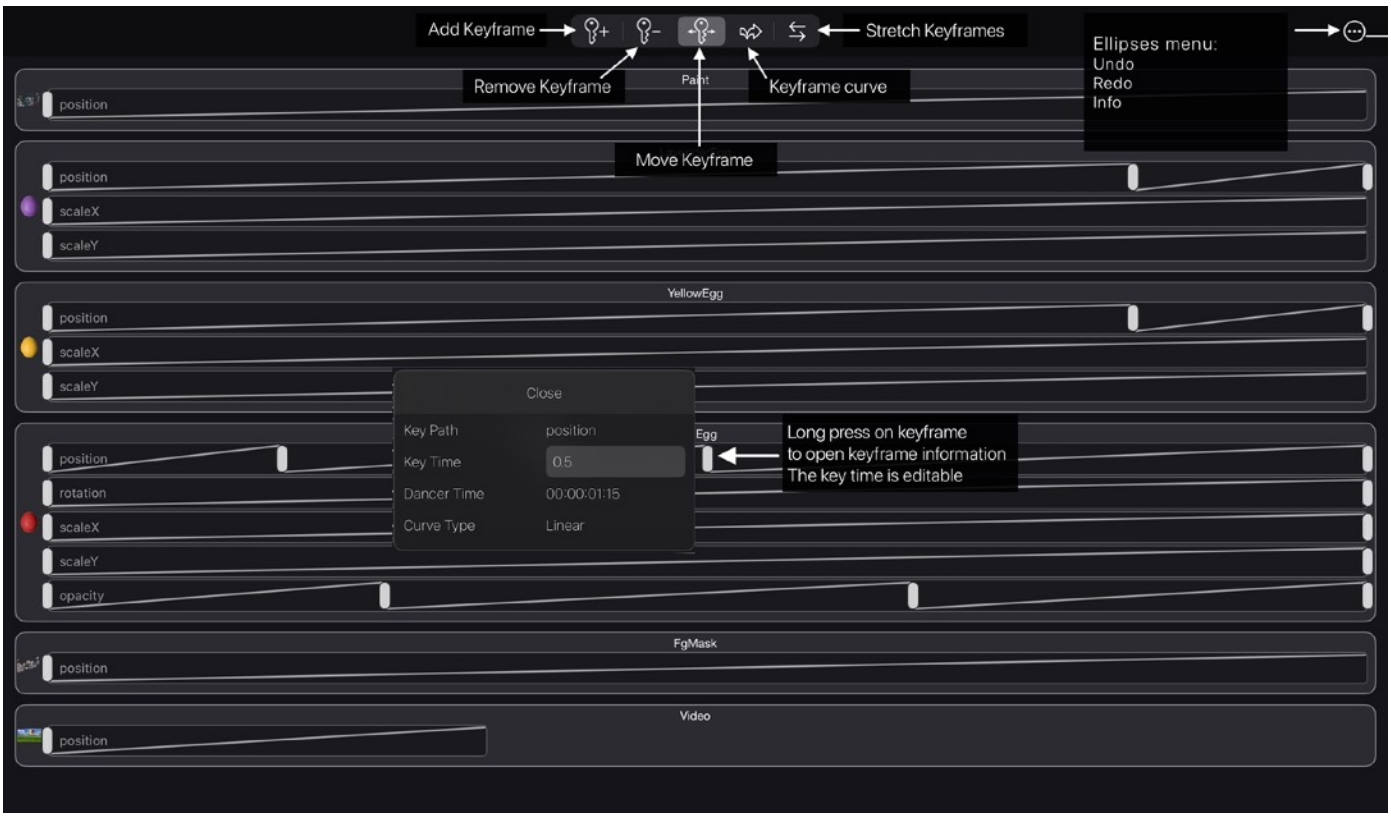
than an image, it is necessary to save the animation, then add the new element and load and apply the saved animation to it. If your scene is very long, you might not notice the player moving, but it is working.

Keyframe Editors

Element Keyframes

Each section in the keyframe editor represents an element. Each channel that currently has keyframes is visible. At a minimum, there is one channel per element for the default position keyframe. You can pan and zoom to make editing keyframes easer. Keyframes can be moved by turning on the move keyframe button and performing tap, hold and move on individual keyframes. Keyframes can be deleted by turning on the delete button and tapping on the keyframes you want to remove. To add keyframes turn on the add button and tap where you want a new keyframe. To change the keyframe type between ease in, ease out, ease in/out and linear, press the timing button. Every selected keyframe will present the timing popover. A keyframe with linear timing is white, ease out is white on top and red on the bottom, ease in is red on top and white on the bottom, and ease in/out is red. In addition to the color changes to the keyframes when the timing is changed, the curve is also drawn between keys so you can see how the parameter will animate.

Select or deselect elements by tapping on their section. If no elements are selected, the goto next / previous keyframe buttons will take into account all elements in the scene. If an element is selected, only it will be taken into account when navigating keyframes.



To stretch keyframes for channels associated with one element, select the stretch button. When you tap on a keyframe the stretch popover will be presented. The stretch popover displays all channels for one element. You can disable a channel so it isn't affected by the 'stretch to range' function. It is also possible to edit individual keyframes by moving them gesturally.

Filter Keyframes

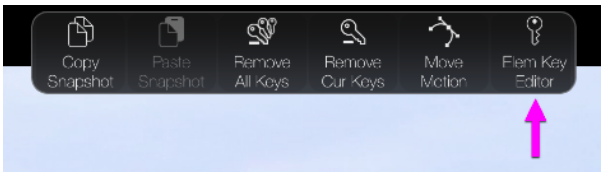
Each section in the filter keyframe editor corresponds to one filter. All animatable channels for each filter are displayed, whether they have keyframes or not. The controls are identical to the element keyframe editor.

Keyframe Bar

The keyframe bar displays the location of all keyframes for the selected element, or all keyframes for the background filters. The background filter keyframes are only displayed when the background filters editor is opened. You know you are seeing background filter keyframes when the background color of the bar is red.

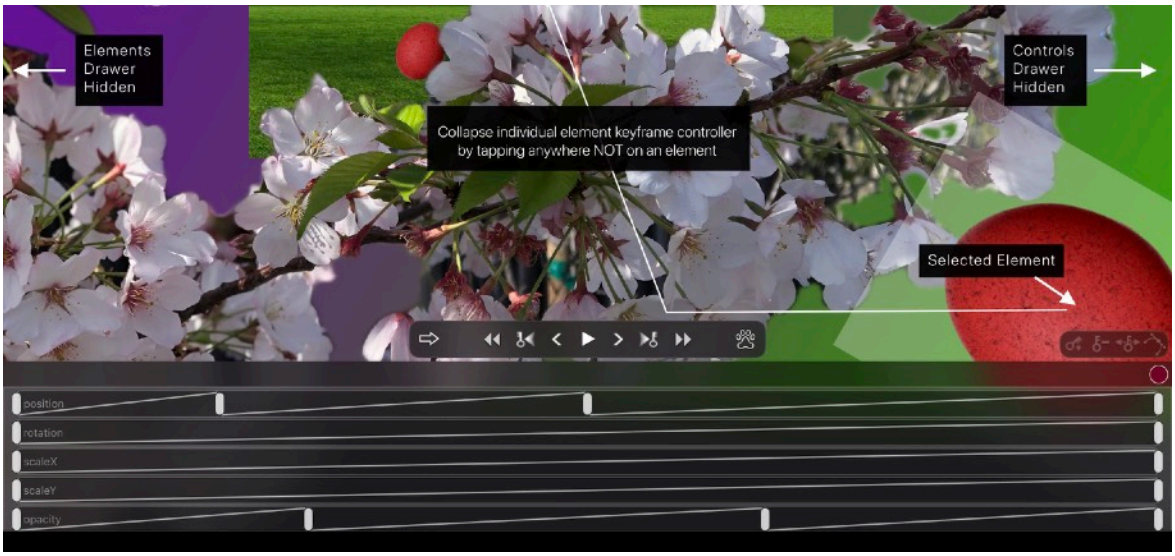
Individual Element Keyframe Editor

The individual element keyframe editor allows you to edit the keyframes of an individual element without having to open a full screen editor. It is displayed at the bottom of the view. There is a maximum height, so if you have lots of animated channels, you can scroll the editor. It is also zoomable to aid in fine tuning.



To access the individual element keyframe editor, use the marker menu/Actions item. When expanded, the editor displays all animated channels for the selected element. The add, move, delete and timing buttons enable the same editing functions as the full keyframe editor. When the single element keyframe editor is open, the Elements and Adjust/Filter drawers are hidden. They will remain hidden until you close the editor by deselecting all elements. When you select a new element it will display its channels.

To close the editor, tap anywhere in the view, NOT on an element. Opening any full screen editor, most non-informational popovers and rendering will close it.



Scene and Element Modification

There are numerous scene and element editing features in MotionGraphix. The modify popover is opened by pressing the wrench icon.

Editors

The editors section contains the editors you will use to change parenting, keyframing, timeline, camera, stereo settings, non-proportional scaling and the focused editor. Each of the editors is a full screen view.

Elements

In the Elements section you will find functions for removing elements, clearing the scene, removing keyframes, duplicating elements and something called motion mover mode. When motion mover mode is turned on, any position change to an element will affect all keyframes in the animation. This is a great way to move an already fine-tuned animation, especially one that has a lot of keyframes to a new location in the scene. Without using this mode, moving an element would only create a new keyframe at the current time or move an existing one. When you are finished with motion mover mode, press the button that appeared in the upper portion of the main view.

Motion

MotionGraphix contains a library of ready to use motion templates. These are pre-calculated actions which can be added to an element at any time in the workflow. Each motion has one or more channels that it affects. For instance the bounce motion animates the position channel and the fadeIn motion affects the alpha channel. One motion can be added per channel.

Looks

The looks section has items for adding/editing a look on an element. This opens the looks editor. Remove Look removes the currently applied look

Scene

Change Background

The first item in the scene section is 'Change Background'. You can change the background to any type you want. If the length of the new background is different from the original, element animations will either be shorter to too long. They will not be retimed in any way.

Save and load scene

Storing a scene stores the state of all elements, including their animations into a small file. You can then load that file into a different project. You might want to do this if you have

created an amazing set of elements with fine tuned animations, and you would like to add them to a different project, or to make a standard opening or closing title sequence.

Change Scene Duration

Change the duration of your project. Video projects can only be shorted. All other projects can be shorten or lengthened, with a minimum of 1 second and maximum of 10 seconds. You can optionally scale all the animations in the scene to stretch to the new duration.

Snapshot

Making a snapshot of an element will store the current state of the element: position, scale, rotation, drop-shadow, etc. into a file that you can then paste onto another element. A snapshot does not contain animation.

Animation

The entire animation for an element can be stored into a small file and then loaded onto another element. When you load an animation it will overwrite the current state of the element with the new animation.

Edit Manager

The edit manager section has items for displaying the undo/redo history in a list view, setting the undo/redo levels (The default is unlimited), and purging the undo/redo history.

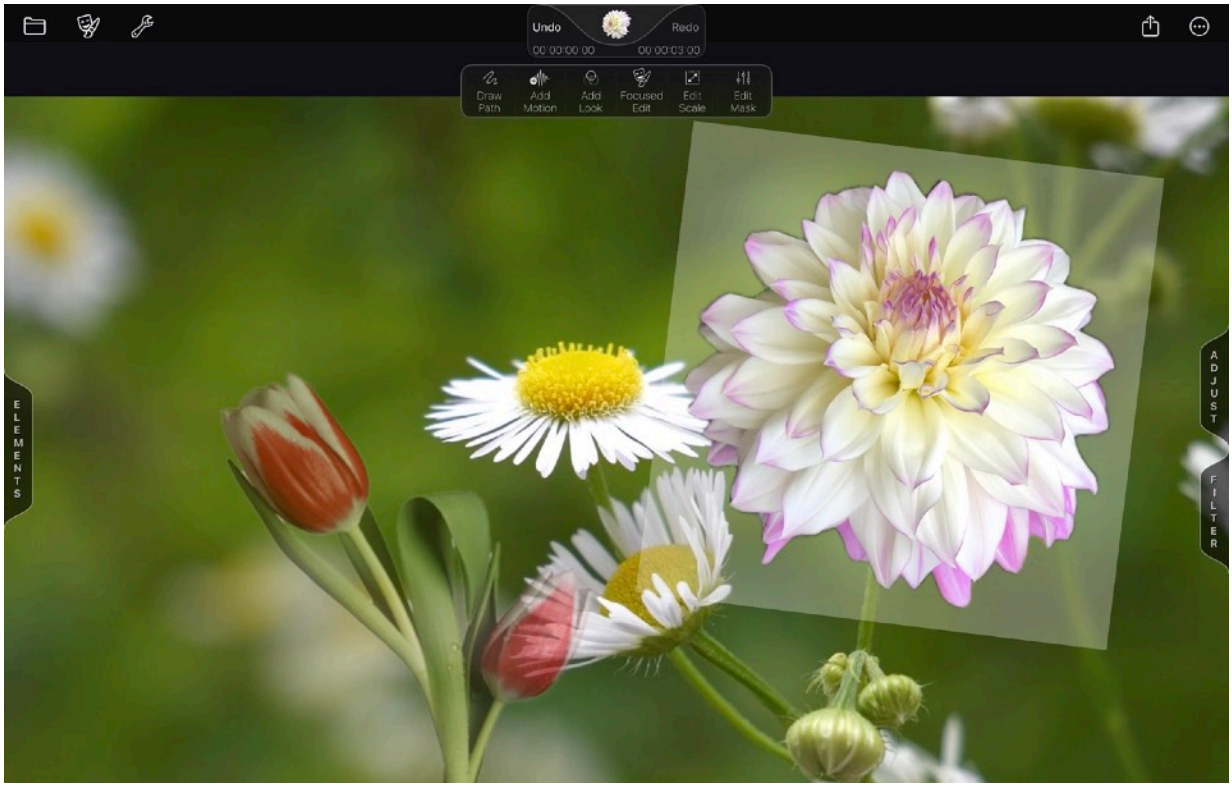
Draw Path

Selecting this item will open an editor with the current image from the view. You can draw a path which the element will follow. When originally entering draw path mode, the tool mode is add path, once you have double clicked to finish adding a path, the tool mode switches to pick and you can edit the path.

Marker Menu

Long press on an element to display the marker menu. You can tap with one or two fingers. Tapping on one of the buttons will perform that action. Tap anywhere in the view to close the marker menu.

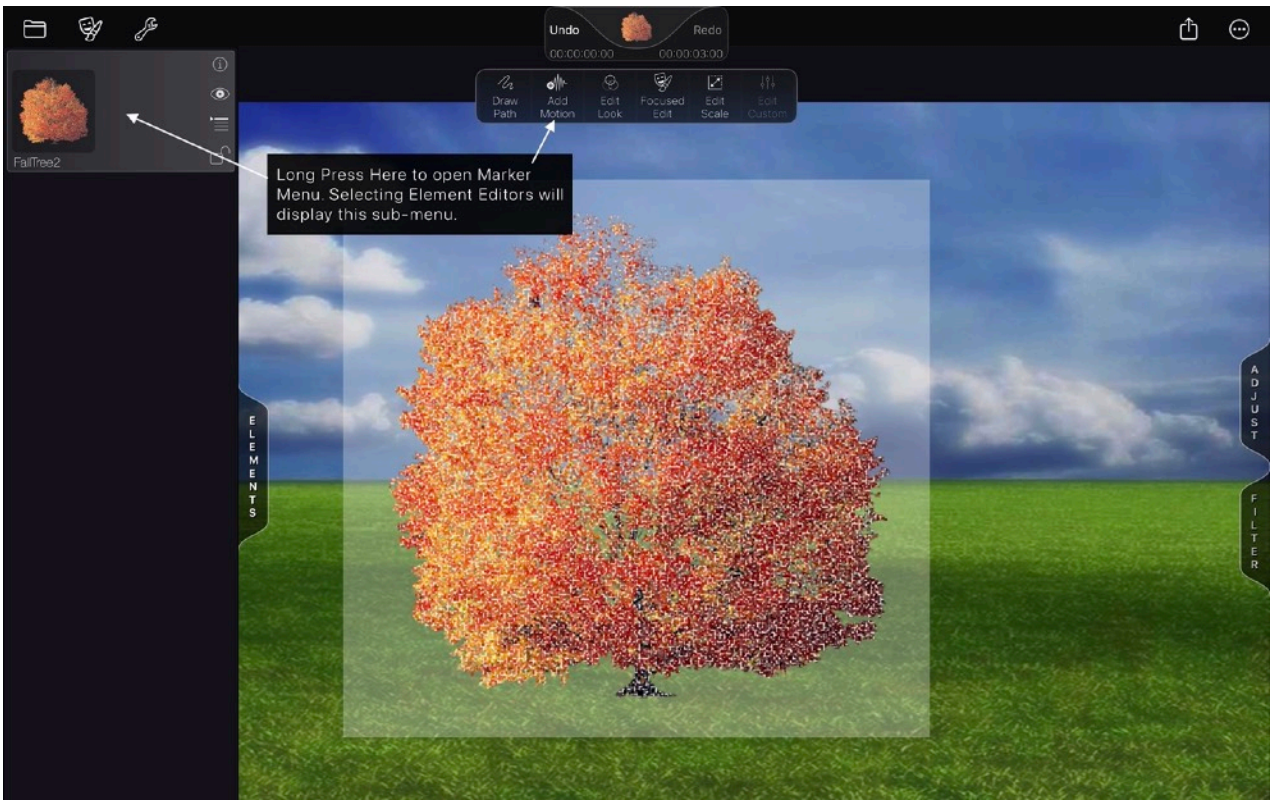
In some items such as “Element Editors”, “Nudge Element”, and “Element Actions”, a secondary smaller marker menu will appear with further sub-items.



Looks Editor

All image based elements can have a look applied to them. A look is an effect which changes an element's color, texture or sometimes warps an element. Each look has parameters associated with it, which when changed, change the appearance of the look. If you adjust parameters to create a look you particularly like you can save it and share it.

An element with Pointillize applied to it



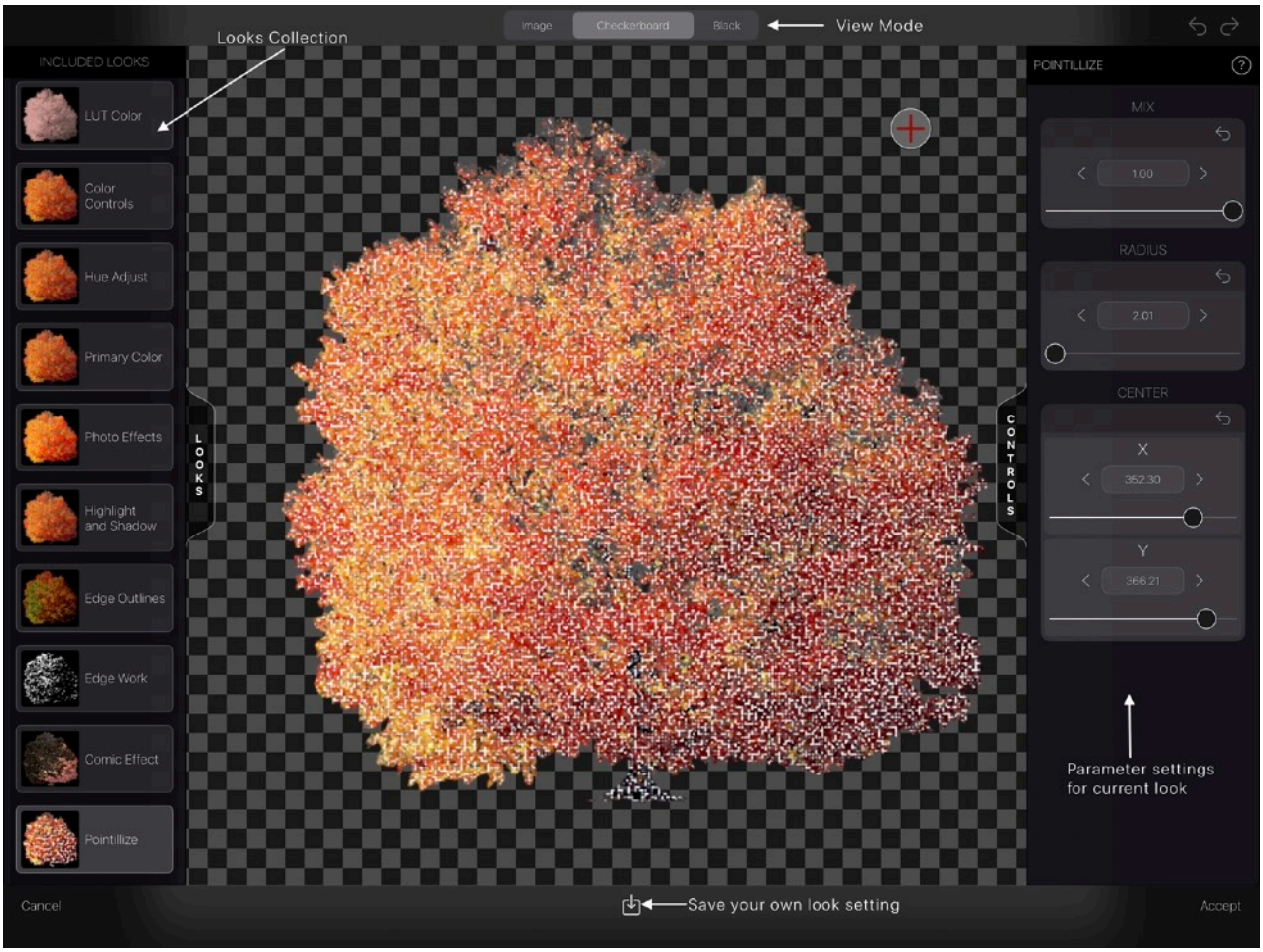
The Looks editor can be opened in 3 ways:

- Using the **Marker Menu**, open element editors and select Add/Edit Look
- From the Focused **Element Editor**, select the Edit Look button
- From the Element List, long press on an item. This will display the Marker menu.

Once the looks editor is open, the collection of looks is on the left and the parameters for the current look are on the right. The element is in the center and updates live as you change parameters. Undo/Redo is available at every step. Animated looks are not available.

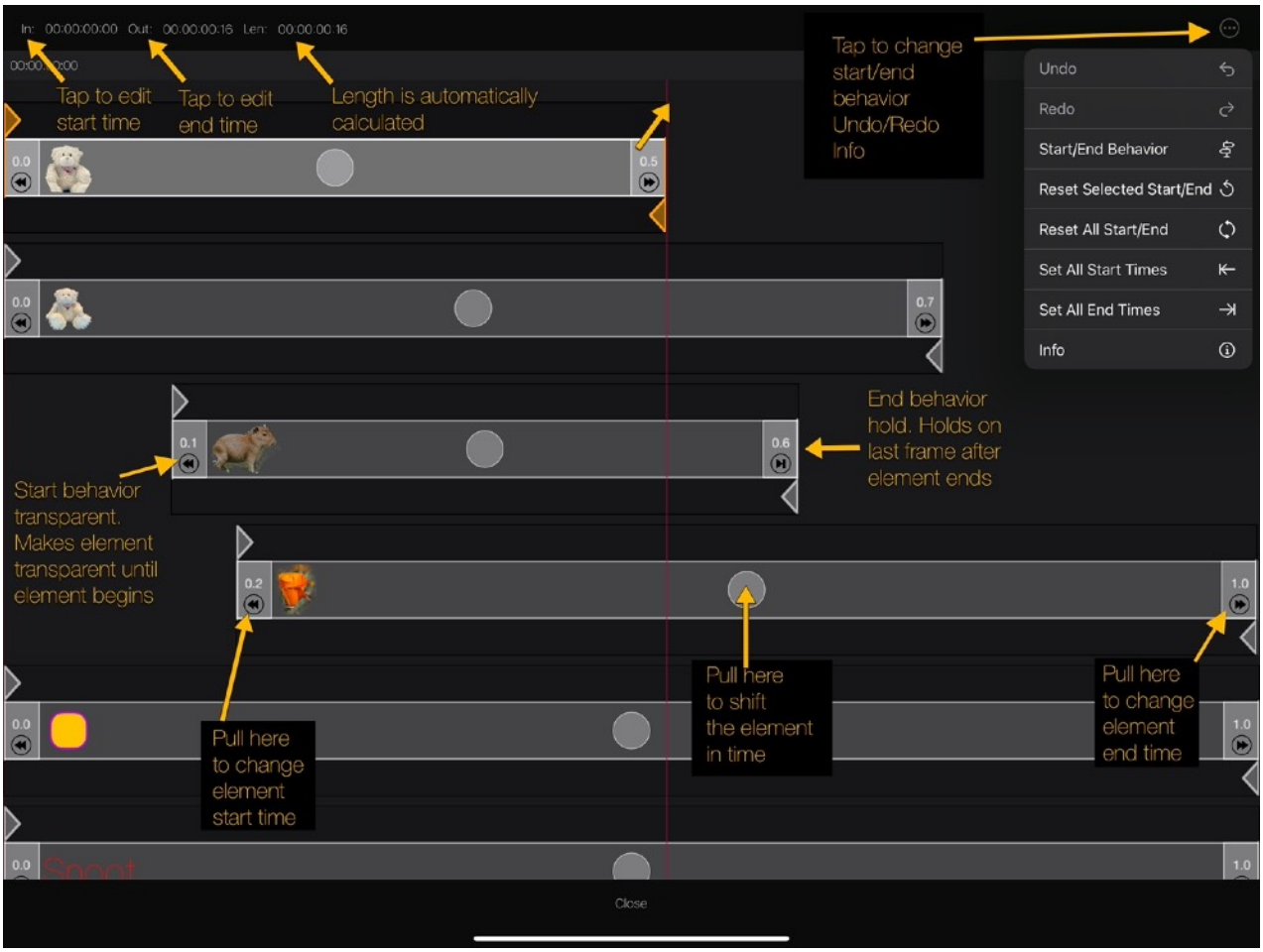
You can re-edit the look on an element at any time by opening the look editor.

You can save a look for the future, by selecting the down-arrow button at the bottom of the view. The custom looks are stored in a folder called Looks.



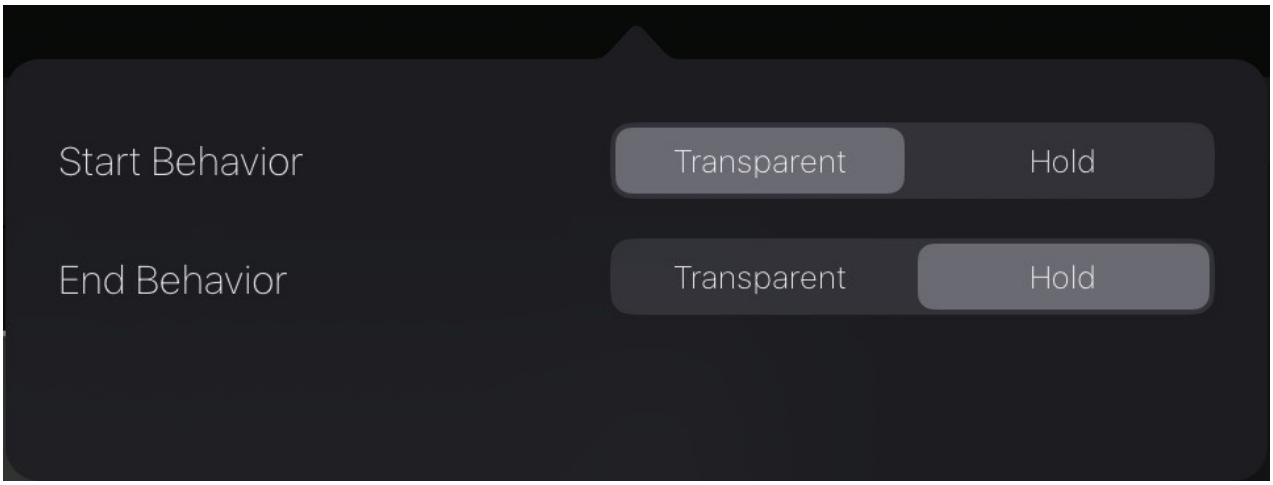
Timeline Editor

The timeline allows you to edit the timing of your elements. Each element is displayed as a segment in the timeline. To change the start time of the element drag on the orange hot spot at the start of the segment. To change the length, drag on the orange hot spot at the end of the element. To change the overall position of the element in time, drag on the circular colored hotspot in the middle. If the element is very short and the center is hard to hit, you can also reposition the whole element with a long press and drag. When an element is selected, you can also touch on the start or end values at the top to open a numeric entry keypad. When an element has had its time adjusted, it will not be visible in the output video outside its time range. In the editor, it will appear semi transparent when time is outside of its range. This helps keep track of where elements are, so they aren't completely invisible while you are working. The minimum length for an element is 15 frames.



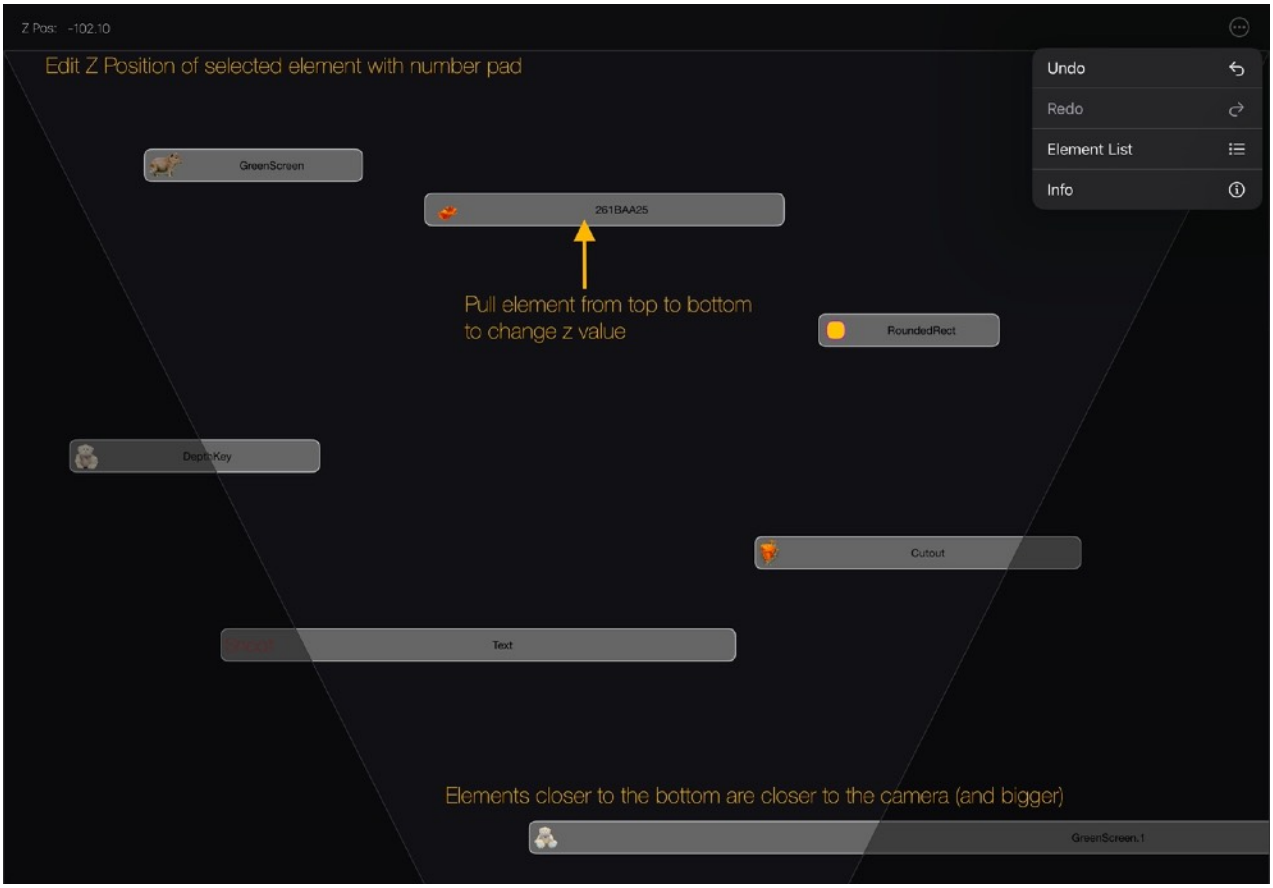
Element end behavior can be edited by selecting the ellipsis button. If the end behavior is set to transparent the element will be invisible in the final output and semi-transparent

in preview. If the end behavior is set to hold, the element will hold on the first or last frame, depending if it is set for the start or end. Element start and end can have different end behaviors. The default “element end” end behavior for animated sprites is hold, all other sprites have transparent as their default.



Camera Editor

The camera editor allows you to edit the z position of each element from a top down view. At the bottom of the editor is the camera, the lighter area is the view frustum. It shows what will be visible in the scene. Dragging elements closer to the camera will make them bigger in the scene. Elements closer in Z will also appear over other elements.



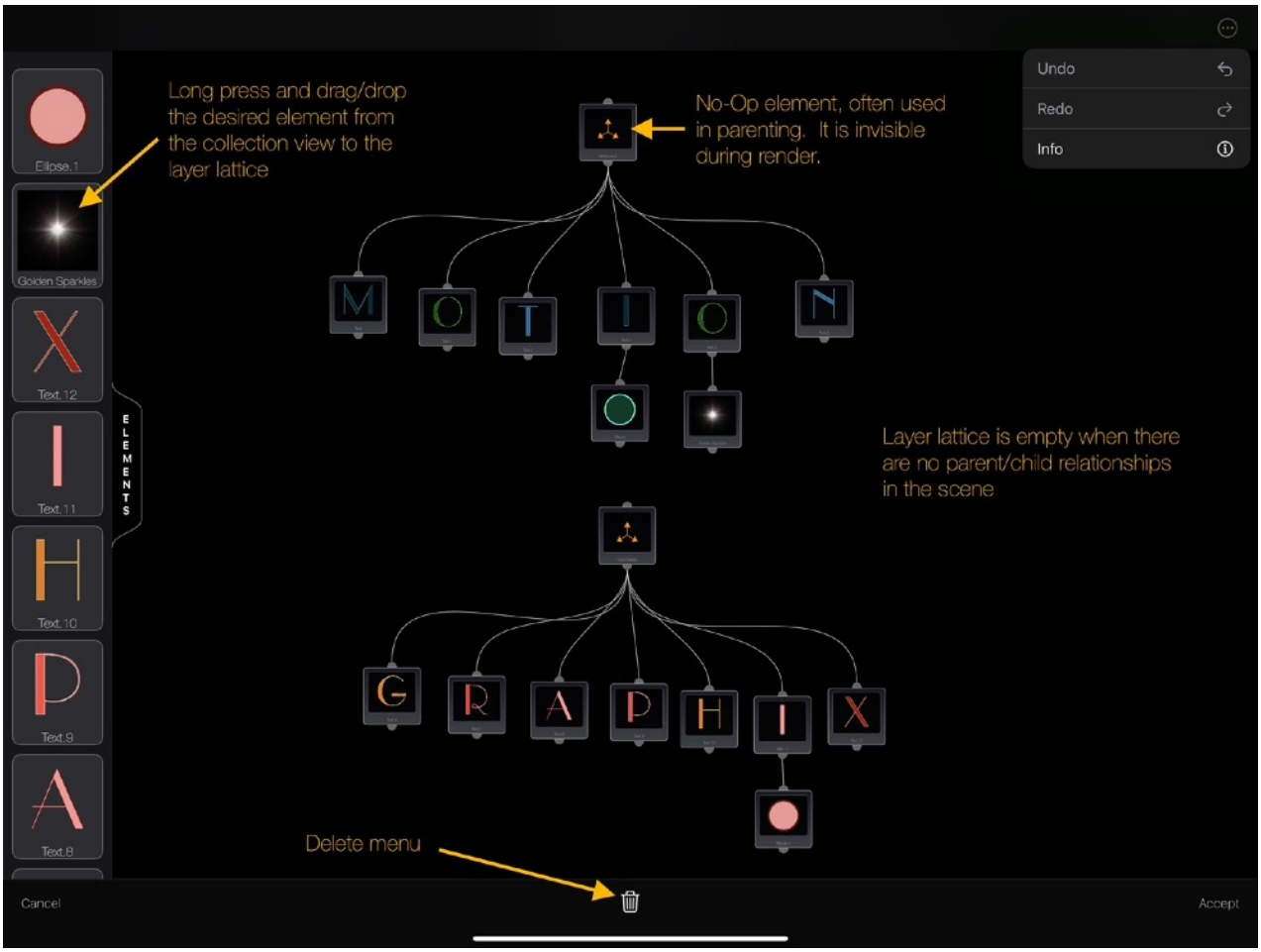
For precise placement you can also touch on the ZPos at the top to open a numeric keypad. There is also a popover available with sliders.

Parenting Lattice

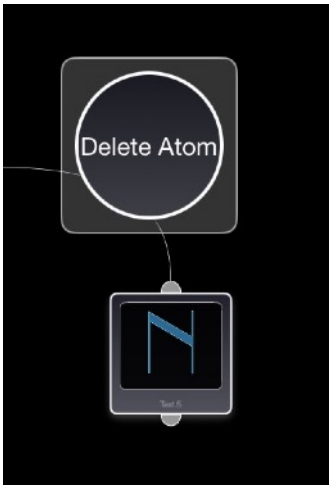
It is possible to make parent child relationships between elements. The parent lattice can be opened from edit menu/editors.

On the left is the list of elements from the scene. The parenting lattice is empty to start, before you have set any relationships. If you want to make a parent child relationship long press on an element in the element collection and drag and drop it onto the scene. An element can only be added once into the lattice. To delete an atom, link or the entire lattice, you can press on the trash icon or long press on an atom or link and a button will be made visible depending on which type of item you have selected.

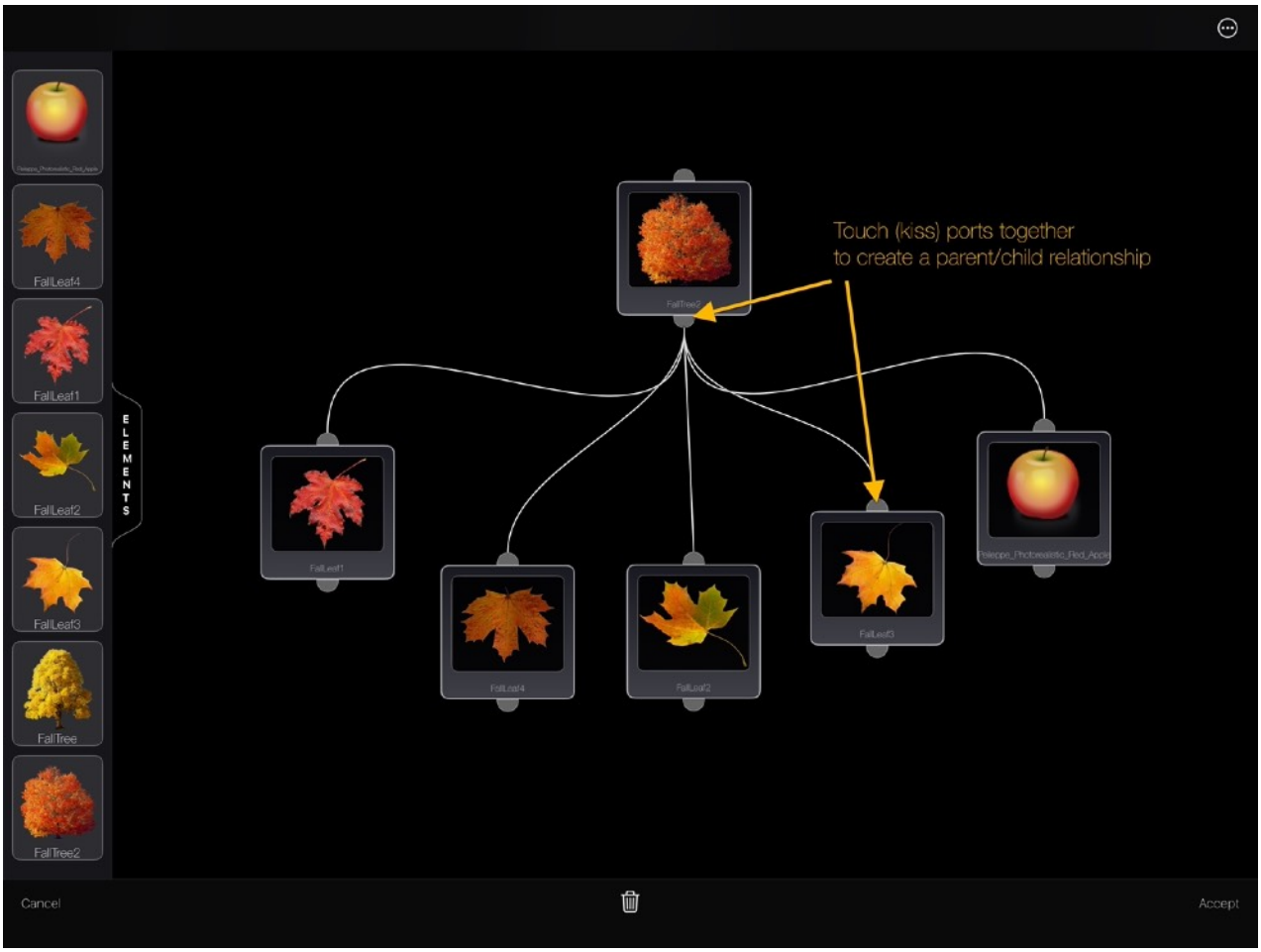
To create a parent / child relationship touch on an element and move its parent or child port near to the opposing port of another element.



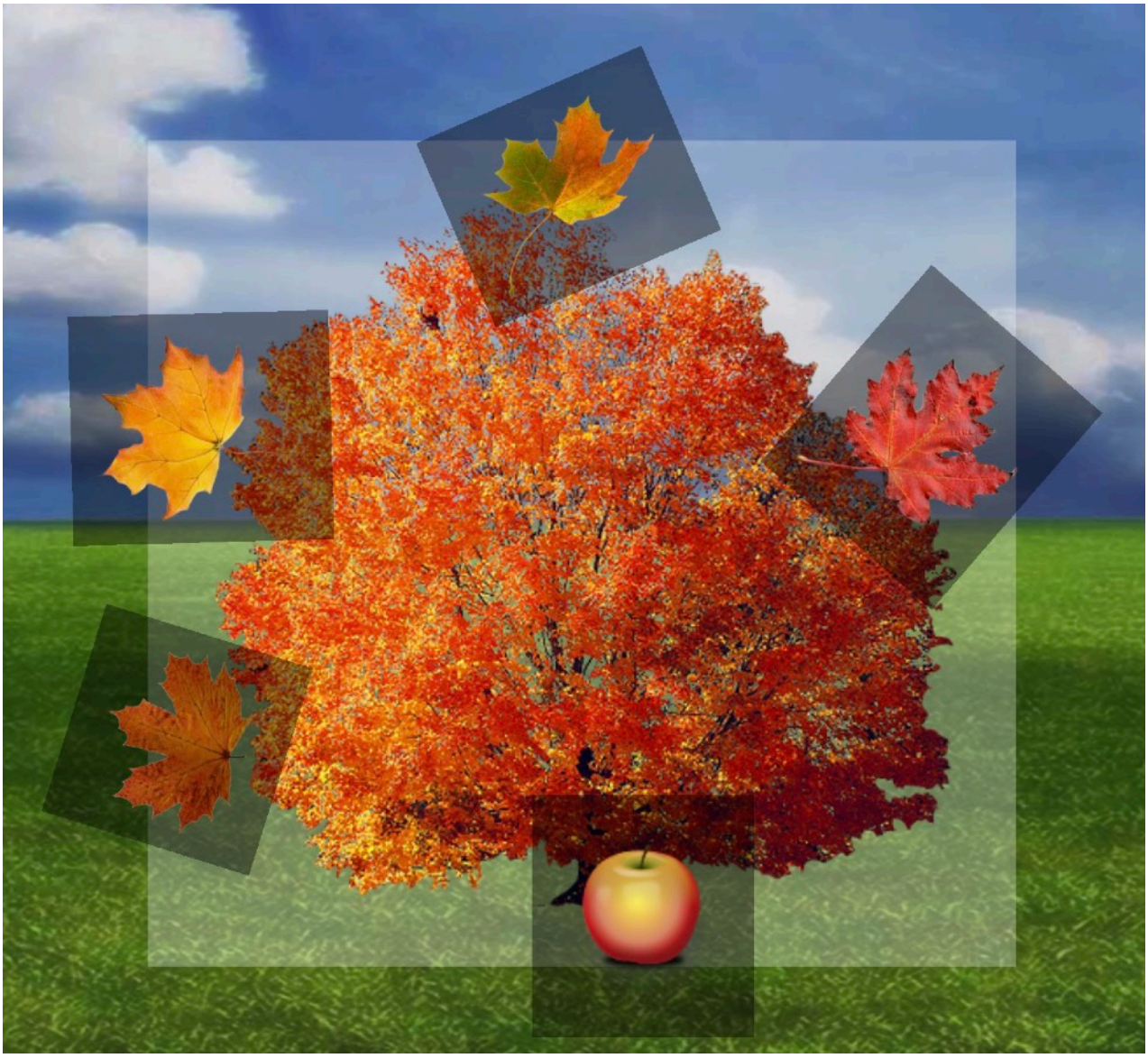
Long press on an atom or a link, opens a small marker menu with a single button for delete Atom or delete link.



To make a connection between parent and child, move the ports near to each other in an action called a kiss.



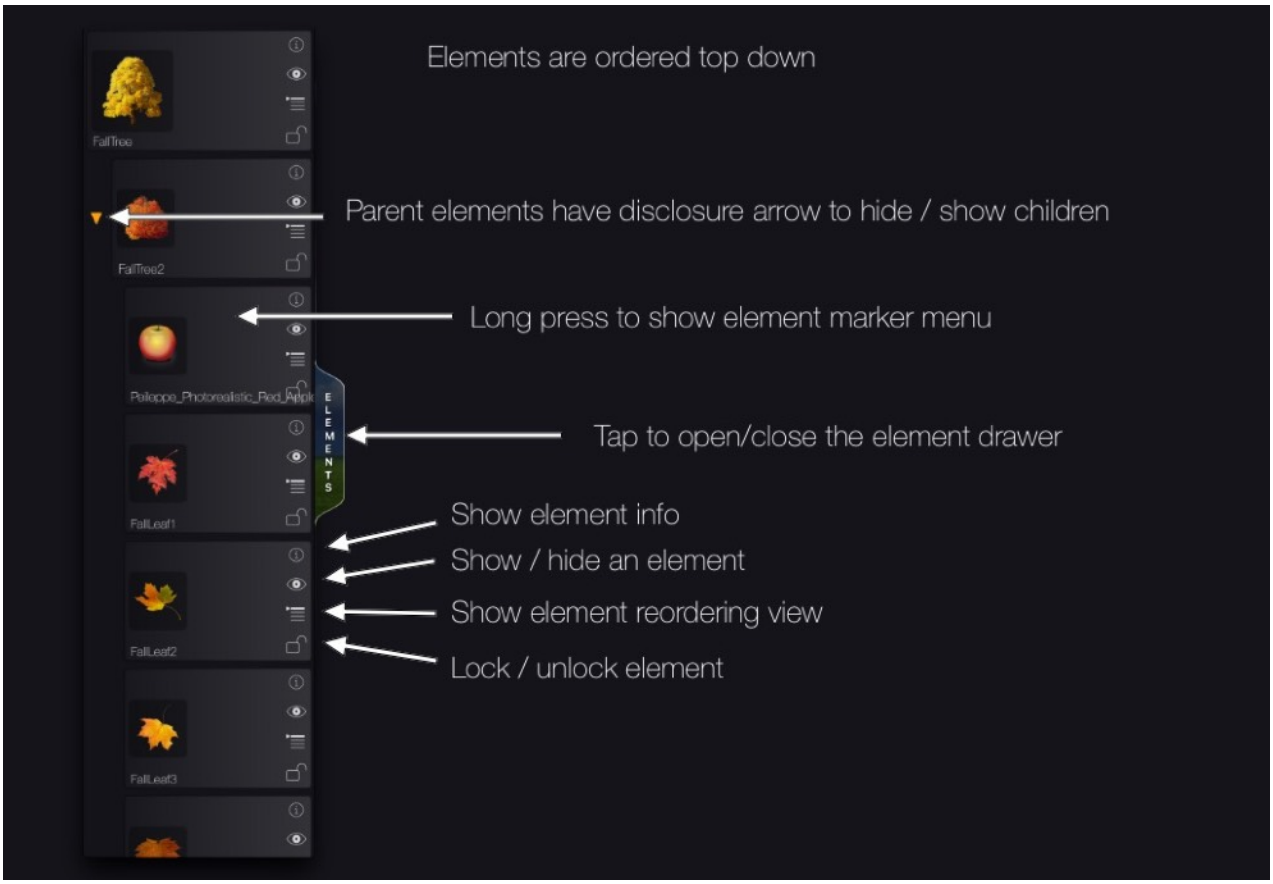
When you close the Layer Lattice, the above parenting arrangement will result in the four leaves and the apple always following the movement of the tree. If you select the parent element it will display its children with dark selection boxes.



If you scale or rotate the parent element the children all also be scaled and rotated. Transparency and shadow are not inherited from parent to child. You can set a different transparency on children layers from their parent. Children can also be transformed independently of their parents. When you un-parent children they will lose all the parent transforms, so it can happen that they get larger or smaller, lose rotation etc.

Element's Drawer

The element drawer displays all elements in the scene. The elements list is in the drawer on the left. Touching the elements button will open and close the drawer. The elements are ordered based on layer order. The top element in the list is the top element in the scene. However, if you have edited z positions, this may no longer be the case. Z position takes precedence over layer order. You can lock an element from the elements list. This means the element is no longer selectable or gesturally editable. This is a helpful feature for editing, because selecting elements with touch can get difficult when there are lots of elements in a scene, or you have many full screen elements. Locking elements that you are finished editing can make editing the rest easier and prevent accidental changes. It is still possible to change the parameter values in the adjust drawer on a locked element! You can also hide an element completely. The only way to know it exists once it is hidden is by looking in the elements list. Parent elements have a chevron next to them which expands/collapses the children. If you want to add children to a layer you do it in the **Parenting Lattice**, and it is visualized in the **Elements List**.



Element Adjust Drawer

The adjust drawer can be opened by pressing the adjust button on the right. The adjust elements drawer has editors for all channels of an element. There are 4 pages of element editing. The buttons on the top switch between the pages. From left to right:

Element State

The element state controls consist of name, locked state, hidden state, position X, Y, Z, scale X, Y, rotation, tilt, turn, opacity, border width, corner radius, background color, border color, and start/end Behavior. Animatable properties have a key button at the left. When the button is red it means the element has a keyframe at that time. If you press the button when it is red, it will remove the keyframe. Pressing the button when it is clear will add a keyframe at that time with that parameter value. The curved arrow on the right resets the parameter to its default value. You can choose to reset just the current frame or Remove all Keyframes. Reset current frame sets all the values to default but leaves the keyframe. Remove all keyframes set the values to default and removes the keyframes. The left right arrows in the center increment the value by a small amount. The value button shows the current value of the property. If you press the value button a numeric keypad will open. The numeric keypad lets you set a value with a calculator like popover.

Element Shadow

The shadow parameters consist of offset X and Y (how far the shadow is moved from the element), Shadow Radius (the blur size of the shadow), opacity and color. The parameter controls are the same as element state.

Element Style

The parameters found in the element style are all the parameters which are specific to a particular layer type. For instance a shape layer will have additional controls for line width, stroke color, fill color etc. Some elements will allow you to go back into the original editor to fine tune.

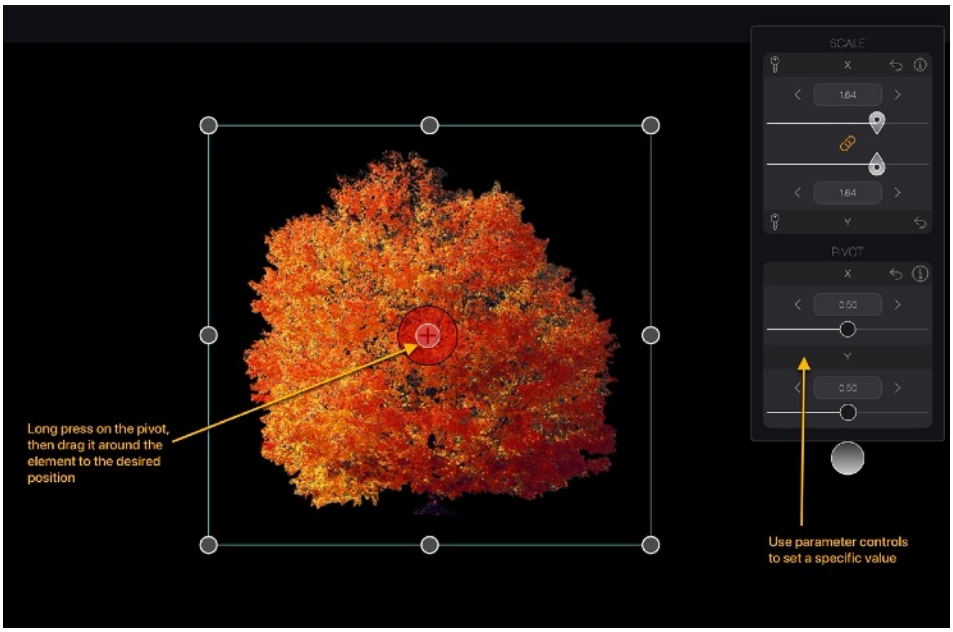
Element Pivot

The pivot of an element is its center of scale and rotation. Simply drag on the small cross to change it. There are two other ways to edit the pivot. In the non-proportional editor

(described in a different section), and in the Focused element editor directly on the element.

Non-proportional Scale Editor

When you long press on the pivot, you can see it turn red around your finger. When this happens you know it is ready to drag around the element.



Pivot editing in focused element editor

In the focused element editor, select the pivot button. You can either drag the pivot around in the view or use the sliders.

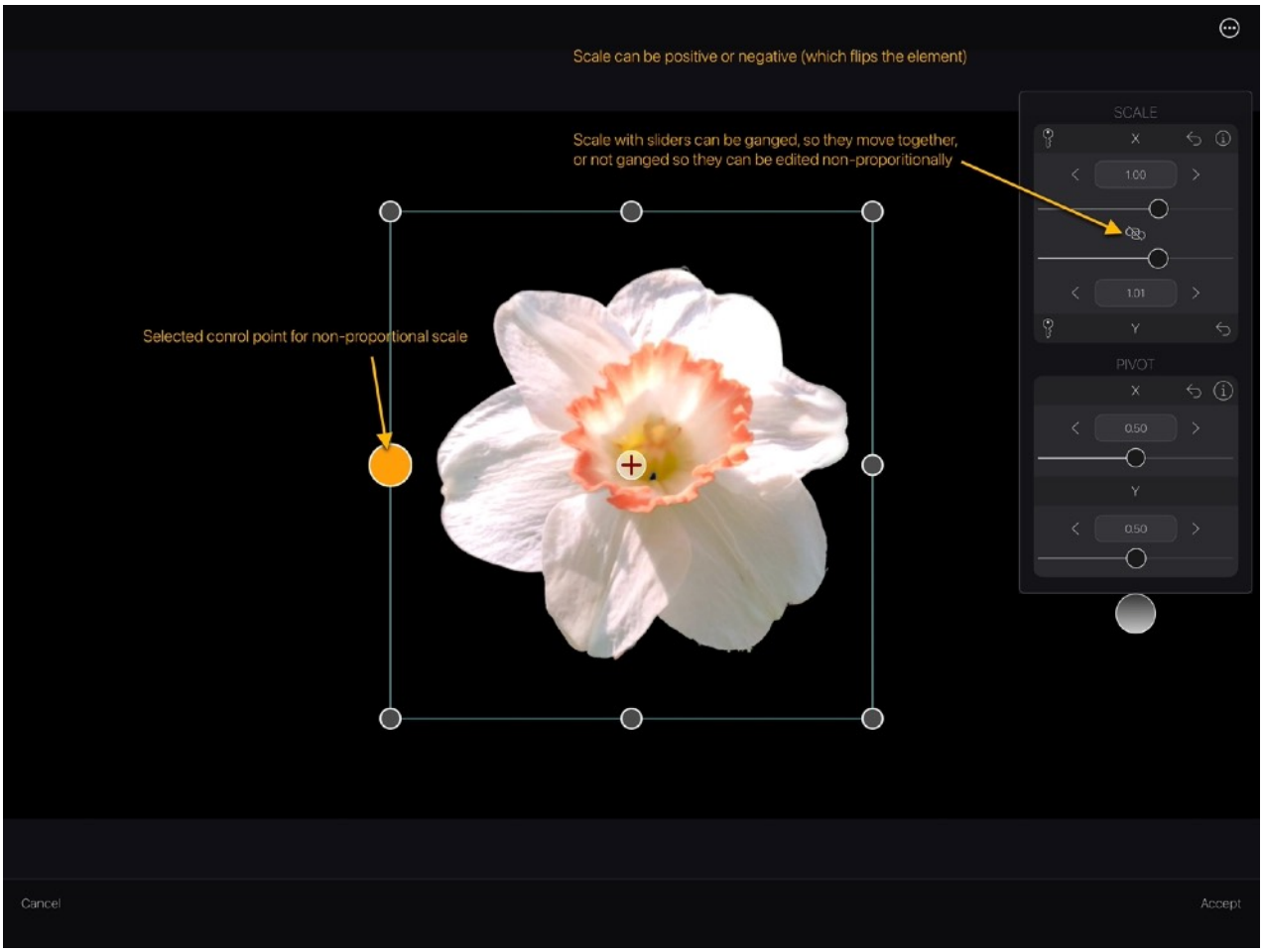
Non-Proportional Scale

The non-proportional scale editor is an editor dedicated to scaling elements. The Scale editor enables both proportional and non-proportional editing. The element is displayed without 3D transforms to simplify editing and visualization. It is possible to edit both gesturally or using sliders.

A long press on the pivot initiates gestural pivot editing. Once the pivot is activated it turns a reddish color. Holding down the pivot, move it over the element to change the center of scale and rotation.

A long press on a control point at the edge of the bounding rectangle initiates gestural scaling. Once a point is activated it turns an orange color. Holding down the point, move it to scale non-proportionally.

It can be opened from the element parameter drawer, the marker menu/Element Editors menu, and the Editors section of the edit popover.



Background Filter

Background filter adjust drawer can be opened by pressing the filter button on the right. The background filter parameters consist of the controls for all the image processing filters available in MotionGraphix. The parameter controls work similarly to those in element adjustment.

The top filter corresponds to the background image, whether it is a still frame, video, depth image, stereo image or video, and can not be disabled.

The filter parameter drawer has two features not available in the element parameter drawer.

1) The expand/collapse button, which allows you to hide a filter's parameters. They still have an effect, they are simply no visible.

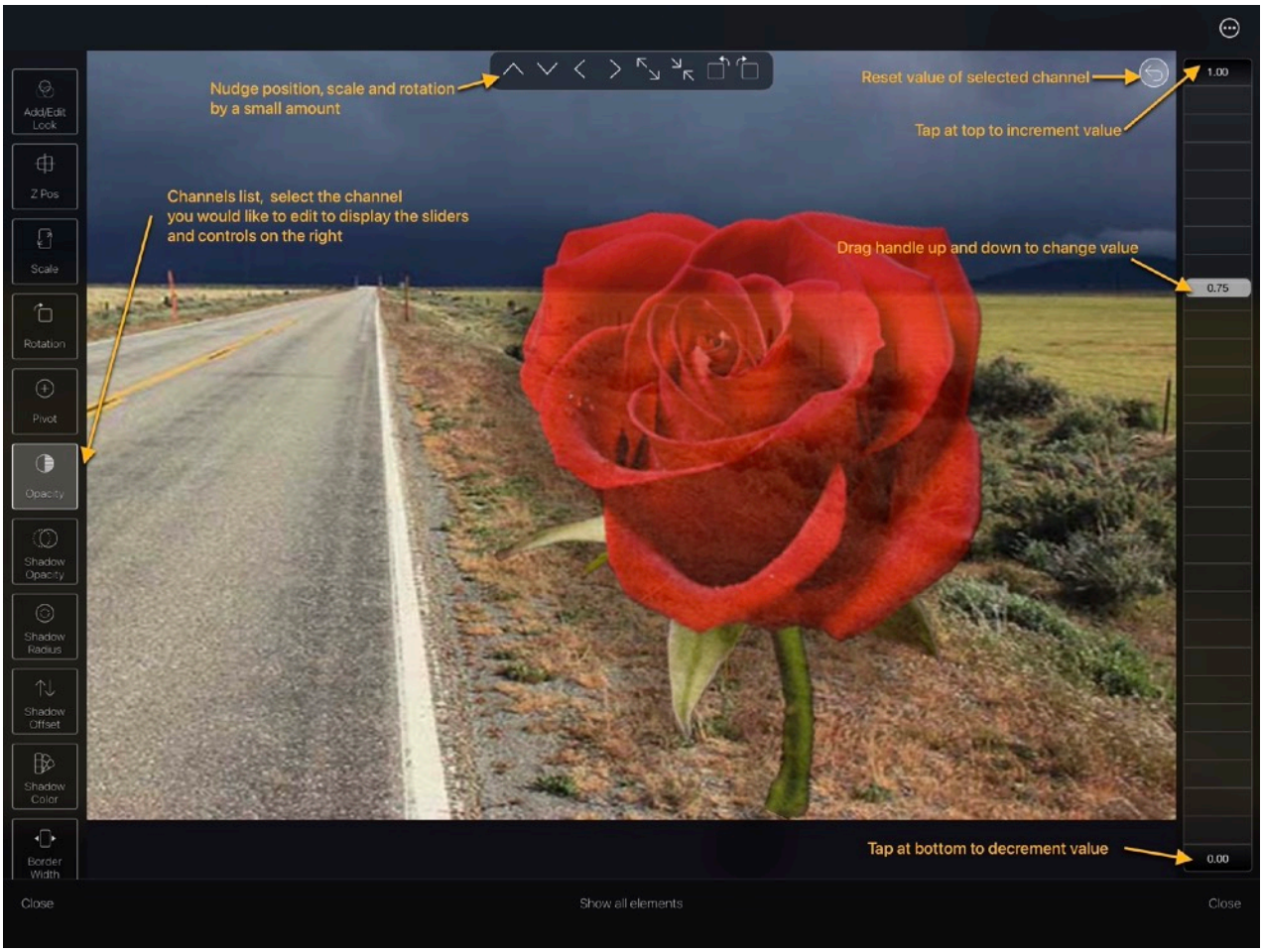
2) The enable/disable toggle, which allows you to disable the effect of each filter separately.

Focused Element Editor

The focused element editor is basically a different view of the element adjustment controls. It allows you to focus on editing an element with all the controls you need surrounding the view. On the left are all the channels available for editing: state, shadow and style. On the right are the sliders or controls available for the selected channel. There are nudge controls at the top for performing small incremental changes. You access the focused element editor by double tapping on an element.

You can show/hide the other elements in the view with the button at the bottom.

The add/edit look button will open the look editor in case you want to add a look from here.



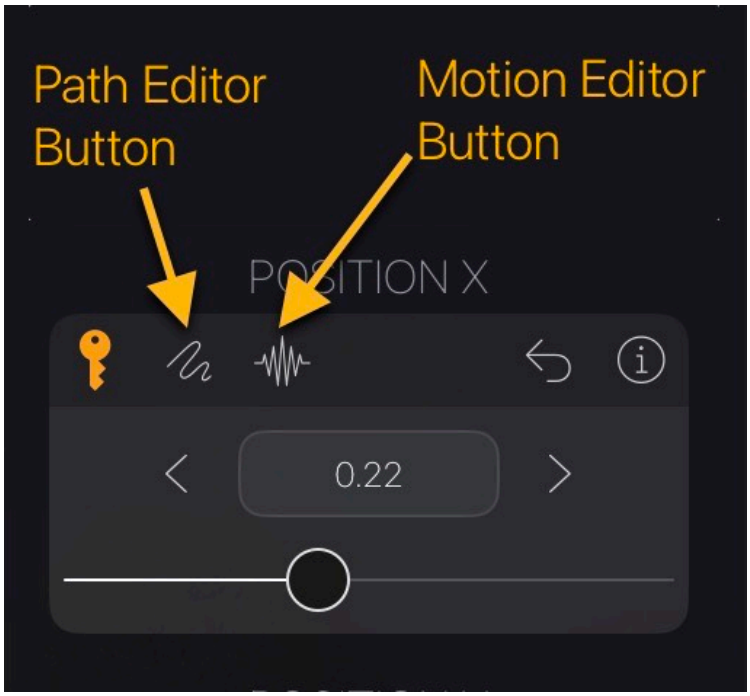
Draw Path Editor

You can open the draw path editor from three locations:

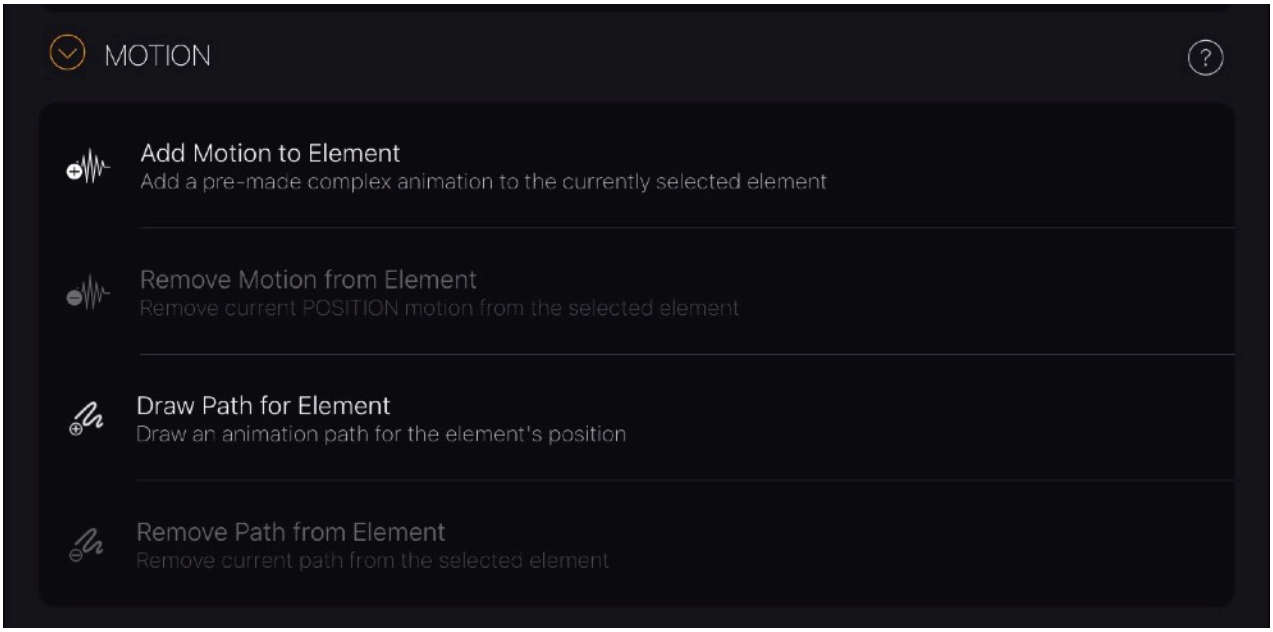
- Long tap on an element to show the markerMenu and selected Element Editors,
- From the edit popover in the motions section
- From the contour button in the parameters view.

Long tap marker menu:

Path button in Parameters View:



Edit Popover:

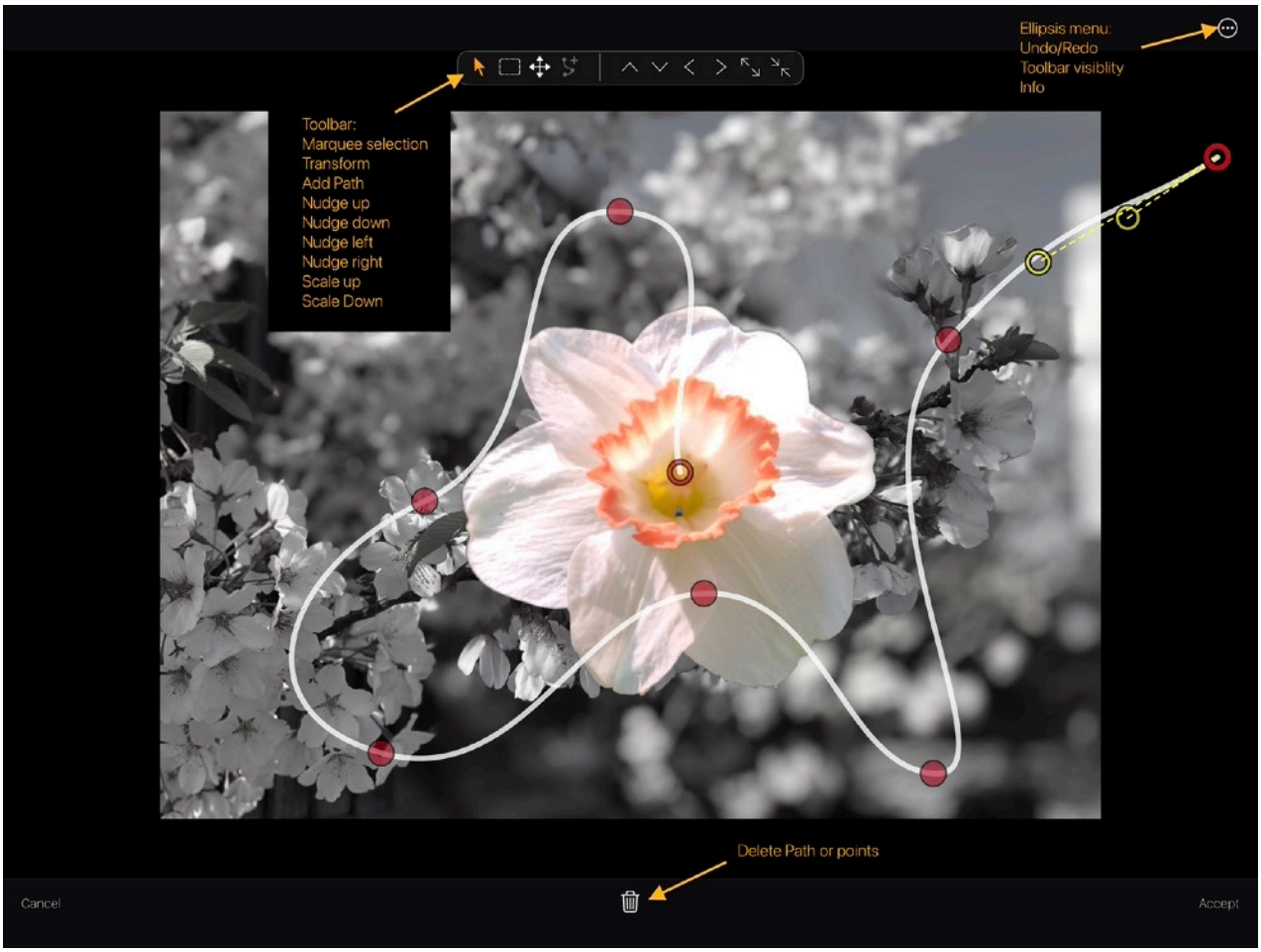


Once open, the UI has similar shape editing controls to the cutout and shape element editors.

When you first open the editor the tool is in Add path mode. Double click finishes adding and then editing can begin. Pulling on a point changes the shape, double clicking

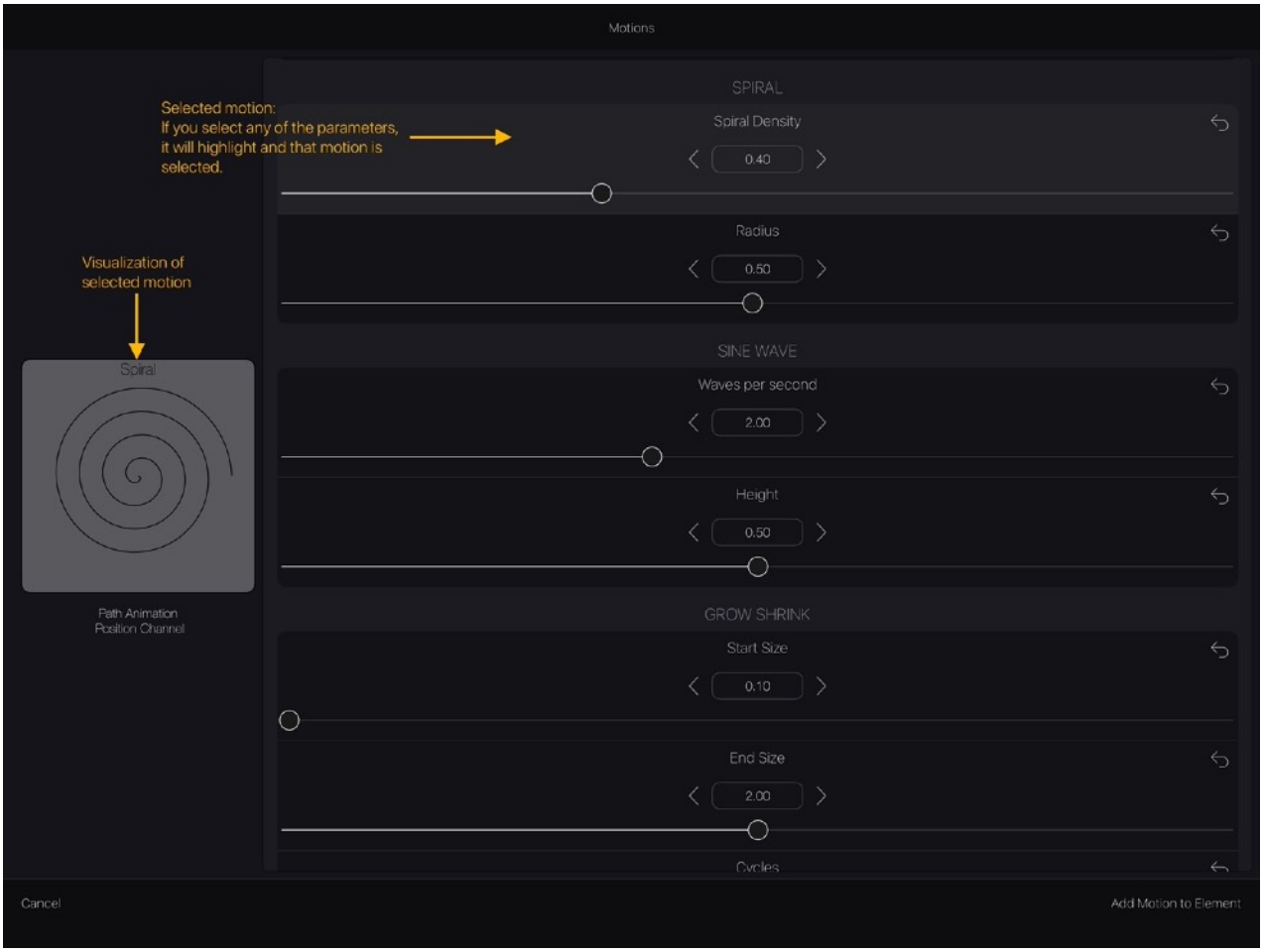
on a point breaks and joins the tangents. The trash button at the bottom shows and hides the deletion popover, which allows you to delete the path or points in the path. Editing actions are undoable. When you are happy with the path, select accept to save the path the position animation of your element. The element will move to the start position of the path. To make a change, re-open the editor (from either the contextual menu or the popover), make your changes, and update again.

The path editor opens with the current frame in the background for registration.



Motion Editor

A motion is a procedural animation that can be applied to various element channels: position, alpha, size, etc. Some motions are keyframe animations, such as bounce or fadeIn and fadeOut. Bounce is a position motion and fadeIn and Out are alpha motions. One motion can be added to each channel. If you have a bounce applied to the position channel and then choose to change to Randomize, the position animation will be replaced. You can however apply bounce to position and fadeIn to opacity at the same time.



Motion Mover mode

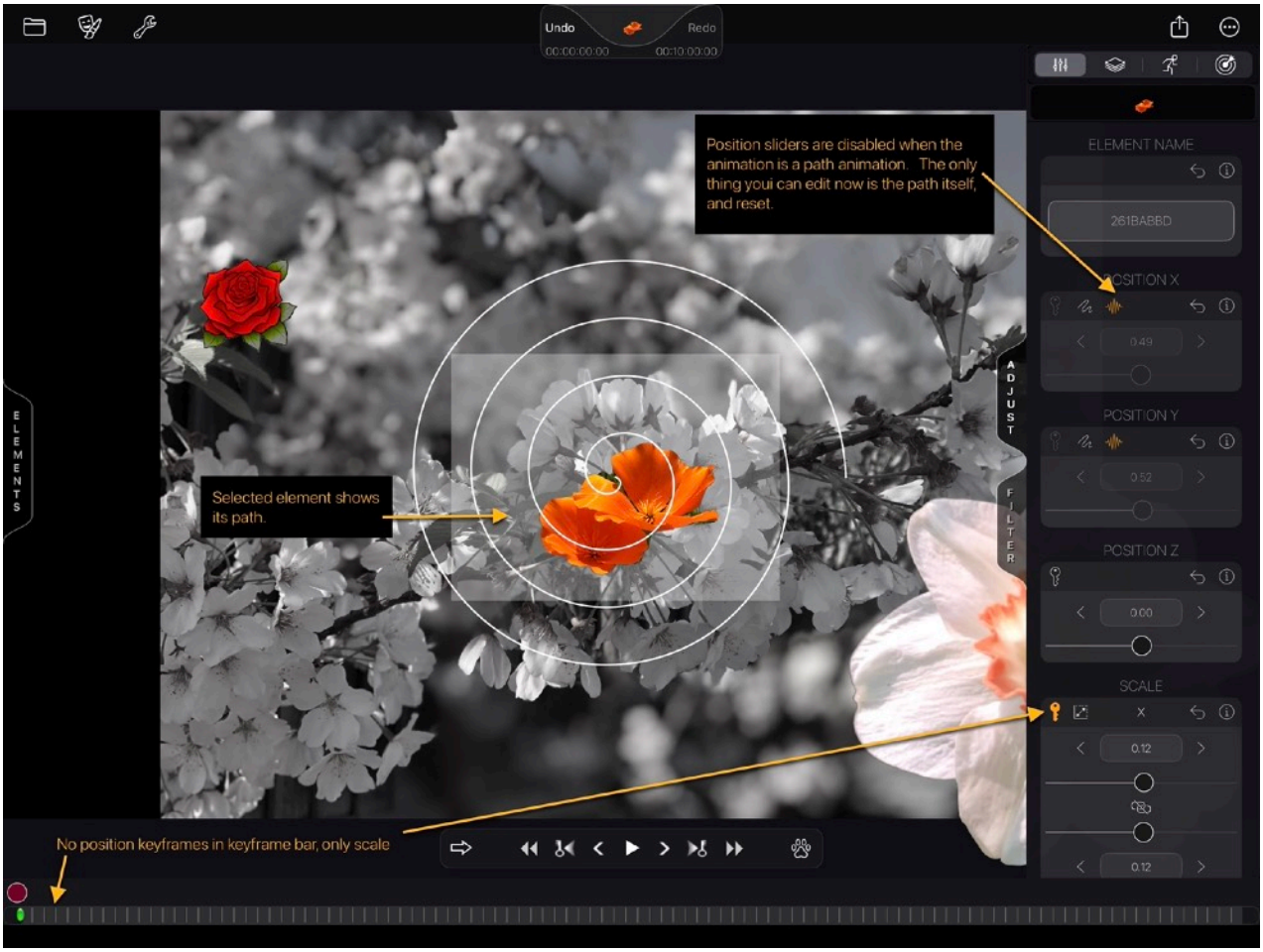
When motion mover mode is turned on, any position change to an element will affect all keyframes in the animation. This is a great way to move an already fine-tuned animation, especially one that has a lot of keyframes to a new location in the scene. Without using this mode, moving an element would only create a new keyframe at the current time or move an existing one. When you are finished with motion mover mode, press the button that appeared in the upper portion of the main view.

If your element has a path animation, and not a keyframe animation, you don't have to turn motion move move on to move the whole animation. It will happen automatically.

There are a number of motions which can be added to an element.

- Circle - position Channel
- Spin - rotation Channel
- Bounce - rotation channel
- Randomize - position channel
- Spiral - position channel
- Sine Wave - position channel
- Grow Shrink - scale channel
- Fade In - opacity channel
- Fade Out - opacity channel
- Fade In/Out - opacity channel

Once you add a motion to your element, the channel behaves the same as any other path or keyframe channel. You can edit keyframes by moving the element or fine tune them by opening the keyframe editor.



Play Controls

There are numerous play controls in MotionGraphix. All have a sub-set of the following buttons. All play controls are movable. If you press on a space where there are no buttons, you can move the play controller around the screen. A double tap in the view will hide the play controls. They are also hidden when you press play. A single tap in the view will bring them back in order to stop playing.

Play Mode: loop or play to end

Goto start: if an element is selected that has a different start point than the scene, the goto start button will first navigate through the selected element's end and start points and then goto start. If nothing is selected, goto start will go straight to the beginning of the scene.

Goto previous keyframe: this button is only enabled when an element is selected or the background filter drawer is open. It will navigate time to the previous keyframe.

Step back: go back one frame

Play: plays to end or loops, depending on the play mode setting.

Step forward: go forward one frame

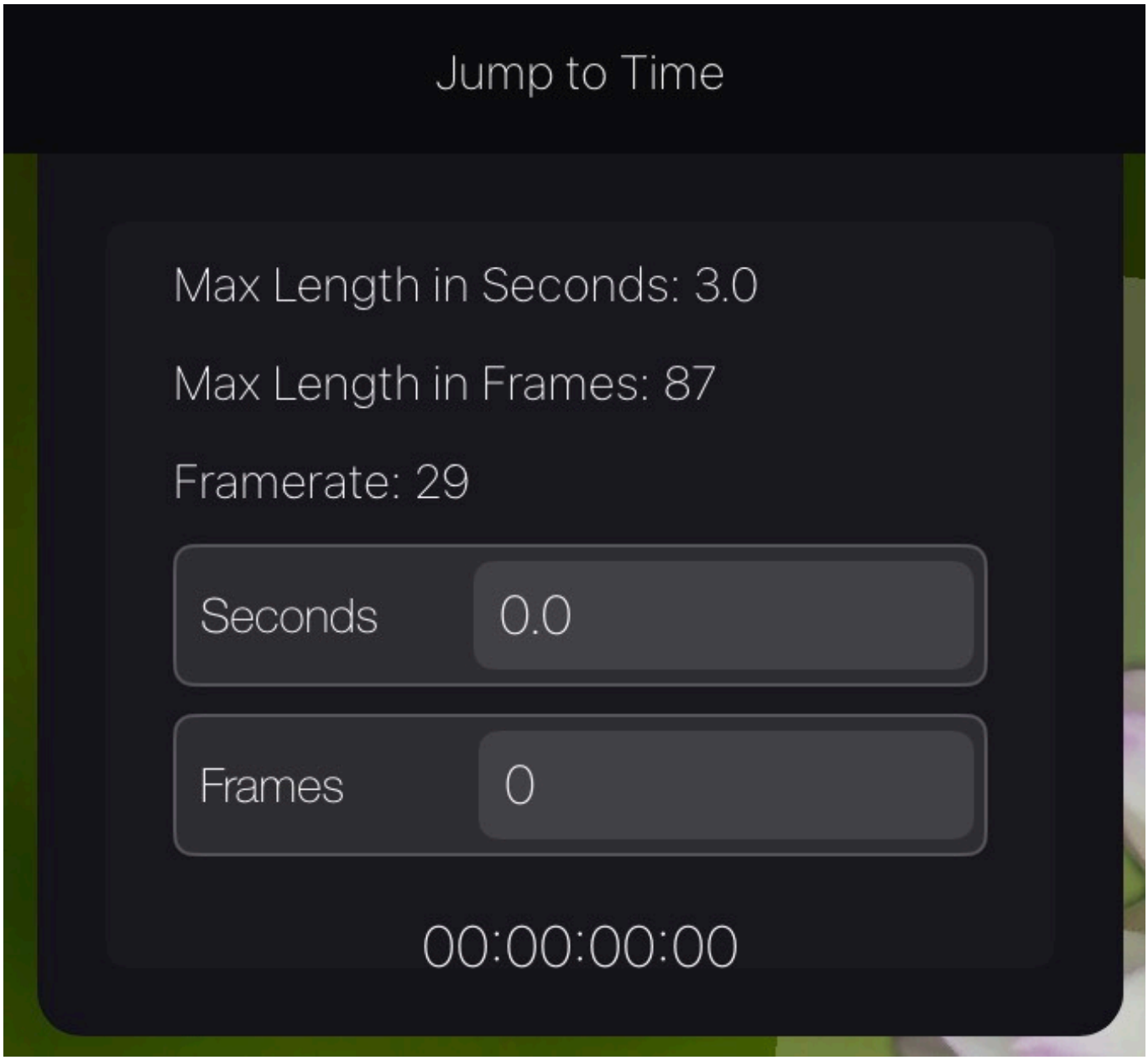
Goto next keyframe: this button is only enabled when an element is selected or the background filter drawer is open. It will navigate time to the next keyframe.

Goto end: if an element is selected that has an end or start point different than the scene, the goto end button will first navigate through the selected element's start and end points and then goto end. If nothing is selected, goto end will go straight to the end of the scene.

Digital tracking: is a toggle which needs to be turned on before you start digital tracking.

Goto Time

The 'Goto Time' feature is found in the ellipsis men. You can set a time in seconds or frames and the player will jump to that time. The button is disabled in a still frame project.



Stereo Setup

The stereo setup view is where you edit the stereo settings in your project. It displays the current frame with the current settings. Everything but the preview format and preview anaglyph format will be stored in the project for rendering.

You can access the stereo setup view from the edit menu/editors section

There are two options for checking your stereo. Both these options help greatly in setting horizontal disparity and element stereo offset.

1) Turn 'Wobble Eyes' on and set the wobble rate. This will flip back and forth between the eyes.

2) Set the preview mode to 'Anaglyph'. This will create a red-blue stereo anaglyph. You can change the anaglyph mode for more or less color. If you work in anaglyph it is useful to have red-blue glasses so you can see your stereo effect.

Horizontal Disparity

Horizontal disparity indicates a relative shift of the left and right images, which changes the zero parallax plane and manipulates apparent depth. The greater the value, the more stereo effect. Generally, the background stereo effect should be smaller than the foreground.

Stereo Offset

Stereo offset indicates a relative horizontal shift of the foreground elements, which increases/decreases the stereo depth. The greater the value, the more stereo effect. Generally, the foreground stereo effect should be smaller than the background horizontal disparity. It is very helpful to wear anaglyph glasses when editing the HIT. When changing this value by slider, the change only takes effect on touch up. The change is computationally intensive, namely slow.

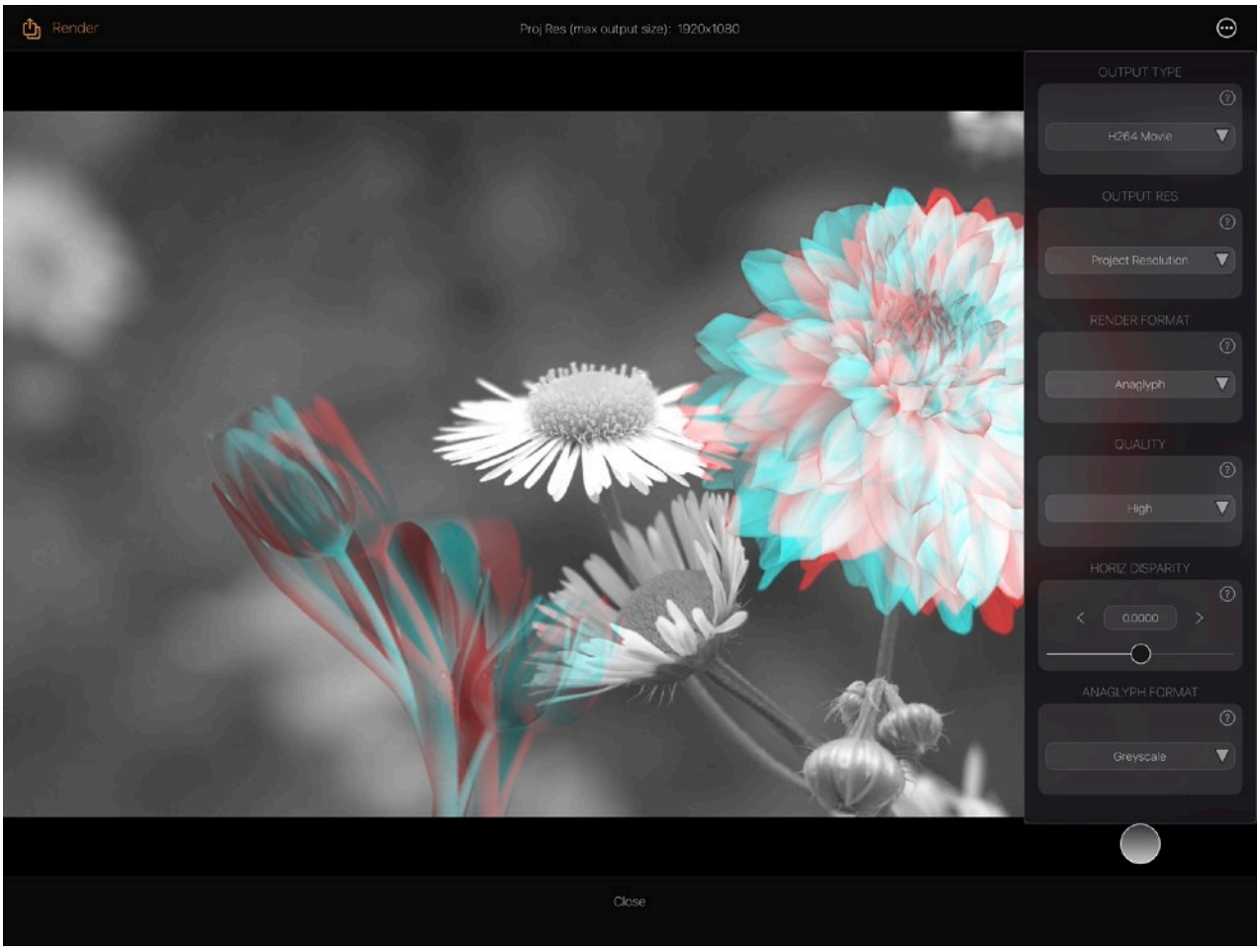
Important tip: The overall horizontal disparity will also affect the foreground element stereo offset. It is best to set the background disparity first and then edit the foreground

RENDERING

When you are ready to render your animation, press on the share button.

The render view is where you set up your output settings, render and share your masterpiece. It displays a preview of the current frame with the current settings. When rendering video, the video can be downsampled (reduced in size) but not upsampled. The project resolution is always displayed at the top of the view, as the max output size. Depending on the output type and render format, different settings will be displayed. For instance, Anaglyph Format is only available when you have Anaglyph set as the render format. The GIF output type has restrictions: 1) the output size can not exceed 640x480 (the render process will perform the sub-sample for you), 2) the length of the GIF movie may not exceed 10 seconds. GIF will not be available if the length restriction isn't met. When you select the render button at the top left, the render view will close and the render will be performed. At the conclusion of the render, the share popup will be presented.

Following is an example of a render setup for anaglyph stereo.



Size

You can render your movie to 4K (3840x2160), Full HD (1920x1080), HD (1280x720), Half HD (960x540) and SD (640x480)

Type

You can render PNG, JPEG, HEIC still images, and H264, HDR, ProRes, GIF and MV-HEVC (spatial stereo) videos.

Optional Settings

Depending on the file type you choose, additional settings will be presented:

GIF or PNG

Render Transparent Background allows you to render only the elements over a black background with alpha.

GIF

GIF Looping will loop the animation in case the animation is shorter than overall video length.

VR

Cardboard K1 is the first distortion calibration parameter

Cardboard K2 is the second distortion calibration parameter

Format

The format defaults to flatty (non-stereo), but you can also render to stereo side-by-side, stereo top-bottom, stereo anaglyph, and VR

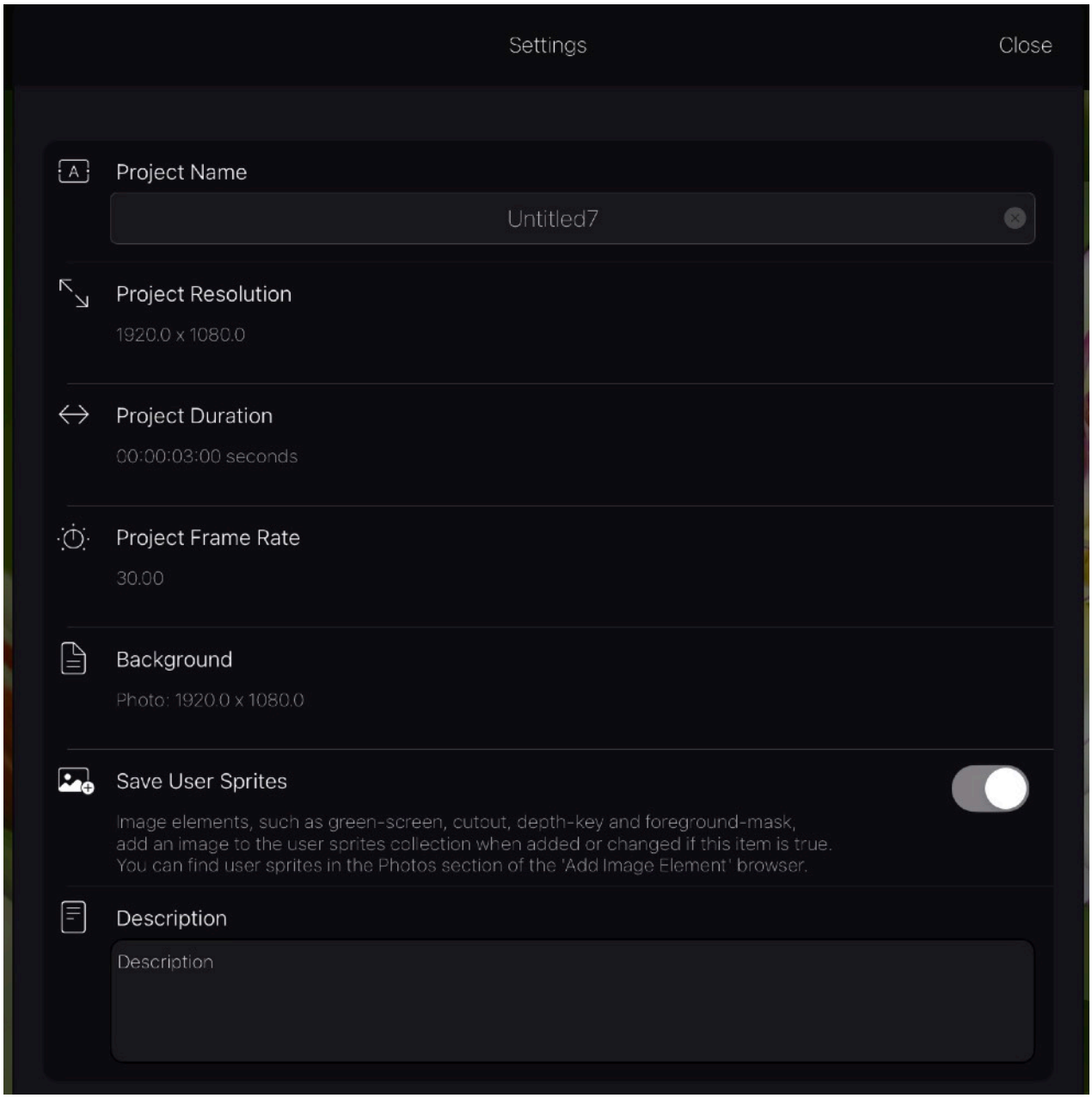
Render

After you press the render button, when the render is finished, you are presented with all the options for sharing your movie or still frame. MotionGraphix supports saving to photos and any other sharing methods you have available on your device.

SETTINGS

The settings popover lets you view the current state of your project, as well as rename and change the description. It is accessed from the main ellipsis menu.

The 'Save User Sprites' setting takes effect when you create image based elements such as Green-Screen, Fg-Mask, Depth-Key and Cutout.



UNDO / REDO

MotionGraphix has unlimited undo/redo throughout the app. The main view holds the main edit manager. Everything you do is added to the edit manager. Each dedicated editor such as the Cut, Shape, ChromaKey, Text and Path Editors have individual undo managers while the editor is open. When you close an editor the undo history for the editor is closed with it. The final element edit is then added to the main undo manager.

The undo-redo edits that are stored in the main edit manager can be visualized in the Edit Manager Table. The Edit Manager Table can be opened from the top edit menu in the toolBar (Pencil Icon). The table displays the entire current history. The current position is marked by a red dot. You can press on an item in the list to jump to that position in the undo/redo history. All edits which are above the current position are greyed out but can still be selected. Using this table you can only go back as far as the first edit. If you want to go back further, you will need to use the undo button.