



# HARMONY

TOON BOOM HARMONY 12.1  
- Premium Edition -  
**Traditional Animation Guide**

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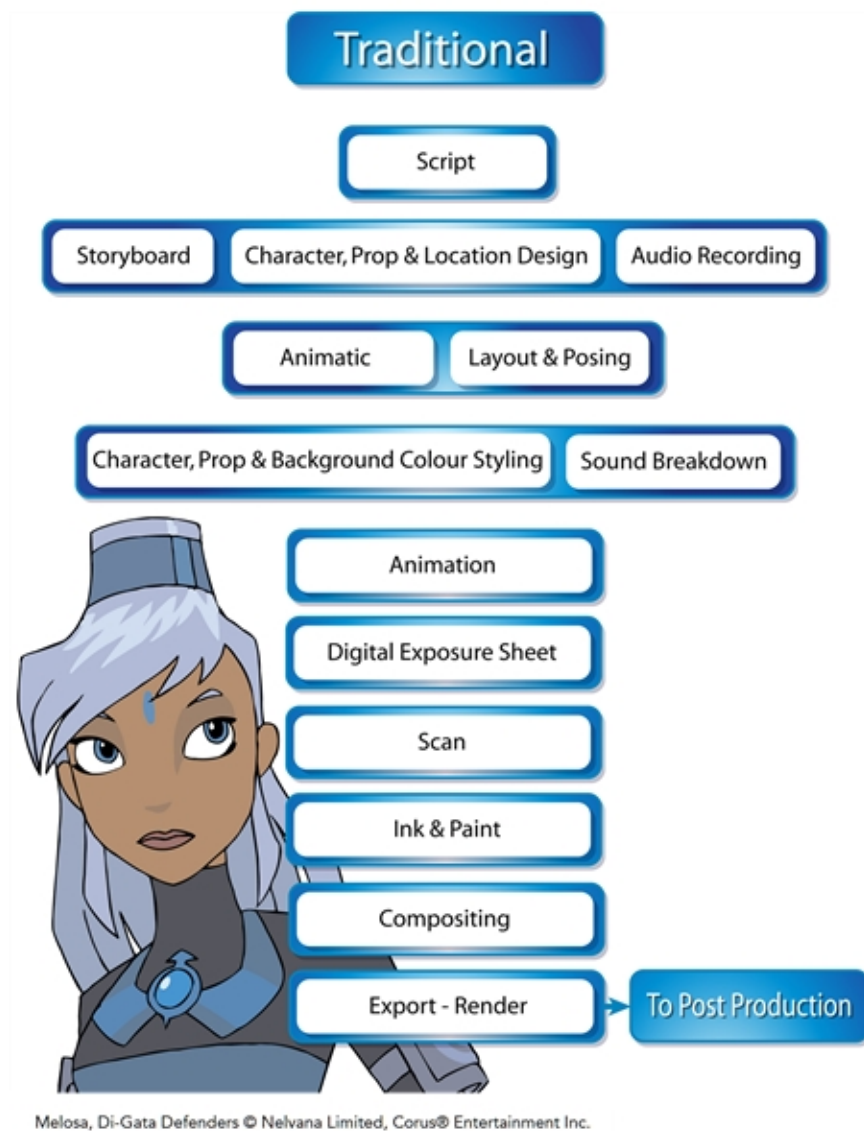




# Chapter 1: Traditional Animation - An Introduction

Harmony is a high-performance animation software which not only offers a wide range of features, but also handles more than one animation type and workflow. In this guide, you will learn how to perform tasks related to the traditional animation workflow from start to finish using Harmony.

Before reading this guide, be sure to take some time to familiarize yourself with the basic concepts in the Fundamentals Guide. Each chapter is self-contained, so you can concentrate only on the chapter pertaining to your task. You do not need to read the entire guide, but you should read the whole chapter before starting to work.



Topics in this section:

- [Scanning on page 11](#)
- [Timing on page 37](#)
- [Colour Styling and Colour Models on page 125](#)
- [Ink and Paint on page 173](#)



## Chapter 2: Scanning



Once your traditional animation sequences are completed and cleaned up, you're ready to scan and import them in Harmony. The scanning process is the point where the traditional production becomes digital. It's the moment where you use Harmony to control the project.

This chapter is divided as follows:

- [The Scanning Process](#) on page 11
- [Scanning and Importing Drawings](#) on page 12
- [Custom Vectorization Parameters](#) on page 21

### The Scanning Process

There are three steps in the scanning process which Harmony handles automatically:

- Vectorization
- Line art and colour art creation
- Optical registration

You can choose the following vectorization styles, which are set at the vectorization step:

- Solid lines
- Texture lines

This retains the texture from the original drawing and applies it to the vectorized drawing as a bitmap filling zone.



Harmony can receive images from any TWAIN device, such as scanners or digital cameras. You can load these images as bitmaps into your scene or convert them into vector-based images that can be edited using Harmony.

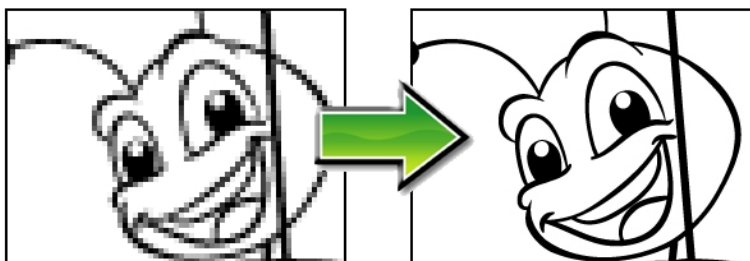
You must install a TWAIN driver for your device in order to access its contents. Refer to the manufacturer of your device to get a TWAIN driver. Once all the animation layers are scanned in, you can set the timing in the digital exposure sheet.

## Scanning and Importing Drawings

Once your scene length is set, you can start scanning drawings and importing them into Harmony in one of the following ways:

A bitmap image is an image composed of pixels that are both size and resolution dependent. In Harmony, you can scan an image as a bitmap drawing.

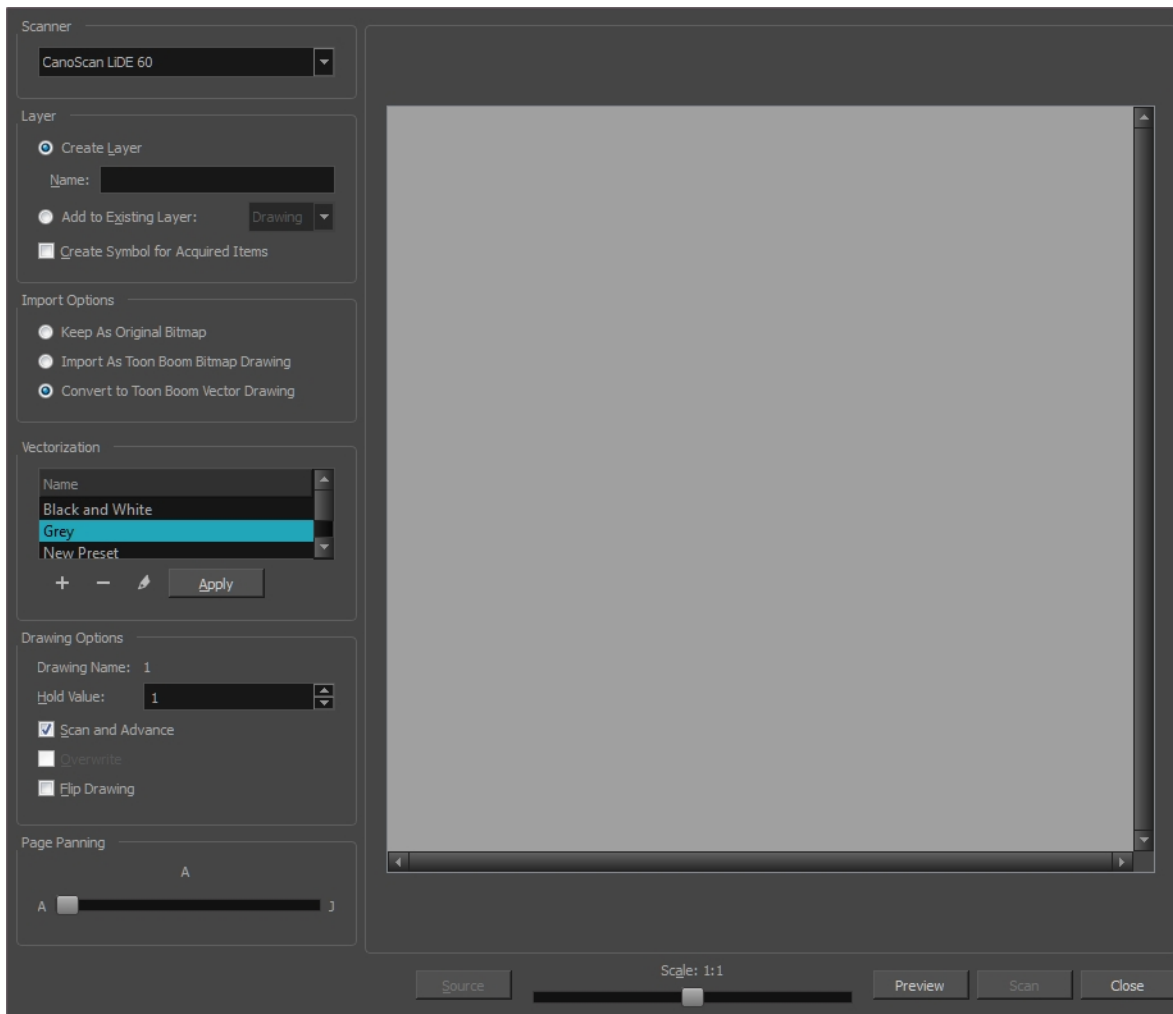
You can turn bitmap images into vector drawings, while maintaining the sketchiness of a pencil line or into vector images with a bitmap fill. Both options can add life to an animation, which straight vectorization with smoothing does not usually afford.



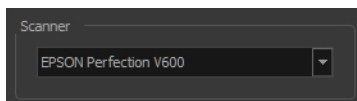
### How to scan images as bitmap drawings

1. From the top menu, select **File > Import > From Scanner**.

The Scan Drawings window opens.



2. Select your scanner from the Scanner list.



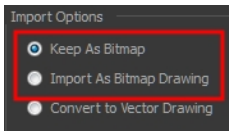
3. In the Layer section, decide if the scanned or imported image will be placed on a new layer or existing layer.

‣ **Create Layer:** Scans or imports the image into a new layer. Select one of the following options:

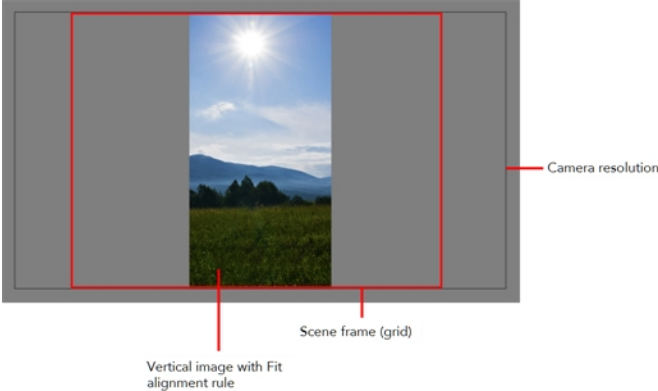

Parameter	Description
Create Single Layer Named	Creates a layer you can name.
Create Layer(s) Based on Filenames	Creates a layer based on each unique filename prefix. For example, the filenames a-1.tga, a-2.tga and b-1.tga will create layers named "a" and "b", where "a" has two drawings and "b" has one. When creating a single layer from these three filenames, all three drawings will be inserted in the new layers.

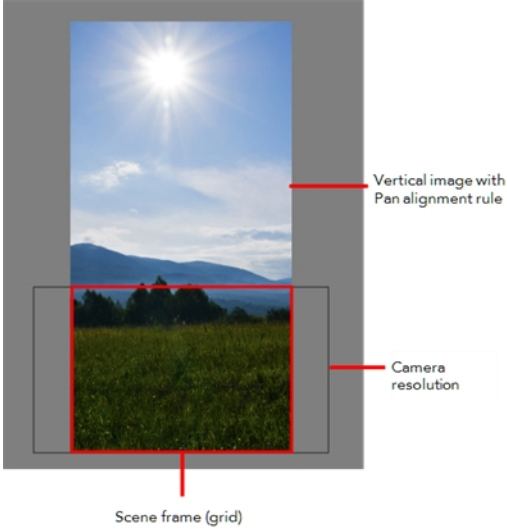

- ▶ **Add to Existing Layer:** Scans or imports the image into an existing layer. Select a layer from the Layer list. You must scan into the same layer type if you're using an existing layer.
- ▶ **Create Symbol for Acquired Items:** Encapsulates the bitmap image in a symbol. To mix bitmap images with vector drawings on the same layer, the bitmap image must be encapsulated in a symbol and vice versa. Symbols will also be automatically added to the Symbol folder in the Library view.

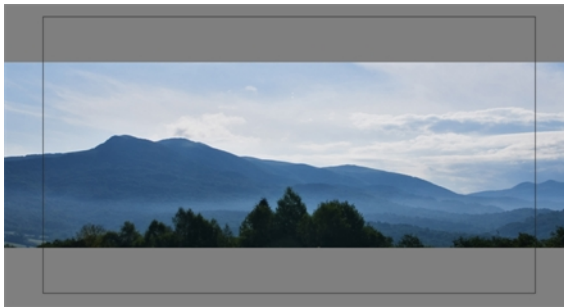
4. In the Import Options section, select one of the following:





- ▶ **Keep As Bitmap:** Retains the imported image as a bitmap. In the Alignment section, decide on the size and placement of your image within the camera frame. Depending on the Scene Settings (the height and width in pixels that you chose for your project), an image that you import may get scaled to the point where all its individual pixels become visible. There are three options available in the Alignment section:

Parameter	Description
Fit	<p>Enlarges or shrinks (but not distorts) the image height to match the full height of the scene grid.</p>  <p>If the image orientation is landscape, this will enlarge or shrink (but not distort) the image width to match that of the scene grid.</p>  <p>Note that the Fit alignment rule equals the Center Fit rule in the layer</p>

	properties.
Pan	<p>This is the opposite of the Fit parameter. If the image orientation is portrait, its width will be made to match the width of the scene grid. As a result, part of the image's height will extend beyond the height of the frame. This can be useful if you want to make your background move up and down, or from left to right to make it appear as if the camera is panning or to actually perform a camera pan.</p>  <p>The opposite will apply to a landscape image. Its height will be fit to the scene grid, therefore it is possible that the image will extend beyond the scene grid's boundaries.</p>  <p>Note that the Pan alignment rule equals the Center First Page rule in the layer properties.</p>
Project Resolution	<p>Scales the image in proportion to the scene's resolution. The system looks at the resolution of the bitmap image, for example 4000 x 2000, then compares it to the scene's resolution, for example 1920 x 1080, and adjusts the scale factor in proportion. So, in this example, the bitmap would appear at 208% (4000/1920). If you import a bitmap that is 960 x 540, it will be displayed at 50% (960/1920) of the size of the project resolution.</p>

	
<p>Note that the Project Resolution alignment rule is equal to the As Is rule in the layer properties.</p>	

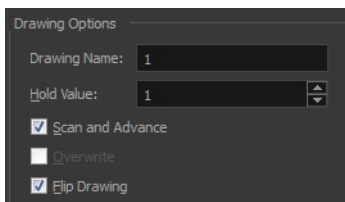
- ▶ **Import As Bitmap Drawing:** Imports a bitmap drawing into a vector layer where you can edit the image using the drawing tools. In the Alignment section, select one of the following:

Parameter	Description
<p>Vertical Fit</p>	<p>Enlarges or shrinks (but not distort) to your image height to match the full height of the scene frame (alignment grid).</p> 
<p>Horizontal Fit</p>	<p>Enlarges or shrinks (but not distort) to your image height to match the full width of the scene frame (alignment grid).</p> 



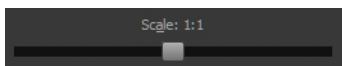
Actual Size	Scales the image in proportion to the scene's resolution. The system looks at the resolution of the bitmap image, for example 4000 x 2000, then compares it to the scene's resolution, for example 1920 x 1080, and adjusts the scale factor in proportion. So, in this example, the bitmap would appear at 208% (4000/1920). If you import a bitmap that is 960 x 540, it will be displayed at 50% (960/1920) of the size of the project resolution.
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5. In the Drawing Options section, set the following options if desired:

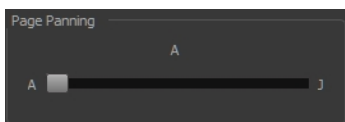


- ▶ **Drawing Name:** Name of the drawing to import.
- ▶ **Hold Value:** Type the number of frames that the drawing will be exposed.
- ▶ **Scan and Advance:** Lets you scan one drawing after another every time you click **Scan**.
- ▶ **Flip Drawing:** Mirrors the drawings horizontally and scans it this way.

6. Adjust the **Scale** control and sliders in the Preview Image window until you are satisfied with the view.



7. Click **Scan** to scan your drawing.
8. If you are scanning panoramic drawings, in the Page Panning section, move the slider to the next letter to capture your next frame.

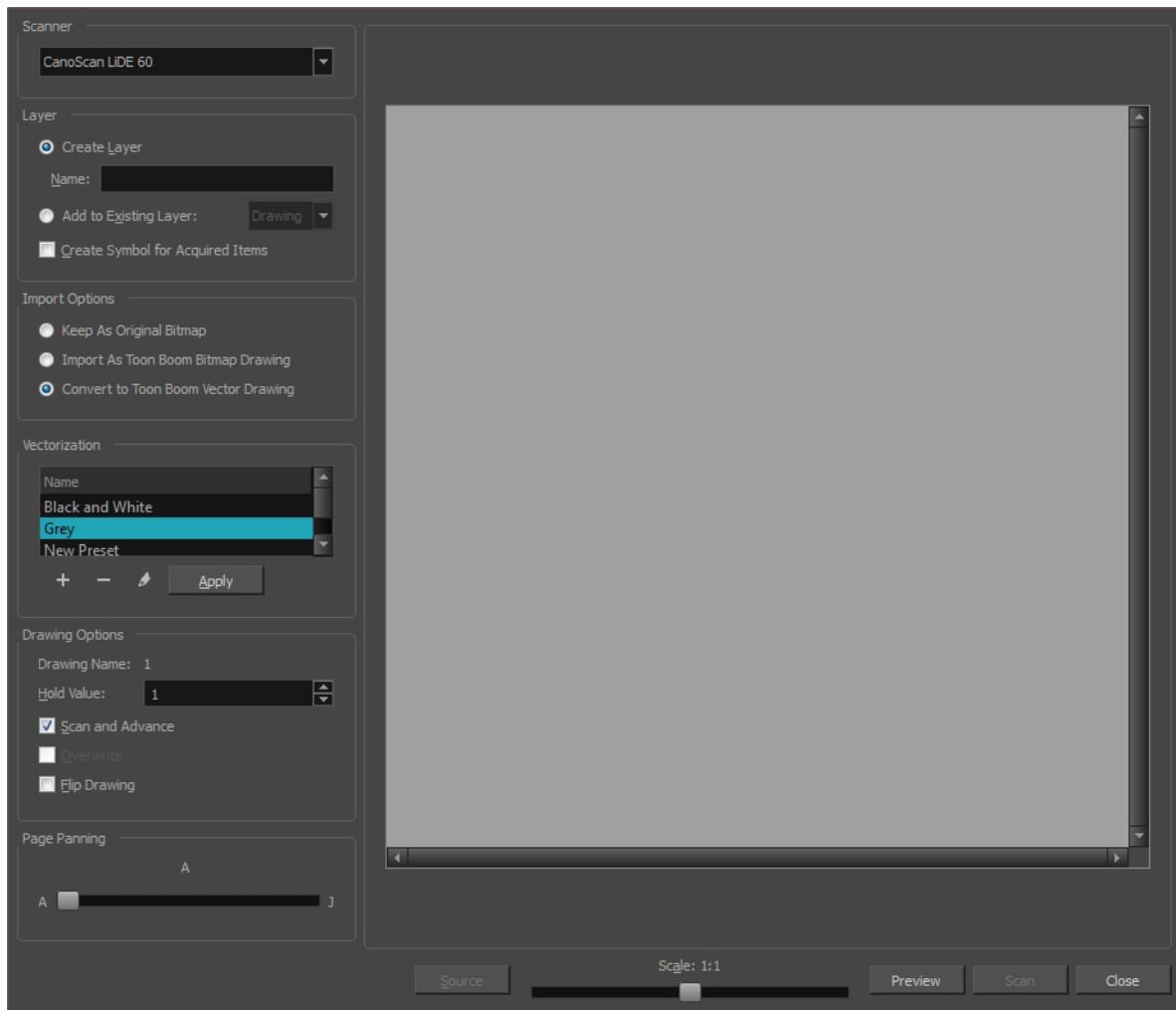


9. If you have more than one drawing, set the next drawing in place and click **Scan** again. Repeat until you have finished scanning all your drawings.

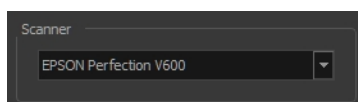
## How to import and vectorize bitmap drawings

1. From the top menu, select **File > Import > From Scanner**.

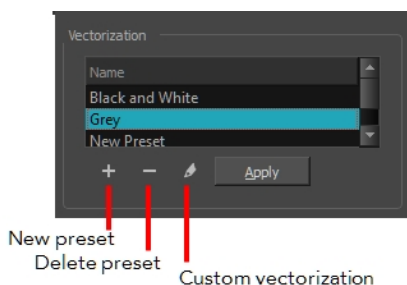
The Scan Drawings window opens.



2. Select your scanner from the Scanner list.

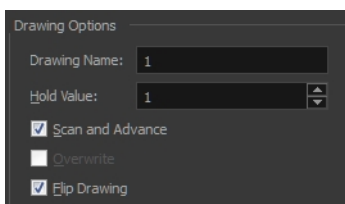


3. Click **Preview** to get a test scan of your drawing.
4. In the Layer section, select one of the following:
  - **Create Layer:** Imports an image into a new layer. Type a name for the layer in the **Name** field.
  - **Add to Existing Layer:** Imports the image into an existing layer. Select a layer from the Layer list.
5. In the Import Options section, select the **Convert to Vector Drawing** option.
6. In the Vectorization section, set the following:



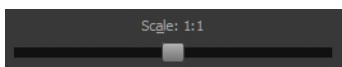
- ▶ **Black and White:** Vectorizes drawings as a solid black line; creates a 100% vector-based drawing. Set the Threshold and Smooth parameters.
- ▶ **Grey:** Vectorizes the image as a mix of vector contour and greyscale bitmap filling. Lines keep the texture from the scan, and the white of the paper becomes transparent.
- ▶ **New Preset:** Lets you create a new preset.
- ▶ **Delete Preset:** Lets you delete any preset in the list.
- ▶ **Custom vectorization:** Lets you set custom vectorization parameters—see [Creating a Vectorization Style on page 29](#).

7. In the Drawing Options section, set the following options if desired:



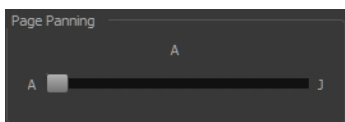
- ▶ **Drawing Name:** Name of the drawing to import.
- ▶ **Hold Value:** Type the number of frames that the drawing will be exposed.
- ▶ **Scan and Advance:** Lets you scan one drawing after another every time you click **Scan**.
- ▶ **Overwrite:** Lets you overwrite existing drawings—see [Overwriting Drawings on page 20](#).
- ▶ **Flip Drawing:** Mirrors the drawings horizontally and scans it this way.

8. Adjust the **Scale** control and the sliders in the Preview Image window until you're satisfied with the view.



9. Click **Scan** to import your drawing.

10. If you are scanning panoramic drawings, in the Page Panning section, move the slider to the next letter to capture your next frame.



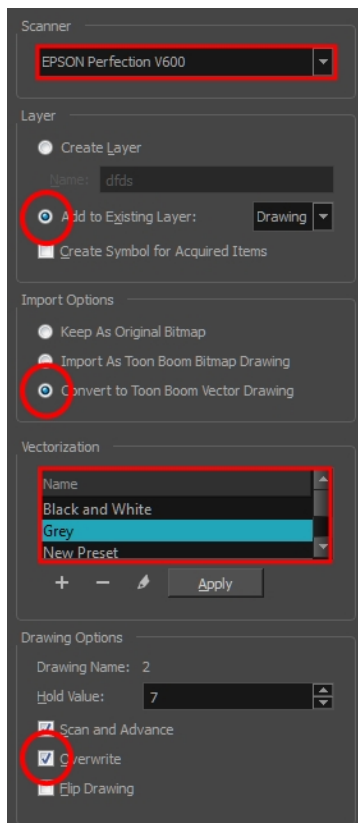
11. If you have more than one drawing, set the next drawing in place and click **Scan** again. Repeat until you have finished scanning all your drawings.

## Overwriting Drawings

At times, it might be more efficient to create a scene and fill in the exposure sheet before scanning. Then you can simply scan your drawings to fill in the necessary cells in the exposure sheet. Note that when you start scanning, the drawings are named sequentially regardless of whether there is an exposure or not in the Xsheet.

### How to overwrite existing drawings

1. In the Xsheet, select the first cell to overwrite.
2. From the top menu, select **File > Import > From Scanner**.
3. In the Scan Drawings window, do the following:
  - **Scanner:** Select your scanner from the list.
  - **Layer:** Select the **Add to Existing Layer** option.
  - **Import Options:** Select the **Convert to Toon Boom Vector Drawing** option.
  - **Vectorization:** Select an appropriate option: Black and White or Grey, or create a new preset.
  - **Drawing Options:** Select the **Overwrite** option.



4. Click **Preview**.

The scanner window opens.

5. Make any necessary adjustments to the image before scanning, then click **Preview**.

6. In the Scan Drawings window, click **Scan**.

The scanned drawing replaces the selected cell in the Xsheet, filling the entire exposure. The Drawing Options section indicates the name of the cell the drawing overwrote and its exposure value.


## Custom Vectorization Parameters

You can create your own vectorization settings with Harmony. The vectorization parameters you create can be saved, shared and also inserted into the `vectOptions.conf` file used by the Scan and Control Center modules when scanning or vectorizing a series of drawings.

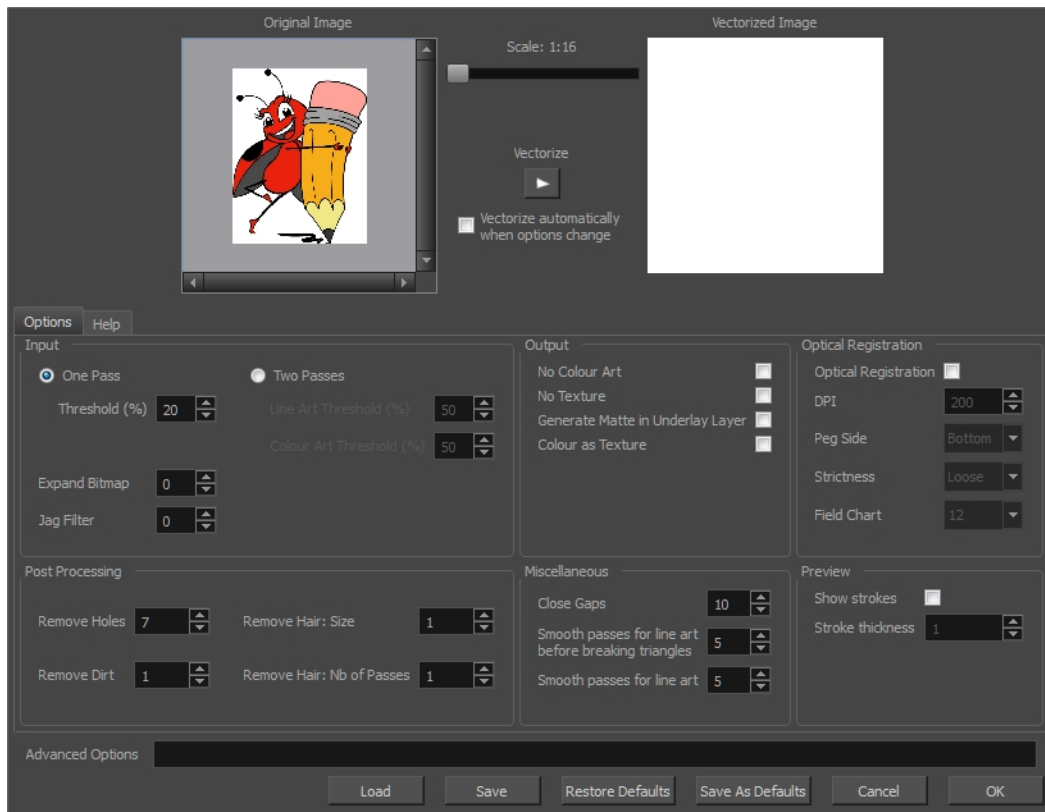
You can use an interface to select and test the different options, as well as type in some advanced settings.

The Vectorization Parameters dialog box lets you vectorize pencil drawings, along with any red, blue or green pencil marks you may have used to indicate highlights and shadows. The drawing will be vectorized into pure red, blue, green and black (RGB values), while creating colour art zones wherever lines connect. After painting in your tones and highlights, change your pure RGB colours to transparent (0 Alpha) in the Colour Picker window and watch the indicator colour zone lines disappear.

### How to open the Vectorization Parameters dialog box

1. From the top menu, select **File > Import > From Scanner**.  
You can also open it from any other import option that allows you to customize the vectorization parameters (i.e. from the scanner).
2. In the Scan Drawings window, do the following:
  - ▶ In the Layer section, decide on the layer options.
  - ▶ In the Import Options section, select the **Convert to Toon Boom Vector Drawing** option
  - ▶ Click **Preview**.
3. In the Vectorization section, click the Vectorization Parameters  button.

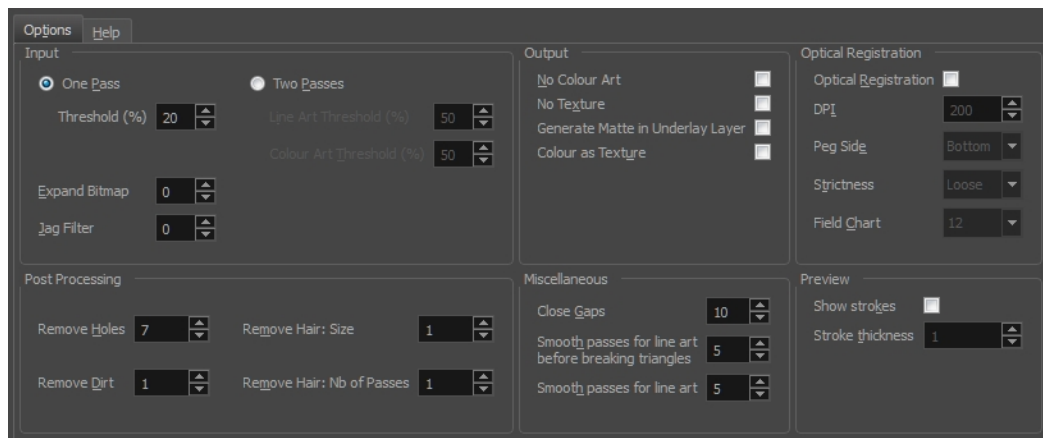
The Vectorization Parameters dialog box opens.



- [Options Tab](#) on page 22
- [Help Tab](#) on page 24

## Options Tab

The Options tab contains the main vectorization settings. More settings are available in the Help tab.



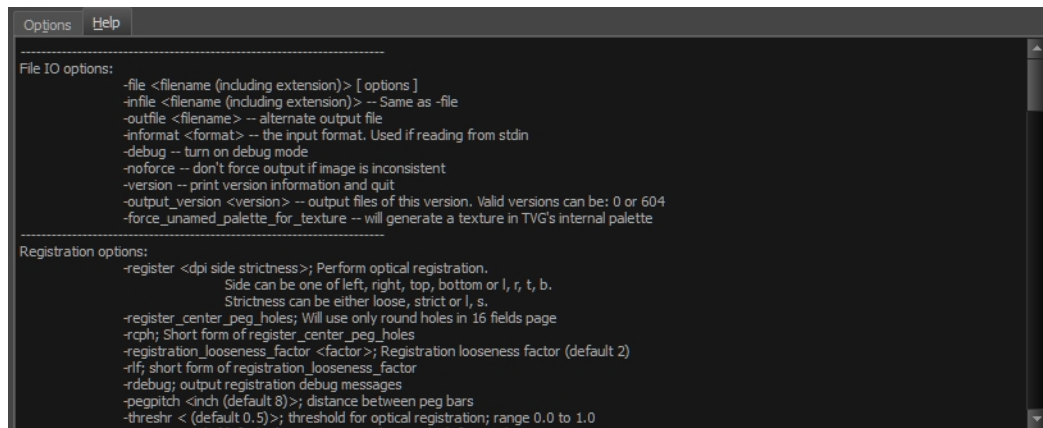
Parameter	Description
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Input	The input filters are applied to the bitmap image before it is vectorized.
	<b>One Pass:</b> One threshold value is applied to both the Line and Colour Art. For drawings with distinct vector-style lines of mattes, you only need one pass.
	<b>Two Passes:</b> Applies a different threshold value to each layer. For greyscale drawings, you may want to perform the vectorization process twice to apply different threshold values to the Line and Colour Art layers.
	<b>Threshold:</b> Determines which values in the scanned image are considered part of the Line or Colour Art layer and what will be eliminated from the vectorized drawing; 0% is white and 100% is black. The threshold is between these two values.
	<b>Expand Bitmap:</b> Lets you enter a value to scale the bitmap to detect small variations in the line. Use this option if you scanned a greyscale image and want to preserve small variations in the texture to apply to the line art.
	<b>Jag Filter:</b> Lets you enter a value to scale back the bitmap to remove some of the line's roughness. This is useless when you have a drawing that appears quite rough; the Jag filter will eliminate excess strokes in the final drawing.
Output	The output filters are applied during the vectorization process.
	<b>No Colour Art:</b> Does not generate filling zones in the Colour Art layer.
	<b>No Texture:</b> Does not generate texture in the Line Art layer in the final images. Select this option to create solid lines in the final line art.
	<b>Generate Matte in Underlay Layer:</b> Creates an opaque zone behind your drawing's lines to avoid seeing through the layers.
	<b>Colour as Texture:</b> Converts colour values into a texture layer.
Optical Registration	The optical registration options are used to automatically align drawings based on the position of the peg holes on the animation paper. The peg holes must appear in the scanned drawings for the optical registration to work.
	<b>DPI:</b> Lets you enter the dots-per-inch value of your image. You must enter the same value as the DPI used to scan the image.
	<b>Peg Side:</b> Lets you select the position of the peg holes on your drawings. Identify whether they are on the top, bottom, left or right.
	<b>Strictness:</b> Determines how exact the location of the peg holes must be for the software to recognize them. There are two values to choose from: <ul style="list-style-type: none"> <li>• <b>Strict:</b> The peg holes must be in a tightly defined area to be recognized.</li> <li>• <b>Loose:</b> The peg holes can be recognized somewhere in a larger area. This is the recommended setting.</li> </ul>
	<b>Field Chart:</b> Lets you indicate the size of the animation paper, 12 or 16.

Post Processing	The Post Processing filters are applied to the final vector images.
	<b>Remove Holes:</b> Removes holes of a specified value that might make painting difficult.
	<b>Remove Dirt:</b> Removes stray marks and dirt of a specified value. Try a value around 500.
	<b>Remove Hair Size:</b> Removes small strokes that have no line art.
Miscellaneous	<b>Remove Hair: Number of Passes:</b> The number of times the drawing will be analyzed to identify hair marks.
	<b>Close Gaps:</b> Closes gaps in the Colour Art so you can paint it.
	<b>Smooth Passes for Line Art Before Breaking Triangles:</b> The number of times the smoothing operation runs before creating the triangles that break lines in the drawing. If unnecessary triangles are appearing in the drawing, increase this value.
Preview	<b>Smooth Passes for Line Art:</b> The number of times the smoothing operation is performed after the triangles have been created. This further smooths the line art.
	<b>Show Strokes:</b> Shows the strokes in the Vectorized Image panel.
	<b>Stroke Thickness:</b> Shows the size of the strokes.

## Help Tab

The Help tab contains the most advanced vectorization settings which you type in the Advanced Option fields at the bottom of the Vectorization Parameters dialog box.



```

Options Help
-----
File IO options:
-file <filename (including extension)> [ options ]
-infile <filename (including extension)> -- Same as -file
-outfile <filename> -- alternate output file
-informat <format> -- the input format. Used if reading from stdin
-debug -- turn on debug mode
-noforce -- don't force output if image is inconsistent
-version -- print version information and quit
-output_version <version> -- output files of this version. Valid versions can be: 0 or 604
-force_unnamed_palette_for_texture -- will generate a texture in TVG's internal palette
-----
Registration options:
-register <dpi side strictness>; Perform optical registration.
    Side can be one of left, right, top, bottom or l, r, t, b.
    Strictness can be either loose, strict or l, s.
-register_center_peg_holes; Will use only round holes in 16 fields page
-rph; Short form of register_center_peg_holes
-registration_looseness_factor <factor>; Registration looseness factor (default 2)
-rf; short form of registration_looseness_factor
-rdebug; output registration debug messages
-pegpitch <inch (default 8)>; distance between peg bars
-threshr <(default 0.5)>; threshold for optical registration; range 0.0 to 1.0

```

### File IO Options

- file <filename (including extension)> [ options ]
- infile <filename (including extension)>; same as -file
- outfile <filename>; alternate output file
- informat <format>; the input format. Used if reading from stdin



**-debug**; turn on debug mode

**-noforce**; don't force output if image is inconsistent

**-version**; print version information and quit

**-output\_version** <version>; output files of this version. Valid versions can be: 0 or 604

**-force\_unnamed\_palette\_for\_texture**; will generate a texture in TVG's internal palette

## Registration Options

**-register** <dpi side strictness>; perform optical registration.

- Side can be one of left, right, top, bottom or l, r, t, b.
- Strictness can be either loose, strict or l, s.

**-register\_center\_peg\_holes**; will use only round holes in 16 fields page

**-rcph**; short form of register\_center\_peg\_holes

**-registration\_looseness\_factor** <factor>; registration looseness factor (default 2.000000)

**-rlf**; short form of registration\_looseness\_factor

**-rdebug**; output registration debug messages

**-pegpitch** <inch (default 8.000000)>; distance between peg bars

**-threshr** <(default 0.500000)>; threshold for optical registration; range 0.0 to 1.0

**-rmargin** <inch (default 1)>; region size where to look for peg bars

**-peg\_distance\_from\_center** <inch (default 5.25)>; peg distance from centre of the image

**-pdfc**; short form of -peg\_distance\_from\_center

**-out\_peg\_position** <side (default same)>; wanted position of the peg on the drawing.

- Can be one of right, left, top, bottom (or r, l, t, b) or same.
- A rotation will be performed if it is different from the side passed to -register.

**-output\_peg\_matrix**; output the peg transformation matrix on standard output.

**-scanner\_calibrate**; <(default 1.0000 1.0000) > x and y scale factors to be applied to scanner image.

## Filtering Options

**-pixel** <pixel\_shape (default '4x3')>; Valid values: 4x3

**-gap** <worldUnits (default 10)>; close gaps up to this big

**-pencil**; generate line art only

**-keep\_dirt**; don't filter out dirt

**-thresh** <threshold (default 0.2)>; range 0.0 to 1.0

**-rmv\_hairs** <worldUnits (default 1)> <passes (default 1)>

- remove hairs of size smaller than "size" in "passes" passes

**-rmv\_holes** <area (default 7)>; remove holes smaller than "area"

**-rmv\_dirt** <area (default 1)>; remove dirt smaller than "area"

- try values between 100 and 500 for **rmv\_holes** and **rmv\_dirt**. The area is in world units squared

**-rmv\_triangles** <worldUnits (default 30.000000)>; remove triangles at "pixels"

- distance from each other. Use **-no\_break** to remove all triangles

**-no\_texture**; don't generate textured strokes

**-color\_as\_texture**; will vectorize the alpha channel and put the RGB colour in a textured colour

**-noclosegap**; disable all gap closing algorithms

**-no\_break**; disable the breaking of line art

**-jag\_filter** <pixels (default 0)>; expand the pixels in the vectorization bitmap

**-expand\_bitmap** <pixels (default 0)>; expand the pixels in the vectorization bitmap

**-fit\_errorc** <error (default 1.000000)>; fitting error for the colour art

**-fit\_errord** <error (default 1.000000)>; fitting error for the line art

**-smoothl** <passes (default 1)>; number of smooth passes for line art

**-smoothc** <passes (default 1)>; number of smooth passes for colour art

**-first\_smooth** <passes (default 0)>; number of smooth passes for line art before breaking triangles

**-first\_smoothl** <passes (default 0)>; number of smooth passes for line art before breaking triangles

**-first\_smoothc** <passes (default 0)>; number of smooth passes for line art in colour art pass (needs **-2pass**)

**-2pass**; specify two sets of parameters; one for line art "l", one for colour art "c"

(-thresh, -rmv\_holes and -rmv\_dirt will be overridden by -threshl, threshc, -rmv\_holesl, -rmv\_holesc, -rmv\_dirtl and -rmv\_dirtc)

**-threshl** <threshold for line art (default 0.5)>; range 0.0 to 1.0

**-threshc** <threshold for color art (default 0.5)>; range 0.0 to 1.0

**-jag\_filterl** <pixels (default 0)>; expand the pixels in the vectorization bitmap for line art

**-jag\_filterc** <pixels (default 0)>; expand the pixels in the vectorization bitmap for colour art

**-expand\_bitmapl** <pixels (default 0)>; expand the pixels in the vectorization bitmap for line art

**-expand\_bitmapc** <pixels (default 0)>; expand the pixels in the vectorization bitmap for colour art

**-rmv\_holesl** <area (default 7)>; remove line art holes smaller than "area"

**-rmv\_holesc** <area (default 7)>; remove colour art holes smaller than "area"

**-rmv\_dirtl** <area (default 1)>; remove line art dirt smaller than "area"

**-rmv\_dirtc** <area (default 1)>; remove colour art dirt smaller than "area"

try values between 100 and 500 for **rmv\_holesl**, **rmv\_holesc**, **rmv\_dirtl** and **rmv\_dirtc**. The values are in world units squared

**-margins** <inch (default 0.25)>; remove margin around bitmap

- top\_margin** <inch (default 0.25)>; remove margin at top of bitmap
  - bottom\_margin** <inch (default 0.25)>; remove margin at bottom of bitmap
  - left\_margin** <inch (default 0.25)>; remove margin at left of bitmap
  - right\_margin** <inch (default 0.25)>; remove margin at right of bitmap
  - remove\_peg\_bars**; remove the peg bar holes
  - field\_size** <fields (default 12 or use value in scan file)>; set the drawing to this field size
  - fs**; short hand for -field\_size
  - peg\_bar\_size** <inch (default 1)>; the size of the peg bar region
  - noframe**; do not put a frame around the colour art
  - frame\_fields** <default -1.000000>; put a frame of the specified dimension around the colour art
  - downscale\_input** <default 1>; downscale the raw input by this integer factor
  - downscale\_texture** <default 1>; downscale the output texture by this integer factor
  - buildmatte**; generate a matte on underlay for line test
  - buildmatte\_colourart**; generate a matte on colour art for line test
- Note: -buildmatte and -buildmatte\_colourart are mutually exclusive
- copystrokes**; copy original strokes when building matte.

### Options for bitmap that has no registration information

- pixel\_margins** <inch (default 0)>; remove margin around bitmap
- top\_pixel\_margin** <inch (default 0)>; remove margin at top of bitmap
- bottom\_pixel\_margin** <inch (default 0)>; remove margin at bottom of bitmap
- left\_pixel\_margin** <inch (default 0)>; remove margin at left of bitmap
- right\_pixel\_margin** <inch (default 0)>; remove margin at right of bitmap
- dpi** <(default -1)>; dpi information of input bitmap

### RGB Keying Options

- rgb**; generate separate zones for red, green and blue lines
- rgb\_alpha** <value (default 255)>; generate red, green and blue colour with alpha of this value
- no\_red**; ignore red colour in vectorization
- no\_green**; ignore green colour in vectorization
- no\_blue**; ignore blue colour in vectorization
- flatten**; flatten the drawing after generating colours
- rmv\_rgb\_dirt** <threshold area default 0.0>; remove red, green and blue regions smaller than area
- expand\_bitmap\_rgb** <pixels (default 0)>; expand the pixels in the vectorization bitmap for rgb

**-threshrgb** <value> <threshold for rgb vectorization default 0.200000>;

**-threshsv** <saturation threshold default 0.500000> <value threshold default 0.500000>; thresholds on saturation and value to consider a pixel to be grey

## Colour Vectorization Options

**-color\_vectorize**; perform a colour vectorization

**-file2** <colour art filename>; specify the colour art bitmap

**-penstyle** <center alpha (0.0-20.0)> <edge alpha (0.0-20.0)> <gamma (0-10)><centre pressure effect (0.0-1.0)> <edge pressure effect (0.0-1.0)><texture bitmap downscaling (0.2-20)> <texture bitmap file (valid filename or "" if no file)>; generate brush texture for the line art

**-pressure\_variation** <strategy (0, 1 or 2)> <min pressure (0.0-1.0)> <max pressure (0.0-1.0)> <max variation (0.0-1.0)>; specify a pressure strategy for the centre line.

**-blur\_radius** <pixels (default 0)>; blur the penstyle texture generated

**-color\_contour\_smooth\_passes** <times (default 3)>; perform number of smooth passes on contour before computing texture

**-ccsp** <times (default 3)>; short for -color\_contour\_smooth\_passes

**-color\_rmv\_holesl** <world units (default 0.000000)>; remove holes of this size when computing texture

**-color\_fill\_holesl** <world units (default 0.000000)>; fill holes of this size for colour line art

## Bubble Usage (implemented only for colour vectorization's line art)

**-create\_bubbles**; add bubbles into the LineArt. Implemented for colour vectorization only

**-bubble\_gap** <value (default 3)>; max number of colour art points between 2 bubbles

**-bubble\_length** <value (default 10)>; max number of circles in a bubble

**-min\_radius** <value (default 1.5000)>; min radius of a circle in a bubble relative to the line thickness (must be >= 1.0)

**-max\_radius** <value (default 3.5000)>; max radius of a circle in a bubble relative to the line thickness (must be >= 1.0)

**-uniform\_gap**; the space between bubbles is constant

## 4 Colour Vectorization

**-4colours** [key:value] ... [key:value] ; The key value list can be empty. The list of keys is:

**rgbdiff:value** ; between [0.0-1.0] or [0-255]

**dark:value** ; between [0.0-1.0] or [0-255]

**grey:value** ; between [0.0-1.0] or [0-255]

**white:value** ; between [0.0-1.0] or [0-255]

**dirt:value** ; dirt area. 200 is a good value

**rt:value** ; between [0.0-1.0] or [0-255]

**gt:value** ; between [0.0-1.0] or [0-255]

**bt:value** ; between [0.0-1.0] or [0-255]

**NOTE:**

There must be no space between the colon and the key/value. For example: -4colours rgbdiff:20 dark:20 grey:120 white:250 dirt:200 rt:240 gt:240 bt:240

## Creating a Vectorization Style

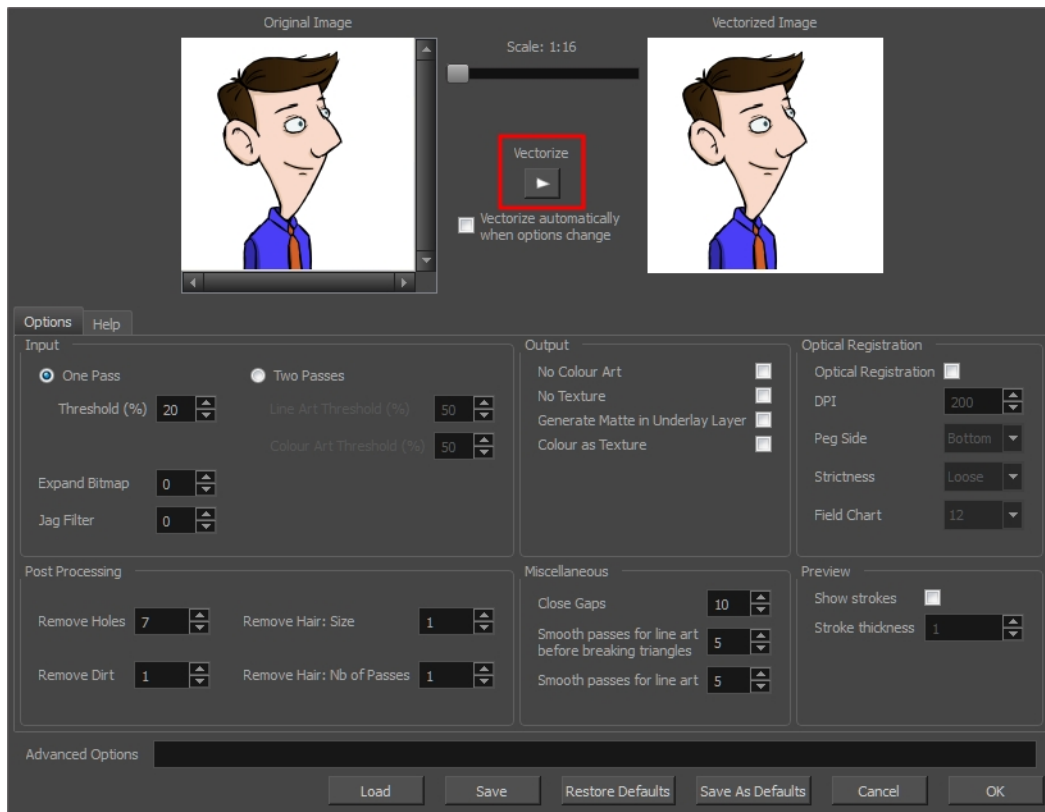
With Harmony, you can create custom vectorization parameters that can be saved, reused, shared, or used to set the Scan module vectorization style list.

You can vectorize drawings using one of the following methods:

- **Black and White:** All the lines become vector based and 100% black. The white areas become completely transparent.
- **Greyscale:** All the lines preserve their initial textured look in grey shades as a bitmap image contained inside a vector frame. The white areas become completely transparent.
- **Four Colours:** With the advanced parameters, you can isolate the red, green, blue, and black lines and turn them into 100% vector lines, preserving their original colours—see [Custom Vectorization Parameters on page 21](#).

### How to create or modify the vectorization parameters

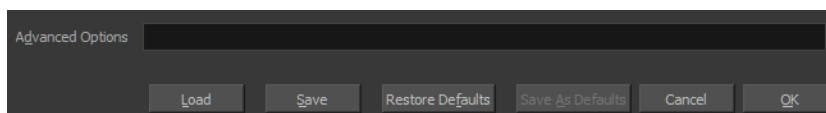
1. Set the different options available in the Vectorization Parameters dialog box.



2. Click the **Vectorize** button to update the Vectorized Image preview.

The vectorized image is just a preview. The actual vectorization happens when you click **OK** in the Import Images dialog box. There are many options to try in the Vectorization Parameters dialog box. These are applied during the vectorization process.

3. To set advanced parameters, read the information on the Help tab, then type in the Advanced Options field at the bottom of the dialog box.
4. To save your vectorization parameters to reuse them later, share them, or use them to set the Scan module vectorization style list, click **Save**.
5. In the Browser window, name and save the file.



6. To save the current settings as your default settings, click **Save As Default**. To restore the default settings, click **Restore Defaults**.
7. To load a vectorization style, click **Load** and locate the existing \*.vof file.
8. Click **OK**.

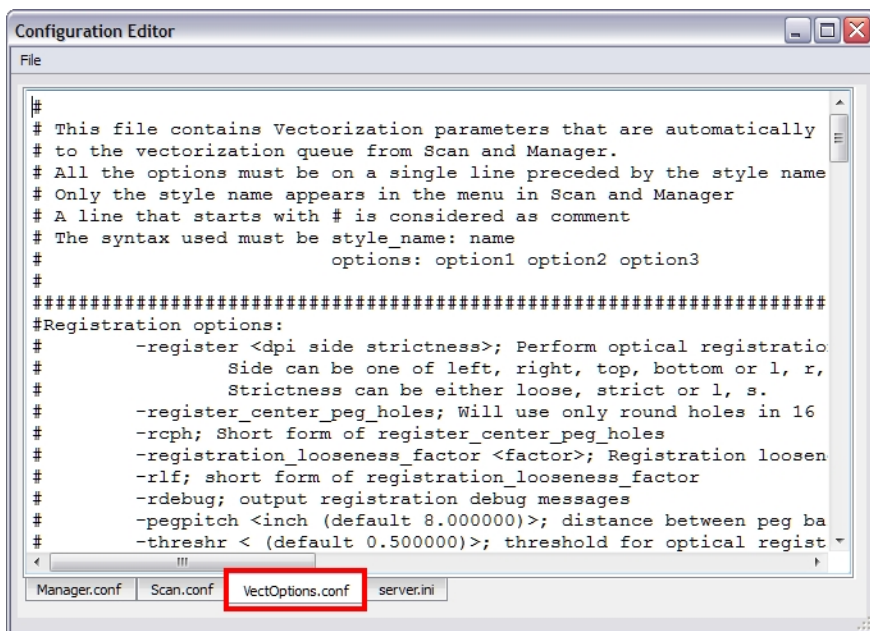
## Setting the VectOptions.conf File

Toon Boom Harmony Server uses a file called `VectOptions.conf` to get the vectorization style when batch vectorizing a series of drawings. A series of default styles is available in this file, but you will certainly want to create your own to fit your production style.

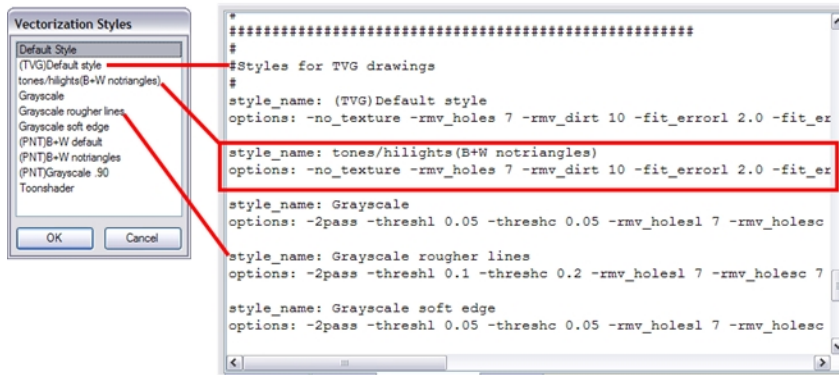
### How to set the VectOptions.conf file on Windows or Mac OS X

1. Open the `vectOptions.conf` file:
  - ▶ Windows: Select **Programs / All Programs > Harmony 12.1 > Tools > Configuration Editor**.
  - ▶ Mac OS X: Select **Applications > Harmony 12.1 > Tools > Configuration Editor**.

The Configuration Editor window opens.



2. In the bottom section of the window, select the `VectOptions.conf` tab.
3. Scroll down the `VectOptions.conf` file to see all the different options available for creating your custom vectorization style. These options are the same as in the Vectorization Parameters dialog box. It is recommended that you create your vectorization style using Harmony and the Vectorization Parameters window and copy the result parameters in this file—see [Creating a Vectorization Style on page 29](#)
4. Scroll down toward the bottom of the file to see the default styles. You can modify them or add new ones to the list using the parameters you got using the Vectorization Parameters window. Notice that some of the lines have a “#” sign at the beginning to indicate that the line is a comment and will not appear in the style list. The lines that have no sign at the beginning appear in the style list.



- To create a new style, type the following below the existing styles:

**style\_name:**

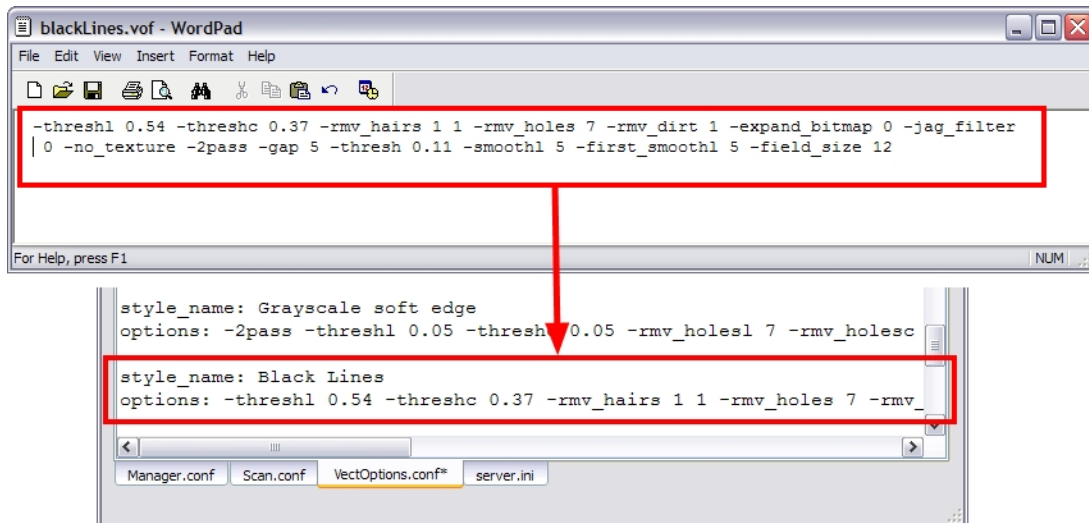
This should be followed by the name of your new style. For example: **style\_name: Black Lines.**

- Under the style name line, type the following:

**options:**

- Copy and paste the information in your \*.vof style when saving your settings in the Vectorization Parameters window.

▶ To open the \*.vof file, use any plain text editor application.



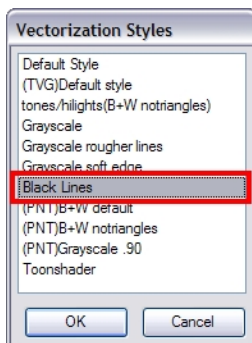
- In the Configuration Editor's top menu, select **File > Save**.
- If you have Toon Boom Harmony Scan on your computer, you can start the application and verify that the new style appears in the Vectorization Style list under **Edit > Vectorization Style**.



**NOTE:**

If you are using the batch processing method available with Toon Boom Harmony Server to scan and vectorize drawings, the selected style must be available on all the machines included in the batch processing list.

Refer to the Control Center Guide Guide to learn more about setting up and using batch processing.



### How to set the VectOptions.conf file on Linux using the vi text editor

1. Open a Terminal window:  
Menu: **Applications > System Tools > Terminal**
2. Open the etc folder inside the installation directory:  

```
$ cd /usr/local/ToonBoomAnimation/harmony_12.1/etc
```
3. Change your user to "root":  

```
$ su
```

  - If your user is part of the sudoers list, enter the following command and go to step 5.  

```
$ sudo vi VectOptions.conf
```
4. Enter the root password.
5. Open the VectOptions.conf file:  

```
$ vi VectOptions.conf
```
6. To start editing, press **I** to enter Insert mode.
7. When you're finished editing the file, press **Esc** to exit Insert mode.
8. To save the changes made to the file, type the following and press Enter/Return:  

```
$ :w!
```
9. To exit the vi editor and return to the Terminal, type the following and press Enter/Return:  

```
$ :q
```

- If you have Toon Boom Harmony Scan module on your computer, start the application and verify that the new style appears in the Vectorization Style list under **Edit > Vectorization Style**.

**NOTE:**

If you are using the batch processing method available with Toon Boom Harmony Server to scan and vectorize drawings, the selected style must be available on all the machines included in the batch processing list.

Refer to the Control Center Guide Guide to learn more about setting up and using batch processing.



### How to set the VectOptions.conf file on Linux using the gedit text editor

- Open a Terminal window:  
Menu: **Applications > System Tools > Terminal**
- Open the `etc` folder inside the installation directory:  

```
$ cd /usr/local/ToonBoomAnimation/harmony_12.1/etc
```
- Change your user to "root":  

```
$ su
```

  - If your user is part of the sudoers list, enter the following command and go to step 5.  

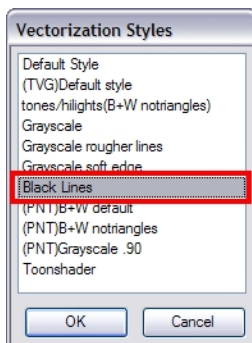
```
$ sudo gedit VectOptions.conf
```
- Enter the root password.
- Open the `VectorOptions.conf` file:  

```
$ gedit VectOptions.conf
```
- Edit the parameters of the `VectOptions.conf` file as you would do in most text editor applications.
- Select **File > Save**.
- Select **File > Quit**.
- If you have Toon Boom Harmony Scan module on your computer, start the application and verify that the new style appears in the Vectorization Style list under **Edit > Vectorization Style**.

**NOTE:**

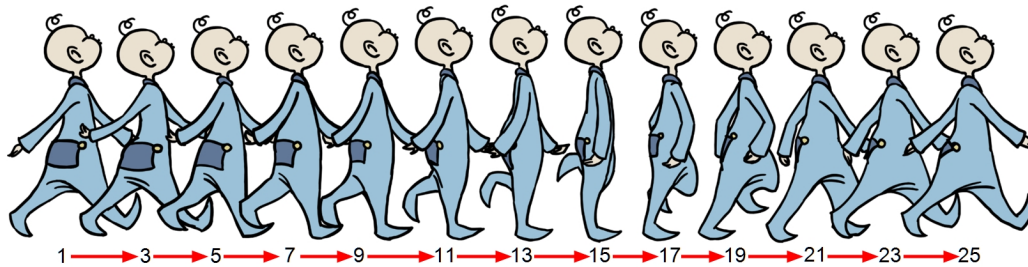
If you are using the batch processing method available with Toon Boom Harmony Server to scan and vectorize drawings, the selected style must be available on all the machines included in the batch processing list.

Refer to the Control Center Guide Guide to learn more about setting up and using batch processing.





## Chapter 3: Timing



When you create hand-drawn animation traditionally or in a paperless environment, it's important to know how to set and modify the timing of your drawings.

In a traditional workflow, the person in charge of the digital exposure sheet reproduces the paper exposure sheet created by the animator. In a paperless workflow, the animator creates and manages their own exposure sheet directly in Harmony without the need for reproduction.

If you're more of a traditional animator, you will probably work with an exposure sheet. If you're a digital animator, you may prefer to work with a timeline to visualize your timing. Harmony offers both.

The Xsheet view displays the digital reproduction of a traditional paper exposure sheet used in hand-drawn animation. You can set the animation sequence's exposure and name the drawings.

The Timeline view is also used to visualize timing, and represents elements and groups of elements as layers.

You can adjust timing in both views; your choice depends on which technique you're accustomed to using. Depending on your working style, some actions may seem preferable to do in one view instead of another. Many of the actions you perform in the Xsheet can also be accomplished in the Timeline. This chapter will often show both techniques. You can choose which one you prefer.

In this chapter, you will learn how to work on your drawing's exposure and length. The exposure and animation paths for symbols are covered in separate chapters.

**NOTE:** The exposure sheet is not mandatory for cut-out animation. It can be useful for creating characters and parts, but is not really needed for animation and timing. If you plan to work with cut-out animation, you can still learn useful tips by reviewing the section on exposure sheets.

The basic digital exposure sheet process is divided into the following steps:

### Preparation

The digital exposure task is quite simple. There are very few things to prepare in order to get ready.

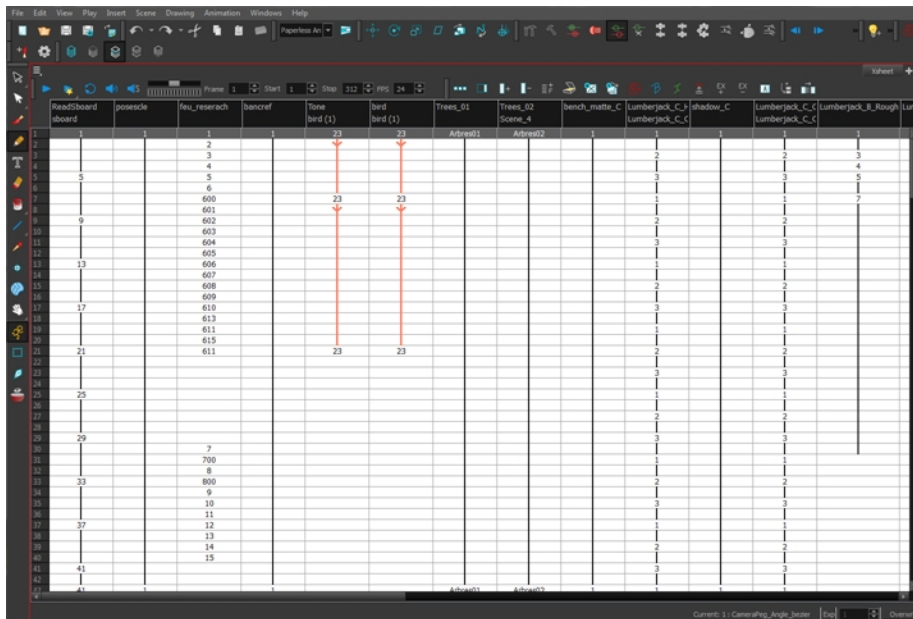
## Opening the Scene

The scene is generally created during a previous step, such as scanning (in a traditional animation workflow), scene set up, digital layout, or production organization.

## Using the Workspace

The person creating the exposure sheet will need only the Xsheet view to create the digital exposure sheet, although the Timeline view may also be helpful. If you're doing paperless animation, use the Camera or Drawing view if you want to sketch at the same time.

If you work with this layout often, you can use the Workspace Manager to save it as a workspace, and name it **Xsheet**, for example.



While drawing and animating paperless animation, you can use the Workspace Manager to save a frequently used layout and name it **Paperless Animation**, for example.

## Preparing References



To start an exposure sheet, you need to prepare your references. For traditional animation, you will need to reproduce the animator's paper exposure sheet. If you're working remotely, the studio can scan the paper exposure sheet using third-party software and send the digital files to be opened and viewed digitally.

In paperless animation, you will usually create an exposure sheet from the Xsheet view. The information from your layout and posing or storyboard will help you approximate how many elements are required in the scene.

## Frames

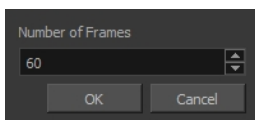
Once the references are ready, you need to set the scene length by adding the right number of frames to your scene. You can set the global scene length from the top menu.

In the Xsheet and Timeline view, you can add and remove frames from a scene to edit its length.

### How to set the scene length

1. From the top menu, select **Scene > Scene Length**.

The Set Scene Length dialog box opens.

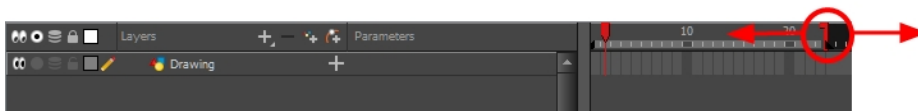


2. In the Number of Frames field, enter the number of frames needed.

### How to extend or reduce the scene length in the Timeline view

When you remove frames at the end of a scene to reduce the scene length in the Timeline view, the exposed drawings and symbols are not deleted. They're still available if you extend the scene afterward.

1. In the Timeline view, drag the scene length bracket:
  - ▶ **Right:** To add more frames to your scene.
  - ▶ **Left:** To reduce the number of frames in your scene.



### How to add frames in the middle of a scene

You can add frames anywhere in the middle of the scene—before or after a selection. If you select a frame row in the Xsheet view, Harmony will add the new frames before or after the selection, depending on your choice.


1. Do one of the following:
  - ▶ In the Xsheet view, select a frame row.

	Drawing_3	Drawing_2	Drawing_1	Drawing
1	13	15	1	1
2	14		2	
3	1		3	
4			4	
5		1	5	1
6		2	6	
7		3		
8	2	4		

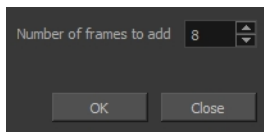
- ▶ In the Timeline view, select the frame to which you want to add frames before or after.



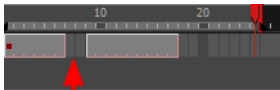
2. Do one of the following:

- ▶ From the top menu, select **Scene > Frame > Add Frames Before Selection** or **Add Frames After Selection**.
- ▶ In the Xsheet view, right-click and select **Frames > Add Frames Before Selection** or **Add Frames After Selection**.
- ▶ In the Xsheet toolbar, click the Add Frames  button to add frame after your selection.
- ▶ Press Ctrl + G and Ctrl + H (Windows/Linux) or ⌘ + G and Ctrl + H (Mac OS X).

The Add Frames dialog box opens.



3. In the Number of Frames to Add field, enter the number of frames needed in the scene.
4. Click OK.

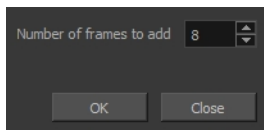


Two frames were added  
before selected frame

### How to add frames at the start or end of a scene

1. In the top menu, select **Scene > Frames > Add Frames at Start** or **Add Frames at End**.

The Add Frames dialog box opens.



2. In the Number of Frames to Add field, enter the number of frames needed in the scene.

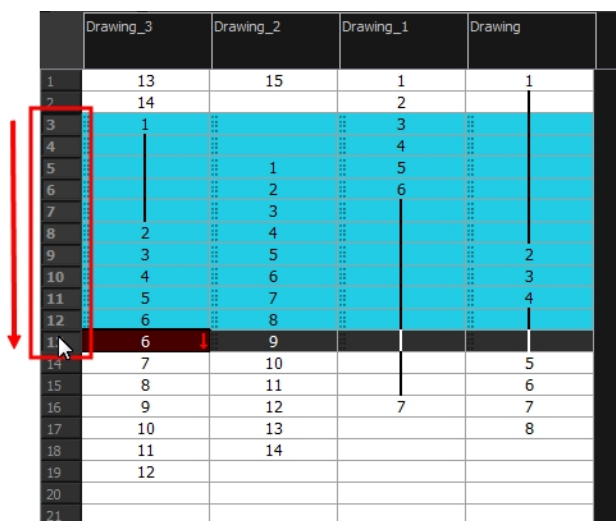


3. Click OK.


### How to remove a frame or a range of frames to reduce the scene length in the Xsheet view

In the Xsheet view, you can remove any selected frame range, such as the last frame.

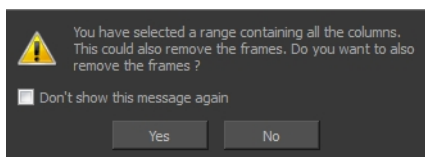
1. In the Xsheet view, do one of the following:
  - ▶ Select a frame in a given column.
  - ▶ Select a frame range by clicking the first frame's number and then dragging the selection highlight down to the last frame to delete.



	Drawing_3	Drawing_2	Drawing_1	Drawing
1	13	15	1	1
2	14		2	
3	1		3	
4			4	
5		1	5	
6		2	6	
7		3		
8	2	4		
9	3	5		2
10	4	6		3
11	5	7		4
12	6	8		
13	6	9		
14	7	10		5
15	8	11		6
16	9	12	7	7
17	10	13		8
18	11	14		
19	12			
20				
21				

2. To delete the selected frames, do one of the following:
  - ▶ From the top menu, select **Scene > Frame > Remove Selected Frames**.
  - ▶ Press Delete to delete the selection.
  - ▶ Click the Remove Frames  button. To remove several frame selections, click the button repeatedly.

If you selected a range of frames, the Warning dialog box may open.



3. To complete the operation:
  - ▶ Click **Yes** to delete the selection.
  - ▶ Click **No** to delete only the exposure in the cell and not the frames.
  - ▶ Select the **Don't Show This Message Again** option to prevent the warning message from being displayed each time you delete a frame range.

## Creating Drawings

Before filling any value or setting any timing or exposure, you need to add different drawing elements.

Each drawing element is represented as a vertical element column in the Xsheet view and a horizontal element layer in the Timeline view.

In Harmony, whether you work in the Timeline or Xsheet view, any modification you do to one view will be applied to both. You can also see your layers displayed in the Node view as nodes.

To start an exposure sheet, you will use drawing elements. Drawing elements are drawing containers. Any image file, either bitmap or vector, will use a drawing element.

When you add a drawing element to your scene, a folder is added to the scene directory. This folder is named the same way as the drawing element. Its purpose is to contain all the drawings related to this element. For example, in cut-out animation, a character can have many heads available. All of the head drawings will be contained in this folder, even if they are not exposed in the Timeline or the Xsheet view. There is always a drawing container connected to a drawing element (layer, column).

**NOTE:** There are different element types available, such as sound and expression. A sound element contains sound files. Expressions, Beziers, eases, 3D path, Quadmaps and Pegs are for motion purposes during the compositing step. It's not necessary to create these types to create your exposure sheet.

You can add drawing elements from the Timeline view, Xsheet view, and the Scene menu.

This section is divided as follows:

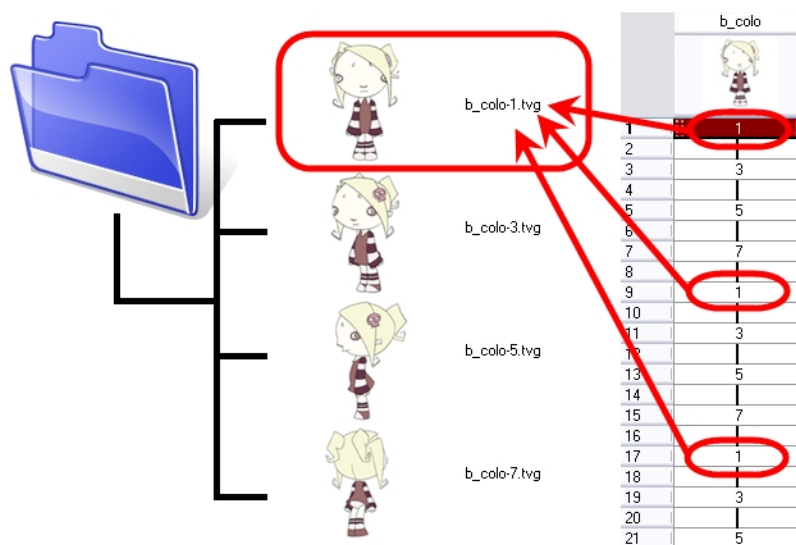
- [Layer and Column Concepts on page 42](#)
- [Layer and Column Types on page 43](#)
- [Adding New Drawing Elements on page 46](#)
- [Deleting Layers and Columns on page 49](#)
- [Layer and Column Properties on page 50](#)
- [Modifying Layers and Columns on page 53](#)
- [Duplicating Layers and Columns on page 56](#)
- [Cloning Layers and Columns on page 56](#)
- [Adding an Annotation Column on page 57](#)
- [Linking External Files with Timing Columns on page 62](#)

## Layer and Column Concepts

A layer is linked to a directory, the location where all its drawings are saved. This directory has the same name as the layer. When a name is typed in a cell, Harmony searches the layer's directory for the corresponding drawing to display. If there is no corresponding drawing, a new one is created.

Drawings are exposed in cells and linked to the drawings saved in the layer's directory. When you remove a drawing from a cell, it is not displayed and still exists in the directory.

A drawing that is exposed multiple times (for example, in a walk-cycle) would be linked to the same original drawing in the layer's directory. If you modify, repaint, or correct the drawing, all exposed drawings with the same name are updated simultaneously. You must duplicate or create a new drawing to modify a single exposure and retain the others.



When you create a drawing cycle, all of the repeated drawings are linked to the original files. This means that when you modify, repaint, or correct a drawing named "1," all drawings named "1" are updated simultaneously. In order to modify a drawing independently from its other exposures, you must duplicate the drawing.

## Layer and Column Types

A column is also known as a layer. There are several types of layers that you can add in the Xsheet and Timeline view. Each layer is indicated by an icon to help you differentiate them. Some layers are represented differently in the Xsheet view.

### Drawing Layer



The most common layer type is the drawing layer. Any time you need to create a vector drawing or import a symbol or image, you can use a drawing layer. You can also create bitmap artwork on a drawing layer.

**NOTE:** Bitmap images are contained in bitmap layers.

### Bitmap Layer



If you import a bitmap images (as original bitmap) in your project, they are inserted in a Bitmap layer. If you choose to vectorize your image when you import, the vectorized object will be placed on a Drawing layer.

When importing a bitmap image, you have the option of encapsulating the image in a symbol. If you place a bitmap into a symbol, you will be able to mix vector drawings with it on the same layer.

### Camera Layer



You can only have one Camera layer at a time in the Timeline view. By default, there is no Camera layer when you create a scene. You need to add a Camera layer when you want to create a camera motion.

The Camera layer is not visible in the Xsheet view.

**NOTE:** If you want to have several cameras with different settings, you can keep adding Camera layers in your Timeline view (however, only one will ever be visible at a time as you can only have one camera at a time in your timeline). To switch to a different camera, select **Scene > Camera** and select another camera layer.

### Effect Layer



To enhance the look of your scene, you can add effect layers and attach your drawings to them.

In Harmony, there is a series of effect nodes in the Node Library view.

When you select the Effect layer in the Timeline view, the effect's parameter columns are displayed in the Functions section of the Xsheet view.

### Colour-Card Layer



The Colour-Card layer is used to add a plain colour background to a scene. By default, your scene has no background colour and if you render it as a QuickTime movie or image sequence, it will have a black background.

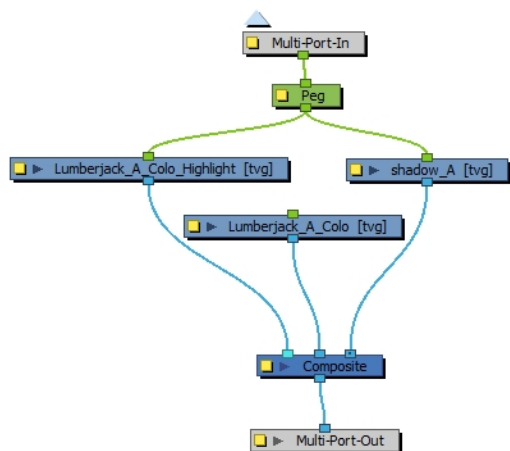
This layer is not visible in the Xsheet view.

### Group Layer



A Group layer can be used to organize both the Timeline and Node views. You can drag and drop other layers onto a Group layer and then collapse the Group layer to hide these other layers from view.

If you create the Group layer in the Timeline view, a corresponding node will appear in the Node view. Any layers that you connect to the Group layer will appear in the Group node connected to an Input and Output port.



## Peg Layer



A Peg layer is a trajectory or motion path layer that does not contain drawings. It can be attached to any drawing layer, cut-out puppet, or other peg layers; they will all follow the trajectory you set in the Peg layer.

When you select the Peg layer in the Timeline view, the peg's function columns are displayed in the Functions section of the Xsheet view.

## Quadmap Layer



A Quadmap layer can be described as a deformation transformation layer that does not contain drawings. This can be attached to any drawing layer, cut-out puppet, or even other Peg layers. They will all follow the deformation you set in the Quadmap layer.

When you select the Quadmap layer in the Timeline view, the Quadmap's function columns are displayed in the Functions section of the Xsheet view.

## Sound Layer



You can import sound files to add dialog and sound effects to your project. The sound layer will be added to your Timeline and Xsheet view when you import a sound file in your scene.

In the Xsheet view, the Sound layer is a dark grey colour.

## Advanced Column Types

In the Xsheet view, you can add several advanced column types to create particular animation paths. When you create these columns, they are not linked automatically to any particular drawing layer. You can create a motion path using these columns and then link or unlink several drawing or peg layers to it.

Advanced column types include:

- Timing
- 3D Path
- 3D Rotation
- Bezier Curve
- Ease Curve
- Expression
- Annotation

## Adding New Drawing Elements

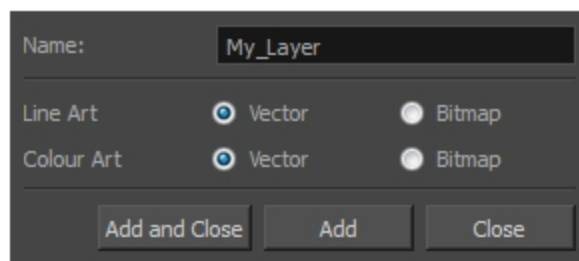
There are different ways to add a drawing layer to your project. By default, when you create a new scene there is one Drawing column in the Xsheet view and one corresponding Drawing layer in the Timeline view.

You can add an element for each drawing and it will appear as a column in the Xsheet view, a layer in the Timeline view, and a node in the Node view.

### How to add a drawing element from the Timeline view

1. In the Timeline view, click the Add Drawing Layer  button or press Ctrl + R (Windows/Linux) or ⌘ + R (Mac OS X).

The Add Drawing Layer window opens.



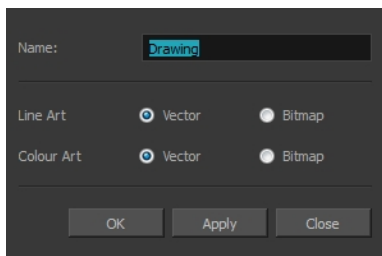
2. In the Name field, name your new layer.
3. Set the Line Art and Colour Art options to **Vector** to get a vector layer or to **Bitmap** to have a bitmap layer.
4. Do one of the following:
  - Click **Add** to add a first layer and keep the window open to add more layers.
  - Click **Add and Close** to add a new layer and close the window.

A new drawing layer is added to the Timeline view.

### How to add a drawing element from the top menu

1. From the top menu, select **Insert > Drawing**.


The Add Drawing Layer dialog box opens.



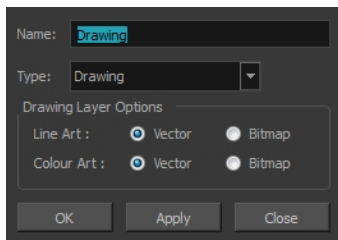
2. In the Name field, type a relevant element name and click **OK**.

The new drawing element appears in your scene.

### How to add a drawing element from the Xsheet view

1. Do one of the following:
  - ▶ In the Xsheet menu, select **Columns > Add Columns**.
  - ▶ Click the Add Columns  button.
  - ▶ Press Shift + C.

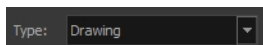
The Add Column dialog box opens.



2. In the Name field, type a relevant element name.



3. In the Type field, select **Drawing**.



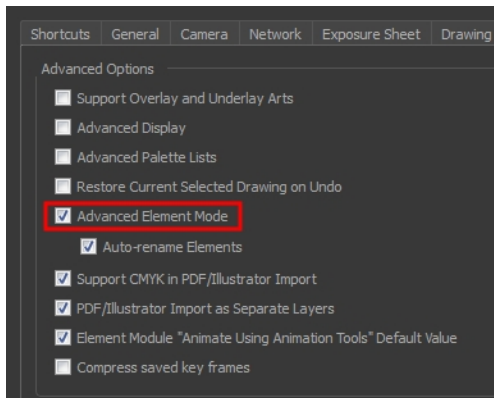
4. To complete the operation:
  - ▶ Click **OK** to add your new layers and close the dialog box.
  - ▶ Click **Apply** to add your new layers and keep the dialog box open to add column.
  - ▶ Click **Close** to cancel the operation.

The new drawing element appears in the Timeline, Xsheet and Node views—see [Layer and Column Types](#) on page 43.

### How to create a column using the advanced Add Column dialog box

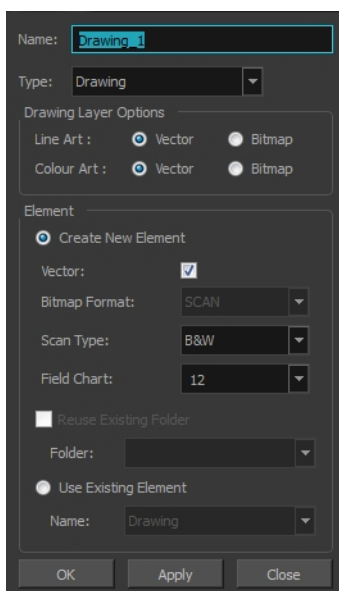
You can use the advanced Add Column dialog box to make more file format and field size options available when you insert a column.

1. From the top menu, select **Edit > Preferences** (Windows/Linux) or **Stage > Preferences (Mac OS X)** and select the **Advanced** tab.
2. In the Advanced Options section, select the **Advanced Element Mode** option to access the advanced Add Column dialog box.



3. Click **OK**.
4. In the Xsheet menu, select **Columns > Add Column** or press Shift + C.

The Add Column dialog box opens.

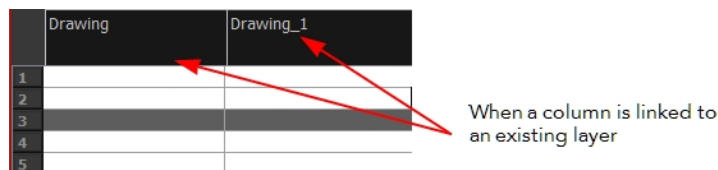


5. In the Name field, type the new column's name.



6. In the Type menu, select the Drawing type.
7. In the Element section, select one of the following:
  - ▶ **Create New Element:** Creates an independent column with its own drawing folder.
  - ▶ **Reuse Existing Folder:** Links your column to an existing folder within the Element folder of your scene. If you select this option, in the Folder menu, select the folder to which you want to link your new column.
  - ▶ **Use Existing Element:** Uses drawings from an existing column in the new column. Both columns will be attached to the same set of drawings, but their timing will remain independent from one another. If you modify one of the drawings, it will be modified in both columns. This is the same principle as the Clone column.

In the Name menu, select the column to which you want to link your new column.



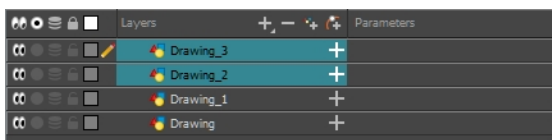
8. If you selected the Create New Element option:
  - ▶ Deselect the **Vector** option if you want your layer to contain bitmap images or enable it if you want the layer to contain vector drawings. Most of the time, the Vector option will be enabled.
  - ▶ If you deselected the **Vector** option, from the **Bitmap Format** list, select which type of bitmap image you want to insert in the column. Select the **SCAN** type if you are planning to scan drawings using the Toon Boom Harmony Scan module.
  - ▶ If you deselected the **Vector** option and you chose the **SCAN** type, from the Scan Type menu, select what kind of scanning you want to achieve.
  - ▶ In the **Field Chart** field, when importing traditional animation, indicate the size of paper on which the animation or background was drawn. If you are not using perforated animation paper, leave the 12 field default value as is.
9. Do one of the following:
  - ▶ Click **OK** button to create the new column and close the dialog box.
  - ▶ Click **Apply** to create the new column but keep the dialog box opened to create other new columns.


## Deleting Layers and Columns

You can delete an element in the Timeline view or Xsheet view.

### How to delete layers in the Timeline view

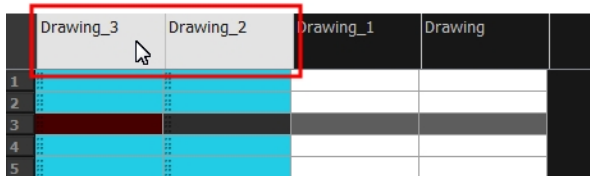
1. In the Timeline view, select the layers to delete.




2. Do one of the following:
  - In the Timeline's Layer toolbar, click the Delete Layers  button.
  - Right-click on the selection and select **Delete**.

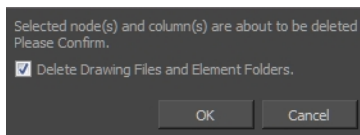
### How to delete columns in the Xsheet view

1. In the Xsheet view, select the columns to be deleted by clicking on their header.



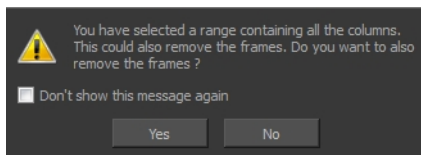
2. Do one of the following
  - Right-click on the selection and select **Delete Columns**.
  - In the Xsheet toolbar, click the Delete Columns  button.
  - Press Delete.

The Confirm Delete dialog box opens.



- Select the **Delete Drawing Files and Element Folder** option if you want to delete the drawings and folders linked to the selected column.
3. To complete the operation:
    - Click **OK** to delete the selected layers.
    - Click **Cancel** to cancel the operation.

The Warning dialog box may open.



4. Do one of the following:
  - Click **Yes** to delete all the frames from your scene.
  - Click **No** to keep the frames in your scene.
  - Select the **Don't Show This Message Again** option if you do not want the dialog box to display again in the future.

## Layer and Column Properties

Each element has its own set of properties that you can modify, including effect and peg layers.

If you want to modify an element's properties, you can display the properties of a selected layer in the Timeline view or selected node in the Node view. If you're working with the Xsheet, you can display its properties as well. You can display a layer's properties as a window or as a view of its own.

The Layer Properties editor allows you to:

- Rename the layer
- Enable or disable the layer
- Lock the layer
- Change the track colour
- Activate the onion skin preview
- Adjust the positioning and animation parameters
- Adjust many other advanced parameters

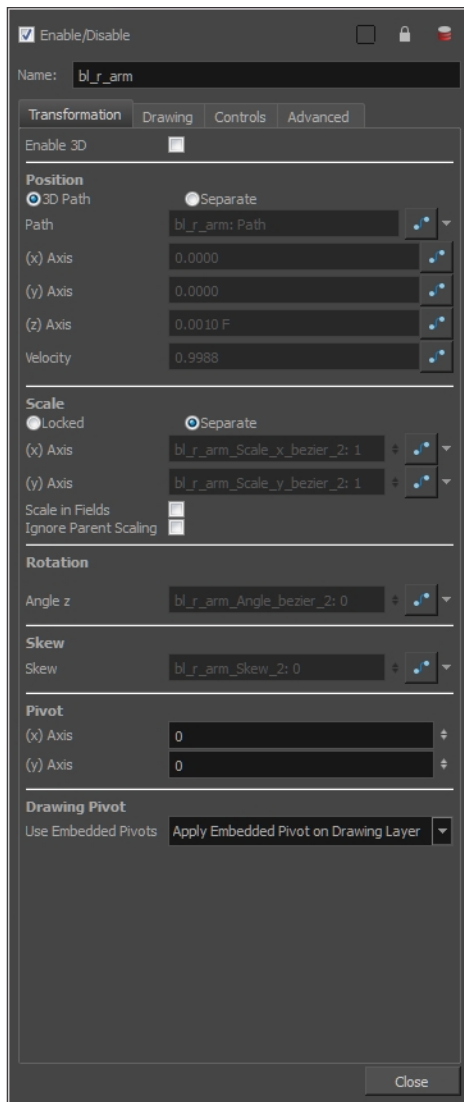
The Column Properties editor allows you to:

- Rename the layer
- Enable or disable the layer

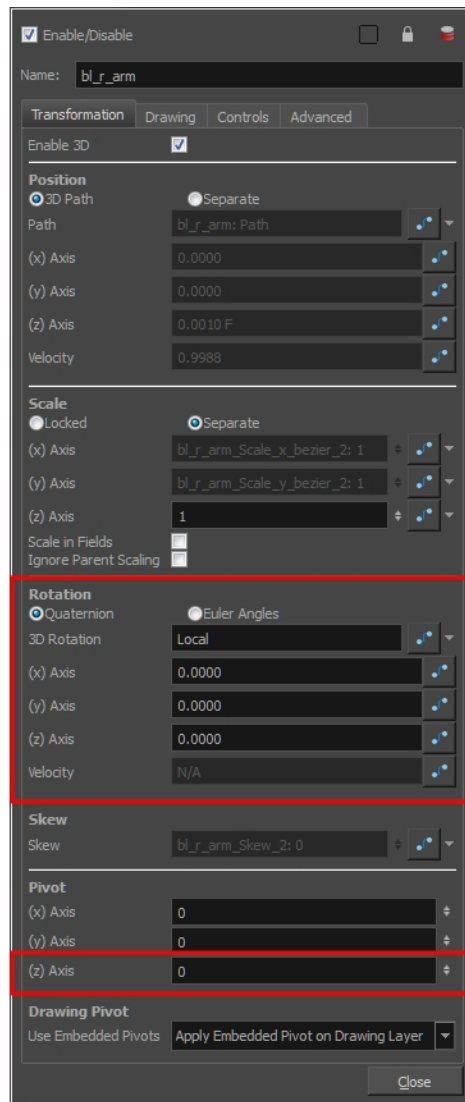
### How to display a layer's properties

1. Do one of the following:
  - In the Layer Properties view is not part of your workspace, from the top menu, select **Windows > Layer Properties**. In the Timeline view, select a layer
  - In the Timeline view, double-click on a layer.
  - Press Shift + E.
  - In the Node view, click on a node's yellow properties button.

The properties display.



Transformation tab with the Enable 3D option deselected

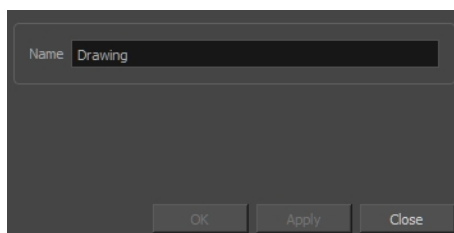


Transformation tab with the Enable 3D option selected

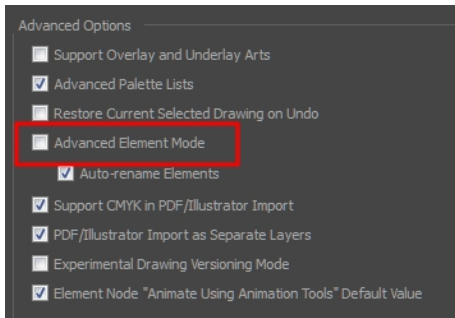
## How to display a column's properties in the Xsheet view

- In the Xsheet view, do one of the following:
  - ▶ Double-click on a column header.
  - ▶ Right-click on a column header and select **Column Editor**.

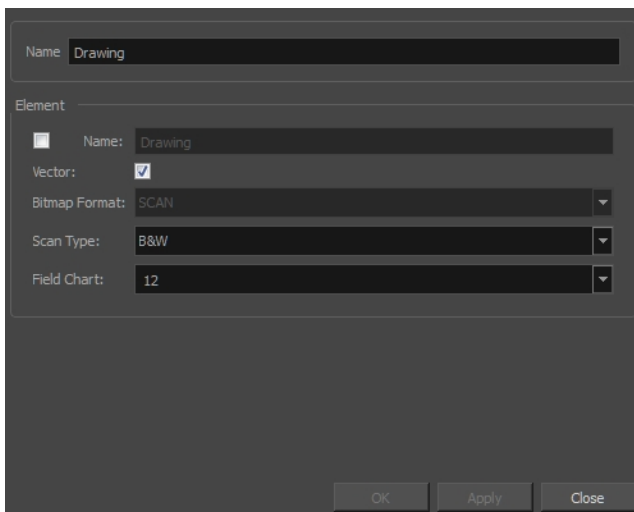
The properties for the column are displayed.



- (Optional) To view additional properties, select **Edit > Preferences** from the top menu.
- In the Preferences dialog box, select the **Advanced** tab, then select the **Advanced Element Mode** option.



- In the Xsheet view, double-click on a column header. Additional properties for the column are displayed.



## Modifying Layers and Columns

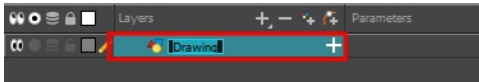
Once you add layers and columns to your project, you can modify their properties, names, or ordering.

You can change the order of your elements in the Timeline view and Xsheet view. When you change the order of your elements in one view, the other one is updated.

The Element Manager window lets you add, delete or modify elements (drawing folders) in your scene. If you have drawing folders that are not linked to a column in your scene, use the Element Manager to delete them if needed.

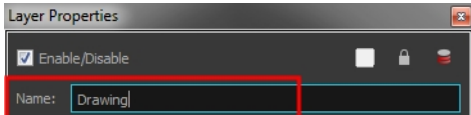
### How to rename a layer in the Timeline view

- In the Timeline view, double-click on the name of the layer to rename.
- In the Name field, rename the layer and press Enter/Return.



### How to rename a layer in the Layer Properties editor

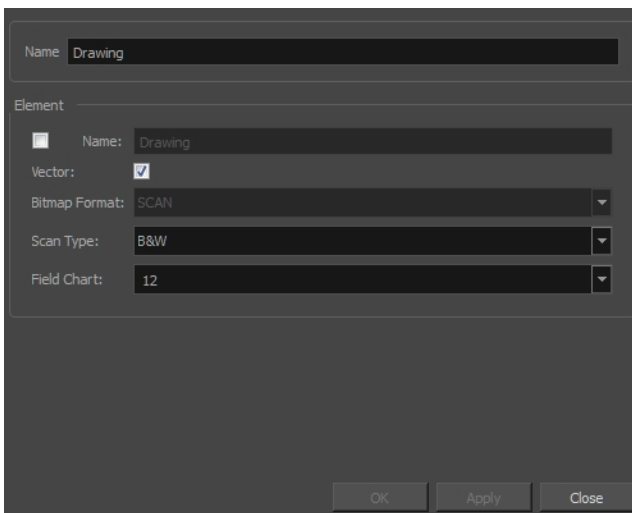
1. In the Timeline view, double-click anywhere on the layer except the layer name to rename. The Layer Properties editor opens.
2. In the Name field, rename the layer.



3. Click **Close**.

### How to rename a column

1. In the Xsheet view, double-click on a column name. Do not click on the drawing folder name that the column is linked to (this also appears in the column header just below the column name). The Drawing dialog box opens.



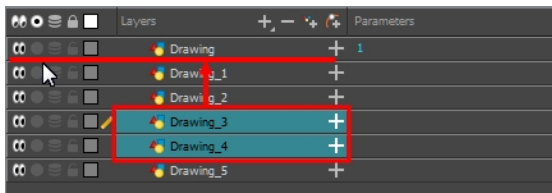
2. In the Name field, rename the column.
3. Click **OK**.

### How to reorder layers in the Timeline view

1. In the Timeline view, select the layers to move.
2. Drag the selection to the new location.

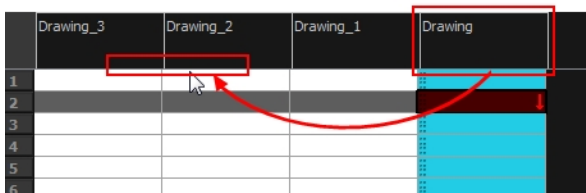
3. Do one of the following:

- ▶ Drop the selection on an existing layer to make it a child of another element layer.
- ▶ Drop it between the existing layers. Timeline layers that are located above the selection are displayed in front it. Layers located under it in the Timeline View are displayed behind it.



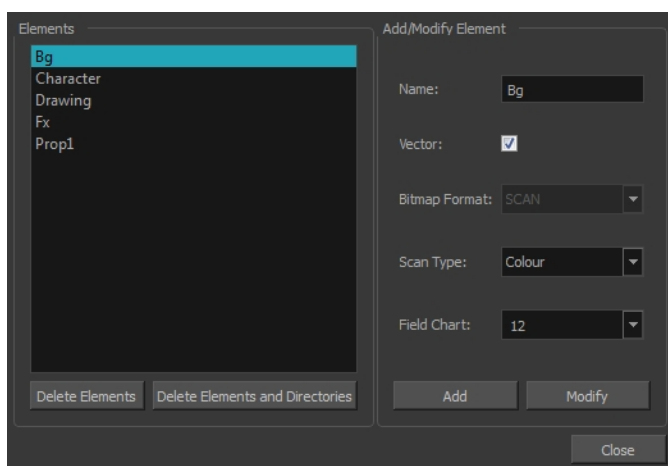
### How to reorder columns in the Xsheet view

1. In the Xsheet view, click on the column's header with the middle mouse button.
2. Drag the column to its new position.



### How to use the Element Manager dialog box

- ▶ From the top menu, select **Scene > Element Manager**.



Interface Element	Action
<b>Elements</b>	Displays a list of the elements in the scene.
<b>Delete Elements</b>	Deletes the selected elements.
<b>Delete Elements and Directories</b>	Deletes the selected layer and its directories (drawing folder).

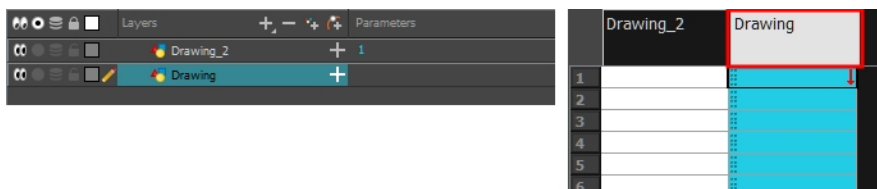
Interface Element	Action
<b>Add/Modify Element</b>	Use this area to add or modify an element.
<b>Name</b>	Type in a new name in this field to create an element or to rename the selected element.
<b>Vector</b>	Select this option if the new element is a vector drawing or if you want to enable the parameters on the selected element in the Elements list.
<b>Bitmap Format</b>	Lets you select the file format of the bitmap layer.
<b>Scan Type</b>	If you're planning to scan elements with the Toon Boom Harmony Scan module, select the scan type from the list.
<b>Field Chart</b>	If you're importing traditional animation, select the size of the paper on which the animation was drawn.
<b>Add</b>	Creates a new element with the current parameters entered in the <b>Add/Modify Element</b> section.
<b>Modify</b>	Applies the parameter changes made to the selected element.

## Duplicating Layers and Columns

Duplicating an element provides you with a copy of the drawings and their exposure. You can modify anything you want in the duplicated element without affecting the original one.

### How to duplicate an element

1. In the Timeline or Xsheet view, click the layer or column you want to duplicate.



1. In the Timeline or Xsheet menu, select **Drawings > Duplicate Drawings** or press Alt + Shift + D.

The new duplicated layer or column appears.

## Cloning Layers and Columns

Cloning a layer or column provides you with a copy of the selected element that uses the same drawings as the original. For example, if you modify a drawing in the cloned or original column, it is updated in both columns.

You can choose whether or not to copy the column timing to the cloned columns.

- You can modify the column timing independently from each other, but the drawings remain linked.



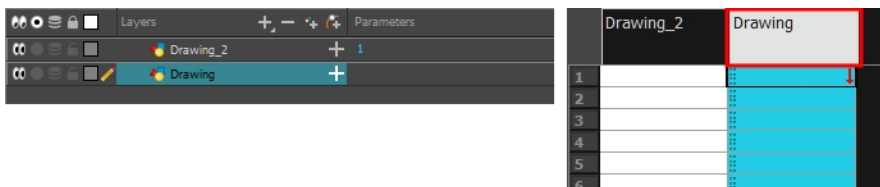
- You can copy the columns timing, so drawings and timings remain linked.

You can clone selected nodes from the Node view in the same way.

This is useful when you want to reuse a hand-drawn animation but have different timings.

### How to clone an element

1. In the Timeline or Xsheet view, select the layer or column you want to clone.



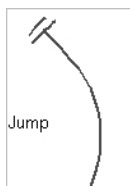
1. Do one of the following:
  - From the top menu, select **Edit > Clone: Drawings Only** to clone only the layer or column drawings.
  - From the Timeline menu, select **Layers > Clone Selected Layers: Drawings Only**.
  - In the Xsheet menu, select **Columns: Clone Selected Columns: Drawings Only**.

The new cloned layer or column appears.

## Adding an Annotation Column

The annotation columns are useful for marking actions, corrections or other information related to your animation that you want to draw or write. This way, you can print your Xsheet, take it back to your animation table and work with the annotations.

Before you can draw in the Annotation column, you must first activate the Enable Drawing option to activate the Drawing mode. Pen tablet pressure sensitivity is not supported in the annotation column.



In the annotation column, you can type in your notes and relevant information, as well as draw sketches and ideas that will be useful in producing your animation.

Typing in an annotation column is independent from the Drawing mode. You can be in either mode and the typing will work. To learn about typing values in the Xsheet view, see [Typing Exposure on page 65](#).

You can erase part or all of the annotation column's text and drawn annotations. Annotations that you type in cannot be erased using this method.

You can change the pen size and colour when you draw in the annotation column.

When working with the annotation columns, it is useful to display tick marks on odd-numbered frames.

shadow_d Lumberjack_D_Colo	Lumberjack_D_Colo Lumberjack_D_Colo	bench_matte_D_1	Annotation
1	1	1	
2	2		
3	3		
1	1		
2	2		
3	3		
1	1		
2	2		
3	3		
1	1		
2	2		
3	3		
1	1		
2	2		


Tick marks in Annotation column

To display the tick marks, you must run a short script.

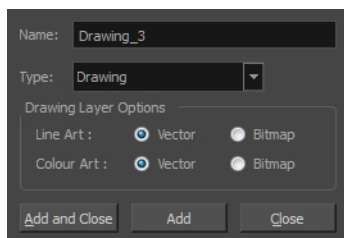
If you scanned your paper exposure sheet's annotations or if you need to place some pictures or drawings in the Annotation columns, you can easily import them.

### How to add an annotation column

1. Do one of the following:

- ▶ In the Xsheet menu, select **Columns > Add Columns**.
- ▶ In the Xsheet toolbar, click the **Add Columns**  button.
- ▶ Press Shift + C.

The Add Column dialog box opens.




2. In the Name field, type in an appropriate name.
3. From the Type list, select **Annotation** and click OK.

The new column appears.

### How to draw in the annotation column

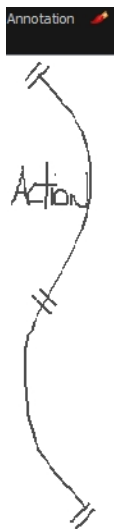
1. Do one of the following:

- ▶ In the Xsheet menu, select **Annotation > Enable Drawing**.

- ▶ In the Annotation column header, click the icon in the upper-right corner to cycle through the icons until the Brush  icon is displayed.

The Drawing mode is enabled.

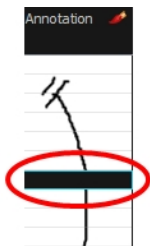
2. To draw in an Annotation column, simply use your mouse or pen tablet.



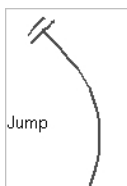
### How to type in an annotation column

1. Do one of the following:


- ▶ In the selected cell, press Ctrl (Windows/Linux) or ⌘ (Mac OS X).
- ▶ In the selected cell, hold down Ctrl + Shift + click (Windows/Linux) or ⌘ + Shift + click (Mac OS X).

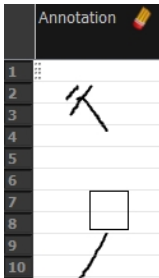


2. In the selected cell, type the desired text.



### How to erase part of a drawn annotation using Erasing mode

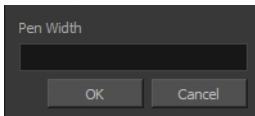
1. In the annotation column header, click the icon in the upper-right corner to cycle through the icons until the Eraser  icon is displayed.
2. In the column, click and drag the cursor on top of the drawn annotation to erase parts of it.



**NOTE:** When using a pen on a tablet, you MUST flip your pen to the eraser side for the eraser to work.

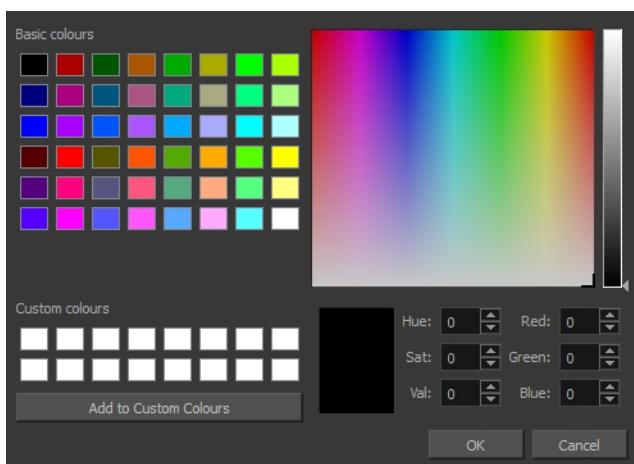
### How to change the pen width

1. In the Xsheet menu, select **Annotation > Pen Width** and do one of the following:
  - Select a pen width preset.
  - Select **Change Current** to display the Pen Width dialog box. In the Pen Width field, type the number of pixels for the pen size and click **OK**.



### How to change the pen colour

1. In the Xsheet menu, select **Annotation > Change Pen Colour**.  
The Select Colour dialog box opens.



2. Choose a new colour.
3. Click **OK**.

### How to display tick marks

1. From the top menu, select **Windows > Script Editor**.
2. From the Script Editor menu, select **File > New Script**.
3. Type in a name for your script and click **OK**.
4. In the File list, select the script you created.
5. On the right side of the view, type the following script:

```
function display_tick_marks()
{
  preferences.SetBool("XSHEET_ANNOTATION_FRAME_MARKER", true);
  MessageLog.trace(preferences.getBool("XSHEET_ANNOTATION_FRAME_MARKER", false));
}
```

6. Click **Verify**.  
The script is verified.
7. From the Script Editor menu, select **Play/Debug > Run**.  
A dialog box opens with your script selected in the Files column.
8. In the Functions column, select **display\_tick\_marks** and click **OK**.

Tick marks appear on odd frames in the Annotation column. If you do not see tick marks, close and restart Harmony.

### How to turn off the display of tick marks

1. Follow steps 1 to 5 of *How to display tick marks* and use the following script:

```
{
  preferences.setBool("XSHEET_ANNOTATION_FRAME_MARKER", false);
  MessageLog.trace(preferences.getBool("XSHEET_ANNOTATION_FRAME_MARKER", false));
}
```

2. Follow steps 6 to 8.

All tick marks are removed from the Annotation column.

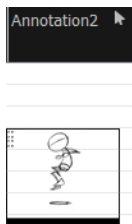
### How to import annotation files

1. In the Xsheet view, select the first cell in the Annotation column where you want the imported image to start.



2. Do one of the following:
  - ▶ Right-click on the cell and select **Annotation > Import File**.
  - ▶ From the Xsheet menu, select **Annotation > Import File**.
3. Browse for the bitmap image to import.
4. Click **Open**.

The image appears in the Annotation column.




## Linking External Files with Timing Columns

Timing columns are unique in that they can reference a source folder outside of the project folder to bring images into the project. For example, you may have background scenes created in a third party software that you might need to update in the future. By using Timing columns, you can dynamically link your backgrounds, expose different backgrounds at different times, and have live, automatic updating capabilities.

**IMPORTANT:** If the project file is moved, or if the folder that the column is linked to is moved, then dynamic linking is broken and the images that were in that folder will disappear in Toon Boom Harmony.

## How to use a Timing column

1. In the Xsheet view, click the Add Columns  button.
1. In the Add Column dialog box, type in the name of the new column, then from the Type menu, select **Timing**.
1. Do one of the following:
  - Click **OK** if you are finished.
  - Click **Apply** if you want to continue adding more columns and column types.

A peach coloured column appears in the Xsheet with the name you typed in, and for the header, <unused>.

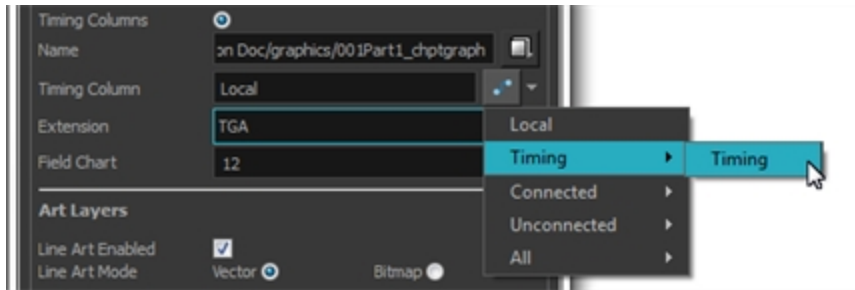
	Drawing	<unused> Timing
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		

1. In the Node view, add a new node.
1. Open the **Layer Properties** editor by clicking the yellow square of the node.
1. In the Drawing tab, select the **Timing Columns** option.
1. In the Name field, enter the path of the folder you want to access. If you use the Browse button to locate a folder, you must select a file in the folder you want and then delete the dash and the suffix (for example, **background-01** should be renamed to **background**) from the file name in the field. If you leave the full file name selected, Harmony will display that file for the entire duration of the scene, regardless of the contents of the Timing Column field.

**NOTE:** This means that all the images in the folder that you are linking to are named using the naming convention described above. If for some reason you are unable to access a certain directory, type the directory extension directly in the path extension field at the top of the browser window.

1. In the Timing Column field, click the **Arrow** button to create a new timing column, or select the name of the column from the list. If you have an element directory selected in the Name field, the Timing Column will indicate which files are called from that element directory. Remember that the file displayed at each frame is based on the element name, cell label, and extension. If the element is **toto**, the timing column is

labeled 1, 2, and 3, and the extension is TVG, Harmony will display drawings `totobody-1.tvg`, `totobody-2.tvg`, and `totobody-3.tvg` at the selected frames.



In the Xsheet, the <unused> header changes to the name of the node in the Node view.

1. From the Extension list, select the file format of the files you want to display.
1. Click **OK**.
1. In the Xsheet view, in the Timing column, type the number that corresponds to the suffix of the drawing file that you want to expose to make it appear in the Camera view.

## Filling Exposure

Harmony provides different tools to fill in exposures and values, create cycles, and set increments.

This section is divided as follows:

- [Filling Exposure Mode on page 65](#)
- [Typing Exposure on page 65](#)
- [Holding Exposure on page 67](#)
- [Extending a Single Exposure on page 68](#)
- [Extending an Exposure Sequence on page 69](#)
- [Extending the Exposure of Previous Drawings on page 70](#)
- [Dragging Cells on page 71](#)
- [Increasing and Decreasing Exposure on page 74](#)
- [Inserting Blank Cells on page 77](#)
- [Setting the Exposure on page 78](#)
- [Filling a Selection with a Single Exposure on page 79](#)
- [Filling a Selection with a Sequence on page 80](#)
- [Filling a Selection Randomly on page 82](#)
- [Filling Empty Cells on page 83](#)
- [Deleting Exposure on page 76](#)
- [Creating Cycles on page 84](#)
- [Managing Key Exposures on page 88](#)



## Filling Exposure Mode

In the Xsheet view, you can fill columns using two different filling modes: Overwrite or Insert. These modes control the filling behaviour. The Timeline view only uses the Overwrite mode.

By default, the Xsheet view is set to Overwrite mode. Adding a new value or a new value sequence overwrites existing ones. The existing timing sequence remains in the same place and is not pushed down the column.

	Drawing	Drawing
1	1	1
2	2	2
3	3	3
4	4	4
5	5	7
6	6	8
7	7	9
8	8	10
9	9	11
10	10	12
11		
12		

The Insert mode is the opposite of the Overwrite mode. When you add a new value or a new value sequence over existing ones, the new values are inserted between the old ones. The existing timing sequence is pushed down the column.

	Drawing	Drawing
1	1	1
2	2	2
3	3	3
4	4	100
5	5	
6	6	
7	7	
8	8	100
9	9	4
10	10	5
11		6
12		7
13		8
14		9
15		10

### How to switch between Overwrite and Insert modes

- Do one of the following:
  - In the bottom-right corner of the Xsheet view, click **Overwrite/Insert**.
  - Press **I**.



## Typing Exposure

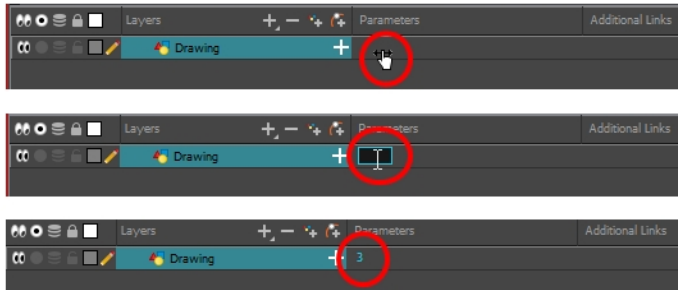
To fill in your exposure, you can type the values directly in the Xsheet view.

If you want to type an exact drawing name or value in the Timeline view, you must use the Parameters section of the Timeline.

**NOTE:** You can only use alphanumeric values. (0-9, a-z, underscore (\_) and dash (-)).

### How to type a value in the Timeline view

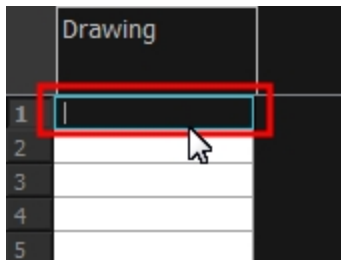
1. In the Drawing Substitution field, double-click to edit the field and type the name of the drawing you want to create.



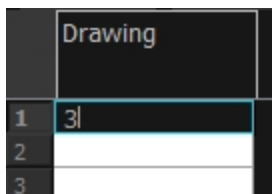
2. Press Enter/Return to validate the value.

### How to type values in the Xsheet view

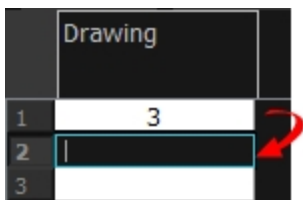
1. In an Xsheet column, double-click on a cell.



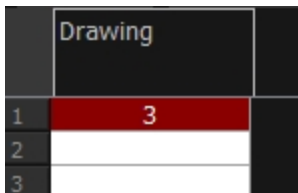
2. Type a value or drawing name in the cell.



3. Press Enter/Return to move to the next cell.



- Press Esc to exit the typing mode and return to normal mode.

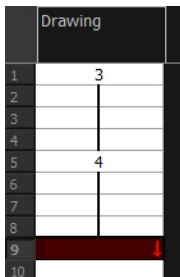


## Holding Exposure

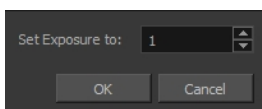
Drawings in an animation project are often exposed for more than one frame. The most common exposure of a drawing is two frames. In the industry, this type of exposure is known as *animation in double frames* or *animation on twos*. A drawing can also be exposed for three, four, or five cells and so on. To prevent mistakes and save time, you can hold cells automatically as you type in the Xsheet view.

### How to hold exposure

- Do one of the following:
  - In the Xsheet menu, select **Exposure > Hold Exposure > Hold 2 Cells**.
  - In the Xsheet view, right-click and select **Exposure > Set Exposure To > Set Exposure to 1, 2, 3, or Set Exposure**. The settings you select will be kept from session to session. You do need to set them every time you use Harmony.
  - From the top menu, select **Animation > Cell > Hold Exposure > the desired option**.
- Type a value or drawing name in the cell.
  - Press Enter/Return to move on to the next cell.
  - Press Esc to quit the typing mode.





- If you selected Set Exposure, the Set Exposure dialog box opens. You can hold as many cells as needed.

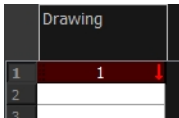


## Extending a Single Exposure

Extending the exposure lets you select a cell that contains a value and pull it down to the desired frame.

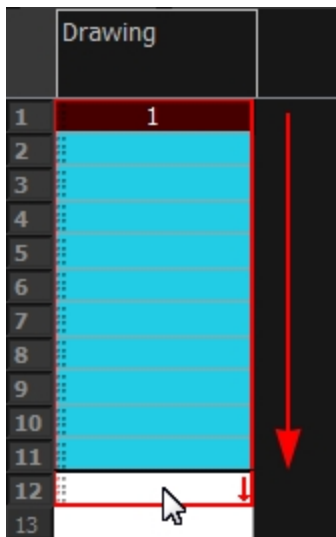
### How to extend a cell exposure gesturally

1. In the Xsheet view, select the red arrow  in the cell's right side. Make sure you see the drag down  cursor.



2. Pull down the selected cell to the desired frame.

**NOTE:** The red selection box must be visible when releasing the cursor. If not, the action is considered cancelled.



### How to extend a sequence from the top menu

1. Do one of the following:
  - From the top menu, select **Animation > Cell > Extend Exposure**.
  - Press F5.



The Extend Exposure dialog box opens.

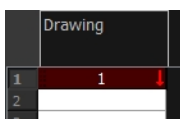
2. Enter the frame number you want to extend the cell to.

## Extending an Exposure Sequence

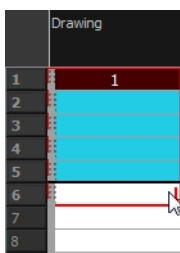
When working with a sequence that contains only numbers, you can extend an exposure sequence in a similar manner to extending a single exposure.

### How to extend an exposure to create a sequence

1. In the Xsheet view, select a cell containing a number.
2. In the selected cell, click the red arrow  on the cell's right side. Make sure to see the drag down  cursor.

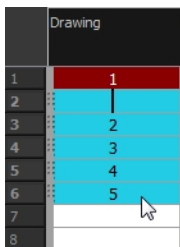


3. Hold down the Shift key. Make sure a plus sign (+) appears.
4. Pull down the selection box to the desired frame.



**NOTE:** The red selection box must be visible when releasing the cursor. If not, the action is considered cancelled.

5. First release the Shift key, then release the mouse button.

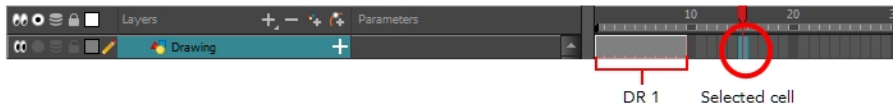


## Extending the Exposure of Previous Drawings

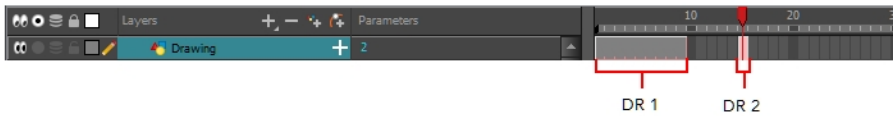
When drawing on a blank frame you can automatically create a new drawing and extend the timing from the previous exposed drawing.

In the following example, a cell is selected on the timeline for creating a new drawing in image A. In image B, the previous exposure does not extend to the new drawing, while in image C, it does.

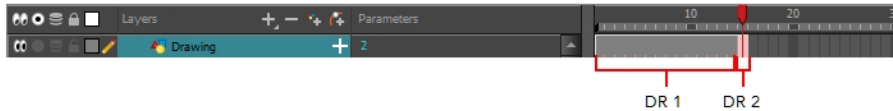
A: A cell is selected for a new drawing.



B: The previous exposure is not extended to the beginning of the new drawing.



C: The previous exposure extends to the beginning of the new drawing.

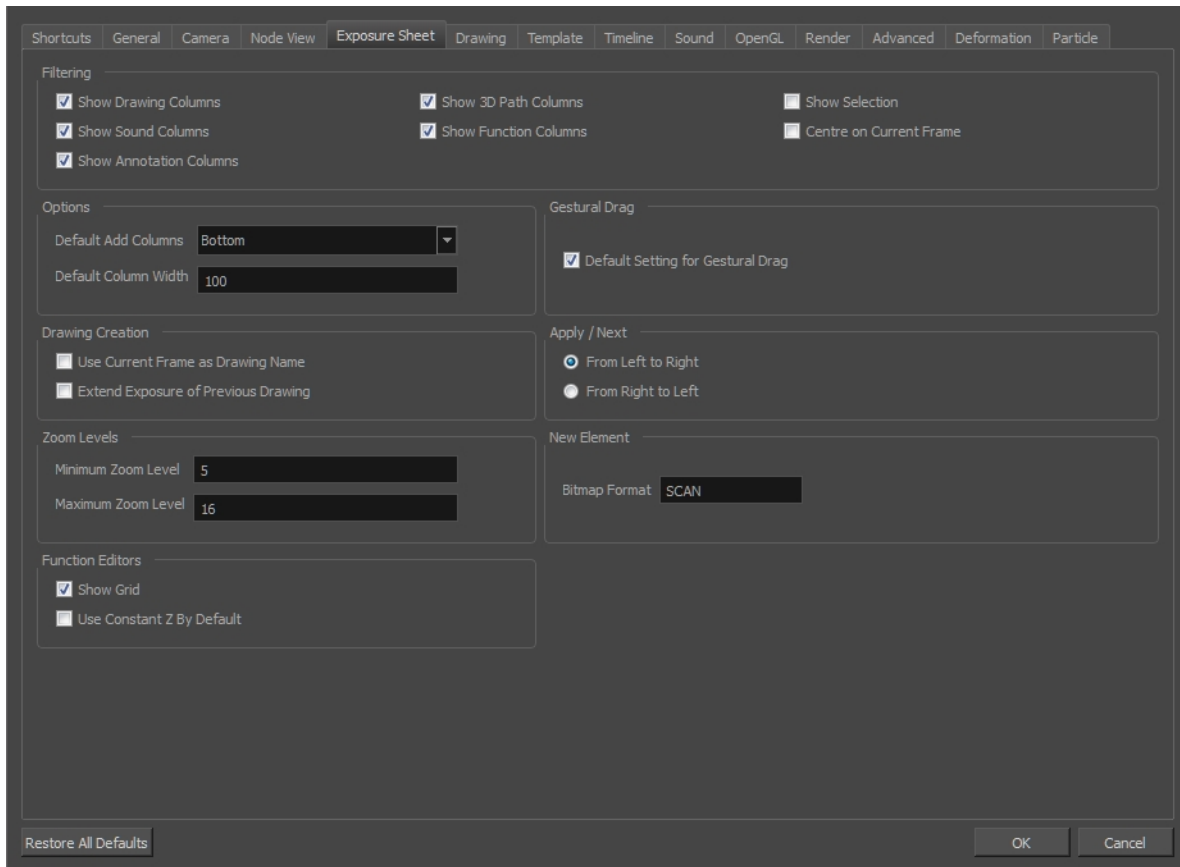


### How to extend the exposure of previous drawings

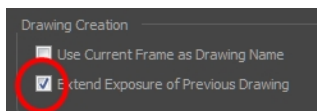
1. Open the Preferences dialog box by doing one of the following:
  - From the top menu, select Edit > Preferences.
  - Press Ctrl + U (Windows/Linux) or ⌘ + U (Mac OS X).

The Preferences dialog box opens.

2. Select the **Exposure Sheet** tab.



3. In the Drawing Creation section, select the **Extend Exposure of Previous Drawing** option.



4. On the left side of the Timeline view, select a cell and create a new drawing.

The previous exposure automatically extends to the beginning of the new drawing.

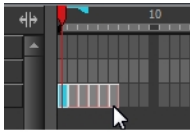
## Dragging Cells

To readjust your timing, you can drag one or more cells to a new location. You can drag a cell to any other frame in the same column or into another column.

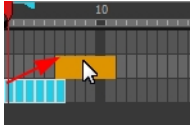
You can turn off the Gestural Drag mode for the Xsheet view to prevent drawings from being dragged from one location to another. This feature does not apply to Annotation columns.

### How to drag a cell to another location in the Timeline view

1. In the Timeline view, select one or more cells to move.

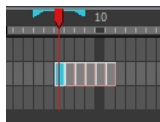


2. Drag the cells to the new location.

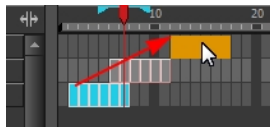


3. Drop the selection by doing one of the following:

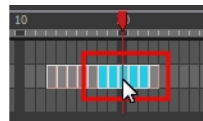
- ▶ Drop by simply releasing the mouse or pen.



- ▶ Hold Ctrl (Windows/Linux) or ⌘ (Mac OS X) while dropping the selection to copy the cells. The original cells will not be moved.




- ▶ Press Shift while dropping the selection to insert them between existing frames.



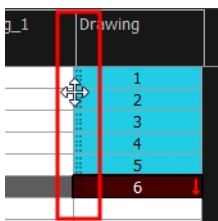
### How to drag a cell to another location in the Xsheet view

1. In the Xsheet view, select one or more cells.

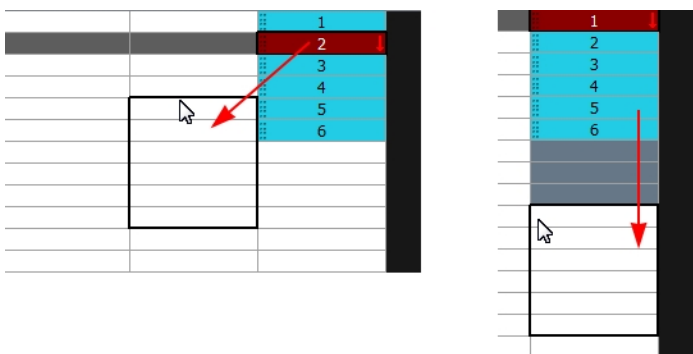
	Drawing_2	Drawing_1	Drawing
1			1
2			2
3			3
4			4
5			5
6			6
7			
8			
9			

2. In the Xsheet view, position the pointer over the small dotted area  on the left side of the selected cells.





3. Drag the selection to any other cell in the same column or in another column.

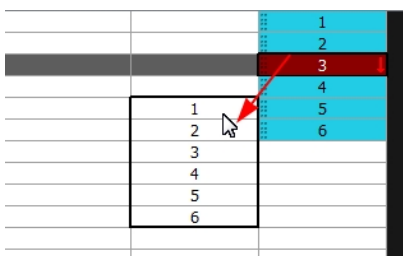


4. Do one of the following:

- ▶ Drop the selection to overwrite the existing cells.

	Drawing_2	Drawing_1	Drawing
1		1	
2		2	
3		3	
4		4	
5		1	
6		2	
7		3	
8		4	
9		5	
10		6	
11		11	
12		12	
13		13	
14			

- ▶ Hold down Ctrl (Windows/Linux) or ⌘ (Mac OS X) while dropping the selection to copy the cells. The original selection will not be moved.



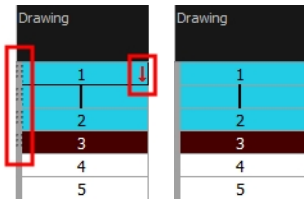
- ▶ Press Shift while dropping the selection to insert it between existing frames.

	Drawing_2	Drawing_1	Drawing
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		1	
9		2	
10		3	
11		4	
12		5	
13		6	
14		8	
15		9	
16		10	
17		11	
18		12	
19		13	

### How to turn off the Gestural Drag mode

1. Do one of the following:

- ▶ In the Xsheet view, right-click and deselect the **Gestural Drag Mode** option.
- ▶ In the Xsheet toolbar, click the Toggle Gestural Drag Mode button (you may have to customize the toolbar to display it).



The dragging pad disappears on selected cells when the Gestural Drag mode is off.

## Increasing and Decreasing Exposure

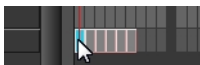
Once a value is entered in the Timeline or Xsheet view, you can increase and decrease its exposure.

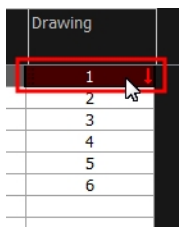
Increasing the exposure adds one more exposure to a selected cell; repeating this action adds an extra cell each time. This is an efficient way to extend a drawing's exposure and is always set in Insert mode. Increasing an exposure pushes the existing exposure forward.

Decreasing the exposure removes one exposure from a selected cell and pulls any cells following it to the beginning of selection.


### How to increase exposure

1. In the Timeline or Xsheet view, select a cell.





2. Do one of the following:

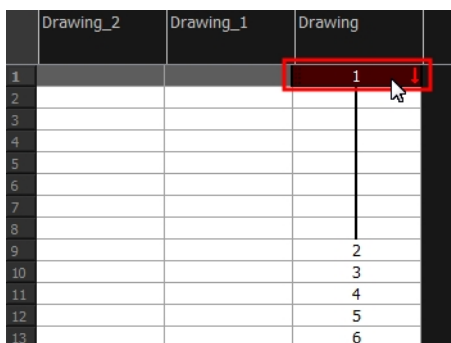
- ▶ From the top menu, select **Animation > Cell > Increase Exposure**.
- ▶ In the Xsheet toolbar, click the Increase Exposure  button.
- ▶ At the bottom-right corner of the Xsheet view, set the number of cells over which the drawing will be exposed.




- ▶ Right-click and select **Exposure > Increase Exposure**.
- ▶ Press +.

## How to decrease exposure

1. In the Timeline or Xsheet view, select a cell.



2. Do one of the following:

- ▶ From the top menu, select **Animation > Cell > Decrease Exposure**.
- ▶ In the Xsheet toolbar, click the Decrease Exposure  button.
- ▶ At the bottom-right corner of the Xsheet view, set the number of cells over which the drawing will be exposed.



- ▶ Right-click and select **Exposure > Decrease Exposure**.
- ▶ Press -.


### How to use the Clear Exposure and Pull feature

1. In the Timeline or Xsheet view, select a range of cells.



	Drawing_2	Drawing_1	Drawing
1			1
2			
3			
4			
5			
6			
7			
8			
9			2
10			3
11			4
12			5
13			6

2. Do one of the following:

- ▶ From the top menu, select **Animation > Cell > Clear Exposure and Pull**.
- ▶ Right-click and select **Exposure > Clear Exposure and Pull**.
- ▶ In the Xsheet toolbar, click the Clear Exposure and Pull  button.

The exposure is reduced by the selected number of cells.

## Deleting Exposure

You can delete a drawing's exposure in several ways. When you delete a drawing's exposure from the Timeline or Xsheet view, you are not deleting the actual drawing file. You can always retrieve it by typing its name again in a cell.

You can delete the exposure in a selected cell range or delete the entire exposure of a drawing exposed over several cells. Note that you can also delete the exposure for drawings inside a collapsed group.


### How to delete selected exposures

1. In the Timeline or Xsheet view, select the exposure you want to delete.
2. Do one of the following:
  - ▶ Right-click and select **Delete**.
  - ▶ Press Delete.

### How to clear the entire exposure of a drawing

1. In the Timeline or Xsheet view, select a cell of a drawing exposed over several cells.

2. Do one of the following:

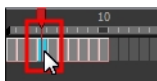
- ▶ From the top menu, select **Animation > Cell > Clear Exposure**.
- ▶ In the Timeline view, right-click and select **Exposure > Clear Exposure**.
- ▶ In the Xsheet toolbar, click the Clear Exposure  button (you may have to customize the toolbar to display it).

## Inserting Blank Cells

You can place an empty cell between other cells.


### How to insert blank cells

1. In the Timeline or Xsheet view, select the cell in which you want to insert a blank cell.



Drawing	
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10

2. Do one of the following:

- ▶ In the top menu, select **Animation > Cell > Insert Blank Cell**.
- ▶ Right-click on the selected cell and select **Exposure > Insert Blank Cell**.
- ▶ In the Timeline or Xsheet toolbar, click the Insert Blank Cell  button (you may have to customize the toolbar to display it).
- ▶ Press Shift + J.

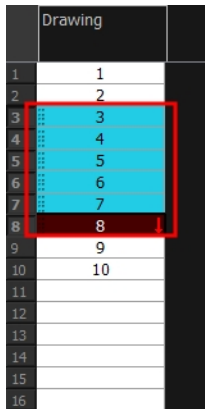
A blank cell is inserted.



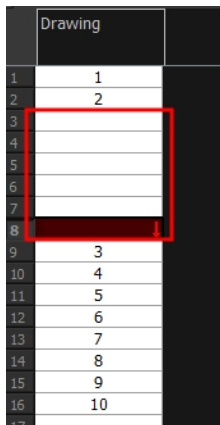
Drawing	
1	1
2	2
3	3
4	
5	4
6	5
7	6
8	7
9	8
10	9
11	10
12	

### How to clear a selected cell range without changing the exposure and timing

1. In the Xsheet view, select a frame range to clear.



2. Right-click and select **Clear**.

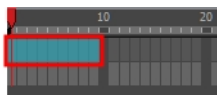


## Setting the Exposure





You can easily increase or decrease the exposure for a selected cell range.

### How to set the exposure

1. In the Timeline or Xsheet view, select the cell range on which you want to set the exposure.



	Drawing
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	

- Do one of the following:
  - From the top menu, select **Animation > Cell > Set Exposure to > Set Exposure to 1, 2, 3, or Set Exposure**.
  - In the Timeline toolbar, click one of the Set Exposure     buttons (you may have to customize the toolbar to display them).
  - In the Xsheet view, right-click and select **Exposure > Set Exposure to > Set Exposure to 1, 2, or 3, or Set Exposure**.
- If you chose the Set Exposure option, the Set Exposure dialog box opens. Enter the number of frames you want the drawings to display and click **OK**.

Set Exposure to: 
▲  
▼

OK Cancel

The new timing is displayed in the Xsheet view.

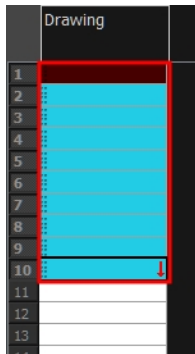
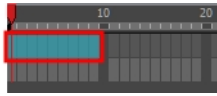
	Drawing
1	1
2	2
3	
4	
5	3
6	
7	3
8	4
9	
10	
11	5
12	
13	
14	6
15	
16	
17	7
18	
19	
20	8
21	9
22	10

## Filling a Selection with a Single Exposure


You can fill the same value over an entire selection. The selection can be over one cell, a cell range in one column, a cell range over many columns, an entire column, or many columns. You can use numbers, words, letters, or any alphanumeric value.

## How to fill a selection with a single exposure

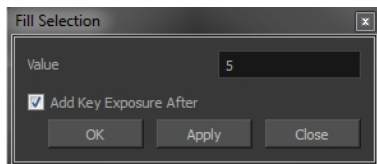
1. In the Timeline or Xsheet view, select a cell range.



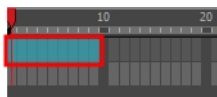
2. Do one of the following:

- ▶ From the top menu, select **Animation > Cell > Fill Selection**.
- ▶ In the Xsheet toolbar, click the Fill Selection  button (you may have to customize the toolbar to display it).
- ▶ Press Ctrl + T (Windows/Linux) or ⌘ + T (Mac OS X).

The Fill Selection dialog box opens.



3. In the Value field, type the desired value.
4. To insert a key exposure in the frame following the last cell in the selection, select the **Add Key Exposure After** option. Otherwise, leave it deselected.
5. Click **OK**.



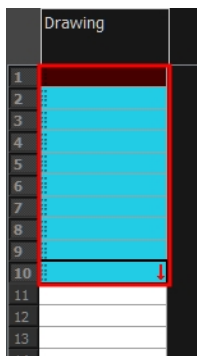
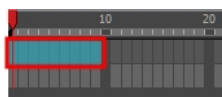
## Filling a Selection with a Sequence

You can create a numbered sequence over a selection. The sequence can be forward, backward, single, double or higher increment, as a cycle, and so on. The selection can be over one cell or a cell range in one column or more or an entire column or many entire columns.




## How to fill a selection with a sequence

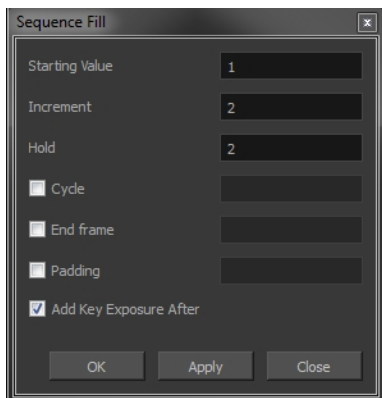
1. In the Timeline or Xsheet view, select a cell range.



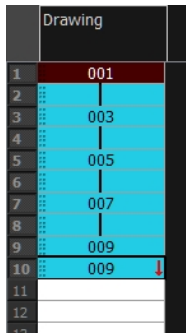
2. Do one of the following:

- ▶ From the top menu, select **Animation > Cell > Sequence Fill**.
- ▶ In the Timeline view, right-click and select **Exposure > Sequence Fill**.
- ▶ In the Xsheet toolbar, click the Sequence Fill  button (you may have to customize the toolbar to display it).
- ▶ Press **Ctrl + M** (Windows/Linux) or **⌘ + M** (Mac OS X).

The Sequence Fill dialog box opens.



3. In the Starting Value field, type the first number in the sequence.
4. In the Increment field, type the number by which the drawing number will increase from frame to frame. For example, an increment of 1 gives you: 1-2-3-4; an increment of 2 gives you: 1-3-5-7; and -2 gives you this: 8-6-4-2.

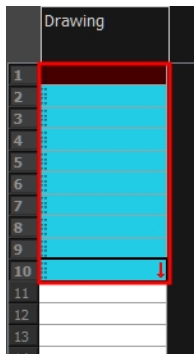
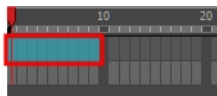


## Filling a Selection Randomly


You can fill in random values over a selection. You can give a maximum and a minimum value and create a range for Harmony to choose the random values from. The selection can be over one cell or a cell range in one column or more or an entire column or many entire columns.

### How to fill cells randomly

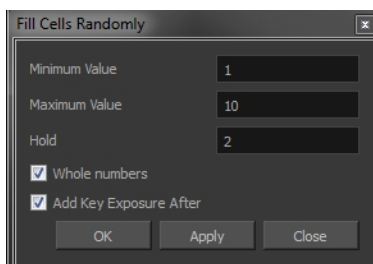
1. In the Timeline or Xsheet view, select a cell range.



2. Do one of the following:

- ▶ Select **Animation > Cell > Fill Cells Randomly**.
- ▶ In the Xsheet view, click the Fill Cells Randomly  button (you may have to customize the toolbar to display it).

The Fill Cells Randomly dialog box opens.



3. In the Minimum Value field, enter the lowest acceptable value.
4. In the Maximum Value field, enter the highest acceptable value.
5. In the Hold field, choose an exposure holding value.
6. If you are applying this option to a drawing column, select the **Whole Numbers** option to avoid decimal points.
7. Click **OK**.

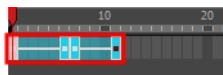
	Drawing
1	5
2	
3	3
4	
5	9
6	
7	2
8	
9	
10	
11	

## Filling Empty Cells


You can fill empty cells to extend the exposure of single frame drawings to fill the range of empty cells after each one. When creating drawings on cells that are not side-by-side, the exposure of the first drawing no longer fills automatically. You must select the frame range where you want your drawings to hold their exposure up to the next drawing and use the Fill Empty Cells command.

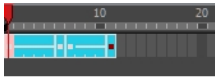
### How to fill empty cells

1. In the Timeline or Xsheet view, select a cell range.



	Drawing
1	1
2	
3	
4	
5	
6	2
7	3
8	
9	
10	
11	4
12	
13	

2. Do one of the following:
  - ▶ Right-click and select **Exposure > Fill Empty Cells**.
  - ▶ From the top menu, select **Animation > Cell > Fill Empty Cells**.
  - ▶ In the Timeline toolbar, click the Fill Empty Cells  button.



Each drawing in the selection is exposed in the range of empty cells that follow it.

## Creating Cycles

Once you have entered a series of drawings and exposures, you can create cycles out of them in several ways.

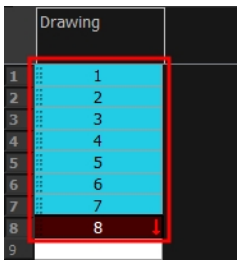
You can loop your drawings using the following commands:


- Create Cycle
- Paste Cycle
- Paste Reverse

When you create a drawing cycle, all of the repeated drawings are linked to the same original files. This means that when you modify, repaint, or correct a drawing named "1" for example, all drawings named "1" are updated simultaneously. In order to modify a drawing independently from its other exposures, you must duplicate the drawing.

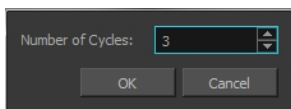
### How to create a cycle

1. In the Timeline or Xsheet view, select the cell range to loop.



2. Right-click on the selection and select **Create Cycle** or in the Timeline toolbar, click the Create Cycle  button (you may have to customize the toolbar to display it).

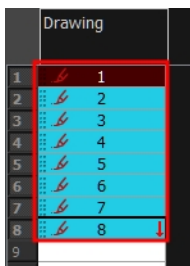
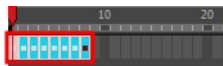
The Create Cycle dialog box opens.



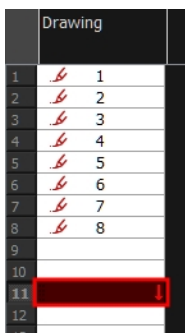
3. Enter the number of cycles you want, including the current selection.

## How to paste a cycle

1. In the Timeline or Xsheet view, select the cell range to loop.

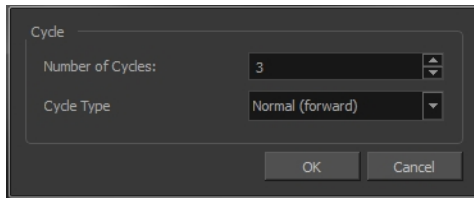


1. From the top menu, select **Edit > Copy Cell from Timeline or Xsheet** or press **Ctrl + C** (Windows/Linux) or **⌘ + C** (Mac OS X).
2. In the Timeline or Xsheet view, select the cell where you want your cycles to start.



3. Do one of the following:
  - ▶ From the top menu, select **Edit > Paste Cycle**.
  - ▶ Right-click and select **Paste Cycle**.
  - ▶ Press **Ctrl + /** (Windows/Linux) or **⌘ + /** (Mac OS X).

The Paste Cycle dialog box opens.



4. Do one of the following:
  - ▶ In the Number of Cycles field, enter the number of cycles you want to paste.
  - ▶ Increase or decrease the number of cycles you want to paste.
5. In the Cycle Type menu, select the type of cycle you want to paste.

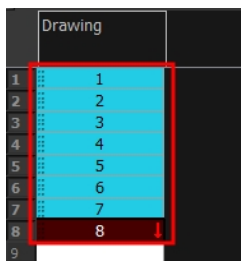
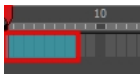


- ▶ **Normal (forward):** Pastes cycles as for all cycles, starting with the first cell of your selection and ending with the last.
  - ▶ **Reverse:** Pastes cycles in the reverse order of the original selection, starting with the last cell of your selection and ending with the first one.
  - ▶ **Forward > Reverse:** Pastes the first cycle in your selection as is, then the following one in reverse order. This repeated until all cycles are pasted.
  - ▶ **Reverse > Forward:** Pastes the first cycle in your selection in reverse order, then the following one as is. This repeated until all cycles are pasted.
6. Click **OK**.

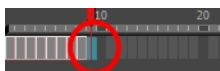
**NOTE:** You can perform the same operation using the Paste Special dialog box. To open the Paste Special dialog box, select **Edit > Paste Special** or press **Ctrl + B** (Windows/Linux) or **⌘ + B** (Mac OS X).

### How to paste a reversed cycle

1. In the Timeline or Xsheet view, select the cell range to paste in reverse order.



- From the top menu, select **Edit > Copy Cell from Timeline** or **Xsheet** or press **Ctrl + C** (Windows/Linux) or **⌘ + C** (Mac OS X).
- In the Timeline or Xsheet view, select the cell where you want your cycles to start.



	Drawing
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	
10	

- Do one of the following:
  - From the top menu, select **Edit > Paste Reverse**.
  - Right-click and select **Paste Reverse**.
  - Press **Ctrl + .** (Windows/Linux) or **⌘ + .** (Mac OS X).

	Drawing
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	8
10	7
11	6
12	5
13	4
14	3
15	2
16	1
17	

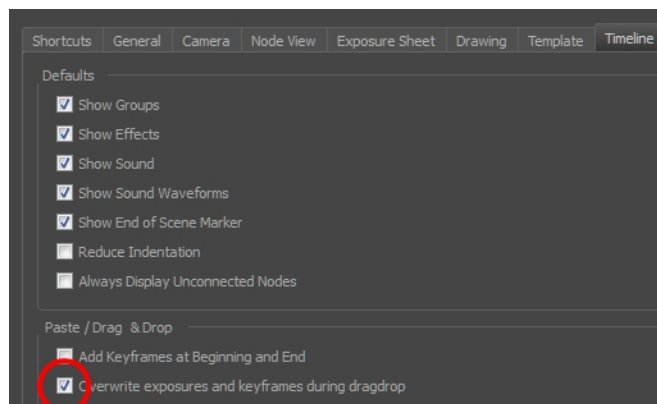
## Overwriting Exposures and Keyframes

If the area on which you are dropping a selection contains exposures and/or keyframes, they are overwritten by the content you are selected by dragging. You can set this mode in two places: the Timeline toolbar and the Preferences dialog box.

### How to override exposure and keyframes

- In the Timeline or Xsheet view, drag to select the drawings you want to move.
- Do one of the following:
  - In the Timeline toolbar, click the **Toggle Override Exposure and Keyframe During Drag and Drop** button (you may have to customize the toolbar to display it).

- ▶ From the top menu, select **Edit > Preferences** or press Ctrl + U (Windows/Linux) or ⌘ + U (Mac OS X). Select the **Timeline** tab, then select the **Override Exposure and Keyframe During Drag and Drop** option.



3. Drop your selection at the desired location.

## Managing Key Exposures

Before working with key exposures, it's important to understand how keyframes, exposure and key exposure work in Harmony:

- **Keyframe:** A keyframe is a point in time where a change to the properties of the object or character occurs. In Harmony, keyframes consist of the coordinates that determine how an entire layer and its contents are moved. Keyframes include these parameters: XYZ position, skew, scale, angle and pivot.
- **Exposure:** Exposure is a property; it is the length of time that a drawing is visible over a series of frames. In Harmony, exposure is independent of keyframes. That is, keyframes are not linked to drawings. Keyframes can be moved independently from the drawing exposure.
- **Key Exposure:** A key exposure in Harmony is a type of exposure that forces a drawing to remain exposed on a specific frame. If a drawing is exposed before a key exposure and you swap out that drawing for another one, then the original drawing is retained. This preserves the key drawing. Note that Harmony automatically sets a key exposure when you perform a drawing swap.

## Adding Key Exposures

Key exposures are mainly used for swapping drawings in cut-out animation where you will have numerous drawings for the various positions of the mouth or eyes of a character for example.

If there is a particular drawing you want to keep on a specific frame, you can set it as a key exposure. This prevents it from being overwritten by a drawing swap on a preceding frame. A key exposure is simply a property of an exposure that forces it to be exposed on a certain frame regardless of whether the previous exposure is the same drawing or not.

**NOTE:** Keep in mind that if you modify the artwork in a drawing, all instances of that drawing will be automatically updated even if set as a key exposure. This keeps your existing animation key poses intact. It is frequently used on a mouth or eyes layer.

**Example:** Swapping a drawing with no key exposure



In the following example, drawing 3 (DR 3) is selected on the timeline and it contains no key exposure.



When it is swapped for drawing 4 (DR 4), the entire duration of drawing 3 substituted for drawing 4.



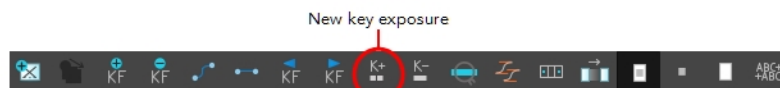
### Example: Swapping a drawing with a key exposure

Here's what happens when swapping a drawing with a key exposure. In the following example, the playhead is positioned in the middle of drawing 5 (DR 5) to set the position for the new key exposure. When the new key exposure is added, drawing 5 is split in two; both halves contain drawing 5. Now if you swap the first drawing 5 for drawing 1, the second drawing 5 retains its exposure.

A location is selected for a new key exposure.



A key exposure is added at the location of the playhead.



One drawing is swapped for drawing 1 (DR 1). The second drawing retains its exposure.



## How to add a key exposure

1. In the Timeline view, select the drawing cell to set as the key exposure.
2. Do one of the following:
  - In the Timeline toolbar, click the Add Key Exposure **K+** button.
  - In the Timeline menu, select **Exposure > Add Key Exposure**.
  - Right-click and select **Exposure > Add Key Exposure**.

A new key exposure is added.

If you added a key exposure at the beginning of the drawing, the entire exposure is filled with that same drawing. If you added a key exposure anywhere other than the beginning of the drawing, then the drawing is split in two and both parts contain the same drawing.

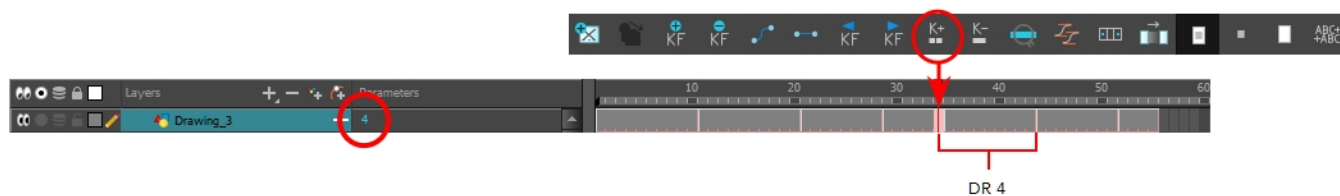
## Removing Key Exposures

When you no longer need a key exposure, you can remove it. When you do this, the existing key exposure is replaced by the preceding exposure. In the following example, a key exposure is set to drawing 1 (DR 1). When the key exposure is removed, the exposure is replaced by the preceding exposure, drawing 4 (DR 4).


Before: Key exposure is set to drawing 1.



After: Key exposure is removed. The preceding exposure, drawing 4, replaces the exposure.



### How to remove a key exposure

1. In the Timeline view, select a key exposure to remove.
2. Do one of the following:
  - ▶ In the Timeline toolbar, click the Remove Key Exposure  button.
  - ▶ In the Timeline menu, select **Exposure > Remove Key Exposure**.
  - ▶ Right-click and select **Exposure > Remove Key Exposure**.

The key exposure is removed and replaced by the preceding exposure.


## Removing Duplicate Key Exposures

When working with drawings to adjust the timing of a mouth in a lipsync, for example, and forcing the use of specific key exposures, unnecessary key exposures will be created. You can delete these duplicates without affecting the rest of the drawing. The first drawing of the selection will be used for the range.

**NOTE:** Duplicate key exposures may occur when pasting with the Enforce Key Exposure option selected.

### How to remove duplicate key exposures

1. In the Timeline view, select the layer that contains duplicate key exposures.

2. In the Timeline toolbar, click the Remove Duplicate Key Exposure  button (you may have to customize the toolbar to display it).

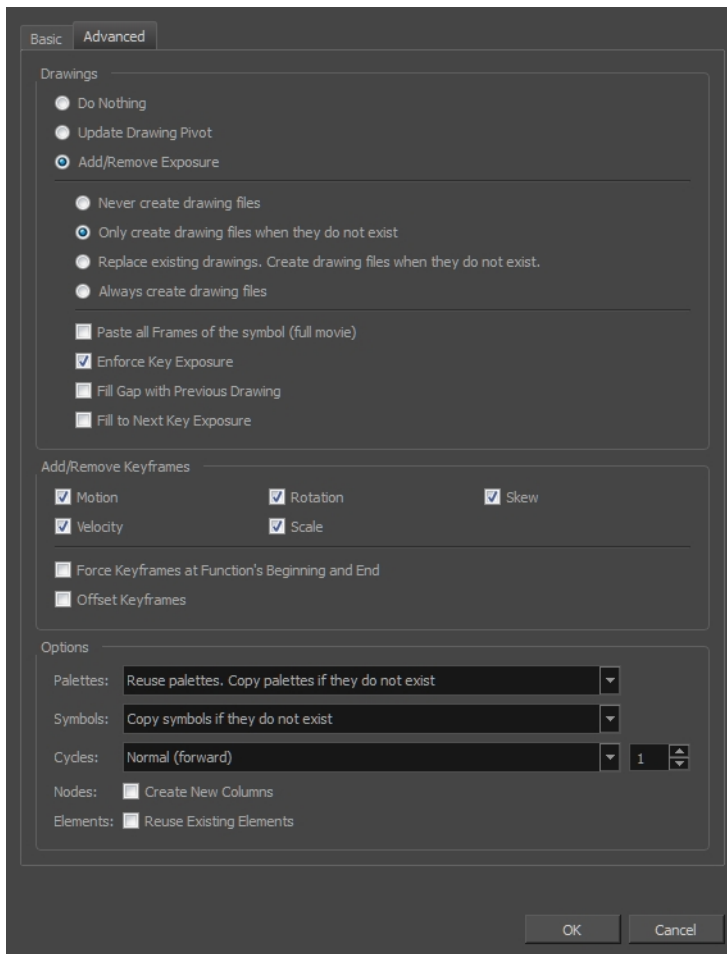
## Pasting Key Exposures Using Different Modes

As you animate, you will find that you reuse key exposures. There are different options to paste your selected drawings when they contain key exposures:

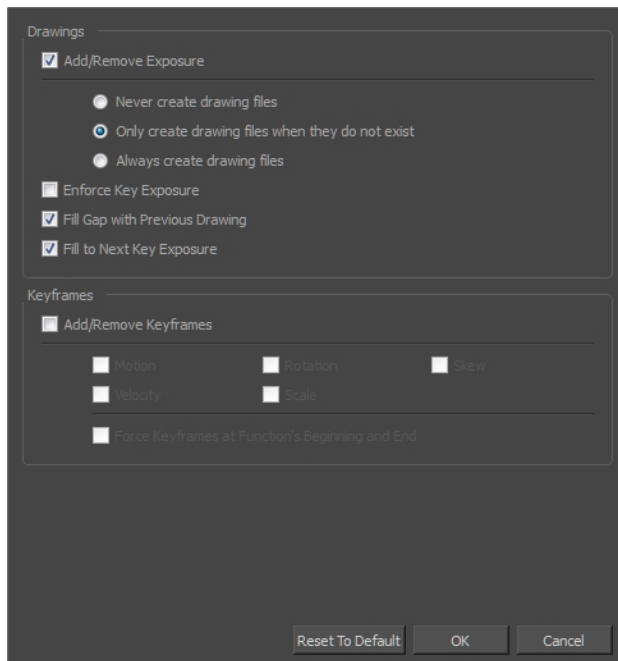
- **Enforce Key Exposure:** If there are key exposures that exist on copied drawings, they are preserved when pasting. No key exposures are added. This is the default behavior when pasting.
- **Fill Gap with Previous Drawing:** Fills selected area in the Xsheet or Timeline view with the previous drawing.
- **Fill to Next Key Exposure:** Fills selected area till the next key exposure.

### How to paste using different modes

1. In the Timeline or Xsheet view, select the drawings you want to copy and press Ctrl + C (Windows/Linux) or ⌘ + C (Mac OS X).
2. In the Timeline or Xsheet view, select the cell where you want your pasted selection to start.
3. Do one of the following:
  - Press Ctrl + B (Windows/Linux) or ⌘ + B (Mac OS X).  
The Paste Special dialog box opens.



- ▶ From the Timeline menu, select **Edit > Modify Paste Presets > Exposure**. The Edit Exposure Paste Preset dialog box opens.



4. Select the **Enforce Key Exposure** or **Fill to Next Key Exposure** option. In the Paste Special dialog box, these options are on the Basic tab.
5. Click **OK**.
6. Press **Ctrl + V** (Windows/Linux) or **⌘ + V** (Mac OS X) to paste your selection.

## Navigating between Frames and Columns

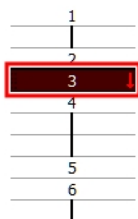
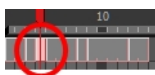
Once a cell is selected in the Timeline or Xsheet view, you can navigate between the drawings, frames, and layers using keyboard shortcuts that work in the Camera, Drawing, Xsheet and Timeline views.

You can navigate through:

- Drawings
- Frames
- Columns

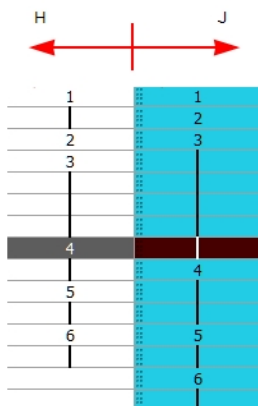
### How to navigate through drawings, frames and columns

1. In the Timeline or Xsheet view, select a cell.

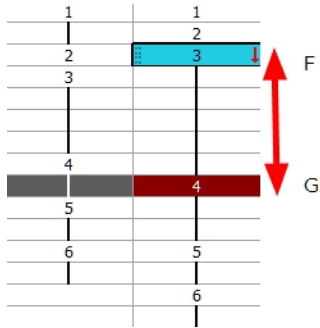


2. Once the cell is selected, you can navigate between:

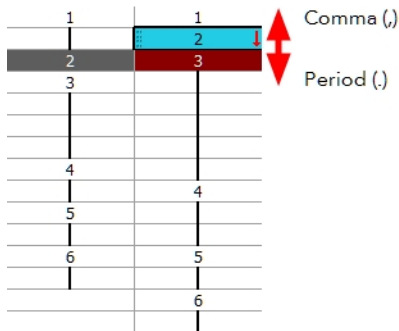
- **Previous and next layers:** From the top menu, select **Drawing > Previous Layer** and **Next Layer** or press **H** and **J**.



- **Previous and next drawings:** From the top menu, select **Drawing > Previous Drawing** and **Next Drawing** or press **F** and **G**.



- ▶ **Previous and next frames:** From the top menu, select **Play > Previous Frame** and **Next Frame** or press comma (,) and period (.).



## Managing Drawings

Drawings that are created in Toon Boom Harmony are not stored in their cells. They are actual files stored in the project's folder. If you want to rename a drawing or delete a drawing from your project, you need to edit the file and not the cells.

This section is divided as follows:

- [Renaming a Drawing on page 94](#)
- [Deleting a Drawing on page 96](#)
- [Duplicating a Drawing on page 97](#)
- [Copying and Pasting Drawings on page 97](#)
- [Merging Drawings on page 99](#)

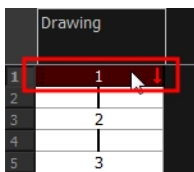
## Renaming a Drawing

To rename a drawing, you need to select the drawing cell and use the Rename Drawing command.


### How to rename a drawing

1. In the Timeline or Xsheet view, select the drawing to rename.

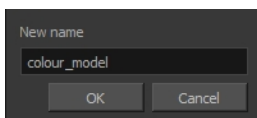




2. Do one of the following:

- ▶ Right-click and select **Drawings > Rename Drawing**.
- ▶ In the Timeline toolbar, click the Rename Drawing  button (you may have to customize the toolbar to display it).
- ▶ Press Ctrl + D (Windows/Linux) or ⌘ + D (Mac OS X).

The Rename Drawing dialog box opens.



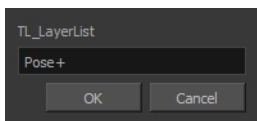
3. In the New Name field, type in the new drawing name.

### How to rename a drawing sequence with a prefix

You can rename a drawing sequence with a prefix, which can be quite useful for cut-out puppet breakdown and deformation animation.

1. In the Timeline or Xsheet view, select a drawing sequence. Note that you can only select a drawing range in one column or layer at a time.
2. Right-click and select **Drawings > Rename Drawing with Prefix**.

The Rename Drawing with Prefix dialog box opens.



3. In the Prefix to Add field, type the prefix to add before the drawing name.

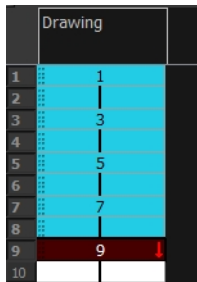
### How to rename drawings by their frame position

You can rename a series of drawings relative to their frame position. This is useful in hand-drawn animation.

1. In the Timeline or Xsheet view, select the drawing sequence to rename.



- From the top menu, select **Drawing > Rename by Frame**.



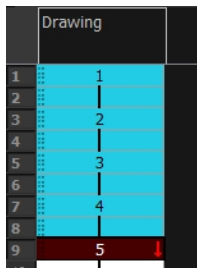
## Deleting a Drawing

You can permanently delete a drawing file from a project's folder.

**NOTE:** Deleting a drawing file is an operation that cannot be undone.

### How to delete a drawing

- In the Timeline or Xsheet view, select the drawings to delete.



- Do one of the following:
  - From the top menu, select **Drawing > Delete Selected Drawings**.
  - Right-click and select **Drawings > Delete Selected Drawings**.



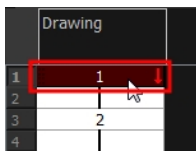
## Duplicating a Drawing


If you want to modify a drawing that already exists, but keep the original drawing intact, you can duplicate the drawing and work on the copy. When duplicating a drawing, the selected cell is replaced with the new drawing. The exposure of the original drawing that was on the current cell is removed. The original drawing is not deleted from the project folder or other cells in which it is exposed.

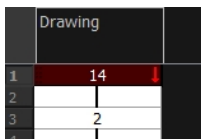
With Toon Boom Harmony, you can create a keyframe at the same time as you duplicate your drawing. This way, you can modify and reposition drawings without affecting the original drawing.

### How to duplicate a drawing

1. In the Timeline or Xsheet view, select the drawing to duplicate.



2. Do one of the following:
  - ▶ From the top menu, select **Drawing > Duplicate Drawings**.
  - ▶ Right-click and select **Drawings > Duplicate Drawings**.
  - ▶ In the Xsheet toolbar, click the Duplicate Drawing  button.
  - ▶ Press Alt + Shift + D.



## Copying and Pasting Drawings

When you copy and paste a selection in the Timeline or Xsheet view, you are not copying and pasting the actual drawings, you are pasting the exposure. Exposure is a property; it is the length of time that a drawing is visible over a series of frames. In Harmony, exposure is independent of keyframes. That is, keyframes are not linked to drawings. Keyframes can be moved independently from the drawing exposure.

If you want to copy and paste selected drawings into a different layer or paste the selection in the same layer to duplicate the drawings, you must use the Paste Special feature.

There are four different ways to paste your selected drawings with the Paste Special dialog box:

**Never create drawing files:** When adding exposures to a drawing layer, drawing files will not be created.

**Only create drawing files when they do not exist:** When adding exposures to a drawing layer, new drawings will be created only when drawings with the same name do not already exist in the destination.

**Replace existing drawings. Create drawing files when they do not exist:** Replace drawings with the same names to update a scene with new modified drawings and preserve the animation.

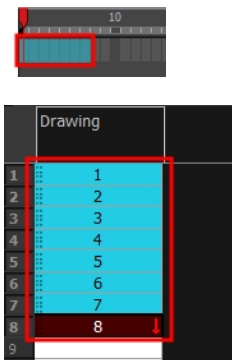
**Tip:** If you don't want to lose the existing animation when pasting a template, such as when placing new drawings after the animation, then delete the template's animation. It will still have updated the drawings but not override the existing animation.

**Always create drawing files:** When adding exposures to a drawing layer, new drawings will always be created. If drawing files with the same name already exist, Harmony will create a new name for the drawing.

If you want to perform another Paste Special operation using the same settings you used previously, you can use the Paste Special Again command instead. You can paste your selection using the same settings as in the most recent Paste Special operation, without opening the Paste Special dialog box.


### How to paste drawings with the Paste Special command

1. In the Timeline or Xsheet view, select the drawings to copy and press Ctrl + C (Windows/Linux) or ⌘ + C (Mac OS X).

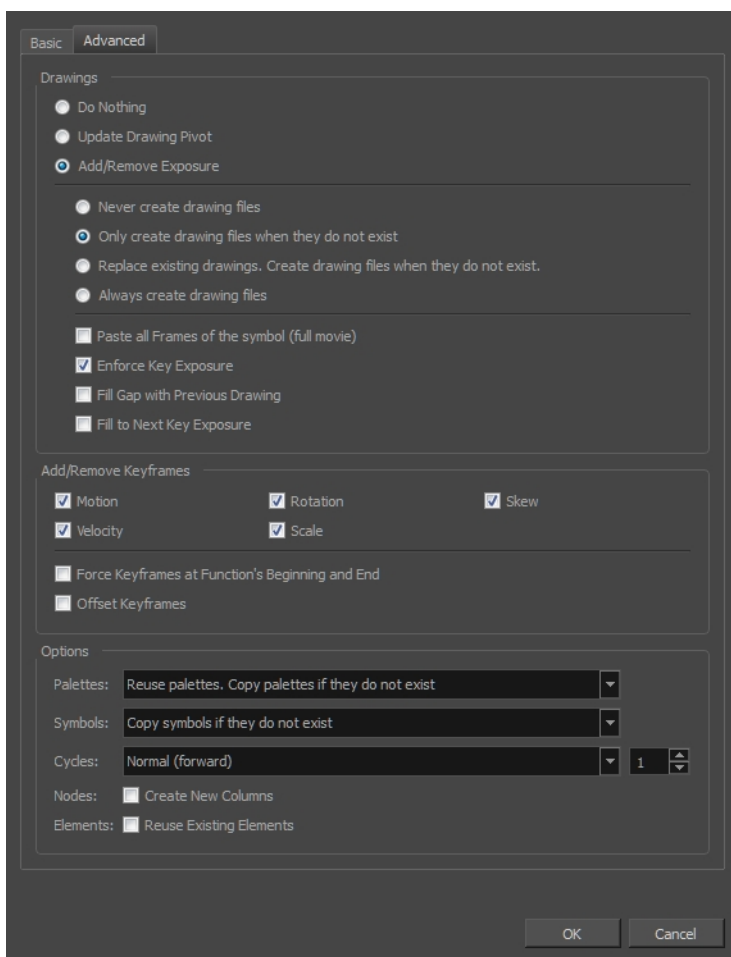


2. In the Timeline or Xsheet view, select the cell where you want your pasted selection to start.




3. Do one of the following:
  - ▶ Right-click and select **Paste Special**.
  - ▶ From the top menu, select **Edit > Paste Special**.
  - ▶ In the Xsheet or Timeline toolbar, click the Paste Special  button (you may need to customize the toolbar to display it).
  - ▶ Press Ctrl + B (Windows/Linux) or ⌘ + B (Mac OS X).

The Paste Special dialog box opens.



4. Select the **Basic** tab.
5. In the Drawings section, select the **Always Create Drawings** or **Only Create Drawings When They Do Not Exist** option.

### How to paste new drawings with the previous Paste Special settings

1. Do one of the following:
  - ▶ From the top menu, select **Edit > Paste Special Again**.
  - ▶ Right-click and select **Paste Special Again**
  - ▶ In the Timeline or Xsheet toolbar, click the Paste Special Again  button (you may have to customize the toolbar to display it).
  - ▶ Press **Ctrl + Shift + B** (Windows/Linux) or **⌘ + Shift + B** (Mac OS X).

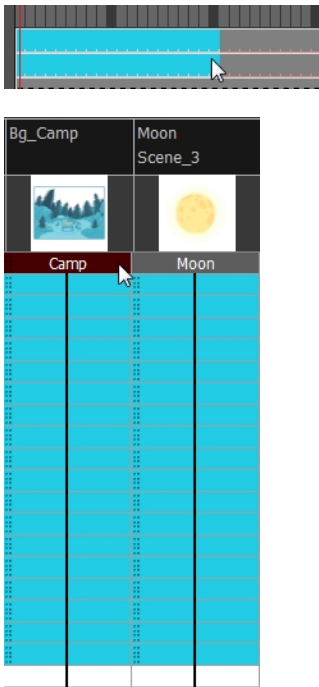
## Merging Drawings

There are two methods of merging drawings.

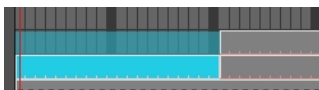
- You can merge selected drawings in adjacent elements. The columns and layers will be left intact, and each new merged drawing will reside in the frames of the left-most column or lower layer.
- You can merge elements. All drawings will be merged. Unused columns and layers will be deleted, but the original drawing files are still accessible.

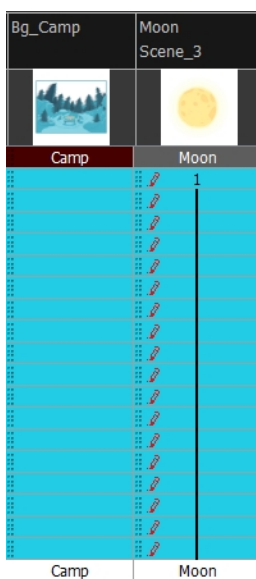
### How to merge selected drawings

1. In the Xsheet view, select the drawings to merge.



2. Do one of the following:
  - In the Xsheet menu, select **Columns > Merge Selected Drawings**.
  - In the Timeline menu, select **Layers > Merge Selected Drawings**.





3. Do one of the following:

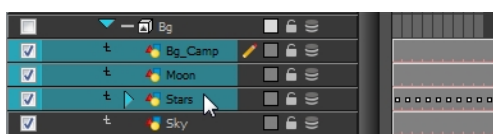
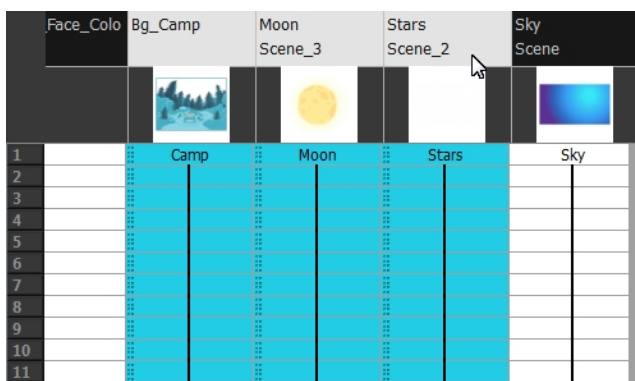
- In the Xsheet menu, select **Columns > Merge Selected Columns**.
- In the Timeline menu, select **Layers > Merge Selected Layers**.

In the Xsheet view, the right-most column will contain the merged drawings and the remaining columns will be left blank at the corresponding frames. In the Timeline view, the bottom timeline layer will contain the merged drawings from all layers and the other layers will be left blank at the corresponding frames. Drawings are not deleted and are still accessible.

### How to merge drawings in entire layers or columns

1. Do one of the following:

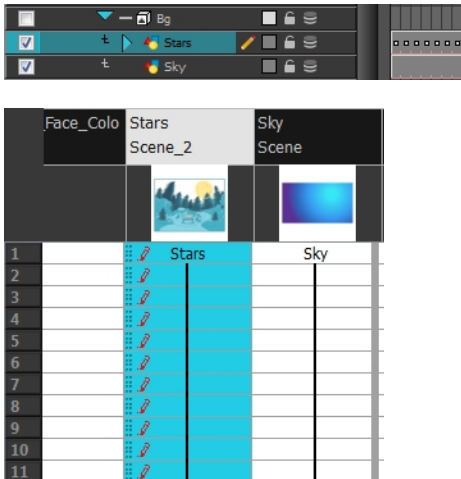
- In the Timeline view, select the layers you want to merge.
- In the Xsheet view, Shift-click the headers of the columns you want to merge.



2. Do one of the following:

- In the top menu, select **Edit > Merge**.

- ▶ In the Xsheet menu, select **Columns > Merge Selected Columns**.
- ▶ In the Timeline menu, select **Layers > Merge Selected Layers**.



In the Xsheet view, the right-most column will contain the merged drawings and the other columns will be deleted. In the Timeline view, the bottom timeline layer will contain the merged drawings from all layers and the other layers will be deleted. Drawings are not deleted and are still accessible.

## Modifying the Layer and Column Display

You can change the way a column in the Xsheet view displays. You can change the way a layer in the Timeline view or a column in the Xsheet view displays. You can stay organized without changing the content of elements or your animation output.

This section is divided as follows:



- [Expanding and Collapsing Layers and Columns](#) on page 102
- [Showing or Hiding Layers](#) on page 103
- [Showing and Hiding Columns](#) on page 105
- [Modifying the Look of the Column](#) on page 108
- [Xsheet Thumbnails](#) on page 114
- [Changing the Colour of a Layer or Column](#) on page 114
- [Setting Scene Markers](#) on page 116
- [Setting Tempo Markers](#) on page 119

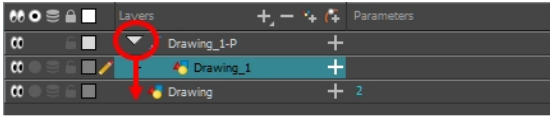
## Expanding and Collapsing Layers and Columns

To simplify the look of the Timeline or Xsheet view, you can expand and collapse the layers and columns. If some layers are parented to other ones, you can collapse the parent layer to hide its children.



### How to collapse or expand selected layers in the Timeline view

1. In the Timeline view, select the layer(s) to collapse or expand.
2. Do one of the following:




- ▶ Right-click on the selection and select **Collapse/Expand > Collapse/Expand**.
- ▶ Click the Expand Children Arrow  button on the parent layer.
- ▶ Click the Collapse/Expand  button (you may have to customize the toolbar to display it).
- ▶ Press Ctrl + I (Windows/Linux) or ⌘ + I (Mac OS X).



### How to collapse or expand all layers in the Timeline view



1. Do one of the following:
  - ▶ Right-click on the layers and select **Collapse/Expand > Expand All** or **Collapse All**.
  - ▶ In the Timeline toolbar, click the Collapse All  or Expand All  buttons (you may have to customize the toolbar to display them).
  - ▶ Press 0 and 9.

### How to collapse and expand 3D path or rotation columns in the Xsheet view

1. In the Xsheet toolbar, click the Show Column List  button to display the Functions list.
2. In the Xsheet view, select the column header of the 3D path or 3D rotation column to collapse or expand.
3. Do one of the following:
  - ▶ Right-click on the column's header and select **Expand/Collapse > Collapse Selection** or **Expand Selection**.
  - ▶ In the Xsheet toolbar, click the Collapse Selection  or Expand Selection  buttons (you may have to customize the toolbar to display it).

### How to collapse or expand all 3D path and 3D rotation columns in the Xsheet view

Do one of the following:

- ▶ Right-click on any column's header and select **Expand/Collapse > Expand All** or **Collapse All**.
- ▶ Press 0 and 9.
- ▶ In the Xsheet toolbar, click the Collapse All  or Expand All  buttons (you may have to customize the toolbar to display it).

## Showing or Hiding Layers

As you work in the Drawing or Camera view, some layers may be in the way or are used as references. You can hide these layers to make your work area less cluttered and easier to navigate. You can show and hide layers in the Timeline view in several different ways.

When using the Solo mode to show or hide layers, here's how it works:

- If you have anything selected, it is not affected.

- When multiple layers are selected and you enable/disable the Solo mode on any of those layers, it is applied to all the selected layers.
- When multiple layers are selected and you enable/disable the Solo mode on layers that are not part of the selection, it is applied only to those particular layers.

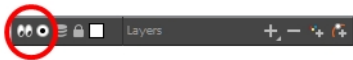
When exporting or rendering a scene, the Solo mode setting of layers is ignored.



#### NOTE:

When a layer is affected by an inverted cutter, enabling the Solo mode for this layer will not show it unless the mask is also enabled.



### How to show or hide all layers

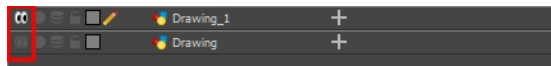
1. Click one of the following in the Layers toolbar:




- ▶ Enable/Disable All  button to show or hide all layers.  
Any hidden layers are unhidden, so you can view all layers.
- ▶ Solo Mode  button to view disable your current Solo mode selection. Any soloed drawing or sound layers are disabled, so you can view all layers. When you click again on the Solo Mode button, you last Solo selection is displayed.

### How to show or hide individual layers

1. Do one of the following:
  - ▶ In the Layer toolbar, click the Solo Mode  button.
  - ▶ Click the layer's Enable/Disable All  button to show or hide that layer.



- ▶ Press A to show a layer or D to hide selected layers.
- ▶ In the Timeline toolbar, click the Enable/Disable  button (you may have to customize the toolbar to display it).

When you deselect a layer in the Timeline view, the corresponding column is hidden in the Xsheet view.

### How to enable the selected layer and disable all others

1. Do one of the following:
  - ▶ Hold down Alt and click the Solo Mode  button of the layer you want to solo and hide all other layers.



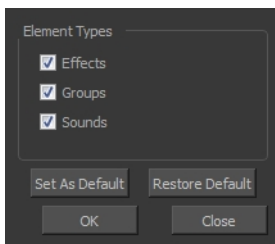
- ▶ In the Timeline toolbar, click the Disable All Others  button (you may have to customize the toolbar to display it).

In the Timeline view, you can hide or show certain types of layers such as Group and Effect.

### How to show and hide layer types in the Timeline view

1. Do one of the following:
  - ▶ From the Timeline menu, select **View > Show > Show Manager**.
  - ▶ You can also select **View > Show > Show Sounds**, **Show Effects** or **Show Groups** to immediately show or hide the selected type. This option will remain only for the current session. When you close and reopen Harmony, the default settings will return.

The Show Manager dialog box opens.



2. Select the types of layers you want to display and deselect the ones you want to turn off.
3. Click **Set As Default** to make these new settings the default ones that will be used each time to start the application. Click **Restore Default** to restore the settings used when installing the application.

In the Xsheet view, you have the choice of hiding or showing certain types of columns such as Annotation and Functions.




## Showing and Hiding Columns

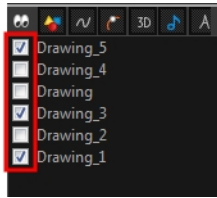
The Xsheet view has a Column List section that displays all the columns contained in the exposure sheet. It can be used to hide individual columns.

If you need to see a column after it has been hidden, you can display it directly from the Xsheet view without using the Column List section.

You can also hide a column type, such as Drawing or Sound. When you do this, its corresponding layer is disabled in the Timeline view.

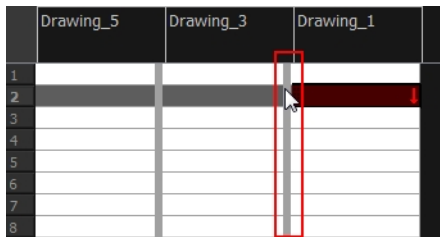
### How to show or hide columns in the Xsheet view

1. In the Xsheet toolbar, click the Show Column List  button.
2. On the right side of the Functions section, click the Expand  button to display the Column List section.
3. Do one of the following:
  - ▶ In the Column List section, select the columns to display and deselect the columns to hide.
  - ▶ In the Xsheet toolbar, click the Hide Selected Column  button (you may have to customize the toolbar to display it).

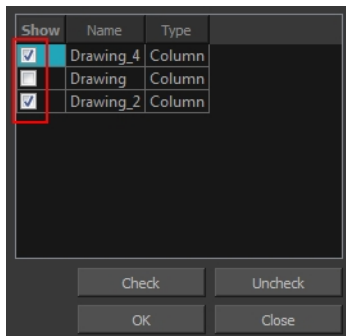


### How to show a hidden column in the Xsheet view

1. In the Xsheet menu, click on the thick grey line that represents a hidden column. You can also right-click on the column header and select **Show Hidden Columns**.



The Show Hidden Columns dialog box opens.



2. In the Show column, select the hidden columns you want to display in the Xsheet view.
  - ▶ Click **Check** to select all the selected columns.
  - ▶ Click **Uncheck** to deselect all selected columns.

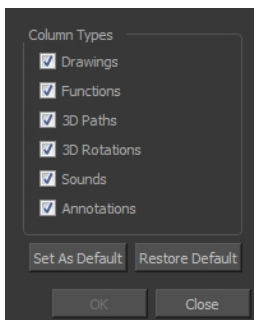
### How to show all columns

- ▶ In the Xsheet menu, select **View > Unhide All Columns**.

### How to show and hide column types



1. In the Xsheet view, select **View > Column Types Manager**.

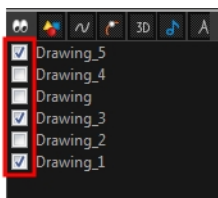
The Column Types dialog box opens.



2. Select the types of columns you want to display and disable the ones you want to hide.
3. Click **Set As Default** if you want to make these new settings the default ones that will be used each time to start the application.
4. Click **Restore Default** if you want to restore the settings used when installing the application.

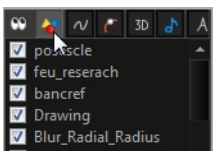
### How to show or hide Xsheet columns using the Column List





1. In the Xsheet toolbar, click the Show Column List  button.
2. On the right side of the Functions section, click the Expand  button to display the Column List section.
3. In the Column List section, select the columns to display and deselect the columns to hide.



### How to show or hide an Xsheet column type using the Column List

1. In the Column List section, click the button corresponding to the column type you want to show or hide.



Column Type	Action
	Show/Hide All Columns
	Show/Hide Drawing Columns
	Show/Hide Function Columns
	Show/Hide 3D Path Columns

3D	Show/Hide 3D Rotation Columns
🎵	Show/Hide Sound Columns
A	Show/Hide Annotation Columns

### How to show or hide function columns on the left side of the Xsheet view

1. Right-click on a column and select **Tag > Function Columns Visible** or **Function Columns Invisible**.

## Modifying the Look of the Column

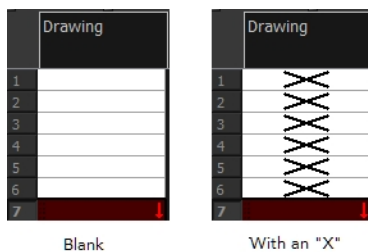
In Harmony, you can modify the way the column displays drawings, empty cells and the column width.

You can modify the following elements:

- Empty cells
- Row units
- Held exposure
- Column width

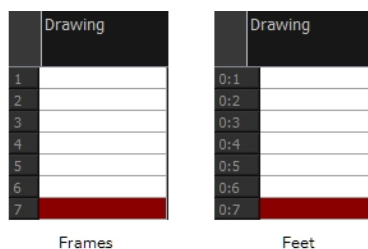
### How to modify the look of empty cell

1. From the Xsheet menu, select **View > Empty Cells > With an "X"** or **Blank**.



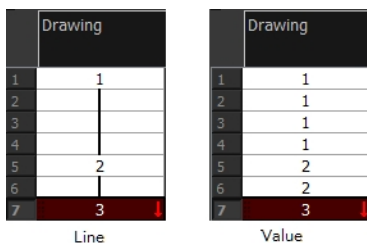
### How to modify row units

1. From the Xsheet menu, select **View > Row Units > Frames** or **Feet**.



## How to modify the look of a held exposure

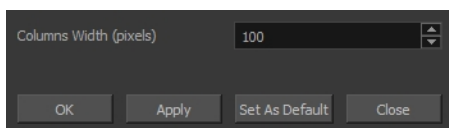
1. In the Xsheet menu, select **View > Held Exposures > Line** or **Value**.



## How to modify column width

1. In the Xsheet view, select any column to modify the width.
2. From the Xsheet menu, select **View > Set Columns Width**.

The Xsheet Column Width dialog box opens.



3. In the Column Width field, enter the desired width in pixels.
4. Do one of the following:
  - ▶ Click **OK** to validate and close the dialog box.
  - ▶ Click **Apply** to validate the operation and keep the dialog box opened to adjust the next column's width.
  - ▶ Click **Set As Default** to create all the new columns to this width.
  - ▶ Click **Close** to cancel the operation.
5. To restore all columns to the default value, in the Xsheet menu, select **View > All Columns to Default Width**.

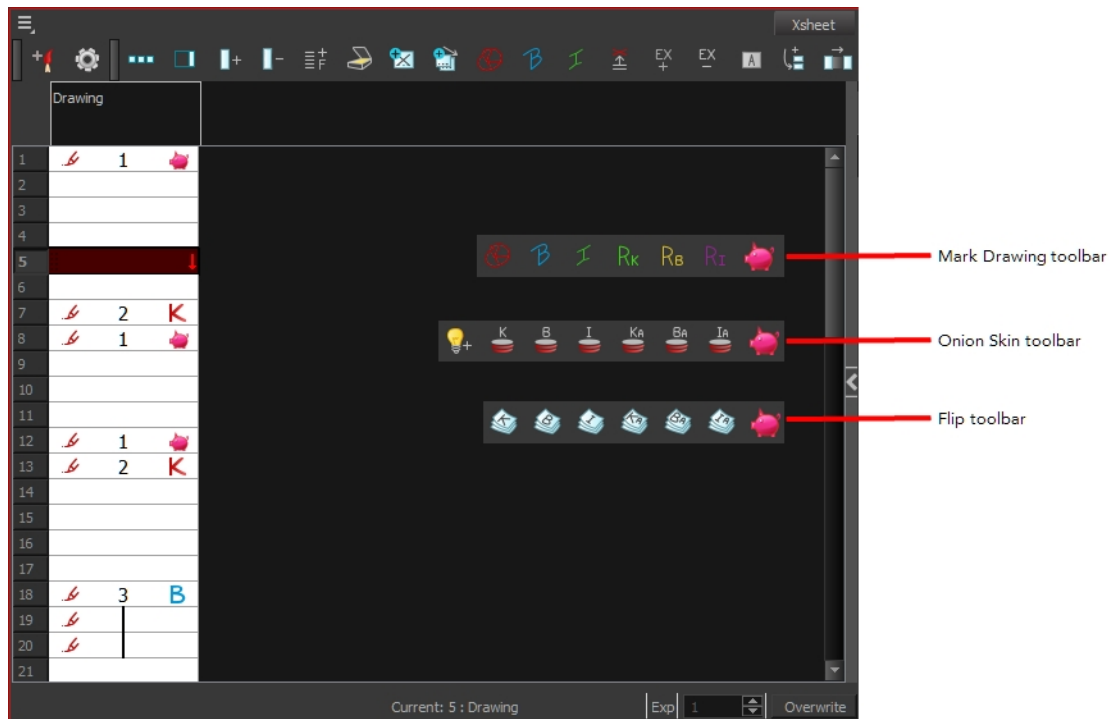
## Drawing Identification

In the Xsheet view, you can identify drawings as Key, Breakdown or In-between. This helps to keep the Xsheet well organized while animating.

When working with several animators, directors or even other studios, the necessity for retakes will often arise. Harmony gives you the possibility to mark new drawings as either Retake Key, Retake Breakdown, or Retake In-betweens.

If your production requires you to mark drawings with a custom marker, you also have the option to create your own.

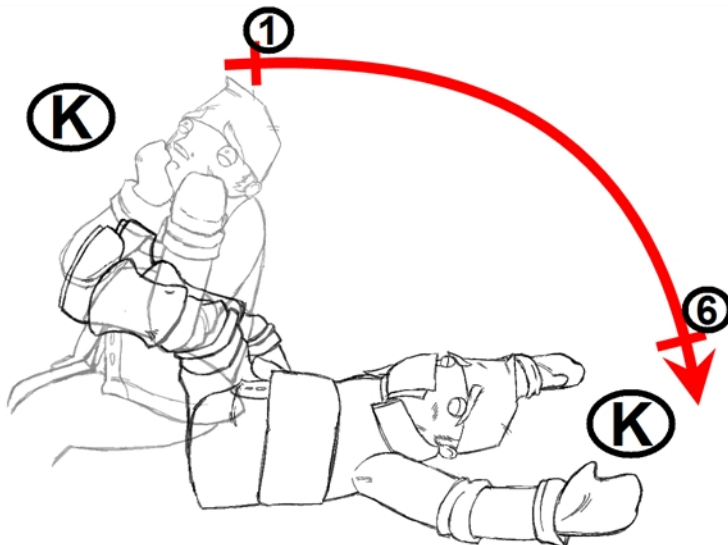
Make custom marks for the Xsheet by creating your own icons, then cutting, pasting and changing a bit of code. Not only is it possible to have your custom mark appear in the Xsheet and Mark Drawing toolbars, but also in the Onion Skin and Flip toolbars.



**NOTE:** You can create custom shortcuts for the Drawing Identification options in the Preferences dialog box.

## Key Drawing

A key drawing is a visually significant pose in a movement, often an extreme position. For example, if a character that is sitting down falls on his back, the key poses would be the character sitting and the character on his back. Of course, it may vary from one animation to another.



## Breakdown Drawing

A breakdown drawing is a pose somewhere between two key poses that better shows the movement. Most animation moves are arcs, such as an arm waving, somebody bending, or a leg walking. All of these movements are rotations. The breakdown pose is used to describe this curve better.

The breakdown drawing is then used to indicate secondary poses, also called the *follow-through*. These actions can be a big stomach jiggle as somebody jumps, a cloak floating behind somebody that is running, or arms moving after the main body action. These moves will generally have a different timing than the primary action. They will mainly start later and finish later. So, the breakdown drawings are used to complete the key drawings.




Note that a breakdown drawing is not always placed exactly in the middle of two keys. It will often be closer to one or the other depending on the timing and the action. Also, you can have more than one breakdown pose between two keys.

### How to mark a drawing as Key, Breakdown or In-between

1. From the top menu, select **Windows > Toolbars > Mark Drawing**.

The Mark Drawing toolbar displays.



2. In the Xsheet view, select the cell you want to identify. This option is not available in the Timeline view.
3. In the Mark Drawing toolbar, click one of these buttons: Mark as Key Drawing , Mark as Breakdown Drawing  or Mark as In-between Drawing . In the Xsheet menu, you can also select **Drawing > Mark Drawing As > Key Drawing, Breakdown Drawing, In-between Drawing, Retake Key, Retake BD and Retake IB**.
  - ▶ If you selected Mark as Key Drawing, a **K** icon appears in the cell.
  - ▶ If you selected Mark as Breakdown Drawing, a **B** icon appears in the cell.
  - ▶ If you selected Mark as In-Between Drawing, there is no icon displayed in the cell since it is used to remove a Key or Breakdown marker.

Drawing_1	
1	1 K
2	
3	
4	
5	
6	
7	2 R <sub>0</sub>
8	
9	
10	
11	
12	
13	3 B
14	
15	
16	
17	4 R <sub>K</sub>
18	
19	
20	5
21	
22	6 R <sub>I</sub>
23	
24	
25	
26	7 K
27	
28	
29	
30	
31	8

### How to create custom markers

- With a bitmap editing software, create the following icons in PNG format:
  - ▶ Mark Drawing Toolbar icon (24 x 24 pixel)
  - ▶ Onion Skin Toolbar icon (24 x 24 pixel)
  - ▶ Flip Toolbar icon (24 x 24 pixel)
  - ▶ Xsheet Column icon (16 x 16 pixel)
- Close Harmony.
- When your icons are ready, open the Toon Boom Harmony **drawingTypes.d** folder.
  - **Windows:**
    - Toon Boom Harmony Premium: C:\Users\[user\_name]\AppData\Roaming\Toon Boom Animation\Toon Boom Harmony\full-1200-pref\drawingTypes.d
    - Toon Boom Harmony Advanced: C:\Users\[user\_name]\AppData\Roaming\Toon Boom Animation\Toon Boom StageAdvanced\full-1200-pref\drawingTypes.d
  - **Mac OS X:**



On Mac OS X, the Library folder is a hidden folder. To display the display the folder, hold down the Alt key.

- Toon Boom Harmony Premium: /Users/[user\_name]/Library/Preferences/Toon Boom Animation/Toon Boom Harmony/full-1200-pref/drawingTypes.d
- Toon Boom Harmony Advanced: /Users/[user\_name]/Library/Preferences/Toon Boom Animation/Toon Boom Stage Advanced/full-1200-pref/drawingTypes.d
- **Linux:**
  - /home/user\_name/Toon Boom Animation/Toon Boom Harmony/full-1200-pref/drawingTypes.d
  - /home/user\_name/Toon Boom Animation/Toon Boom StageAdvanced/full-1200-pref/drawingTypes.d

**NOTE:**

If the **drawingTypes.d** folder does not exist, you must create it. To do so, copy the **resources** folder from the following location.

- Windows: **Start > Programs > Harmony 12.1 Premium**
- Mac OS X: **Applications > Toon Boom Harmony 12.1Premium > resources > drawingTypes.d**
- Linux: **/usr/local/ToonBoomAnimation/harmony\_12/lrx86\_64/bin/Stage/resources/drawingTypes.d**


4. Paste your icons in the **drawingTypes.d** directory.
5. In the same directory, open the **drawingTypes.xml** file in a text editor.
6. For each custom icon you want to create, add the following line. Make sure to place it before this closing tag: **</DrawingTypes>**.
  - ▶ `<DrawingType text="NewButtonName" pixmapFile="XsheetIcon.png" commandIcon="MarkDrawingIcon.png" flipIcon="FlipIcon.png" onionIcon="OnionIcon.png" />`
7. In that line, replace the following information with your new icon information:
  - ▶ **NewButtonName:** Write the name of your new marker. This name will appear in the button tooltip.
  - ▶ **XsheetIcon.png:** Write the name of the icon that you created to appear in the Xsheet column. Include the file extension.
  - ▶ **MarkDrawingIcon.png:** Write the name of the icon that you created to appear in the Mark Drawing toolbar. Include the file extension.
  - ▶ **FlipIcon.png:** Write the name of the icon that you created to appear in the Flip toolbar. Include the file extension.
  - ▶ **OnionIcon.png:** Write the name of the icon that you created to appear in the Onion Skin toolbar. Include the file extension.

8. Save the file and close it.
9. Start Harmony.

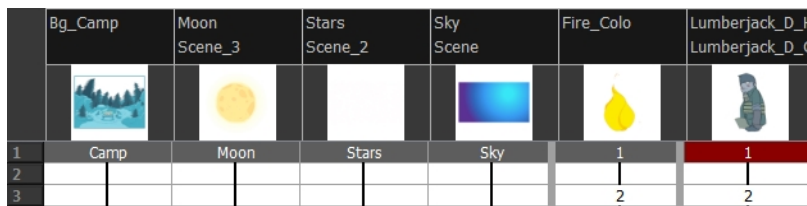
## Xsheet Thumbnails

When there are a large number of columns in the exposure sheet, it's not easy to quickly identify a particular column. Displaying the column thumbnails makes this easier. This option displays a small thumbnail picture of the current frame below the column header.

### How to display the thumbnails

1. Do one of the following:
  - ▶ In the Xsheet toolbar, click the Show Thumbnails  button.
  - ▶ In the Xsheet menu, select **View > Show Thumbnails**.

The thumbnails appear.

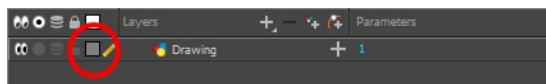


## Changing the Colour of a Layer or Column

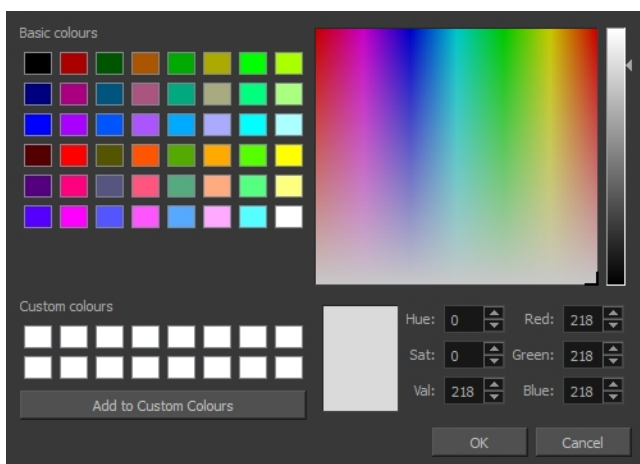
To easily identify elements in the Timeline or Xsheet view, you can change the colour of layers and columns. The colours you choose will be reflected in the Node view.

### How to change the layer's colour in the Timeline view

1. In the Timeline view, click the Change Track Colour  button of the layer you want to modify.



2. In the Select Colour dialog box, select a new colour for your layer.



3. Click **OK**.

The layer's background colour is updated. In a Drawing layer, exposed cells are the brighter, selected colour for easy identification. The corresponding column colour is also updated in the Xsheet.

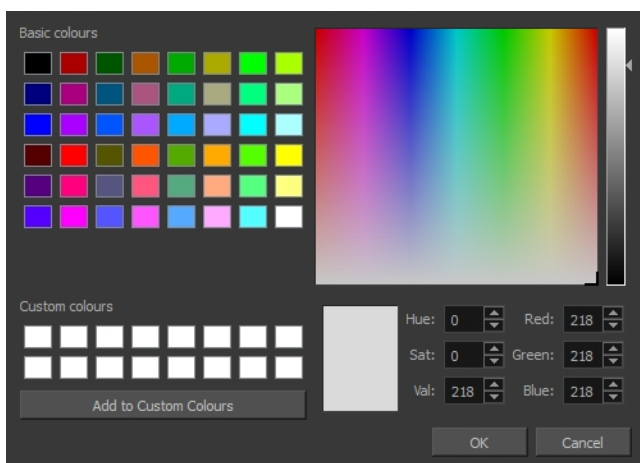


### How to reset a layer's colour in the Timeline view

1. In the Timeline view, select the layers to reset.
2. In the Timeline toolbar, click the Default Track Colour  button (you may have to customize the toolbar to display it).

### How to change a column's colour in the Xsheet view

1. In the Xsheet view, select one or more columns to modify.
2. Right-click on the column's header and select **Colour > Change Columns Colour**.
3. In the Select Colour dialog box, select a new colour for your columns.



4. Click **OK**.

The column's colour is updated. The corresponding column colour is also updated.

	Plant_000	Tower_000	Tower2_000	Moon
1	1	1	1	1
2				
3				
4				
5				
6				
7				
8				
9				

### How to reset the column's colour in the Xsheet view

1. In the Xsheet view, select the columns to reset.
2. Right-click on the column's header and select **Colour > Default Columns Colour**.

## Setting Scene Markers

Scene markers are visual indicators displayed at the top of the Timeline view in the frame counter area. You can use it to denote anything relevant to your work. You can indicate the frames you want to clean up, a change in action, an impact, or where you intend to apply an effect. You can also add a note to a scene marker, which is displayed when you hover over the scene marker.

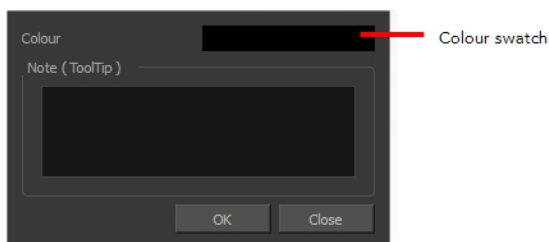
There are two ways to add a scene marker. You can mark the current frame or make a frame range selection and mark the whole section.

### How to mark the current frame

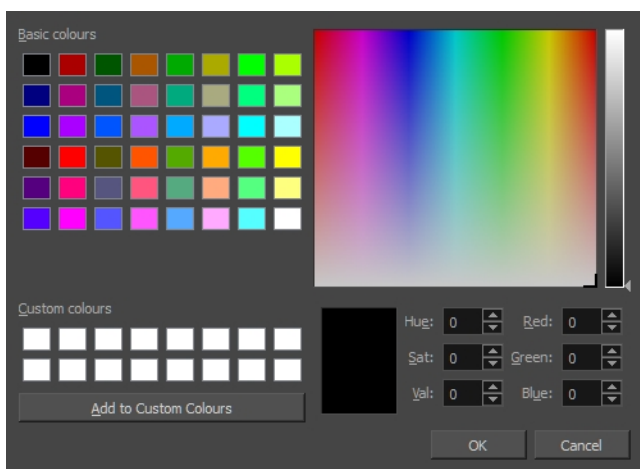
1. In the Timeline view, make sure the red playhead is set on the frame you want to mark. Even if you right-click on a different frame, the scene marker will be created on the current frame on which the playhead is positioned.
2. Right-click in the frame counter area and select **Scene Markers > Mark Current Frame**.



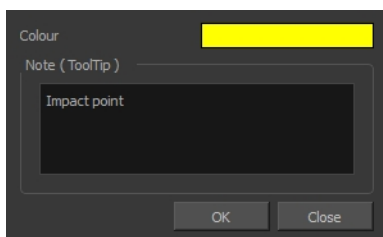
The Timeline Scene Marker dialog box opens. The Colour box displays a black colour swatch, or the colour of the last scene marker you created.



3. Click the Colour swatch to open the Mark Colour dialog box and select a colour for the scene marker. Click **OK**.

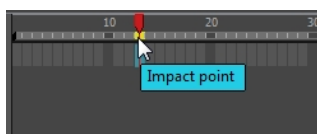


4. In the Note field, enter text to display as the tooltip and click **OK**.



In the Timeline view, the scene marker is displayed at the current frame.

5. Hover over the scene marker to display its tooltip.

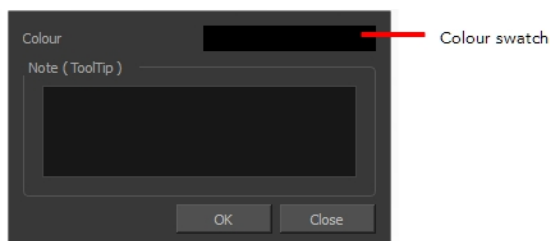


## How to create a scene marker on a frame range

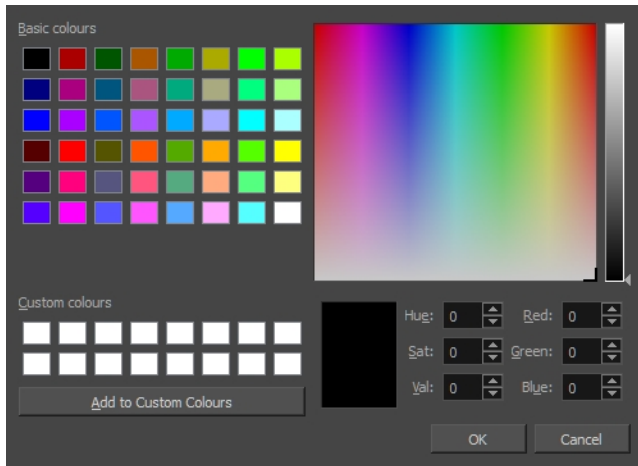
1. In the frame counter area of the Timeline view, select the frame range you want to mark.



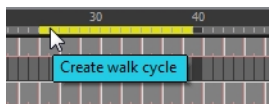
The Timeline Scene Marker dialog box opens. The Colour box displays a black colour swatch, or the colour of the last scene marker you created.



- Click the Colour swatch to open the Mark Colour dialog box and select a colour for the scene marker. Click **OK**.



- In the Note field, enter text to display as the tooltip and click **OK**.  
In the Timeline view, the scene marker is displayed over the selected frame counters.
- Hover over the scene marker to display its tooltip.



### How to edit a scene marker

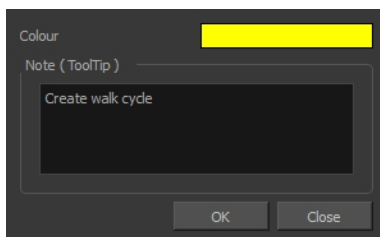
**NOTE:** If you select only a part of a scene marker, you will not open the scene marker for editing. You will only be able to create a new scene marker to overwrite it.

- In the Timeline view frame counter, select the entire scene marker.



- Right-click the selection and select **Scene Markers > Edit Scene Marker**.

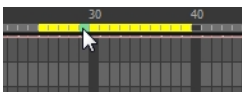
The Timeline Scene Marker dialog box opens.



3. Make your changes.
4. Click **OK**.

### How to delete a scene marker

1. In the Timeline view frame counter, at least one frame counter in the scene marker you want to delete.



2. Right-click the selection and select **Scene Markers > Delete Scene Marker**.

## Setting Tempo Markers

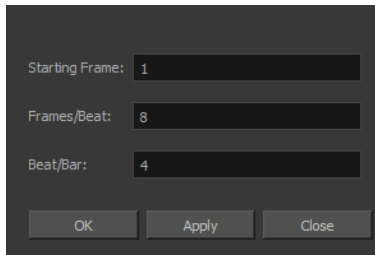
Tempo markers are used to synchronize your animation with a musical score. This lets you reproduce the FPB (Frames Per Beat) and use the tempo signature as tempo markers. The Xsheet view allows you to pace your animation according to the tempo or beat of the soundtrack music or to any rhythmic sound, such as the ticking of a clock or water leaking from a spout.

	Drawing	Limpa_Colour	Kalimba 100%
1	1	1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	
10		10	
11		11	
12		12	
13		13	
14		14	
15		15	
16		16	
17	2	17	
18	3	18	
19	4	19	
20	5	20	
21	7	21	
22	8	22	
23	9	23	
24	10	24	
25	11	25	

### How to set the tempo markers

1. In the Xsheet menu, select **View > Set Tempo Marker**.

The Tempo Marker dialog box opens.



2. Reproduce the tempo and beat value of your music or sound for the Xsheet view marker display.
  - **Starting Frame:** Enter the number of the frame where you want the tempo markers to begin.
  - **Frames/Beat:** Set the frames per beat value. This will determine the frequency (in frames) in which a beat marker will appear. Keep in mind that, by default, 24 frames represent 1 second.
  - **Beat/Bar:** Set the tempo of your music or sound. This will determine the frequency (in beats) in which a tempo marker will appear in the Xsheet view.
3. Click **OK**.

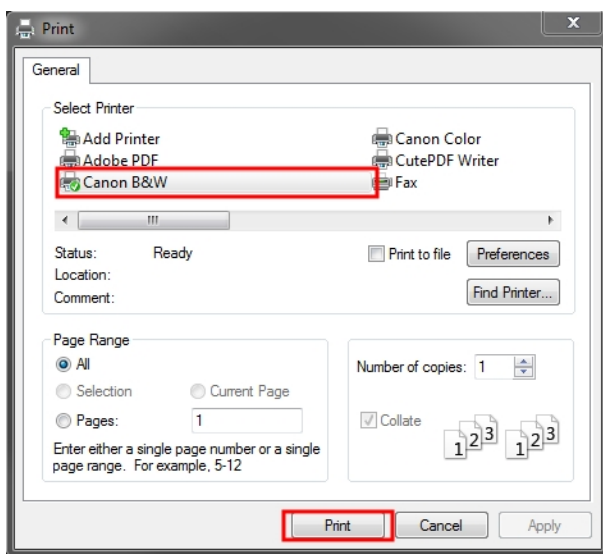
## Printing the Xsheet

Once you have marked all the information, corrections, and timing you want in the Xsheet view, you can print your exposure sheet. Printing the Xsheet allows you to take it with you to your animation table or give a copy to the animator. You can also use it to create your Xsheet skeleton directly in Harmony.

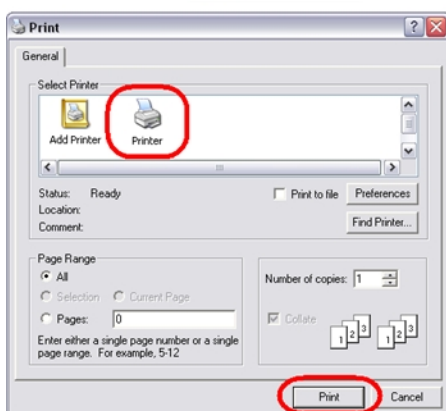
### How to print your exposure sheet

1. Select **File > Print > Xsheet**.  
The Print dialog box opens.

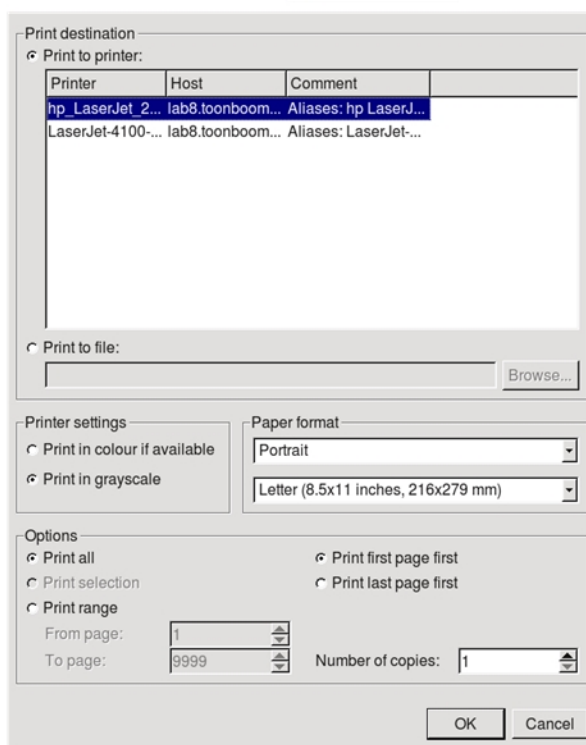




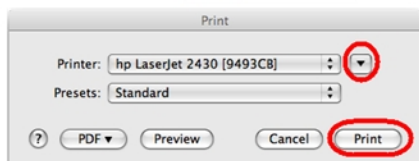
Windows




Linux



Mac OS X



## 2. To set up your print:


- ▶ **Windows:** In the Select Printer section, select your printer and adjust the rest of the printing settings.
- ▶ **Linux:** In the Print Destination section, select your printer and adjust the rest of the printing settings.
- ▶ **Mac OS X:** In the Printer section, select your printer and adjust the rest of the settings by clicking on the Parameters  button. You can also click **PDF** and select an option from the menu if you want to save a PDF version of your exposure sheet.

**NOTE:** Refer to your printer user guide to learn more about its options.

3. Do one of the following:

- **Windows and Mac OS X:** Click **Print**.
- **Linux:** Click **OK**.

	A	B	C	D	Annotation
1	1	001	6	1	
2	2	001	6	1	
3	3	001	9	1	
4	4	001	9	1	
5	5	001	9	1	
6	6	001	9	1	
7	7	001	1	1	
8	8	001	1	1	
9	9	001	3	1	
10	10	001	3	1	
11	11	001	1	1	
12	12	001	1	1	
13	13	001	5	1	
14	14	001	5	1	
15	15	001	2	1	
16	16	001	2	1	
17	17	001	7	1	
18	18	001	7	1	
19	19	001	2	1	
20	20	001	2	1	
21	21	001	7	2	
22	22	001	7	3	
23	23	001	4	4	
24	24	001	4	5	
25	25	001	9	6	
26	26	001	9	7	
27	27	001	2	8	
28	28	001	2	9	
29	29	001	4	10	



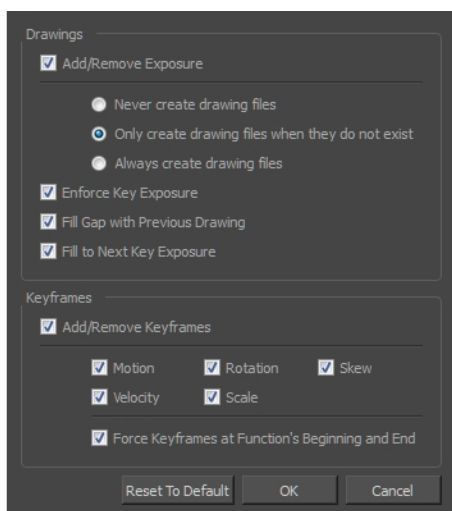
## Modifying Paste Presets

When pasting key frames and exposures, you can modify the existing presets to your liking. There are three presets you can modify: the default presets for both key frames and exposures, key frames only and exposures only.

### How to modify paste presets

1. From the Timeline view menu, select **Edit > Modify Paste Presets** and one of the following options:
  - **All** to edit the default paste preset settings.
  - **Key Frame** to edit the preset settings for pasting key frames.
  - **Exposure** to edit the preset settings for pasting exposures.

The Edit Paste Presets dialog box opens.



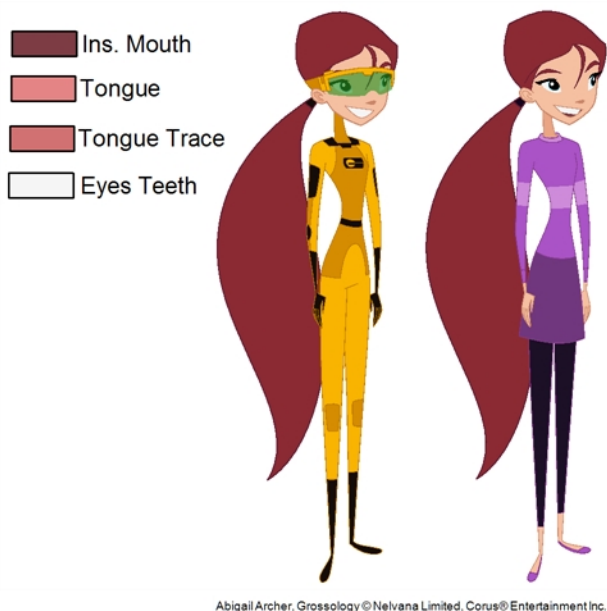
2. Refer to the following table and edit the presets as desired.

### Edit Paste Preset Dialog Box Parameters

Parameter	Description
Drawings	
Add/Remove Exposure	<b>Never create drawing files:</b> When adding exposures to a drawing layer, drawing files will not be created.
	<b>Only create drawing files when they do not exist:</b> When adding exposures to a drawing layer, new drawings will be created only when drawings with the same name do not already exist in the destination.
	<b>Always create drawing files:</b> When adding exposures to a drawing layer, new drawings will always be created. If drawing files with the same name already exist, Harmony will create a new name for the drawing.
Enforce Key Exposure	If there are key exposures that exist on copied drawings, they are preserved when pasting. No key exposures are added. This is the default behavior when pasting.
Fill Gap with Previous Drawing	Fills selected area in the Xsheet or Timeline view with the previous drawing.
Fill to Next Key Exposure	Fills selected area till the next key exposure.
Keyframes	
Add/Remove Keyframes	<b>Motion:</b> Copies the properties of the selected motion keyframe to the new frame.
	<b>Velocity:</b> Copies the properties of the selected velocity keyframe to the new frame.
	<b>Rotation:</b> Copies the properties of the selected rotation keyframe to the new frame.

	<b>Scale:</b> Copies the properties of the selected scale keyframe to the new frame.
	<b>Skew:</b> Copies the properties of the selected skew keyframe to the new frame.
	<b>Force Keyframes at Function's Beginning and End:</b> Adds a keyframe to the beginning and end of the pasted function, reproducing the source function.

## Chapter 4: Colour Styling and Colour Models



Once the characters, props and locations are designed, it's time for the colour styling and colour models creation. This is when the colours and moods are determined. The line models created during the design step are painted and organized as colour models for the colourists.

Harmony has a great concept of colour palettes. Each character can have its own set of colours that is carried through the entire project called the *master palette*. If the master is modified, the colours in the entire project are updated simultaneously.

By doing the colour styling in Harmony, your master palette will be created at the same time, so you do not need to use third party software. Also you will not have to recreate the colour palette again in Harmony. It is possible to create this step in an external software, but it is a great time saver to do it directly in Harmony.

To create the colour style and colour models, follow these steps:

- [Preparation on page 125](#)
- [Working with Palettes on page 130](#)
- [Colours on page 147](#)
- [Painting the Model on page 164](#)
- [Sharing the Colour Model on page 166](#)

### Preparation

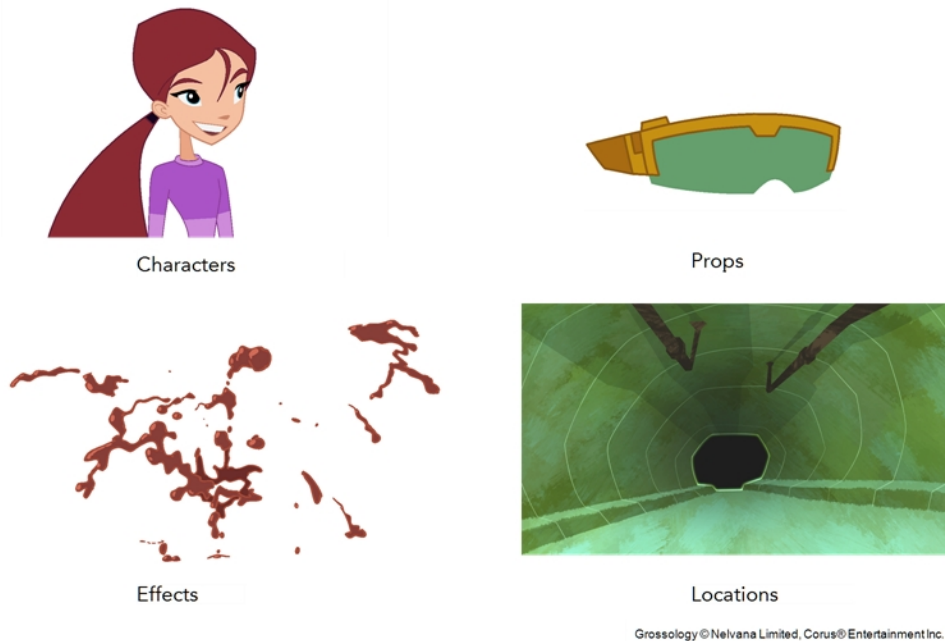
Before painting, you need to organize the colour model scenes and bring in your references. The colour styling preparation is done in five steps:

- [Colour Model Storage on page 126](#)
- [Scene Creation on page 126](#)
- [Setting Up the Workspace on page 127](#)
- [Naming on page 127](#)

## Colour Model Storage

First, you will need to create a storage location for all your models and palettes. The best way to do this is to create a colour model scene. There are different possibilities available to structure your designs and colour model scenes. We strongly recommend that you put all of your colour models in the same scenes. It is important to maintain a structure for your models so they do not end up scattered throughout the project.

There are four main model categories:



If you have a small project, such as a short or an advertising contract, you can always place all the characters, props, effects, and locations in the same scene. For large projects such as feature-length productions or series, you should create four separate model scenes following these categories.

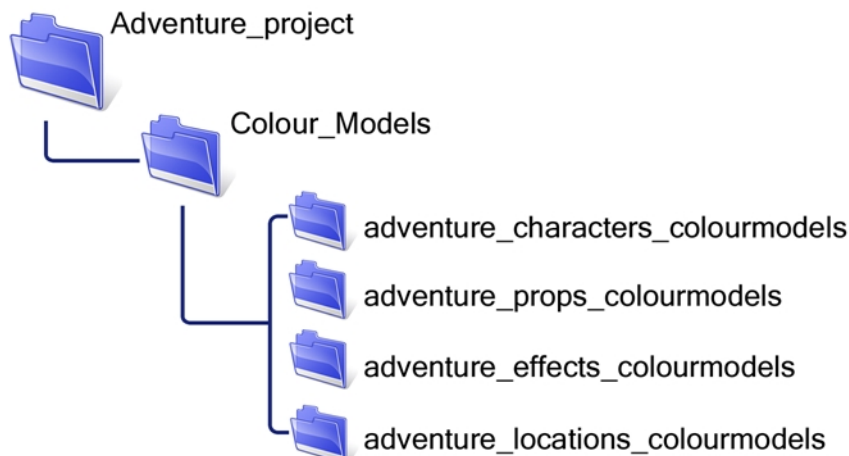
## Scene Creation

In order to create colour models, you need to create your scenes.

When working on a paperless or cut-out animation project, if you have designed your characters, props, effects and locations directly in Harmony, you can paint your models directly in your design scene. You can also create a new colour model scene and import your designs in that one. Refer to the Fundamentals Guide to learn more about creating a scene.

If you have not already done so, refer to the Fundamentals Guide to learn about production structure, file organization, and how to create a Project root directory. We recommend storing your colour model scenes in the root directory or in a colour models subdirectory for even better organization.

A useful way to name your colour model scene is to include the project name, then the colour model type such as characters, props, effects, or locations, and finally `colourmodel1`. For example, a character colour model scene for the Adventure project would be named `adventure_characters_colourmodel1`. This ensures that you always know what scene corresponds to what.



## Colour Model Scene Structure

To store your colour models in a scene, you should create one drawing layer for each character, prop, effect, or location. You should name these according to the model.

You can also load other colour references in the scene to balance your overall colours. For example, if you work in a character colour model scene, it's a good idea to import some of the key locations to compare and adjust the colours so they match well.

## Setting Up the Workspace

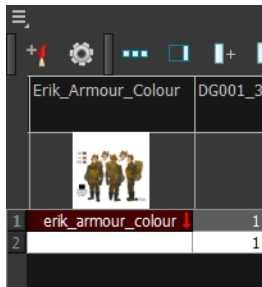
Now that your scenes are created and structured, you can open the corresponding colour model scene. For the optimal workspace for inking and painting, set up your workspace with these views:

- Xsheet
- Camera
- Drawing
- Colour
- Model

## Naming

Now that your models are imported, you can rename them appropriately. You should rename elements (layers) and drawings corresponding to the model. This will help keep the work organized and make it easy for others to follow.

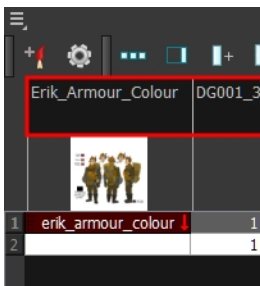
For example, if there is a black and white character model called **Erik** in one drawing element and its colour models in another one, rename your elements to include the character's name. For example, the colour model for Erik's armour could be named: **erik\_armour\_colour**.



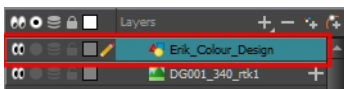
### How to rename a drawing element

1. Do one of the following:

- ▶ In the Xsheet view, double-click on the column header of the drawing element.

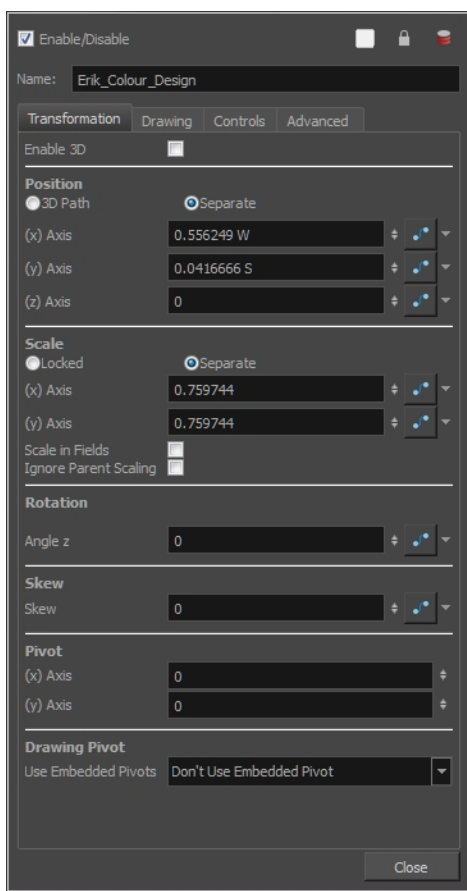


- ▶ In the Timeline view, double-click on the drawing element's layer.



The Layer Properties window opens.





2. Type in a new name.



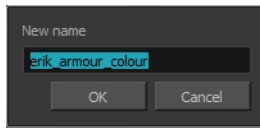
## How to rename a drawing

1. In the Xsheet view, click on a drawing name.



2. Do one of the following:
  - ▶ From the Xsheet view menu, select **Drawings > Rename Drawing**.
  - ▶ Right-click on the drawing name and select **Drawings > Rename Drawing**.
  - ▶ Press **Ctrl + D** (Windows/Linux) or **⌘ + D** (Mac OS X).

The Rename Drawing dialog box opens.



3. Type in a new name and click **OK**.

## Working with Palettes

In animation, specific colours are used to paint each particular character. In order to maintain absolute consistency, a colour palette is created for each character, prop and effect throughout the production. This is referred to as a **master palette**<sup>1</sup>.

Master palettes contain a colour swatch for each zone to colour with a precise RGBA colour value.

Using a master colour palette has many benefits, including:

- Each character consistently retains their dedicated colours.
- You cannot accidentally use a colour which is not in the master palette.
- Standardization and colour consistency throughout the production
- Multiple artists can use the same colour palette and produce the same results.

Toon Boom Harmony uses palettes to hold all the colours needed to paint your elements, allowing complete control and consistency in your painting process.

A **palette**<sup>2</sup> is created by assigning a set of colours to each character, prop or effect. You will create a new palette and add a new colour, known as a *colour swatch*, for each zone of the character, such as the skin, hair, tongue, shirt, pants, and so on.

In Harmony, palettes are individual files that you can copy, transfer, and store. Palettes have a **\*.plt** file name extension—see [Palette File Storage](#) on page 134.

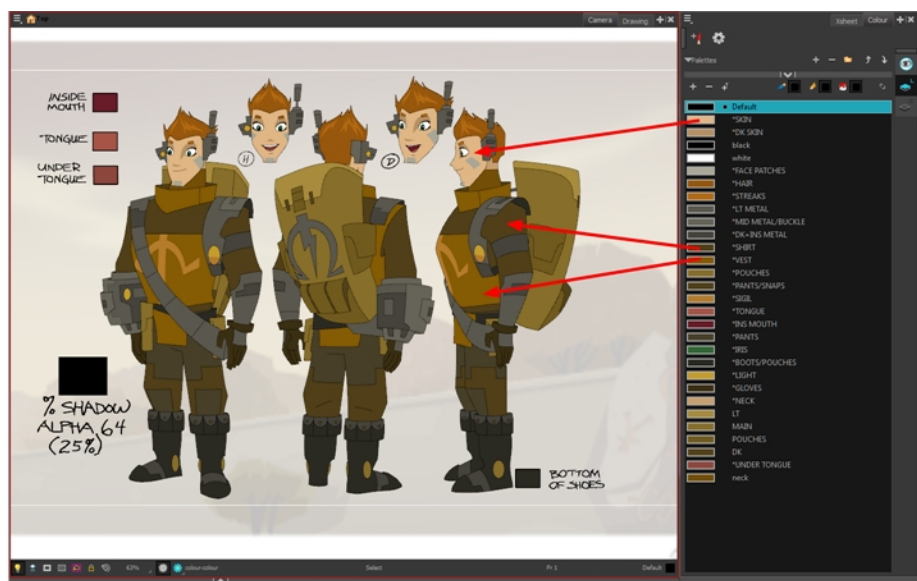
When a zone on the character is painted with the colour contained in a colour swatch, a link is automatically created between that colour swatch and the zone. This means that if the tint of the colour in the colour swatch is changed, any zone linked to it will update to the new tint. This is one way that colour palettes can save time and money in your production.

Another advantage of this system is that you can create complete palettes for different lighting situations. For instance, in addition to the regular palette for a character, you could have one for that character in the rain using colours that are duller and less vibrant than the dry daytime colours, or yet another for using in a night scene. Using palettes linked to your character in this way allows you to instantly change its colouring to suit the mood and atmosphere of the scene without tediously repainting each element.

---

<sup>1</sup>A master palette is a group of colours attributed to a character or a prop. The palette is used throughout the entire production to maintain consistency in the look and to ensure that the same colours are used throughout the production. Also known as palette.

<sup>2</sup>A palette or master palette is a group of colours attributed to a character or a prop. The palette is used throughout the entire Toon Boom Studio project to maintain a consistency in the look and avoid the colour changing during the animation. Also referred to as a master palette.



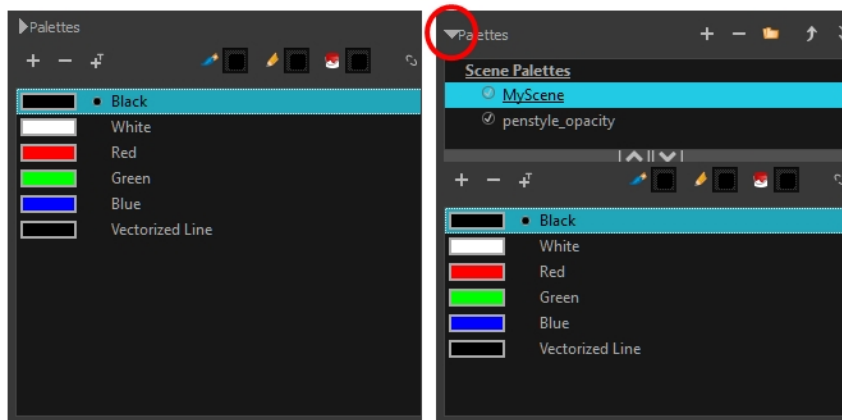
Erik, Di-Gata Defenders © Nelvana Limited, Corus® Entertainment Inc.

This section is divided as follows:

- [Palette Lists](#) on page 131
- [Palette File Storage](#) on page 134
- [Creating a Colour Palette](#) on page 135
- [Duplicating a Colour Palette](#) on page 139
- [Cloning a Colour Palette](#) on page 140
- [Importing and Linking Palettes](#) on page 142

## Palette Lists

The Colour view has two modes: basic and advanced.



Basic mode

Advanced mode

- **Basic Mode**

The Colour view's basic mode only shows the Colour list. When you open Toon Boom Harmony, you only see the colours available in the Default palette which contains six basic colour swatches and is automatically named the same as your scene. For simple projects, you can manage with the default palette, but for movies, series, or shorts it is recommended that you create palettes for your characters. To create a palette, you have to switch to the Advanced mode of the Colour view and show the Palette list.

- **Advanced Mode**

The Advanced mode displays the list of all palettes that are linked to the scene. To create palettes for your characters, you must display the Palette list.

A palette list is a file containing all of the links to the original palette files. Every drawing layer has a palette list. The scene also has a palette list. For example, a drawing layer can use three different palettes stored in three different locations, while another drawing layer can use two of these palettes plus another one coming from another scene. The palette list keep track of the locations of the palettes.

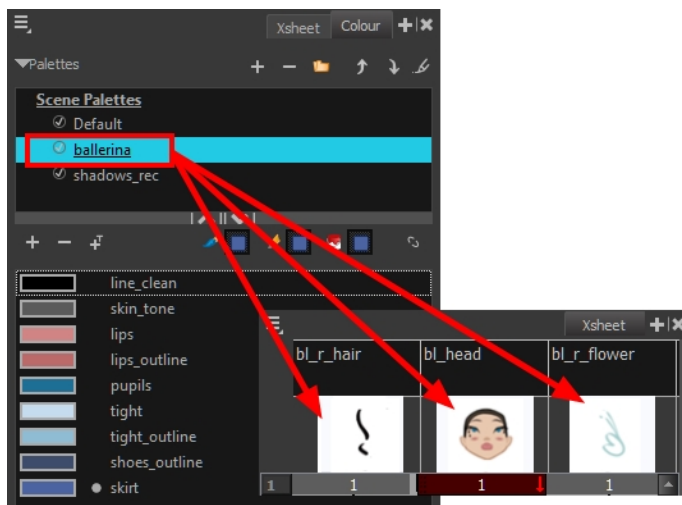
There are two types of palette lists:

- **Scene Palette List**

The Scene Palette list is mainly used with cut-out animation, but is also very useful for paperless and traditional animations. A cut-out character will often be divided into 20 to 30 different drawing elements that use the character's master palette.

The palette list is stored at the scene level instead of the Element directory. This way, all palettes linked to this list will appear in every drawing element created in the scene. There is no need to manually load the palette in each element.

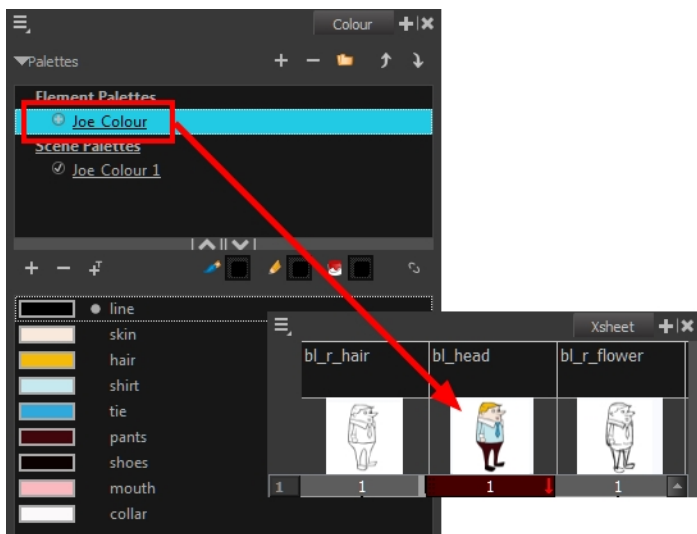
The Scene Palette list is the simplest one to use. By default, Toon Boom Harmony is set to use only Scene Palette lists.



- **Element Palette List**


In Toon Boom Harmony, you can switch to Advanced Palette List mode and choose to save your palette at an element's level. The Element Palette list is mainly used with traditional and paperless animation. Unlike cut-out animation, all columns (drawing elements) contain different characters, props, backgrounds, and effects. The Element Palette list is used when you do not necessarily want all of the palettes for all of your elements linked in every column.

The palette list is stored in the drawing element's directory instead of directly in the Scene level. This ensures that the links to the palettes appear only in the appropriate element. If you prefer to access a global palette list, link your palettes to the Scene Palette list.

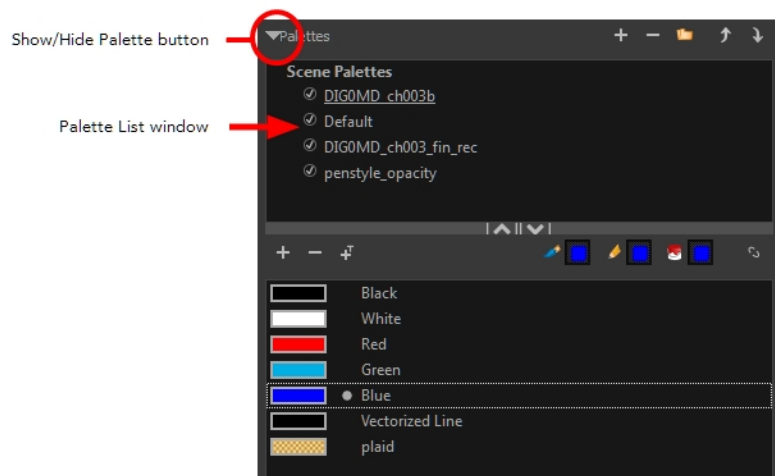


When you are using several cloned palettes that are related to the same original palette, Toon Boom Harmony uses the palette located highest in the list to determine the colour of the painted zones—see [Cloning a Colour Palette](#) on page 140.

### How to show or hide the Palette list

- ▶ In the Colour view, click the Show/Hide Palette List View  button to expand or collapse the Palette List area.

The Palette List window opens and displays all your palettes.





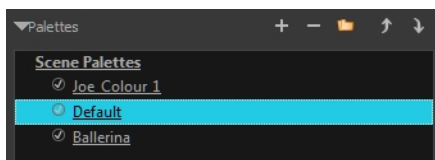
### How to set the Advanced Palette Lists mode

1. Do one of the following:
  - From the top menu, select **Edit > Preferences** (Windows/Linux) or **Stage > Preferences** (Mac OS X).
  - Press **Ctrl + U** (Windows/Linux) or **⌘ + U** (Mac OS X).
1. Select the **Advanced** tab.
2. In the Advanced Options section, select the **Advanced Palette Lists** option.
3. Click **OK**.

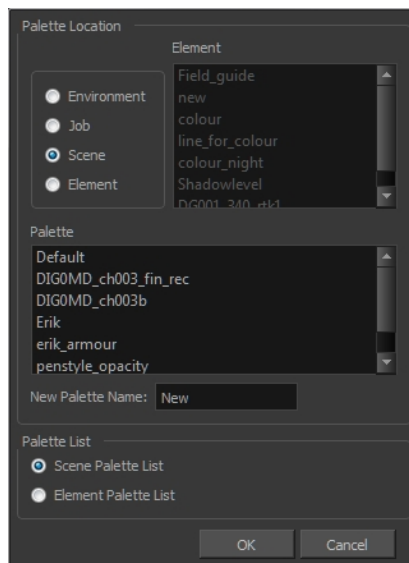
### How to reorder palettes in the Palette list

Do one of the following:

- From the Colour View menu, select **Palettes > Move Up** or **Move Down**.
- In the Palette list, click the Up  and Down  buttons.



## Palette File Storage



In Harmony, palettes are individual **\*.plt** files that can be copied, transferred and stored. When a palette is created from Harmony, it needs to be stored somewhere. By default, the palette file is stored in the scene directory in a palette-library folder unless you specify a different location. There are four locations where you can find palette-library folders:

- **Element:** The Palette Library folder is stored directly in the drawing Element folder.
- **Scene:** The Palette Library folder is stored directly in the Scene folder.
- **Job:** The Palette Library folder is stored in a Job folder contained in the Scene folder.
- **Environment:** The Palette Library folder is stored in an Environment folder contained in the Scene folder.

By default, the palette is stored at the scene level. For simple projects and standalone projects, it is recommended to keep it as is. If you work with a larger studio, it is recommended to verify with them on the file structure.

This existing structure is compatible with Harmony Server. Harmony's database has a leveled structure starting from the Environment down to the Element. Its client-server configuration allows all data, such as palettes and scenes, to be shared between a series of client machines.

## Element Level

Working with Harmony Stand Alone, the Element level is very useful when there are a lot of different palettes. When a colour model drawing is created, it is stored in its element folder. By storing the corresponding palette file with the colour model, the colourist can load them both from the same location. This also creates a more organized structure.

## Scene Level

Working with Harmony Stand Alone, a palette file can also be saved at the scene level, so that all of the palettes from the scene are stored together. The palette naming must be structured so the colourist or character builders can find the correct one. Saving the palettes at the scene level makes it very easy to back up the palettes and retrieve their location.

The scene level can also be useful for cut-out animation. Instead of creating a colour model scene that includes all of the characters, props, effects, and location, the colour palette or model will often be directly imported to, or created in, the character building scene. Just as with a cut-out character building scene, each element uses the same palette so it would not be efficient to save the palette inside one element. Instead, it is saved at the scene level. This prevents a palette overload because all of the models are in different scenes. It also allows each scene to have its own set of palettes corresponding to its model.

When working on a cut-out animation production, it is highly recommended that you work with the Scene level.

## Palette Backup

When sharing palettes between scenes, some users may accidentally modify the colours, even though the palettes are locked by default. That is why it is a good idea to copy and back up your palette libraries and master palette directories.

When a palette file is copied, it automatically becomes a clone palette, so there will not be any trouble replacing an altered file. Harmony automatically updates all of the files and drawings linked to it.

## Creating a Colour Palette

You can create a palette in either Basic or Advanced mode.

By default, Toon Boom Harmony is set to the Basic mode. For simple productions, it is recommended to use the Basic mode. This setting stores the palettes automatically for you and saves them at the Scene level. When you

use the Advanced Palette Lists mode, you can decide at which level you want to store your palettes: Environment, Job, Scene, or Element.

Before you can create a palette in the Advanced Palette Lists mode, you must first set your preferences to Advanced Palette Lists mode in the Preferences dialog box.

You can remove palettes from your Palette list if they're not needed in your scene. The actual palette file will not be deleted and you can reimport it in your Palette list later on.

### How to set the Advanced Palette Lists mode

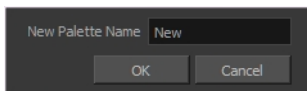
1. Do one of the following:
  - ▶ From the top menu, select **Edit > Preferences** (Windows/Linux) or **Stage > Preferences** (Mac OS X).
  - ▶ Press **Ctrl + U** (Windows/Linux) or **⌘ + U** (Mac OS X).
1. Select the **Advanced** tab.
2. In the Advanced Options section, select the **Advanced Palette Lists** option.
3. Click **OK**.

### How to create a new palette (Basic Palette Lists mode)

1. From the Colour View menu, select **Palettes > New** or click the New Palette **+** button.

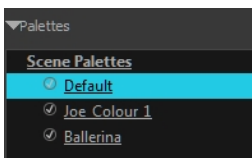
The Create Palette window opens.

2. Enter the palette name according to the model.



3. Click **OK**.

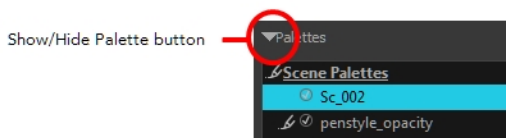
The palette appears in the drawing element's palette list.



### How to create a palette from the Advanced Palette Lists mode

1. In the Timeline or Xsheet view, select the drawing that requires a palette.
2. In the Colour view, click the **Show Palette List View** button to display the palette list.

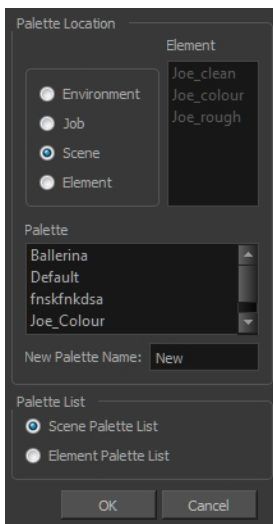




3. Do one of the following:

- ▶ From the Colour view menu, select **Palettes > New**.
- ▶ Click the Create Palette **+** button.

The Palette Browser: Create Palette dialog box opens.

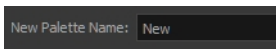


4. Select the level to store the palette file.

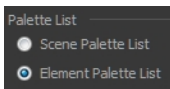
- ▶ **Environment:** The palette-library folder is stored in the scene's parent environment folder.
- ▶ **Job:** The palette-library folder is stored in the scene's parent job folder.
- ▶ **Scene:** The palette-library folder is stored directly in the scene folder.
- ▶ **Element:** The palette-library folder is stored directly in the drawing element folder.

When you select a level that has a palette stored in it, the palette names are displayed in the Palette field.

5. Name the palette. There is no need to add the suffix "palette" to the name as it is always recognized as a palette file.



6. Select a Palette List option.



- ▶ The Scene Palette List is mainly used with cut-out animation. A cut-out character will often be divided in twenty to thirty different drawing elements that use the character's master palette.

The palette list is stored at the scene level instead of the Element directory. This way, all palettes linked to this list will appear in every drawing element created in the scene. There is no need to manually load the palette in each element.

- ▶ The Element Palette List is mainly used with traditional and paperless animation. Unlike cut-out animation, all columns (drawing elements) contain different characters, props, backgrounds and effects. The Element Palette List is used because you do not necessarily want all of the palettes for all of your elements linked in every column.

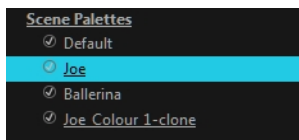
The palette list is stored in the drawing element's directory instead of directly in the Scene level. This ensures that the links to the palettes appear only in the appropriate element. If you prefer to access a global palette list, link your palettes to the Scene Palette List.

7. Click **OK**.

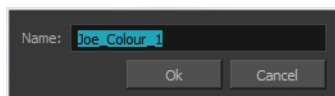
The new palette appears in the palette list.

### How to rename a palette

1. In the Colour view, select the palette to rename.

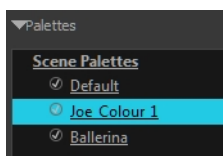



2. Do one of the following:
  - ▶ Right-click and select **Rename**.
  - ▶ From the Colour View menu, select **Palettes > Rename**.
3. In the Rename dialog box, give the palette a new name and click **OK**.



### How to remove a palette

1. In the Colour view, select the palette to remove.



2. Do one of the following:
  - ▶ From the Colour View menu, select **Palettes > Remove**.
  - ▶ Right-click on the selected palette and select **Remove**.
  - ▶ Click the Remove Palette  button located above the Palette list.

If the palette was used in your scene, the zones painted with its colours turn red.



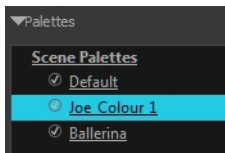
## Duplicating a Colour Palette

A duplicated palette is a simple copy of the original palette. It uses the same names, colour values, but has a different ID and is independent from the original palette. This ensures that both palettes are completely independent.

This option is used when there are similar models and you want to avoid recreating and naming all the colours. You can change the values and the names afterward without affecting the original palette. You can also keep some RGBA values, such as the eyes, teeth, tongue, inside mouth, etc.

### How to duplicate a palette

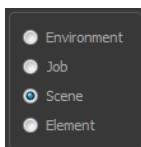
1. In the Colour view, select the palette to be duplicated.



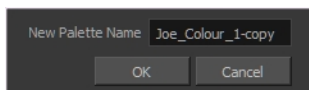
2. Do one of the following:
  - ▶ From the Colour menu, select **Palettes > Duplicate**.
  - ▶ Right-click on the selected palette and select **Duplicate**.

The Palette Browser: Duplicate Palette window opens.

3. If you are in Advanced Palette List mode, select the palette storage level—see [Palette File Storage on page 134](#).



4. In the New Palette Name field, name the palette.

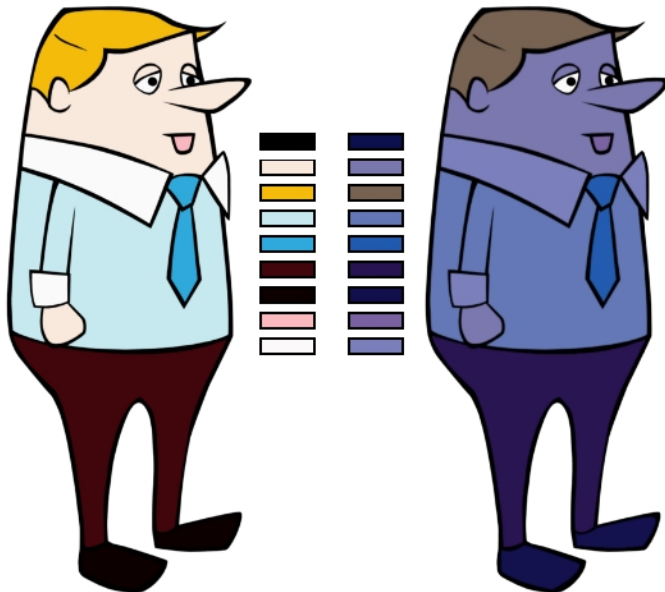


5. In the New Palette Name field, name the palette.

- Click **OK**.

The palette appears in the palette list.

## Cloning a Colour Palette

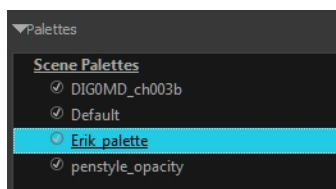


A character usually has only one master palette, although there are times when the characters are placed in different lighting conditions and require a different colour shading. The night palette is a popular choice when a scene or sequence changes from day to night. It can be difficult and time-consuming to repaint everything and creating two independent palettes can be quite complex. As an alternative, Toon Boom Harmony provides clone palettes.

The clone palette is a copy of the master palette. The colours in each palette have the same properties. The colours have the same identification number pointing to the same colour zones, but they can have different names and RGBA values. Depending on the palette (night or day) you're currently using, the painted drawing will update. So there's no need to repaint the animation. All you have to do is create or import a clone palette (palette style).

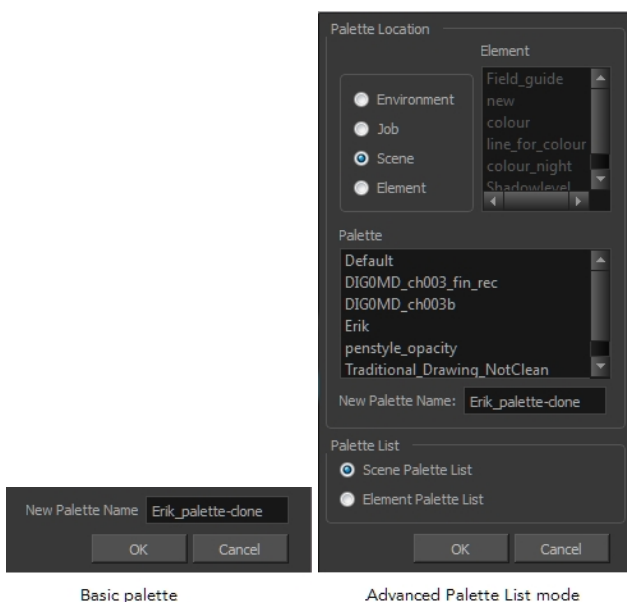
### How to clone a palette

- In the Colour view, select a palette to clone.

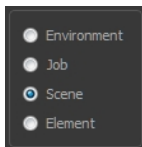


- From the Colour menu, select **Palettes > Clone** or right-click and select **Clone**.

The Palette Browser: Clone Palette dialog box opens.

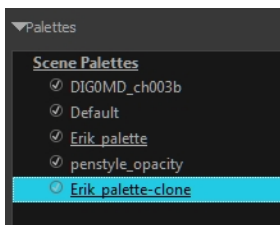


3. If you're in Advanced Palette List mode, select the palette storage level—see [Palette File Storage](#) on page 134.



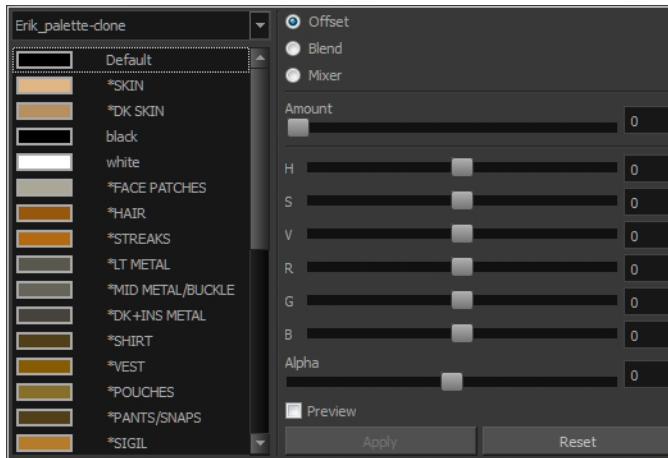
4. In the New Palette Name field, name the palette. We recommend keeping the "-clone" in the name.
5. Click **OK**.

The cloned palette appears in the palette list.

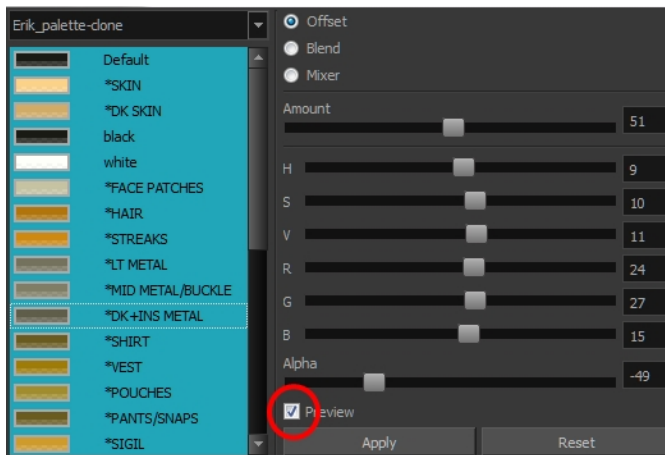


6. In the Palette list, select the clone palette you created to offset or blend colours—see [Mixing Colours](#) on page 162.
7. From the Colour View menu, select **Palettes > Tint Panel** or right-click and select **Tint Panel**.

The Blend/Offset Tint panel opens.



8. Select one or more colours to modify. You can select all your colours by pressing Ctrl + A (Windows/Linux) or ⌘ + A (Mac OS X).
9. Offset, blend, or mix the colours using the sliders and increasing the Amount value.



10. Select the **Preview** option to see a preview of the colours while you adjust them.

**NOTE:** You can also modify the colours individually with the Colour Picker window.

## Importing and Linking Palettes

Before starting colouring work such as ink and paint or even creating new colour models, you may want to load existing colour palettes to your scene. You can do so by linking colour palettes to your palette lists.

You may encounter a case where only a colour palette is visible when a layer is selected. If you need that palette in a second layer, you can link the palette to the second layer's palette list. A good example would be a scene where there is a character on one layer and its arm is on another. In order for both layers to access the palette, you must link both Element Palette lists to that palette. If your palette is linked to the Scene Palette list, it will be accessible by all layers.





If you created a palette in another project and you want to import it in your current project, you can browse for the palette file on your computer and add it to your scene. When the palette is imported in your scene, the file is copied in the project's directory. It is not linked to the original file.

With Toon Boom Harmony as a stand-alone application, every scene is local to the machine. This means that all of the scene's data is only accessible from that particular scene. Palettes are also local to the scene; they can be shared between all drawing layers, but not between scenes.


However, you may want to share palettes across a whole project. Harmony offers that possibility. By default, a palette is an independent file stored in your scene. This file can be copied, moved, or deleted.

To link a palette throughout an entire project, you need to create a central directory where you can copy all the palettes you created. Every time you link a palette in an element, it is linked to this folder. If you modify the palette, it will be updated throughout the whole project.

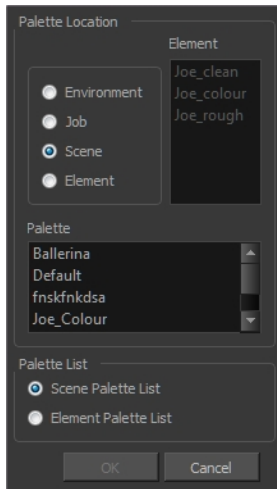
You will notice that when you create or link a palette, a small icon appears on its left. These icons represent the palette's link status.

Icon	Description
	Indicates that the palette is safe.  There won't be any problems once the scene is exported. For example, the palette file is stored in the scene folder and is linked to the Scene Palette List.
	Indicates that the palette file is stored in a directory external to the scene's structure.  The palette file is probably stored in a Master Palette directory on a hard drive external to the palette-libraries planned for the palette storage. The warning in this case is that if you move your Master Palette directory to another location, you may lose the palette in your scene.
	Indicates that a palette file stored in a level such as Element, Scene, Job or Environment is linked to a Palette list that is not on the same level.  For example, a palette file is stored into the Environment folder and is linked to the Element Palette list. The palette is shared.
	Indicates a potentially dangerous situation.  Problems may occur when trying to export or link to the palette file. For example, a palette file is stored into the element folder and is linked to the Scene Palette list. The issue in this case is that if you decide to delete the layer containing the palette, it will be lost from your scene.

### How to link a colour palette

- Do one of the following:
  - From the Colour View menu, select **Palettes > Link**.
  - Right-click and select **Link**.
  - Click the Import  button.

The Palette Browser: Link Palette dialog box opens.



2. Select the level where the palette file is stored—see [Palette File Storage](#) on page 134.
3. Select the palette list linking level by enabling either **Scene Palette List** or **Element Palette List**—see [Palette Lists](#) on page 131.

The palette appears in the Colour view.

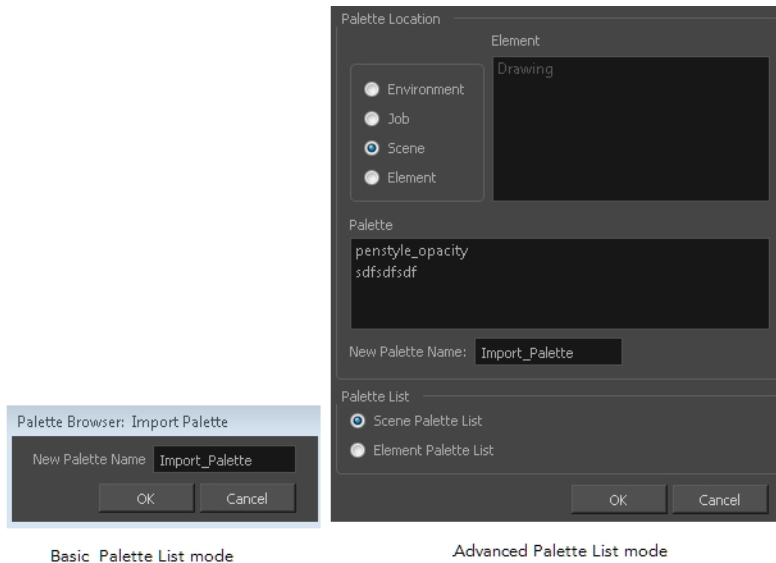
### How to import a palette into your project

1. Do one of the following:
  - From the Colour menu, select **Palettes > Import**.
  - Right-click and select **Import**.

The Browser window opens.
2. Browse for a palette file located (\*.p1t) on your hard drive. You will generally find the palettes in your project's palette-library directory.
3. Click **Open**.

The Palette Browser opens.








Basic Palette List mode

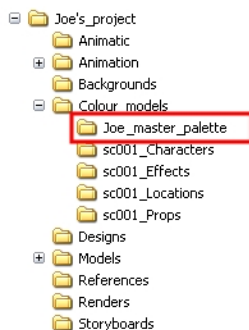
Advanced Palette List mode

4. If you're in Advanced Palette mode, select the level where the palette file is stored—see [Palette File Storage on page 134](#).
5. If you're in Advanced Palette mode, select the palette list linking level by enabling either **Scene Palette List** or **Element Palette List**—see [Palette Lists on page 131](#).
6. In the New Palette Name, name the imported palette.

The palette appears in the Colour view and the file is copied in your project.

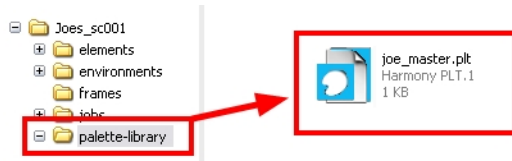
### How to link to an external palette

1. In the Colour view, click on the **Create Palette**  button to create a palette to be used as external.
2. Save your scene by selecting **File > Save** from the top menu or by clicking the Save  button or press Ctrl + S (Windows/Linux) or  + S (Mac OS X).
3. On your computer or server, create a master directory. Ideally, this should be created in your Root folder to keep it within the project directory. You could also place it inside your Colour Model's subdirectory—see *Chapter 6: Project Organization and File Structure* in the Fundamentals Guide.

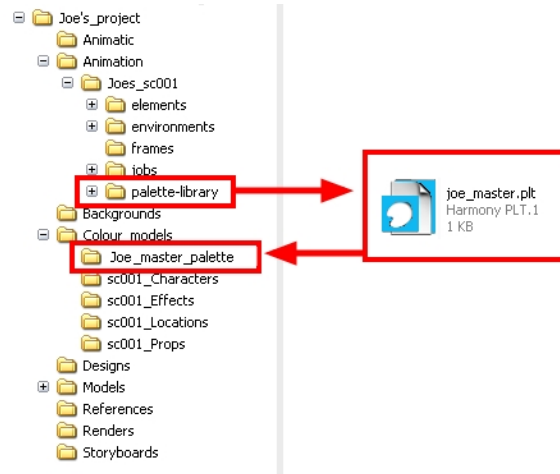


4. Name the folder appropriately, for example: **Joe\_master\_palette**.

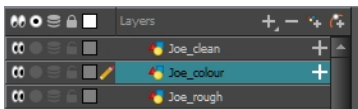
- From your operating system, browse to your Toon Boom Harmony scene and open the palette-library folder.



- Select and copy your palette \*.plt file to copy it to the master palette directory.

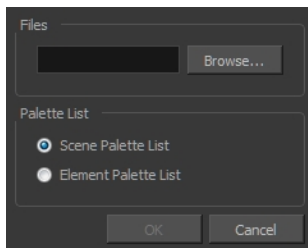


- Create a new Toon Boom Harmony scene or open the scene where you will link this palette.
- In the Timeline or Xsheet view, select the element to link the palette to.




- From the Colour View menu, select **Palettes > Link to External**.

The Link to External Palette dialog box opens.



- Click **Browse** to search for your master palettes folder and select the palette \*.plt file you want to link.
- In the Palette list section, select how you want to load the palette; at the scene or element level.
- Click **OK**.

The linked palette appears in the Colour view.

If a palette is outside the scene, the External  icon appears beside the palette name.

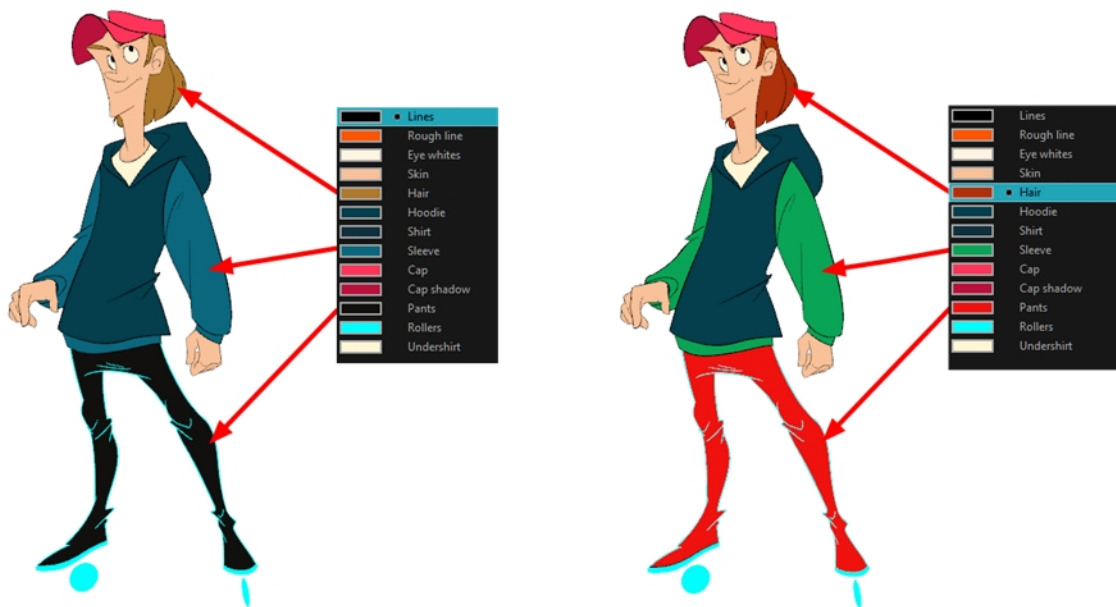
**NOTE:** To link an element (such as a colour model) to the palette that is stored in the external palette directory, you must remove the original palette from the element's palette list. You will then load the duplicated palette into the palette list using the Link to External command, like you did for the other elements.

## Colours

Toon Boom Harmony has some very powerful colouring features when it comes to painting. To paint your drawings, you will use different colour swatches, unlike some other painting programs where you modify the main swatch each time you want to paint with a different colour.



In the Colour view, you choose a different colour swatch for each colour you want to paint in your drawing. You can add as many swatches as you want. You can also rename them and modify existing ones.



When you modify the colour of an existing swatch, it automatically updates all the zones painted with this swatch throughout the entire project. The colour swatch has a unique ID number that associates it with the painted zones. This way, you can change the look of your character at any time without having to repaint it!

This section is divided as follows:

- [Adding a Colour Swatch](#) on page 148
- [Editing Gradients and Textures](#) on page 200
- [Colour Display Modes](#) on page 160
- [Copying and Pasting Colours](#) on page 161
- [Mixing Colours](#) on page 162

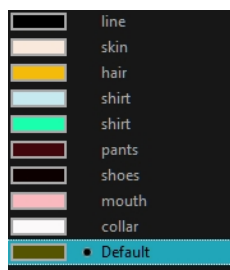
## Adding a Colour Swatch

You can use several different types of colour swatches, including solid colour, gradient colour and bitmap texture swatches.



In Toon Boom Harmony, when you click the Add Colour  $+$  button, a new colour swatch is created using the colour of the currently selected swatch from your palette. However, you can set a default colour to be used every time you create a new colour in your colour palette. This is useful for creating different shades of the same basic colour.

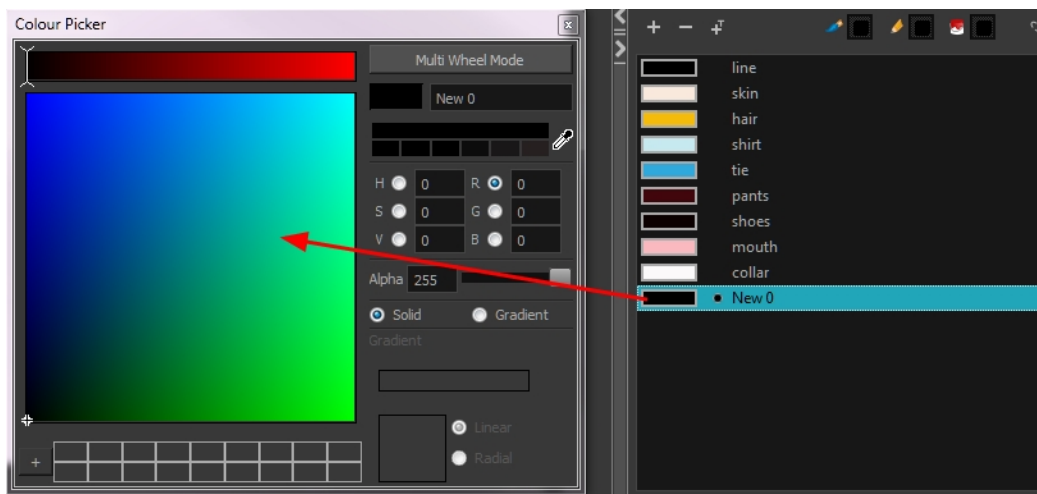
The default colour is also the colour used when you choose to vectorize images you're scanning into your scene, however you add the Default colour swatch to your palette in a different way, so it's unique. It has a unique ID number that makes it easily recognizable from all the other colours in your colour palettes. Being able to change this colour allows you to change the basic colour of all scanned drawings. This can be useful on more than just an aesthetic level as sometimes when you go to NTSC or PAL, pure colours, such as pure black, can create problems.



## How to add or modify a solid colour swatch

1. In the Colour view, click the Add Colour **+** button.
2. From the Colour View menu, select **Colours > Edit** or double-click on the colour swatch.


The Colour Picker window opens.

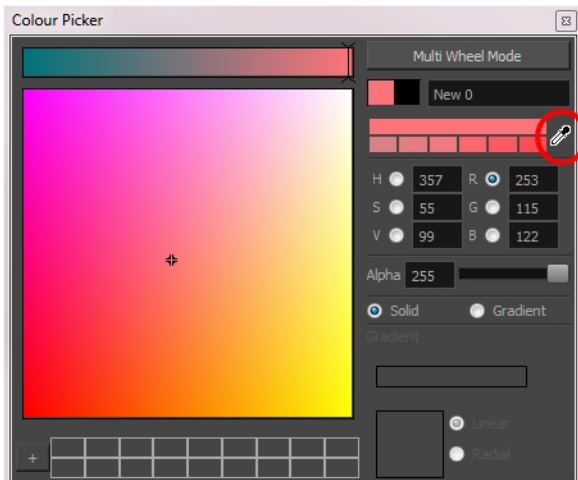


3. To set your colour, do one of the following:

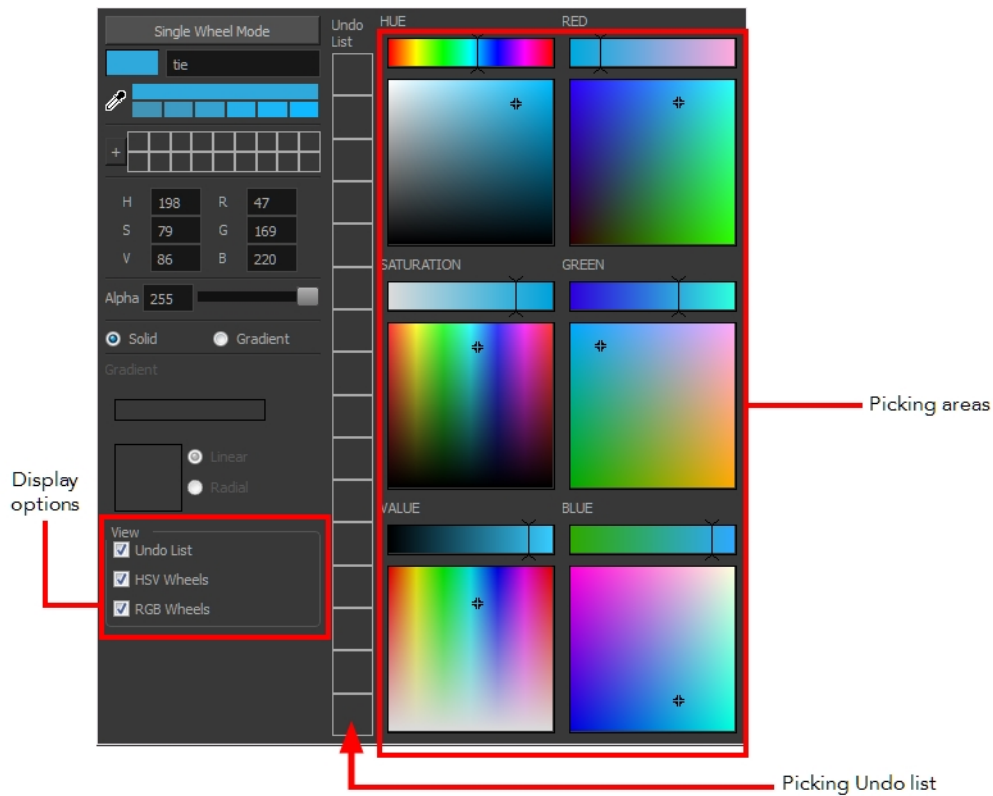
- ▶ In the colour wheel, select a colour.
- ▶ Enter the HSV or RGB values in the corresponding fields. Select the **R,G,B,H,S** or **V** options to change the look of the colour picking area.



- ▶ Click the Dropper  button to select any colour on your screen. It can be from the Harmony interface, your operating system or any other open application.



You can also click **Multi Wheel Mode** to open the Multiwheel Colour window. This displays all the picking area styles together and also contains a picking undo list. To return to the regular Colour Picker window, click **Single Wheel Mode**.



4. Click on the Shade Scale swatches to modify the shade of the selected colour.



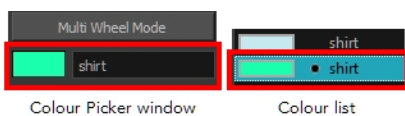
5. Adjust the transparency with the Alpha slider or type the value directly in the Alpha field.



6. Click the **Add** button to add the current selected colour to the Colour Storage Library, so you can quickly access it later.



7. Rename the colour swatch in the Colour Picker window or directly in the colour list by double-clicking on its name.



### How to change the default swatch colour for all your colour palettes

1. From the top menu, select **Edit > Preferences** (Windows/Linux) or **Stage > Preferences** (Mac OS X).
2. In the Preferences dialog box, select the **Drawing** tab.
3. In the New Colour Pots section, select the **Create New Colour Pots Using the Default Colour** option. You can also click on the colour swatch beside the option to change the default colour.

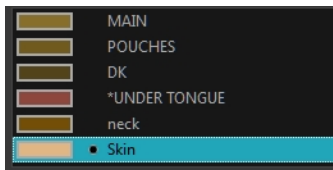
### How to add a new colour swatch using the default colour

- ▶ From the Colour View menu, select **Colours > New**.

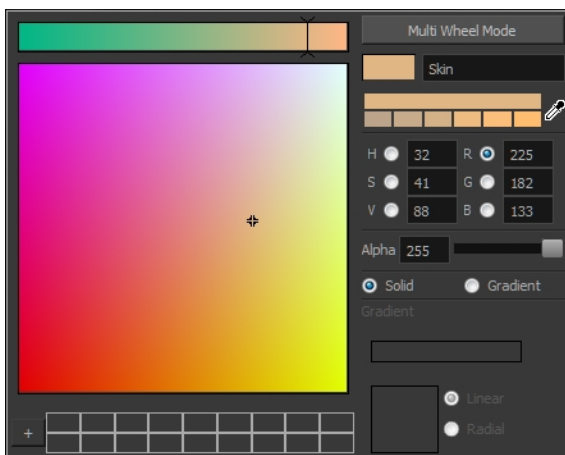
A new swatch is added to your palette using the default colour swatch colour. The new swatch created with the New command will be named **New 0**.

### How to create a gradient colour swatch

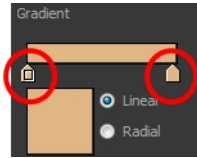
1. In the Colour view, select a colour to modify .
2. Do one of the following:
  - ▶ Click the new colour and from the Colour View menu, select **Colours > New**.
  - ▶ Double-click on the colour swatch.



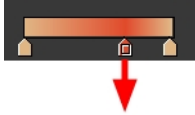
The Colour Picker window opens.



3. Select the **Gradient** option.
4. Select the **Linear** or **Radial** option.
5. Adjust the Gradient arrows to modify the colours.



- Add extra colours by clicking between the arrows below the gradient bar. Then click on the Colour Preview to select a colour.
- Pull down the arrows to remove them.



- Move the arrows left and right to modify the gradient distance.



**NOTE:** To learn how to reposition the gradient zones in your drawings, see [Editing Gradients and Textures](#) on page 200.

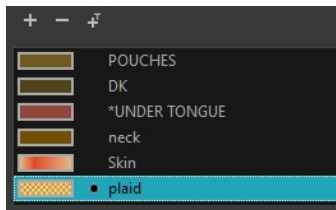
### How to create a texture colour

1. From the Colour menu, select **Colours > New Texture** or click the New Texture  button.

The Browser window opens.

2. Browse for a PSD or TGA bitmap file created with a third party software and click **Open**.

The texture is added to the colour list.

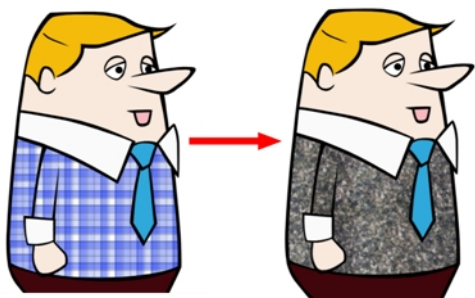


**NOTE:**

To learn how to reposition the textured zones in your drawings, see [Editing Gradients and Textures](#) on page 200.

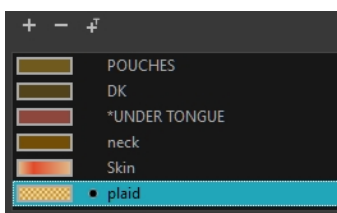
You can also replace a texture once it is painted. If you decide to make the character's shirt wool instead of plaid, just update the texture file in the swatch and the entire project updates. Any transformation previously applied to the texture's position in your drawings will be kept.





## How to replace a texture swatch

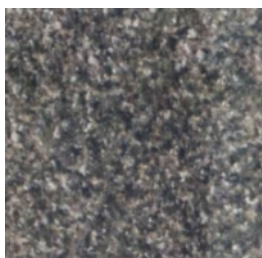
1. In the Colour view, select the texture swatch that contains the bitmap texture you want to replace.



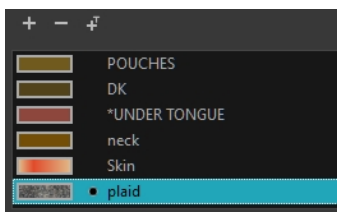
2. From the Colour View menu, select **Colours > Edit Texture** or double-click on the swatch.

The Browser window opens.

3. Browse for the new PSD or TGA bitmap file created in a third party software.

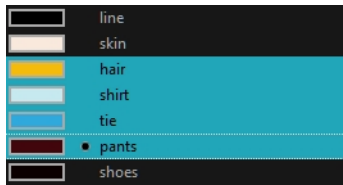



4. Click **Open** to update the colour swatch.



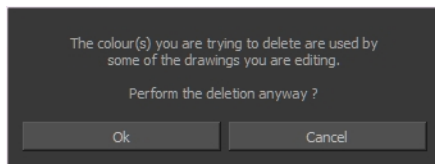
## How to delete a colour swatch

1. In the Colour view, select the colour swatches to delete.



2. Do one of the following:
  - ▶ From the Colour View menu, select **Colours > Delete**.
  - ▶ Click the Delete Colour  button.
  - ▶ Right-click and select **Delete**.
  - ▶ Press Delete.

If the colour swatch is used in a drawing, the Delete Colour dialog box opens.



3. Click **OK** to delete the colours or click **Cancel** to abort the operation.
  - ▶ If you delete colour swatches already in use, the zones painted with them turn red so you can easily identify them.



## Editing Gradients and Textures




If you paint a zone with a gradient or texture colour, you can use the Edit Gradient/Texture tool to modify its position in the zone. You can move, scale, rotate and skew. If you want to match the colour to the animation,

set the first texture position and copy the Edit Gradient/Texture position. When moving to the next drawing, you can select the next texture and paste the previous position to continue the modifications.

If you are painting a hand-drawn animation or if you want the Brush tool and Paint tool to use your gradient's position, angle and scale settings instead of the default ones, you can store your own settings and reuse them afterward.

This way of editing a texture using the Edit Gradient/Texture tool also works with pencil lines drawn with textured "brushes". If you then paint your textured pencil line with a gradient, you can do so and then edit both elements independently at the same time.

### How to use Edit Gradient/Texture tool

1. Do one of the following:
  - ▶ In the Tools toolbar, click the Edit Texture  tool.
  - ▶ From the Camera or Drawing View menu, select **Drawing Tools > Edit Gradient/Texture**.
  - ▶ Press Shift + F3.
2. Click the gradient or texture colour to modify.




Erik, Di-Gata Defenders © Nelvana Limited, Corus® Entertainment

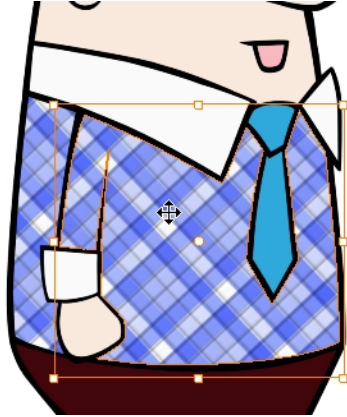
A blue selection frame surrounds the selected gradient or texture.




3. Edit the gradient or texture by adjusting the control handles around the selection frame.




### How to store gradient and texture settings

1. In the Tools toolbar, select the Select  tool or press Alt + S.
2. In the Camera or Drawing view, select the gradient or texture zone to store.




3. In the Tool Properties view, click the Store Colour Gradient  button.

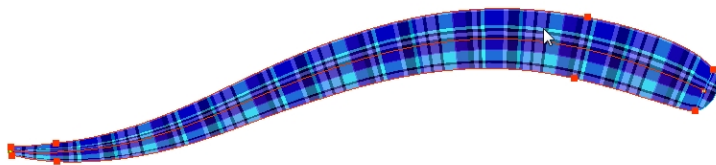
### How to use the stored gradient and texture settings

1. In the Tools toolbar, select the Brush  or Paint  tool.
2. In the Tool Properties view, click the Use Stored Colour Gradient  button.
3. In the Camera or Drawing view, draw and paint.

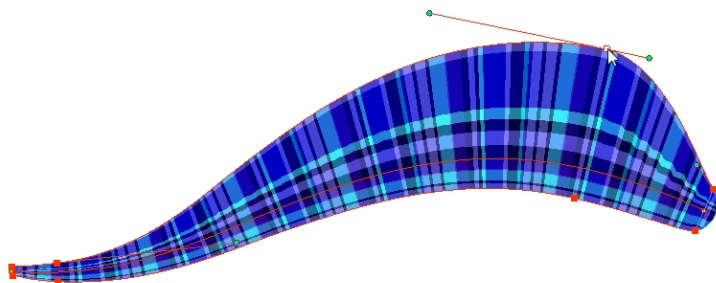
### How to use Pencil Editor tool to edit the texture or gradient on a pencil line

1. Do one of the following:
  - ▶ In the Tools toolbar, select the Pencil Editor  tool.
  - ▶ From the top menu, select **Drawing > Drawing Tools > Pencil Editor**.
  - ▶ Press Alt + W.
2. Click on the pencil line to be modified to bring up its contour envelope.

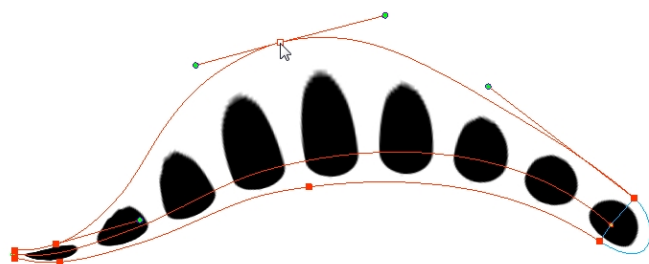




3. Select one of the contour points around the envelope and move its position to change the size of the tiled texture or gradient. You can also pull directly on the lines of the contour envelope or play with the Bezier handles of any given point in order to continue to modify the envelope form.




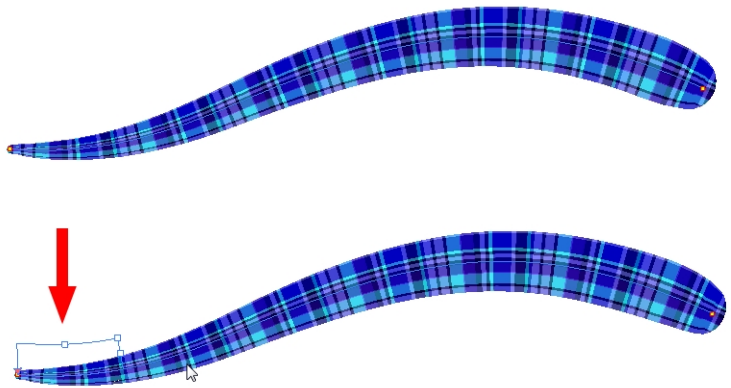
Expanding the width of the envelope parallel to the pencil line's central vector will cause the tiled texture to be stretched. Conversely, reducing the envelope's width will cause the tiled texture to look squashed. Reducing the contour's width perpendicular to the pencil line's central vector will reduce the number of tiles, while expanding it will increase the number of tiled images.



This editing technique does not just work on texture fills, but can also be applied to pencil lines drawn with a textured "brush".

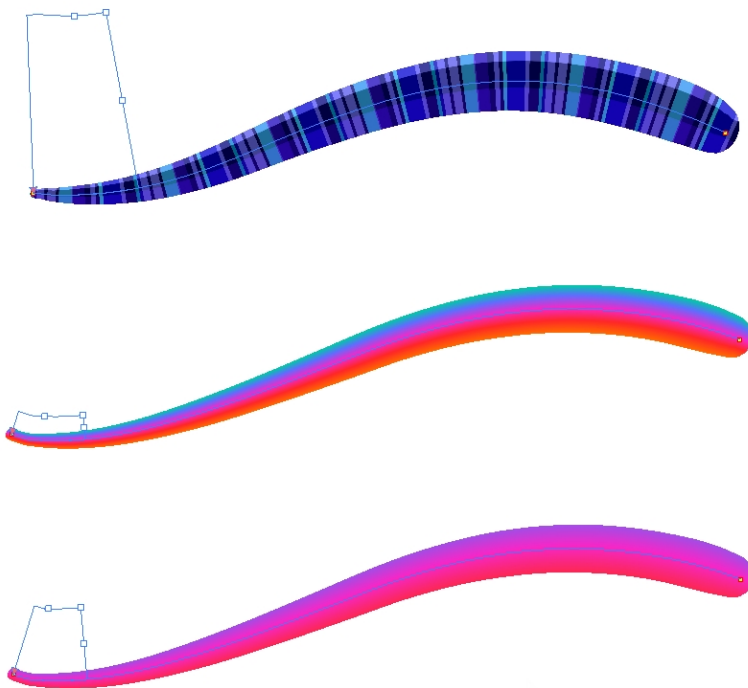
#### How to use Edit Gradient/Texture tool to edit the texture or gradient on a pencil line

1. Do one of the following:
  - ▶ In the Tools toolbar, select the Edit Gradient/Texture  tool.
  - ▶ From the top menu, select **Drawing > Drawing Tools > Edit Gradient/Texture**.
  - ▶ Press Shift + F3.
2. Click on the pencil line to be modified to bring up the editor controls.

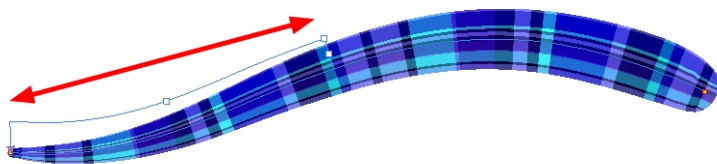


3. The editor controls delineate a single tile in the texture. For gradients, this is less applicable. Pull on the top of the editor controls to stretch the tiled texture throughout the length of the stroke.


As gradients are parallel to the stroke's central vector, this will stretch the way that the gradient is distributed in the pencil line's envelope. The envelope still acts as a boundary for the texture or gradient.

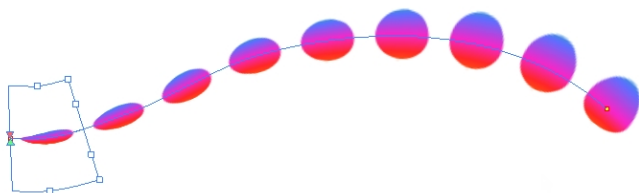


4. Drag the editor control perpendicular to the stroke. You will feel it glide along the stroke's central vector line. This is another way to resize the texture tile. Instead of stretching or shrinking it vertically, this motion stretches or shrinks it vertically. As gradients are parallel to the pencil line's central vector, stretching them vertically gives no visual result.

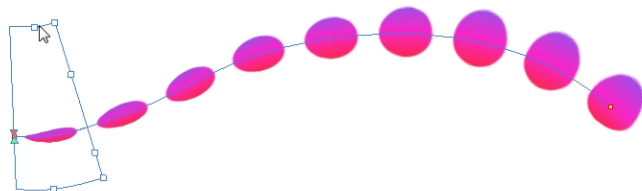


### How to use Edit Gradient/Texture tool to edit the texture and gradient of a pencil line

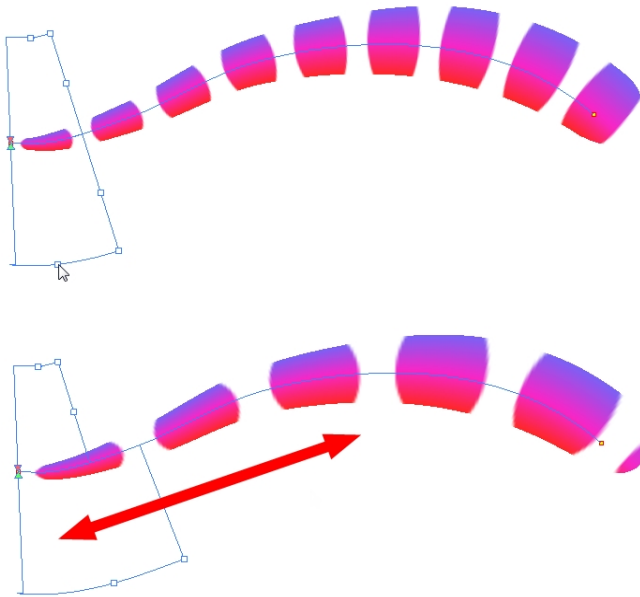
1. Do one of the following:
  - ▶ In the Tools toolbar, select the Edit Gradient/Texture  tool.
  - ▶ From the top menu, select **Drawing > Drawing Tools > Edit Gradient/Texture**.
  - ▶ Press Shift + F3.
2. Click on the pencil line to be modified to bring up the editor controls.



3. Use the top editor controls edit the gradient.



4. Use the bottom controls edit the "brush" texture.



## Colour Display Modes

The Colour view has two display modes:

- List
- Swatch

You can also display the RGB values and names of your solid colour swatches instead of only the name. This option is not available when displaying the colours in Swatch mode.

■	• (000 000 000 255)	line
■	(249 233 220 255)	skin
■	(244 187 010 255)	hair
■	(198 233 239 255)	shirt
■	(047 169 220 255)	tie
■	(065 006 012 255)	pants
■	(012 000 000 255)	shoes
■	(250 185 191 255)	mouth
■	(251 249 250 255)	collar

### How to switch between the display modes

1. From the Colour View menu, and do one of the following:
  - Select **Colours > Swatch Mode** to display the swatches.
  - Deselect **Colours > Swatch Mode** to display the colour list.





## How to display the swatch colour values

- ▶ From the Colour View menu, select **Palettes > Display Colour Values**.

The solid colour swatches' RGB values are displayed between the colour swatch and its name. The gradient colour swatches will be identified as (gradient).

## Copying and Pasting Colours

When you're creating palettes, you may want to copy colour swatches or their values and paste them in other palettes to save time. You can also quickly copy a colour value from a palette in your scene to a selected colour swatch in a different palette.

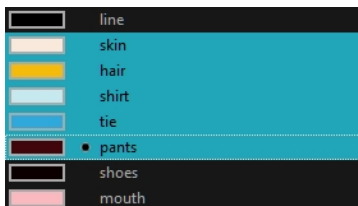
You can copy a selected colour swatch and paste it as a clone. Since it produces a clone colour swatch, it is impossible to use the Paste as Clone command in the same palette as you copied the original colour swatch from.

If you would like to keep a reference file of some colour IDs or use them with custom plug-ins, you can copy the colour swatch IDs. Here is an example of colour ID: **075cf5b552401130**.

```
ToonBoomAnimationInc PaletteFile 2
Solid Black 0x075cf5b15fe006a1 0 0 0 255
Solid White 0x075cf5b15fe006a3 255 255 255 255
Solid Red 0x075cf5b15fe006a5 255 0 0 255
Solid Green 0x075cf5b15fe006a7 0 255 0 255
Solid Blue 0x075cf5b15fe006a9 0 0 255 255
Solid Custom 0x075cf5b15fe006a8 0 0 150 255
Solid "Vectorized Line" 0x0000000000000003 0 0 0 255
```

## How to copy and paste colours

1. In the Colour view, select one or more colours to copy.



2. In the Colour View menu, select **Colours > Copy** or press Ctrl + C (Windows/Linux) or ⌘ + C (Mac OS X).
3. In the Palette list, select the palette in which you want to paste the colours.



4. From the Colour View menu, select **Colours > Paste as New Colours** or press Ctrl + V (Windows/Linux) or ⌘ + V (Mac OS X).
  - To paste the colour values of the copied swatch over an existing colour swatch, select **Colours > Paste Colour Values**.

### How to clone a colour swatch

1. In the Colour view, select the colour swatch you want to clone.
2. From the Colour View menu, select **Colours > Copy** or press Ctrl + C (Windows/Linux) or ⌘ + C (Mac OS X).
3. In the Colour view, select the colour palette you want to paste the clone into or create a new palette.
4. From the Colour View menu, select **Colours > Paste as Clone**.  
The cloned colour swatch appears in the palette.

### How to copy a colour ID

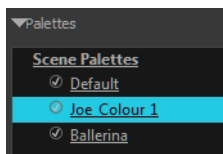
1. In the Colour view, select the colour swatch you want to get the ID from.
2. From the Colour View menu, select **Colours > Copy Colour ID** or press Ctrl + C (Windows/Linux) or ⌘ + C (Mac OS X).
3. Paste the copied value as plain text in the desired document.

## Mixing Colours

If you want to modify a series of colours to blend a tint in them or offset their RGBA values, you can use the Tint panel. You can also create palette styles, such as night and day styles.

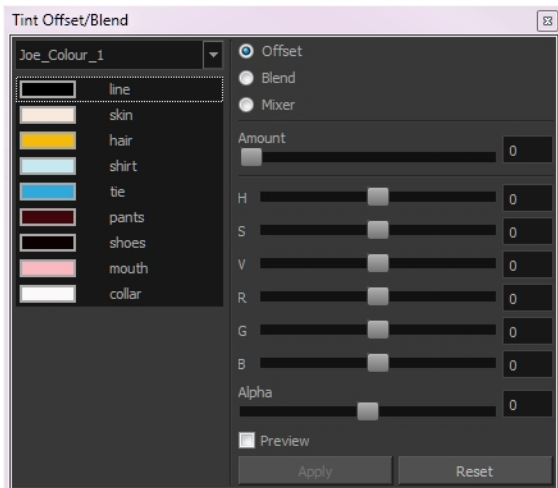
### How to mix colours

1. In the Colour view, select the palette that contains the colours you want to offset or blend.



2. Do one of the following:
  - From the Colour View menu, select **Palettes > Tint Panel**.
  - Right-click and select **Tint Panel**.

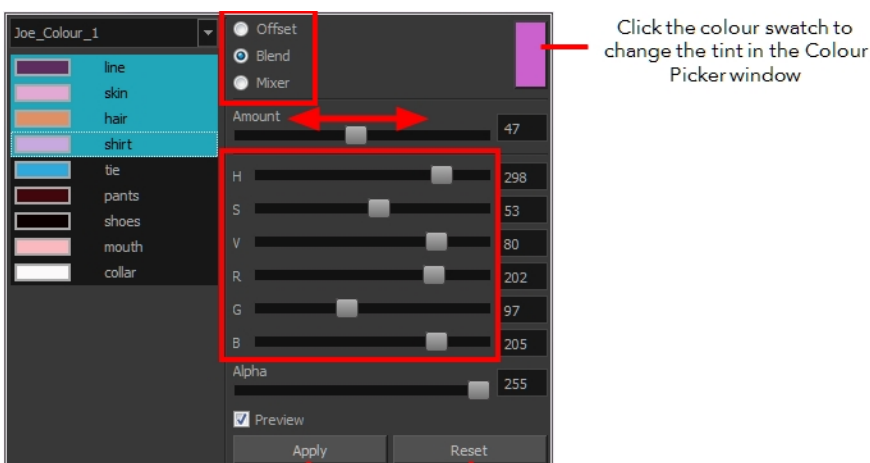
The Tint Blend/Offset panel opens.



3. Select one or more colours to modify in the colour list. To select all the colours, press Ctrl + A (Windows/Linux) or ⌘ + A (Mac OS X).



4. Select **Preview** option.
5. Select the **Offset**, **Blend**, or **Mixer** option.



Click Apply to implement the modification to your palette.

Click Reset button to reset the transformation.

Parameter	Description
Offset	Offsets the selected colours by the adjustments made using the HSB and RGB sliders. Use the Amount slider to adjust the degree of offset. Use the Alpha slider to adjust the opacity of the selected colour.
Blend	Blends the selected colours with the colour swatch in the top-right corner. Use the Amount slider to adjust the degree of blend. A blend of 100% turns the selected colours into the same colour as the swatch. Adjusting the HSB and RGB sliders affect the swatch colour, which in turn affects the selected colours on the left. Use the Alpha slider to adjust the opacity of the swatch.
Mixer	Select a Base and Tint colour to form a third colour swatch. Use the slider just beneath to mix the Base and Tint colours by different amounts. This will affect the mixed swatch whether it is selected or not. Select either the Tint or Base swatch and use the HSB and RGB sliders to adjust its colour. This will affect the mixed swatch colour, which in turn affects the selected colours on the left.

6. Click **Apply**.

## Painting the Model

Now that you've created the colours and the palette, you're ready to paint your model.

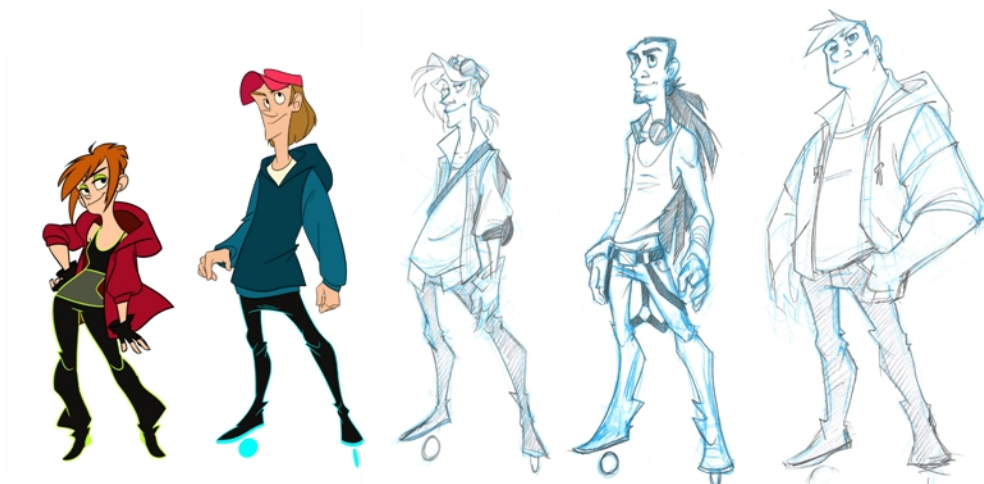
The colour model needs to be painted in order to adjust the colours with the other elements in the production. You can paint your model regardless of the colour RGBA and adjust them later when all the elements are together.

Once your palette is created and your model is painted, you can import a key background and other characters using the Import Drawings option or the Library to compare and adjust the palettes—see [Sharing the Colour Model on page 166](#) to learn how to import your background file.







Abigail Archer, Grossology © Nelvana Limited, Corus® Entertainment Inc.

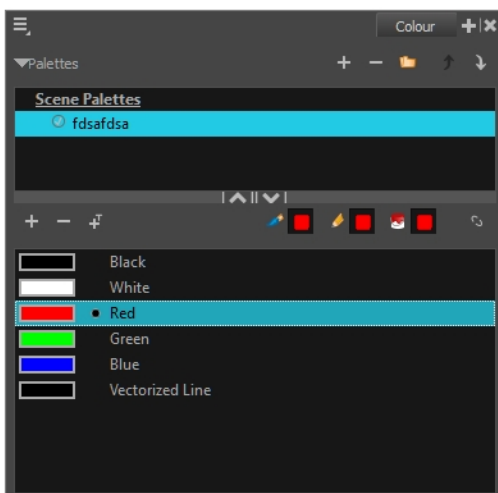
For paperless and cut-out animation, it's a good idea to provide a line-up template with the colour model to show the scale ratio between the characters, props and backgrounds.



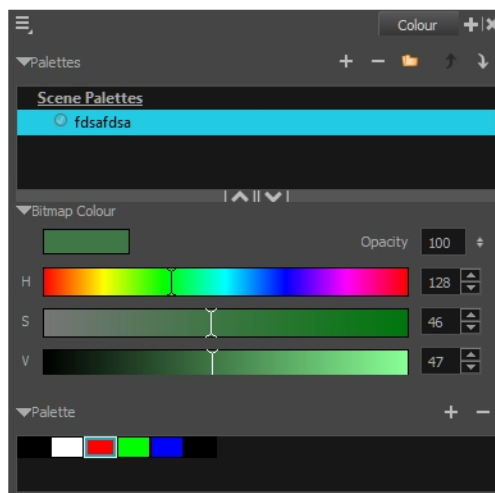
Once your colour model is completed, create a line-up template by pasting one of the production's main characters, or even just a hand, beside the colour model to show the relative size. This allows the animator, layout artist, or scene setup artist to retain the correct scaling throughout the entire project when setting the elements in the scene. You can store your template in the Library.

### How to paint a colour model

1. From the Drawing or Camera View menu, select **View > Switch to Colour Art/Switch to Line Art** or press L.
2. Create your master colour palette—see [Creating a Colour Palette](#) on page 135
3. Add new colours to the palette—see [Adding a Colour Swatch](#) on page 148.
4. Select your Paint Bucket    tool. We recommend the Paint Unpainted  tool.
5. In the Colour view, select a colour to paint your drawing.



Colour view when working with vector layers



Colour view when working with bitmap layers

6. Paint the model by selecting colour swatches in the palette and clicking on your drawing. Note that only closed zones will be painted. If there's a gap in your artwork, you must close before you can paint it.



Abigail Archer, Grossology © Nelvana Limited, Corus® Entertainment Inc.

7. To separate the lines and fill zones on separated art layers, see [Art Layers on page 182](#).
8. Adjust the colours—see [Mixing Colours on page 162](#).

## Sharing the Colour Model

When your colour models are prepared and organized in a colour model scene, it's time to share them. However, since the Harmony scenes are local, the palettes cannot be shared with other scenes. You must prepare templates from the models and store them in the Library.

The Library is a central repository for all the data which will be reused throughout the production. It can be accessed from any Harmony scene; if multiple users are connected to the same network, all machines can access a central library. These models can be shared among all the users to ensure that everyone has the same set of colours and references.

A template is a set of elements created from a Harmony scene that can be imported into other scenes. It can contain drawings, palettes, and any other elements available in Harmony.

A colour model template is very simple to make. When a drawing is stored in the Library, the corresponding palette is attached to it. This means that whenever the colour model is imported from the Library into the scene, the palette is also imported. To learn more about libraries and templates—see the Harmony Cut-Out Animation Guide.

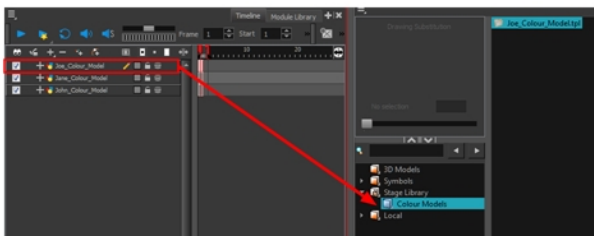
**NOTE:** It is recommended that you add a colour model subfolder to your library.

In the Timeline view, you can create a template by selecting the drawing element's node. This contains all drawings from the drawing element, palettes, and exposure. A template that was created by selecting the drawing exposure contains the selected drawings, their exposures, and the palettes.

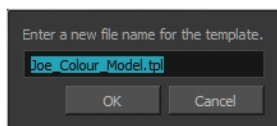
### How to create a template from the Timeline view

1. In the Library, select a folder to store the template. Right-click and select **Right to Modify**.

- From the Timeline view, select the drawings, pegs, effects, keyframes, sounds, exposures, and nodes, and drag them to the Library's folder. Anything that is available in the Timeline view can be stored as a template.



The Rename window opens.

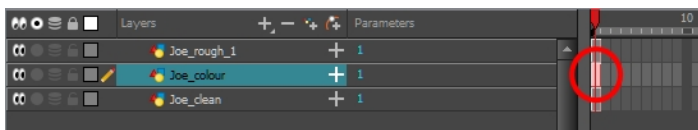


- Type in a name for the template and click **OK**.


There is no need to save the library. Everything is automatically stored and saved as soon as it is pasted in the library.

### How to load a colour model from the Timeline or Xsheet view

- In the Timeline or Xsheet view, select a drawing (\*.tvg).




- Bring the model into the Model view by doing one of the following:
  - In the Timeline view, drag the selected drawing and drop it directly in the Model view.
  - From the Model View menu, select **Use Current Drawing as Model**.

**NOTE:** The Use Current Drawing as Model button is not part of the default Model View toolbar. To add the Use Current Drawing as Model button to the Model toolbar, right-click in the Model view toolbar and select **Customize**. Drag the Use Current Drawing as Model  button from the Available Tools column and move it to the right (Toolbar) column. Click **OK**.

- In the Model View toolbar, click Current Drawing  button.


The model appears in the Model view.


### How to browse for a colour model drawing on your hard drive

1. Do one of the following:
  - ▶ In the Model View toolbar, click the Import Model  button.
  - ▶ From the Model View menu, select **Import Model**.
  - ▶ Select **File > Import > Colour Model**.
2. In the Browser window, browse for any \*.tvg drawing file on your hard drive.
3. Click **Open**.

The model appears in the Model view.

### How to load the default models

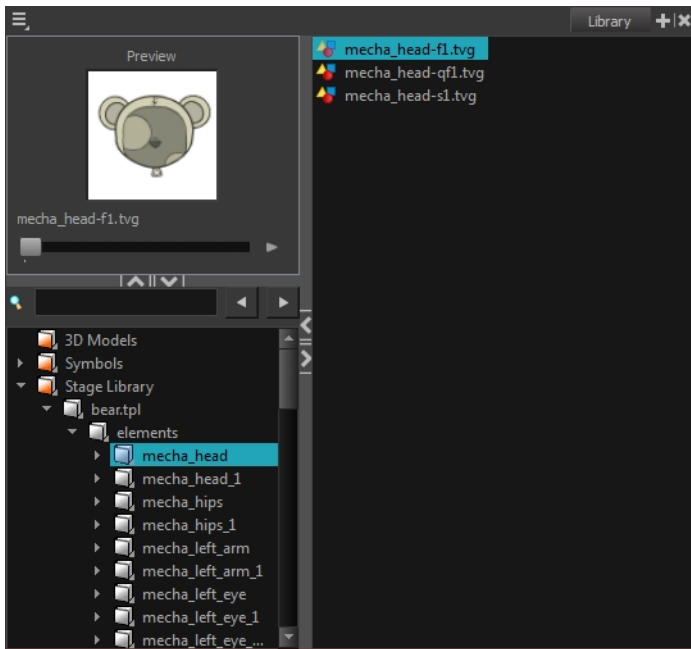
1. In your scene's folder, create a new folder and name it: **models**.
2. On your hard drive, copy the \*.tvg drawing file you want to use as colour models in your scene.
3. Do one of the following:
  - ▶ From the Model View menu, select **Load Default Models**.
  - ▶ In the Model View toolbar, click the Load Default Model  button.

**NOTE:** The Load Default Model button is not part of the default Model View toolbar. To add the Load Default Model button to the Model toolbar, right-click in the Model view toolbar and select **Customize**. Drag the Load Default Model  button from the Available Tools column and move it to the right (Toolbar) column. Click **OK**.

### How to load a single drawing from the Library view



1. In the Library view, click the template containing the drawing to import in the Model view.
2. Right-click on the template and select **Open As Folder**.
3. In the Library view's left side, select the template's folder and continuing expanding its subfolders until \*.tvg files appear on the right side.

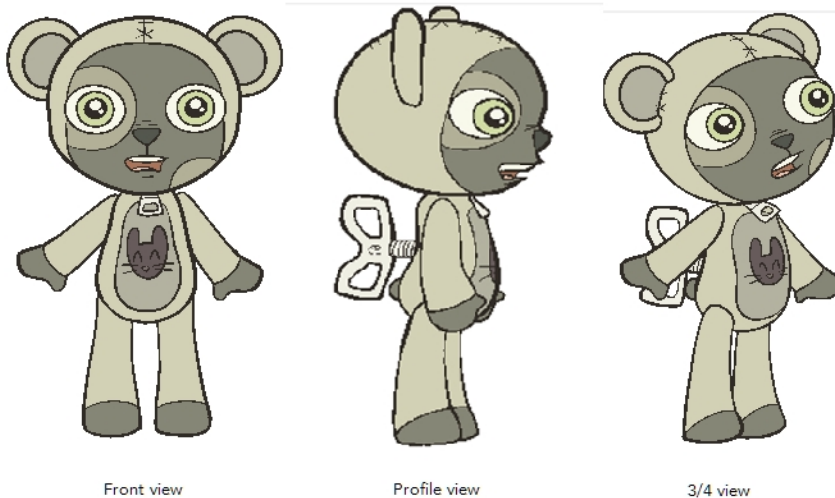




4. In the Library view's right side, select the TVG drawing to import and drag it into the Model view.

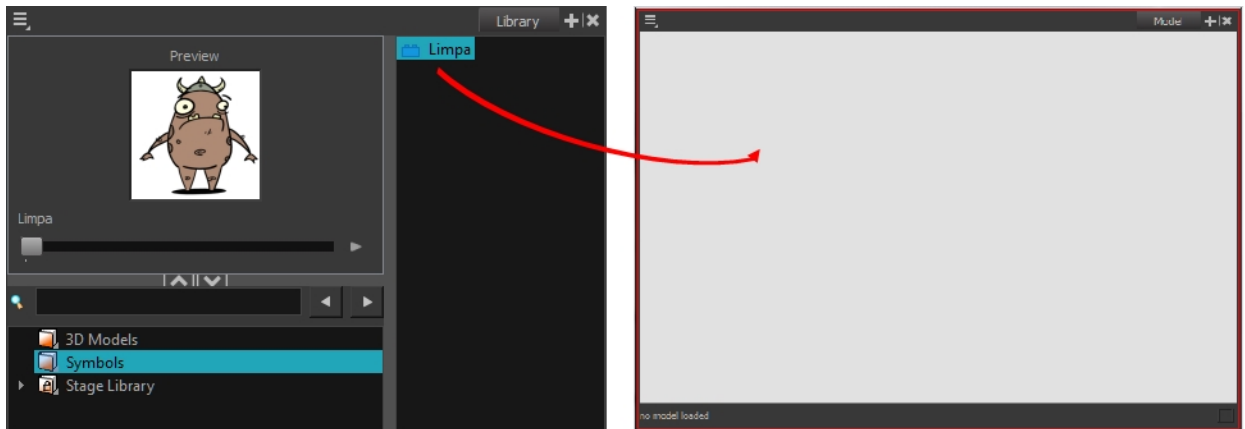
### How to load a template with multiple drawings from the Library view

1. In the Library view, find the template you want to import in the Model view.
2. In the Library view's right side, drag the template (\*.tpl file) and drop it directly in the Model view.
3. Use the Previous Model  and Next Model  buttons in the Model View toolbar to view all the drawings contained in the template. This can often be the front, profile, and 3/4 views of a character.



### How to load a symbol from the Library view

1. In the Library view's left side, select the **Symbols** folder.
2. In the Library view's right side, select the symbol you want to use as a model, and drag and drop it into the Model view.




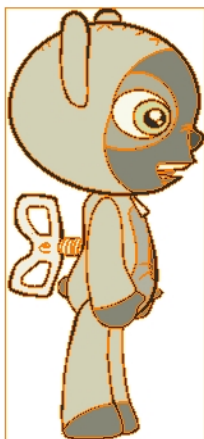
3. Use the Previous Model  and Next Model  buttons in the Model View toolbar to view all the drawings contained in the template. This can often be the front, profile, and 3/4 views of a character.

### How to clear a colour model

- In the Model View menu, select **Clear Model** or press Delete.

### How to copy the entire model from the Model view

1. In the Model View toolbar, select the Select  tool.
1. In the Model view, select your model.




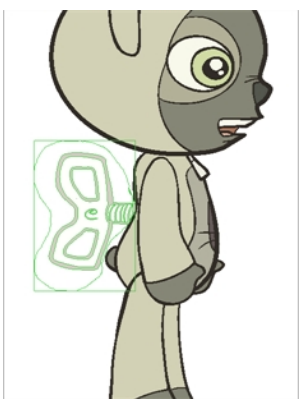
2. From the top menu, select **Edit > Copy Drawing Object** or press **Ctrl + C** (Windows/Linux) or **⌘ + C** (Mac OS X).

2. In the Timeline view, make sure you have the correct layer and frame selected.
3. Select the Drawing or Camera view, then go to the top menu and select **Edit > Paste Drawing Object**, or select the Timeline view and from the top menu, select **Edit > Paste cells in the Timeline** or press **Ctrl + V** (Windows/Linux) or **⌘ + V** (Mac OS X).

The model appears in the selected view.

### How to copy part of the model in the Model view

1. In the Model View toolbar, select the Cutter  tool or press **Alt + T**.
1. In the Model view, use the Cutter tool to create a selection around the part of your model that you want to copy.



2. From the top menu, select **Edit > Copy Drawing Object** or press **Ctrl + C** (Windows/Linux) or **⌘ + C** (Mac OS X).
2. In the Timeline view, make sure you have the correct layer and frame selected.
3. Do one of the following:
  - ▶ Select the Drawing or Camera view and select **Edit > Paste Drawing Object**.
  - ▶ Select the Timeline view and select **Edit > Paste cells in the Timeline** or press **Ctrl + V** (Windows/Linux) or **⌘ + V** (Mac OS X).

The model appears in the selected view.



## Chapter 5: Ink and Paint



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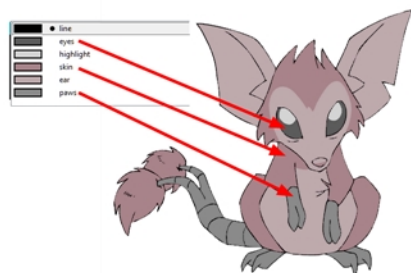
When traditional animation is traced, cleaned up, scanned in and properly exposed, it's time for the ink and paint process. This consists of cleaning all dirt and hair (for example, dust that was in the scanner, dots that do not belong in the drawing, extra floating artwork around the drawing that must be removed), painting the lines and filling the colours in the empty zones on an entire animation sequence.

For paperless animation, the drawings are cleaned up directly in Harmony, so there is generally no dirt to clean, only painting and inking.

For cut-out animation, once the character builder paints the pieces, there is no more ink and paint process because the same parts are always reused and moved around. The ink and paint process applies only to traditional and paperless animation workflows.

Harmony is optimized to ink and paint drawings efficiently. Since most of the drawings are vector-based, the colour zones are completely filled and there are no scattered spots left blank. Also, there are some actions that can be applied on an entire animation sequence at once, like dirt removal, some colour filling, line repainting, and so on.

Harmony uses palettes to hold all the colours you need to paint your elements. A palette is created by assigning a set of colours to each character, prop or effect. The colour styling artist will create a new palette and add a new colour for each zone of the character, such as the skin, hair, tongue, shirt, pants, and so on. Each colour is known as a *colour swatch*—see [Working with Palettes](#) on page 130.



Di-Gata Defenders © Nelvana Limited, Corus® Entertainment

When a zone on the character is painted with the colour contained in a colour swatch, a link is automatically created between that colour swatch and the zone. This means that if the tint of the colour in the colour swatch is changed, any zone linked to it will update to the new tint. This is one way that colour palettes can save time and money in your production.

Another advantage of this system is that you can create complete palettes for different lighting situations. For instance, in addition to the regular palette for a character, you could have one for that character in the rain using colours that are duller and less vibrant than the dry daytime colours, or yet another for using in a night scene. Using palettes linked to your character in this way allows you to instantly change its colouring to suit the mood and atmosphere of the scene without tediously repainting each element.

The ink and paint process is divided into the following steps:

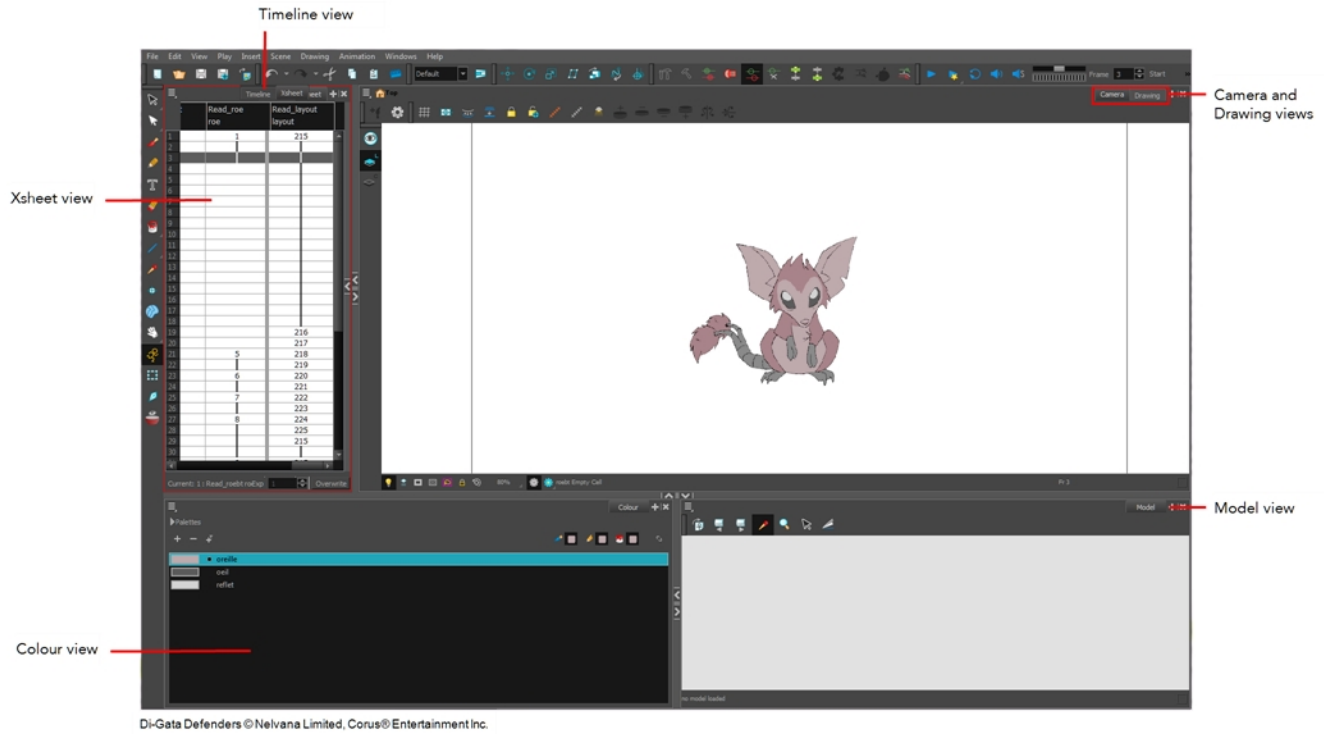
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## Preparation

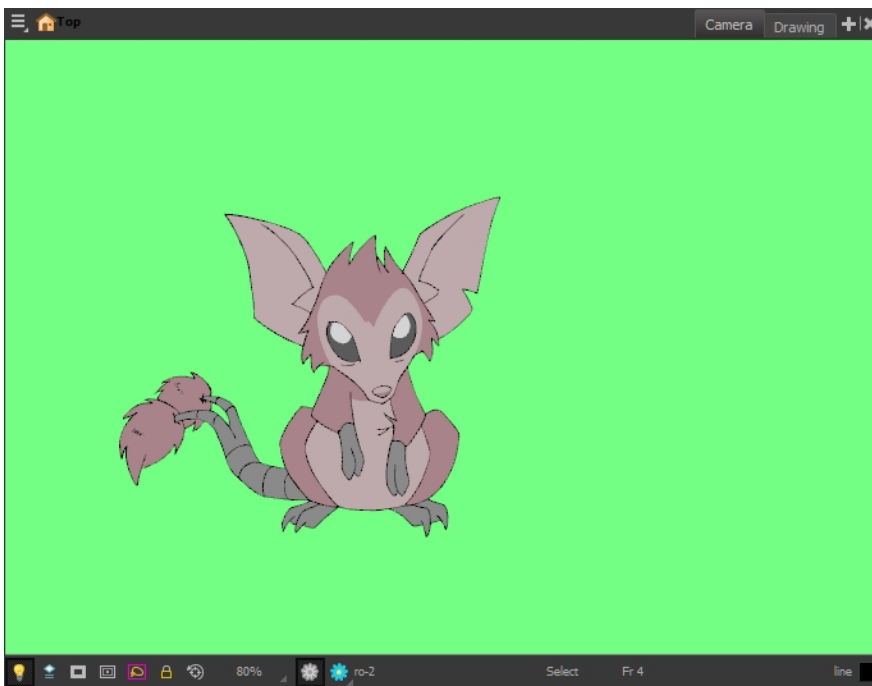
The optimal workspace for creating colour models and inking/painting in traditional animation includes the following views:

- Xsheet
- Camera
- Drawing
- Colour
- Model

As there is no default workspace for these tasks, you will need to create a custom workspace for yourself—see the Fundamentals Guide.



You may have a character or element palette that has colours that are very similar to the Drawing and Camera view's background colour. For example, a white eyeball colour on a white background which makes it difficult to know if the zone was painted. You can change the background colour of the Camera or Drawing view in the Preferences dialog box.



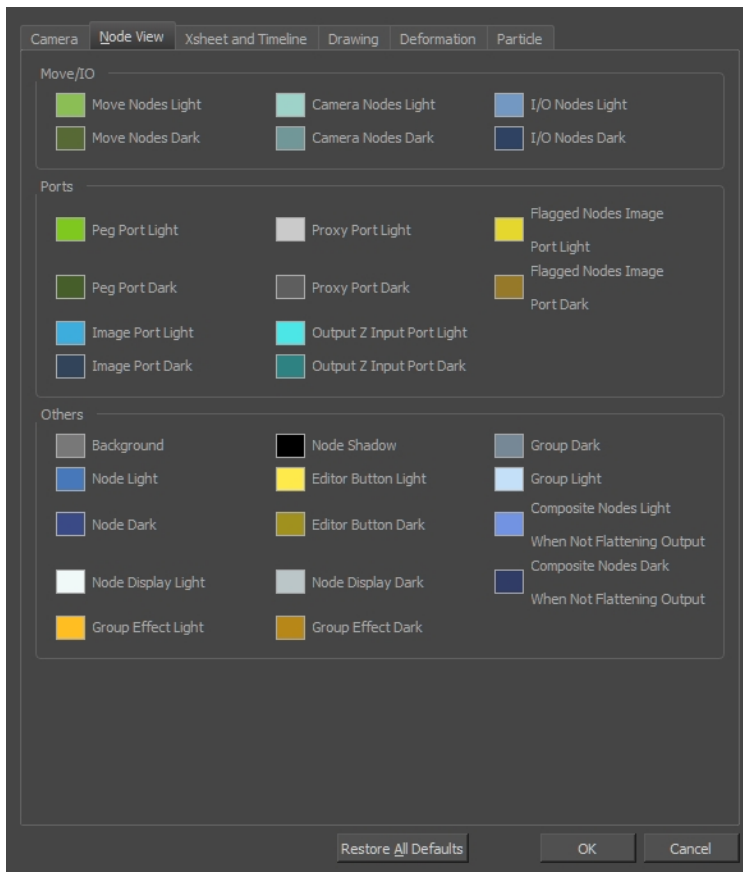
## How to change a view's background colour

- Do one of the following:
  - From the top menu, select **Edit > Preferences**.
  - Mac OS X: Select **Stage > Preferences**.
  - Press Ctrl + U (Windows/Linux) or ⌘ + U (Mac OS X).
 The Preferences dialog box opens.

- Select the **General** tab.

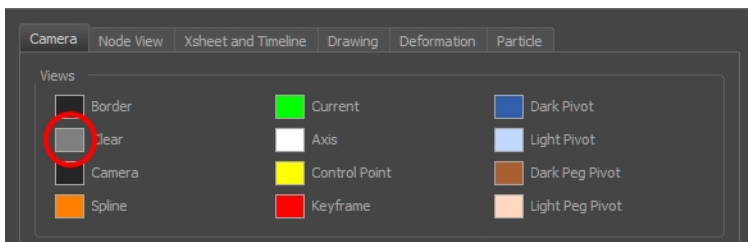
- In the Colours section, click **Edit Colours**.

The Colours dialog box opens.

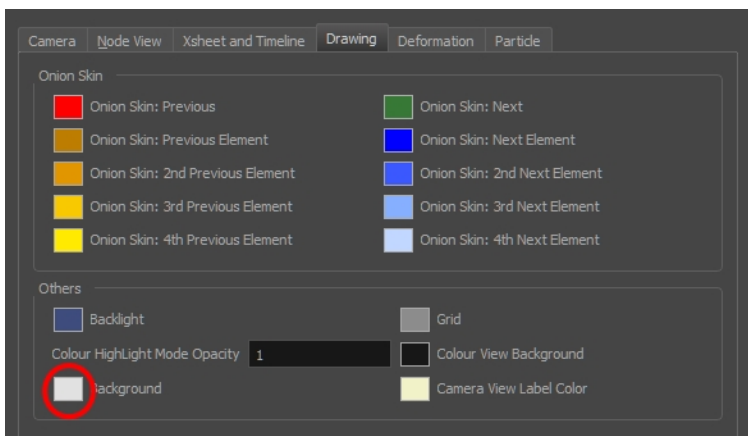


- Select the **Camera** or **Drawing** tab.
- Change the background colour of:
  - Camera View**: Click the **Clear** colour swatch.



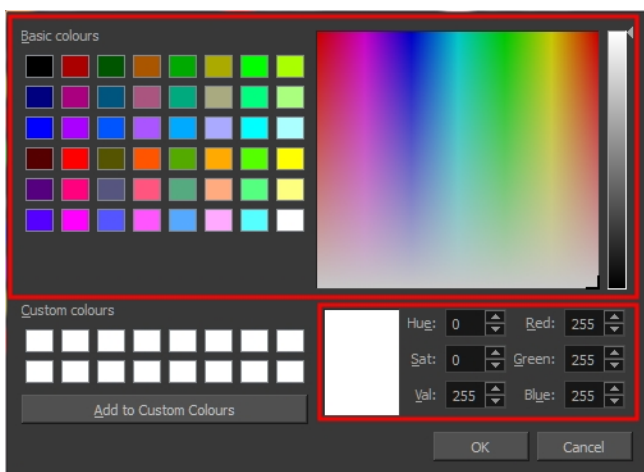


- ▶ **Drawing View:** Click the **Background** colour swatch.



The Select Colour dialog box opens.

6. Select a colour by clicking a colour swatch, clicking a colour in the colour gradient, or entering a HSV/RGB Value.



7. Click **OK** in the three opened dialog boxes to apply your changes.

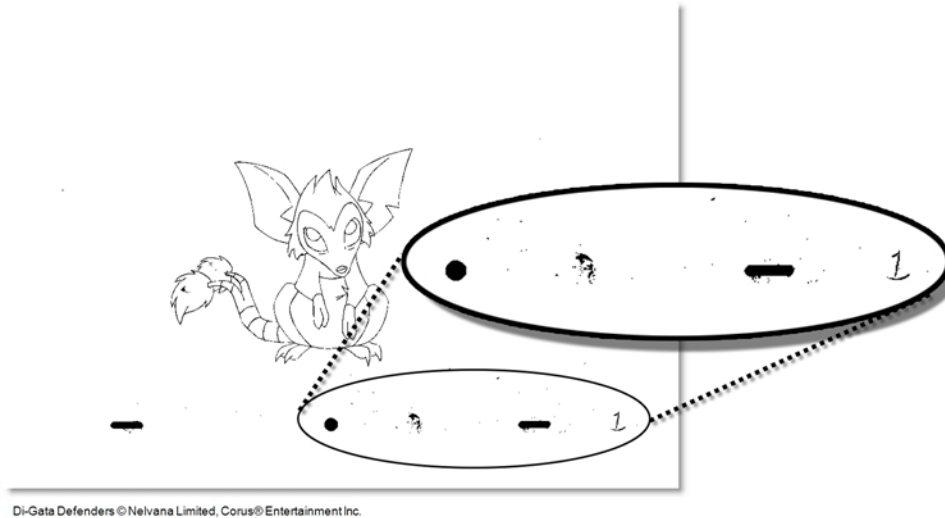
**NOTE:**

When you need to paint drawings with similar colours throughout the palette, you can create a clone of that palette and change all the colours to very bright tints to facilitate the paint process—see [Cloning a Colour Palette](#) on page

140.

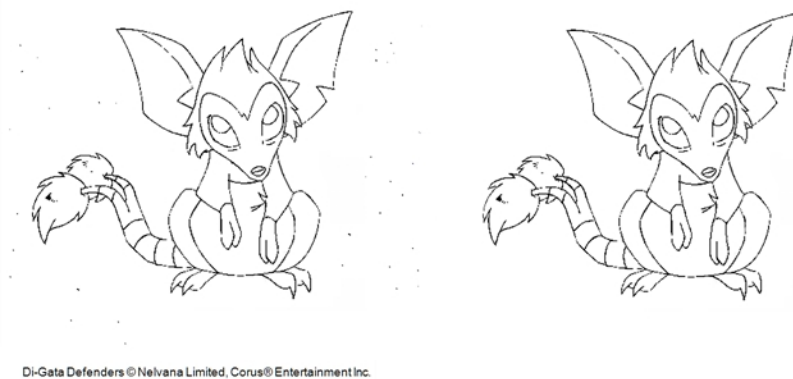
## Dirt Clean Up

When paper drawings are passed through a scanner, there can be some hair and dirt scattered across them. These lines and dots need to be cleaned. Harmony provides different tools to help get rid of them quickly.

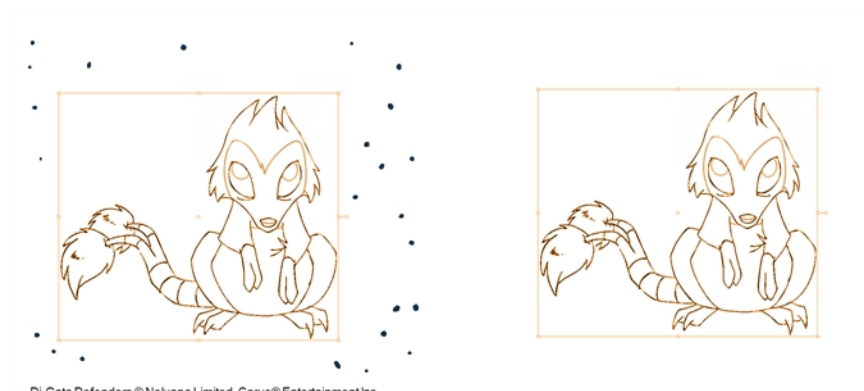


The Remove Dirt tool selects small dots and hairs on the drawing. Raising the Remove Dirt level will select bigger dots. When selecting larger dots, be careful not to lose small details like pupils and nostrils. Once you have chosen the level, you can apply it to the current drawing or the entire animation sequence. This is a quick way to get rid of most dirt and dust.

During this process, the dirt that will be removed is highlighted in red.



The Remove Art Outside Selection option lets you remove any art existing outside a selection. It is recommended that you clean your Colour Art level as well. If you have a stroke accumulation in your Colour Art, it can result in large output files, especially if you work in high-definition resolutions.

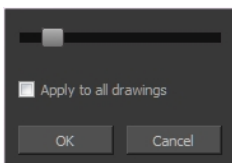


If there are some marks that cannot be removed with the automated tools, you can erase them with the Eraser tool or select them with the Select tool and then delete them. It's always safer to select and delete them than to erase them, so you do not overlook anything.





### How to use the Remove Dirt tool

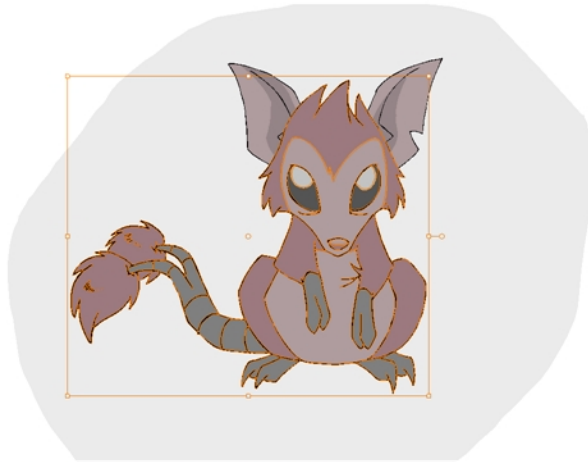
1. Do one of the following:
  - ▶ From the top menu, select **Drawing > Clean Up > Remove Dirt**.
  - ▶ From the Camera or Drawing View menu, select **Drawing > Clean Up > Remove Dirt**.
  - ▶ Press Shift + D.



2. Increase the Remove Dirt value by moving the slider to the right.
3. Select the **Apply to All Drawings** option if you want to apply the operation to all drawings in the layer.

### How to clean dirt with Remove Art Outside Selection

1. In the Tools toolbar, select the Select  tool.
2. In the Tool Properties view, click the Permanent Selection  button.
3. Draw a selection around the animation making sure to include the entire animation sequence.

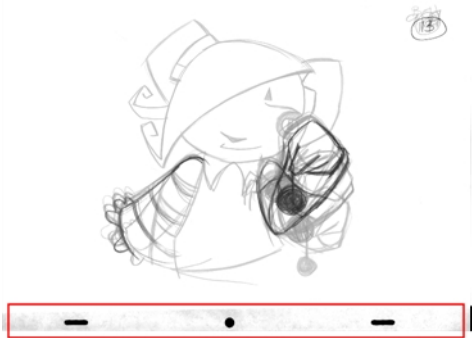


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4. In the Camera or Drawing View menu, select **Drawings > Clean Up** and one of the following options:
  - **Remove Art Outside Selection** to delete artwork outside your selection on a single drawing.
  - **Remove Art Outside Selection on All Drawings** to delete artwork outside your selection on all the drawings.

The art outside the selection is removed.



## Removing Art Inside a Selection



You can delete any art inside a selection with the Remove Art Inside Selection option. We recommend that you clean your Colour Art level as well. If you have a stroke accumulation in your Colour Art, it can result in large output files, especially if you work in high definition resolutions.

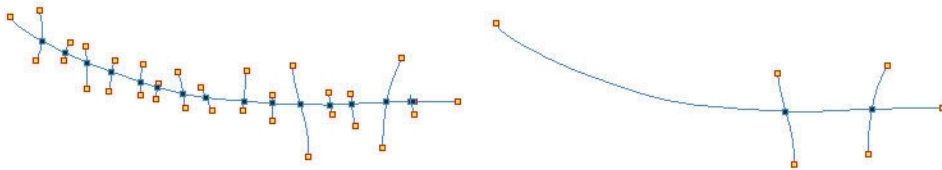
You can simultaneously apply this operation to all your drawings in the layer by using the Remove Art Inside Selection on All Drawings command.

### How to clean dirt with Remove Art Inside Selection

1. In the Tools toolbar, click the Select  tool or press Alt + S.
2. To apply the action to your entire animation, click the Permanent Selection  button in the Tool Properties view.

3. In the Camera or Drawing view, draw a selection around the animation. Make sure the area is large enough to include all the zones to be cleaned up on all drawings.
4. From the top menu, select **Drawing > Clean Up > Remove Art Inside Selection** to delete artwork inside your selection on one single drawing. You can also press Delete.
5. To apply the action on all your drawings in the layer, select **Drawing > Clean Up > Remove Art Inside Selection on All Drawings** to delete artwork inside your selection on all the drawings.

## Removing Small Strokes in the Colour Art Layer

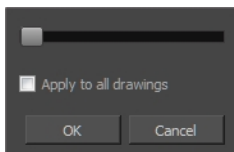


The Remove Hair command lets you remove any small strokes created in the Colour Art layer from very thick lines or filled zones. Increasing the Remove Hair level value will select larger strokes for removal from the drawing.

### How to use the Remove Hair tool


1. In the Timeline or Xsheet view, select the drawing containing the drawing to clean.
2. From the top menu, select **View > Show > Show Strokes** to display the invisible lines or press K.
3. In the top menu, select **Drawing > Clean Up > Remove Hair**.

The Remove Hair dialog box opens.




4. Move the slider to the right to increase the number and length of hairs to be selected.
5. Select the **Apply to All Drawings** option if you want to apply the operation to all the drawings in the layer.
6. Click **OK**.

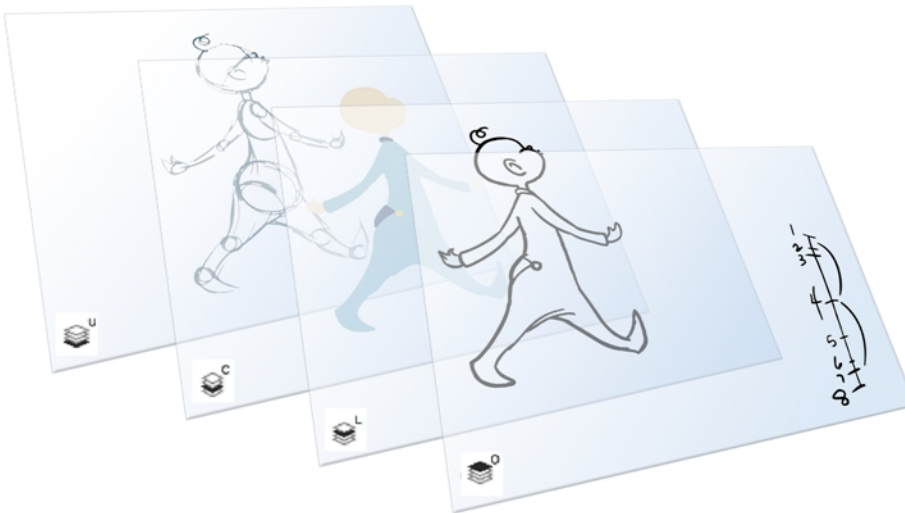
### How to access the Eraser tool

- ▶ From the Tools toolbar, click the Eraser  button.
- ▶ From the top menu, select **Drawing > Drawing Tools > Eraser**.
- ▶ From the Camera or Drawing View menu, select **Drawing > Drawing Tools > Eraser**.
- ▶ Press Alt + E.

### How to access the Select tool

- From the Tools toolbar, click the Select  button.
- From the top menu, select **Drawing > Drawing Tools > Select**.
- From the Camera or Drawing View menu, select **Drawing > Drawing Tools > Select**.
- Press Alt + S.

## Art Layers

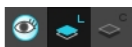


Art layers give you the possibility to divide the artwork in your drawing on different layers. For example, you can separate the outline and colour fill on two art layers, similar to 1950s traditional cell animation. These art layers are contained within a single drawing as opposed to the layers in the Timeline view or Xsheet columns where individual drawings with individual timing are stacked one on top of the other—see [Creating Strokes on page 187](#).

Toon Boom Harmony drawings include four art layers.

-  [Overlay on page 183](#)
-  [Line Art on page 184](#)
-  [Colour Art on page 184](#)
-  [Underlay on page 185](#)

You can access the art layers through the Art Layer toolbar. By default, only the Line Art and Colour Art are displayed. You need to enable the Support Overlay and Underlay Arts option in the Preferences dialog box.



Each layer can be used for separate hand-drawn animation tasks, letting you organize your work and facilitate creation and revision.

## Overlay



The Overlay layer can serve multiple purposes:

- Highlights and tones
- Annotations and corrections



- Sketching

You can also draw in the Overlay layer as it's a regular layer.



### Line Art

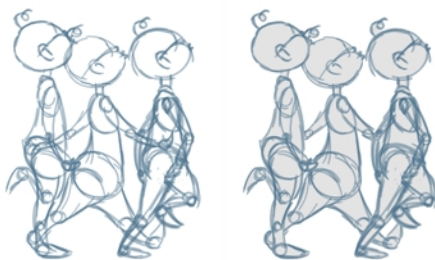


In hand-drawn animation, the Line Art layer is mainly used to trace and clean up animation. The outline is drawn in the Line Art layer and colour is painted in the Colour Art layer.

### Colour Art



In hand-drawn animation, you use the Colour Art layer to paint your animation. The outline is drawn in the Line Art layer and colour is painted in the Colour Art layer. Strokes (invisible lines) are generated from Line Art to contain the painted area.



When you are doing rough animation, you may want to send a clip for feedback or approval before carrying on with your work. If you have several characters in your project that are overlapping, it may be difficult to understand what is going on as you can see through the characters. Toon Boom Harmony can generate a matte automatically in the Underlay, or even in the Colour Art layer, and fill all the zones inside your characters to make them opaque. This process is fast and easy, and allows you to send easy-to-understand movies.



## Underlay





The Underlay layer can serve multiple purposes. It is frequently used by animators to sketch rough animation or generate a matte colour when doing line testing.



### How to enable the Support Overlay and Underlay Arts option

1. From the top menu, select **Edit > Preferences** ( Windows/Linux ) or **Stage > Preferences** ( Mac OS X ).
2. In the Preferences dialog box, select the **Advanced** tab.
3. In the Advanced Options section, select the **Support Overlay and Underlay Arts** option.
4. Click **OK**.


### How to switch between drawing layers

1. In the Art Layer toolbar, click the Line Art  or Colour Art  buttons. When switching art layers, you can edit the select layer without affecting the other one.







2. Click the Preview All Enabled Art Layers  button to display both layers together. Even when the Preview mode is enabled, you will only be able to edit the select art layer. The other ones are only displayed as a reference. By default, the Preview mode is always enabled in the Camera view. You will only be able to see the select art layer by itself if you enable the Current Drawing on Top  option located in the Camera bottom toolbar.



#### NOTE:

To edit both Line Art and Colour Art at the same time, you must enable the Apply to Line Art and Colour Art  button in the Tool Properties of the tools supporting the operation.


### How to switch between the drawing layers in Advanced Art mode

1. In the Art Layer toolbar, click the Overlay Art , Line Art , Colour Art  or Underlay Art  buttons to display the appropriate layer—see [How to enable the Support Overlay and Underlay Arts option on page 185](#). When switching art layers, you can edit the selected layer without affecting the other one.



- Click the Preview All Enabled Art Layers  button to display all the layers together. The other ones are only displayed as a reference. By default, the Preview mode is always enabled in the Camera view. You can view only the selected art layer if you select the Current Drawing on Top  option in the Camera bottom toolbar.

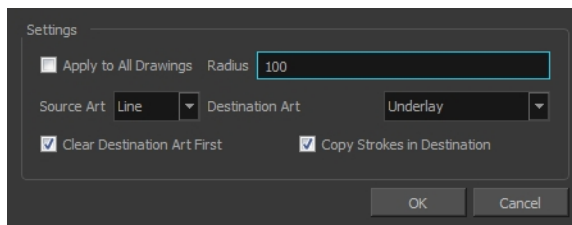
### How to generate a matte

- Do one of the following:
  - In the Tools toolbar, select the Select  tool.
  - Press Alt + S.
- In the Camera or Drawing view, select the drawing you want to create a matte for.

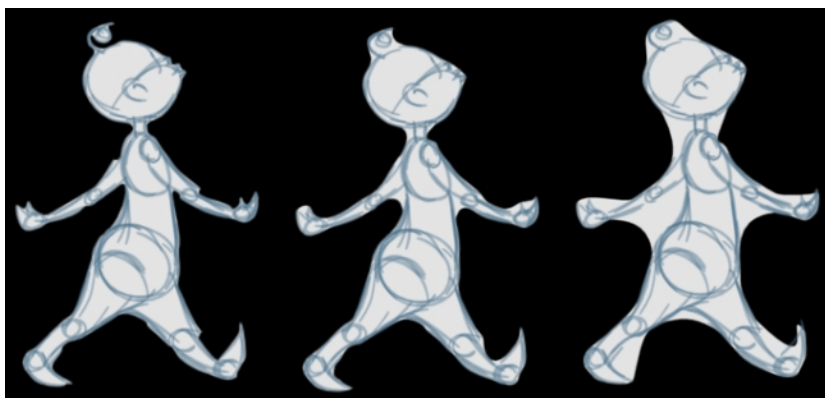
**NOTE:** You can also apply the operation to all the drawings in the layer at the same time.

- Do one of the following:
  - From the top menu, select **Drawing > Generate Auto-Matte**.
  - In the Camera or Drawing menu, select **Drawing > Generate Auto-Matte**.

The Auto-Matte dialog box opens.



- If you want to create a matte for all the drawings included in your layer, select the **Apply to Multiple Drawings** option.
- Depending on how precise or rough your line is, increase or decrease the radius value. The lower the value, the closer to your lines' contours the matte will be shaped. The higher the value, the looser the matte will be shaped.



Radius: 20

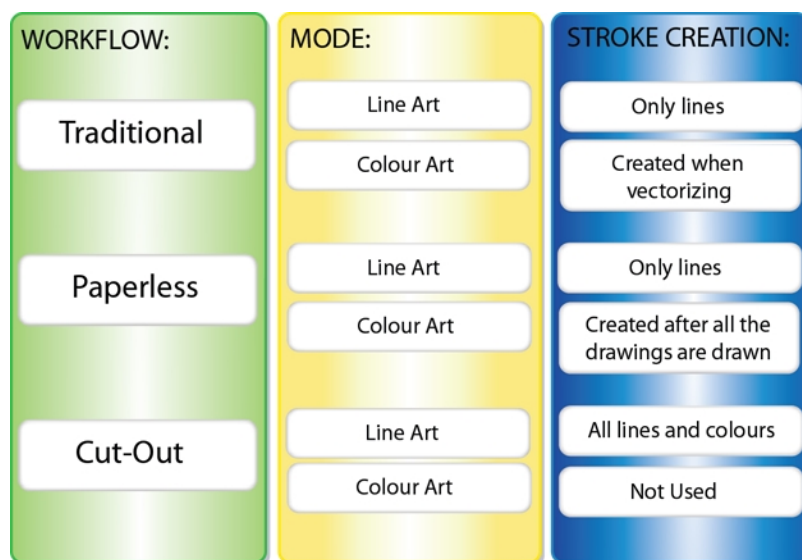
Radius: 100

Radius: 300

6. In the Source Art menu, select the layer from which you want the matte created: **Line Art**, **Colour Art**, **Underlay** or **Overlay**.
7. In the Destination Art menu, select the layer on which you want the matte to be created: **Line Art**, **Colour Art**, **Underlay** or **Overlay**.
8. If you already have artwork on the destination layer and you want the content to be deleted before the matte is added into it, select the **Clear Destination Art First** option.
9. If you want the contour of your lines to be copied as invisible lines in your matte drawing (in case you ever need to keep them for later), select the **Copy Stroke in Destination** option.
10. Click **OK**.

## Creating Strokes

A drawing is composed of Line and Colour filling layers. Lines and colours can be separated or kept together, depending on which animation process you use. The following diagram presents Line Art and Colour Art recommendations based on the selected animation workflow.



When a traditional drawing is scanned, strokes are automatically created in the Colour Art from the Line Art when drawings are vectorized unless you specified otherwise.

When working with Cut-out animation, we recommend that you do all of the work in the Line Art.




Once the drawing sequence is completed for paperless drawings, you can proceed with creating Colour Art strokes if you plan to paint the animation in the Colour Art. Use the Create Colour Art from Line Art option to create strokes from your lines.

You can create strokes in the Colour Art during the following stages:



- After the full drawing is completed in Line Art
- While drawing in Line Art

You may have some traditional drawings that need to be fixed; for example, needing extra lines to patch gaps. Use the Auto-Create Colour Art from Brush option to create the strokes at the same time as the lines are drawn. This creates strokes from the lines and brush strokes created in the Line Art while you draw and is useful for fixing drawings. However, if you are drawing a new sketch, it is better to create the strokes afterward using the Create Colour Art from Line Art option.

### How to create Colour Art zones out of the Line Art content

1. In the Tools toolbar, select the Select  tool or press Alt + S.
2. In the Tool Properties view, click the Permanent Selection  button if you want to apply the operation on all drawings in the layer.
3. In the Camera or Drawing view, select the artwork to transfer to the Colour Art. Create a selection around the entire animation sequence if you want to apply the operation to all your drawings.
1. In the Drawing View toolbar, click the Create Colour Art from Line Art  button or press \*.

### How to create strokes with the Create Colour Art Automatically option

1. In the Tools toolbar, select the Brush tool.
2. In the Tool Properties view, enable the Create Colour Art Automatically  option.
3. Draw the required lines.
4. Once you're done, deselect the Create Colour Art Automatically  option.

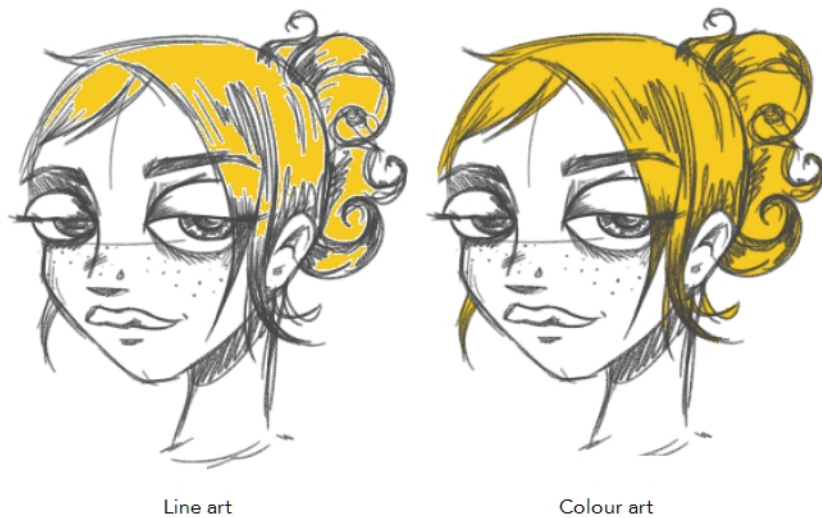
You are now ready to paint your model.

## Painting

You can choose to paint your animation in the Line Art or Colour Art level. You can paint in Line Art, but for traditional and paperless animation, you should fill your colour zones in Colour Art. You can access the art layers through the Art Layer toolbar—see [Art Layers on page 182](#).

There are many advantages to separating the lines and colour zones, but the main one concerns the painting process. To paint very quickly, it's useful to not have to worry about painting over the lines. If the lines are separated, you can fill the zones very quickly and you will never accidentally paint the lines. Conversely, if you are inking the lines, you will not repaint the colour zones either.

If you have transparent lines, bitmap lines, or textured lines with transparency, it's better to have your colour zones bleeding under your lines to avoid seeing the backgrounds and other elements through the lines.



**NOTE:** To avoid painting in Line Art by mistake, turn off the Preview mode and paint in the Drawing view instead of the Camera view. Press P to turn the mode on or off.

This section is divided as follows:

- [Painting Using the Paint Tool](#) on page 190
- [Advanced Painting Features](#) on page 191
- [Selecting a Colour in a Drawing](#) on page 194
- [Importing Models](#) on page 195
- [Editing Gradients and Textures](#) on page 200
- [Closing Gaps](#) on page 205
- [Protecting Colours](#) on page 206
- [Highlighting a Selected Colour](#) on page 207
- [Inverting a Colour Selection](#) on page 208

## Painting Using the Paint Tool

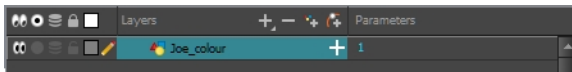



The main tool you will use to paint your drawings with is the Paint tool. The Paint tool can be used in several different modes, which can be customized in the Tool Properties view.

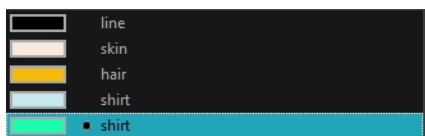
The Paint tool paints closed zones, including brush strokes and pencil lines. If there are gaps in the lines defining a zone, you must close them using the Brush, Pencil, or Close Gap tools or the Automatic Close Gap option.

### How to paint with the Paint tool

1. In the Timeline or Xsheet view, select the cell on which you want to paint.



2. Do one of the following:
  - In the Tools toolbar, click the Paint  tool.
  - Press Alt + I.
3. In the Colour view, select a colour.



4. In the Drawing or Camera view, start painting. Click on a zone or pencil line to paint it, or trace a lasso or marquee selection to paint several zones or pencil lines at the same time.

**NOTE:** The last colour you select while using the Paint tool will be used the next time you select the Paint tool if you're using the unlocked painting tools in the Colour view.

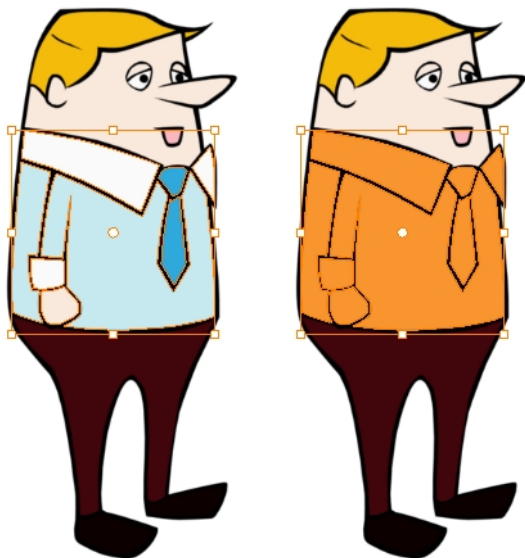
## Advanced Painting Features

The following advanced painting features are available in Toon Boom Harmony:


- [Repaint Selection](#) on page 191
- [Repaint Selection on All Drawings](#) on page 191
- [Repaint Outside Selection](#) on page 192
- [Repaint Outside Selection on All Drawings](#) on page 192
- [Unpaint Selection](#) on page 193
- [Unpaint Selection on All Drawings](#) on page 193
- [Unpaint Outside Selection](#) on page 193
- [Unpaint Outside Selection on All Drawings](#) on page 194

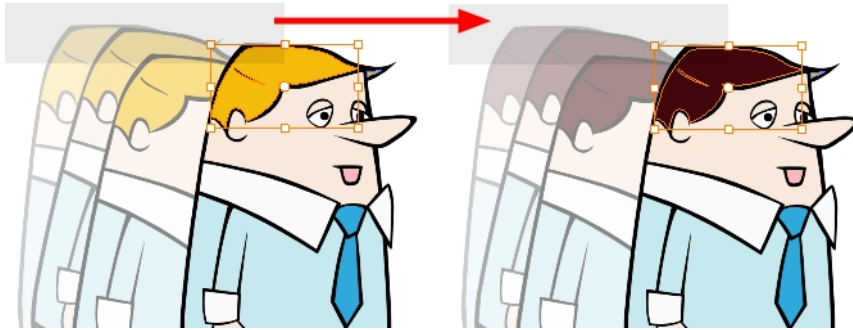
### Repaint Selection

The Repaint Selection command is used to repaint any art inside a selection. You must first draw a selection using the Select tool in order for this command to be available.



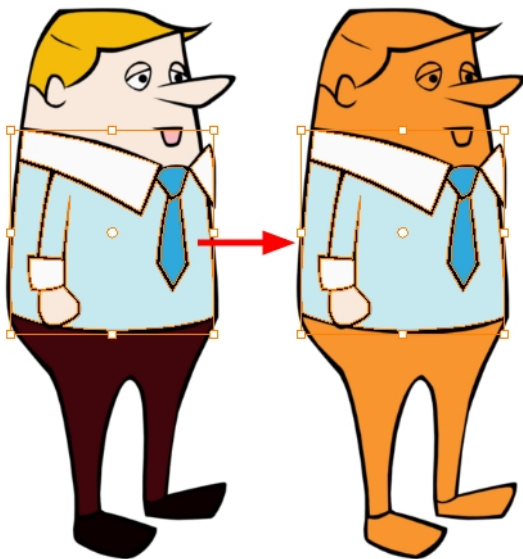
### Repaint Selection on All Drawings

The Repaint Selection On All Drawings command is used to repaint any art inside a selection on all the drawings contained within the same layer. You must enable the Permanent Selection  option in the Select tool Tool Properties view and then select an area of your drawing using the Select tool in order for this command to be available. The Permanent Selection option lets you maintain the same selection throughout the drawings of a same layer.




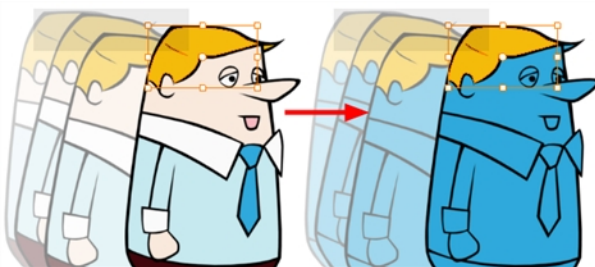
### Repaint Outside Selection

The Repaint Outside Selection command is used to repaint any art outside a selection. If no selection has been drawn using the Select tool, the entire drawing will be repainted.



### Repaint Outside Selection on All Drawings

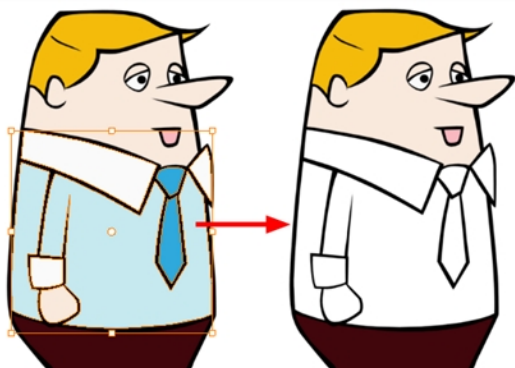
The Repaint Outside Selection On All Drawings command is used to repaint any art outside a selection on all the drawings contained within the same layer. You must enable the Permanent Selection  option in the Select tool Tool Properties view and then select an area of your drawing using the Select tool in order for this command to be available. The Permanent Selection option lets you maintain the same selection throughout the drawings of a same layer.






## Unpaint Selection

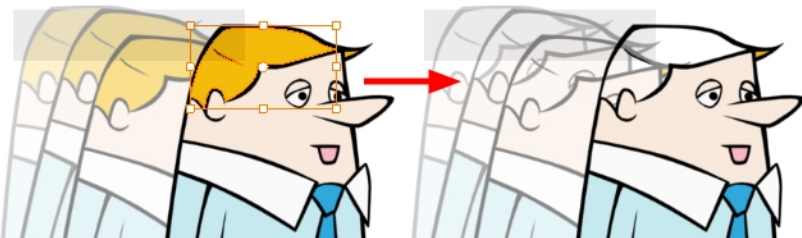
The Unpaint Selection command is used to unpaint any art existing inside a selection. You must first draw a selection using the Select tool in order for this command to be available.



## Unpaint Selection on All Drawings

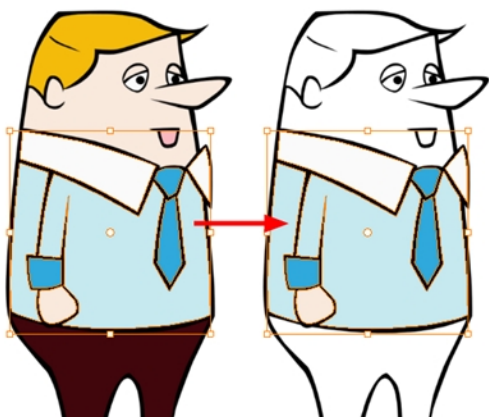
The Unpaint Selection on All Drawings command is used to unpaint all art contained inside a selection on all the drawings within the same layer.

You must enable the Permanent Selection  option in the Select tool Tool Properties view and then select an area of your drawing using the Select tool in order for this command to be available. The Permanent Selection option lets you maintain the same selection throughout the drawings of a same layer.




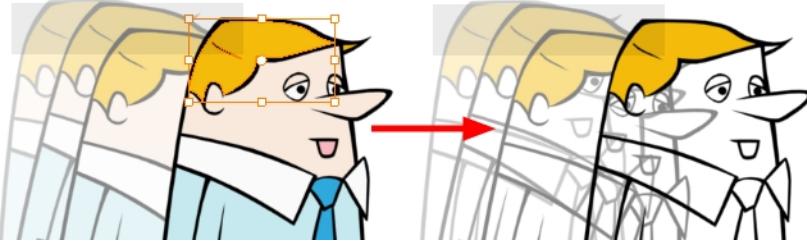
## Unpaint Outside Selection

The Unpaint Outside Selection command is used to unpaint any art existing outside a selection. If no selection have been drawn using the Select tool, the entire drawing will be unpainted.



## Unpaint Outside Selection on All Drawings

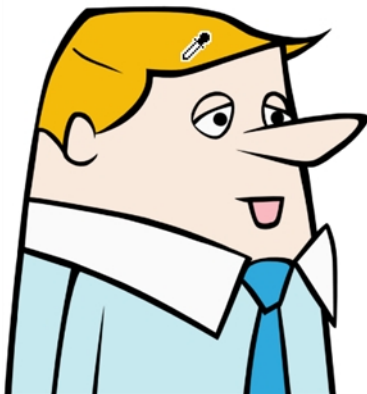
The Unpaint Outside Selection on All Drawings command is used to unpaint all art outside a selection on all the drawings within the same layer. You must enable the Permanent Selection  option in the Select tool Tool Properties view and then select an area of your drawing using the Select tool in order for this command to be available. The Permanent Selection option lets you maintain the same selection throughout the drawings of a same layer.



### How to access the advanced painting tools


- From the top menu, Camera or Drawing view menu, select **Drawing > Paint** and one of the following:
  - Repaint Selection
  - Repaint Selection on All Drawings
  - Repaint Outside Selection
  - Repaint Outside Selection on All Drawings
  - Unpaint Selection
  - Unpaint Selection on All Drawings
  - Unpaint Outside Selection
  - Unpaint Outside Selection on All Drawings

## Selecting a Colour in a Drawing



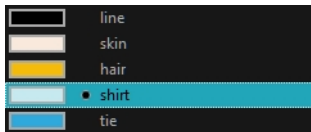
While working in the Camera or Drawing view, you can use the Dropper tool to pick a colour from your drawing without going to the Colour view.

## How to use the Dropper tool

1. Do one of the following:
  - ▶ In the Tools toolbar, select the Dropper  tool.
  - ▶ From the top menu, select **Drawing > Drawing Tools > Dropper**.
  - ▶ Press Alt + D.
2. In the Camera or Drawing view, click on the desired colour.
  - ▶ If you're using another drawing tool such as the Paint tool, you can temporarily hold down the D key and click in your drawing before releasing the key to pick your colour. When you release the key, you will return to your previous tool. You may also want to select the zones painted with the colour currently selected in the Colour view. This can be useful for removing rough lines from a clean drawing.

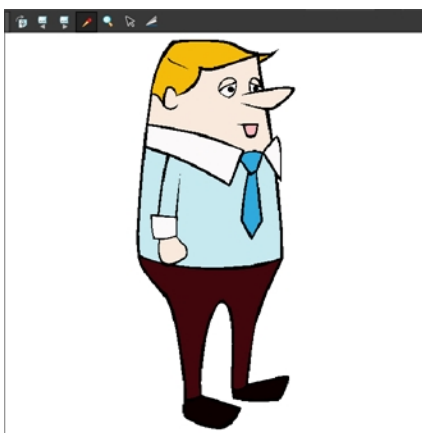
## How to select the zones painted with the current colour

1. In the Colour view, select the colour from which you want to select the corresponding zones.




2. Do one of the following:
  - ▶ Select **Drawing > Select Strokes With Current Colour**.
  - ▶ Press Ctrl + Shift + A (Windows/Linux) or ⌘ + Shift + A (Mac OS X).

## Importing Models



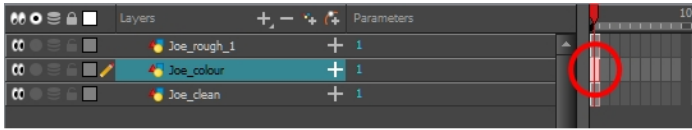
Once you have a fully painted drawing, you can use it as a colour model and load it in the Model view. That drawing can be used and loaded in any of your Harmony scenes.

Once a drawing is loaded in the Model view, you can use the Dropper  to select a colour from the model and use it to paint in your Camera or Drawing view without having to pick the colour from the colour palette.


You can do more than just copy colours from a colour model. Harmony gives you the ability to copy parts of the character directly from its colour model and paste these elements into the Drawing or Camera views.


### How to load a colour model from the Timeline or Xsheet view

1. In the Timeline or Xsheet view, select a drawing (\*.tvg).




2. Bring the model into the Model view by doing one of the following:
  - ▶ In the Timeline view, drag the selected drawing and drop it directly in the Model view.
  - ▶ From the Model View menu, select **Use Current Drawing as Model**.


**NOTE:** The Use Current Drawing as Model button is not part of the default Model View toolbar. To add the Use Current Drawing as Model button to the Model toolbar, right-click in the Model view toolbar and select **Customize**. Drag the Use Current Drawing as Model  button from the Available Tools column and move it to the right (Toolbar) column. Click **OK**.

- ▶ In the Model View toolbar, click Current Drawing  button.
- The model appears in the Model view.

### How to browse for a colour model drawing on your hard drive

1. Do one of the following:
    - ▶ In the Model View toolbar, click the Import Model  button.
    - ▶ From the Model View menu, select **Import Model**.
    - ▶ Select **File > Import > Colour Model**.
  2. In the Browser window, browse for any \*.tvg drawing file on your hard drive.
  3. Click **Open**.
- The model appears in the Model view.

### How to load the default models

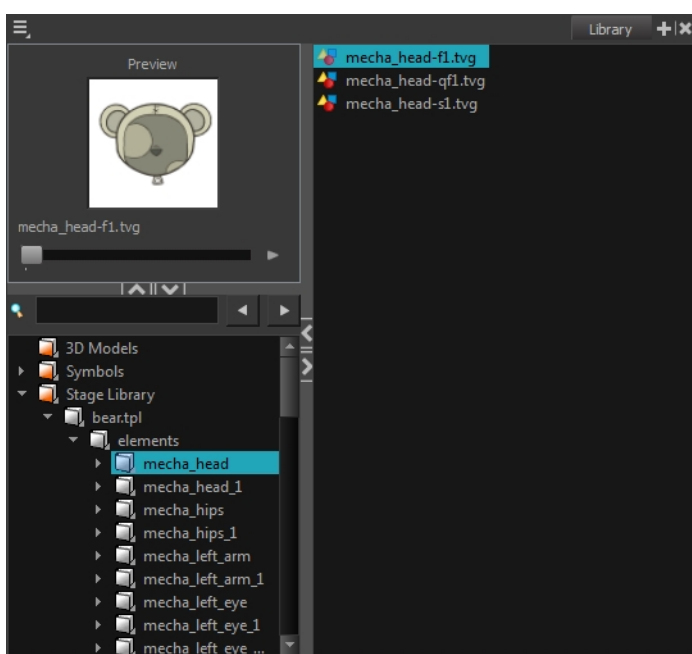
1. In your scene's folder, create a new folder and name it: **models**.
2. On your hard drive, copy the \*.tvg drawing file you want to use as colour models in your scene.
3. Do one of the following:
  - ▶ From the Model View menu, select **Load Default Models**.
  - ▶ In the Model View toolbar, click the Load Default Model  button.

**NOTE:** The Load Default Model button is not part of the default Model View toolbar. To add the Load Default Model button to the Model toolbar, right-click in the Model view toolbar and select **Customize**. Drag the Load Default Model button from the Available Tools column and move it to the right (Toolbar) column. Click **OK**.





### How to load a single drawing from the Library view

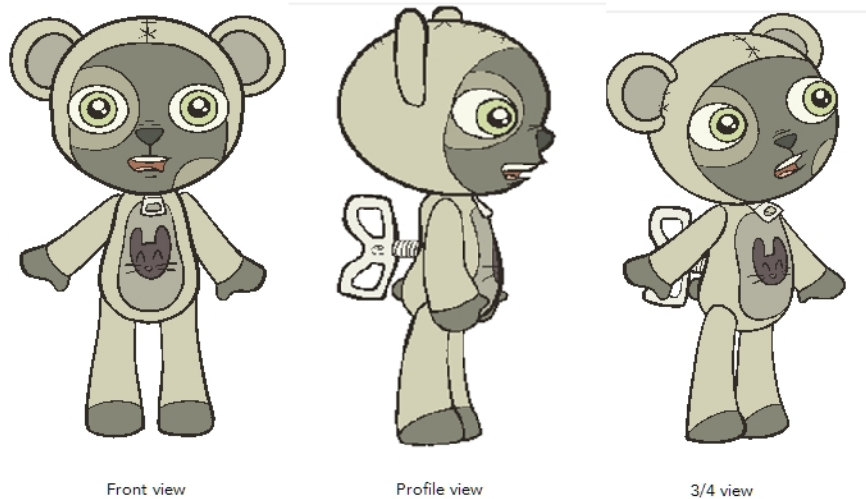
1. In the Library view, click the template containing the drawing to import in the Model view.
2. Right-click on the template and select **Open As Folder**.
3. In the Library view's left side, select the template's folder and continuing expanding its subfolders until \*.tvg files appear on the right side.



4. In the Library view's right side, select the TVG drawing to import and drag it into the Model view.

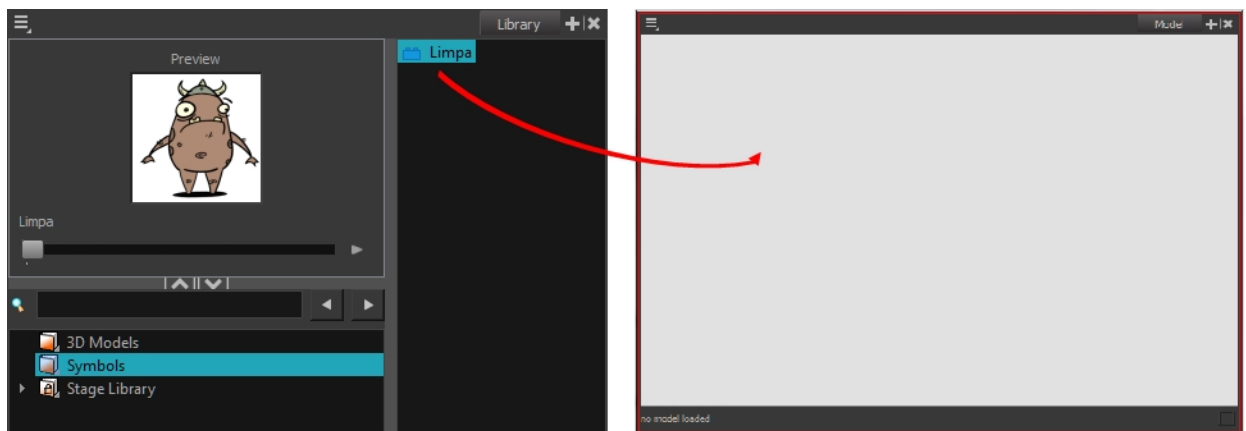
### How to load a template with multiple drawings from the Library view

1. In the Library view, find the template you want to import in the Model view.
2. In the Library view's right side, drag the template (\*.tpl file) and drop it directly in the Model view.
3. Use the Previous Model  and Next Model  buttons in the Model View toolbar to view all the drawings contained in the template. This can often be the front, profile, and 3/4 views of a character.



### How to load a symbol from the Library view

1. In the Library view's left side, select the **Symbols** folder.
2. In the Library view's right side, select the symbol you want to use as a model, and drag and drop it into the Model view.




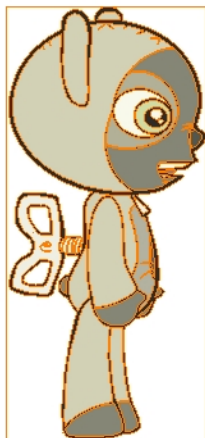
3. Use the Previous Model  and Next Model  buttons in the Model View toolbar to view all the drawings contained in the template. This can often be the front, profile, and 3/4 views of a character.

### How to clear a colour model

- ▶ In the Model View menu, select **Clear Model** or press Delete.

### How to copy the entire model from the Model view


1. In the Model View toolbar, select the Select  tool.
1. In the Model view, select your model.

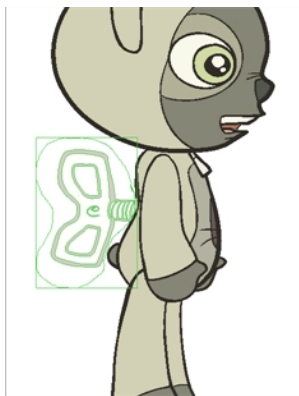


2. From the top menu, select **Edit > Copy Drawing Object** or press **Ctrl + C** (Windows/Linux) or **⌘ + C** (Mac OS X).
2. In the Timeline view, make sure you have the correct layer and frame selected.
3. Select the Drawing or Camera view, then go to the top menu and select **Edit > Paste Drawing Object**, or select the Timeline view and from the top menu, select **Edit > Paste cells in the Timeline** or press **Ctrl + V** (Windows/Linux) or **⌘ + V** (Mac OS X).

The model appears in the selected view.

#### How to copy part of the model in the Model view

1. In the Model View toolbar, select the Cutter  tool or press **Alt + T**.
1. In the Model view, use the Cutter tool to create a selection around the part of your model that you want to copy.



2. From the top menu, select **Edit > Copy Drawing Object** or press **Ctrl + C** (Windows/Linux) or **⌘ + C** (Mac OS X).
2. In the Timeline view, make sure you have the correct layer and frame selected.
3. Do one of the following:
  - Select the Drawing or Camera view and select **Edit > Paste Drawing Object**.

- ▶ Select the Timeline view and select **Edit > Paste cells in the Timeline** or press Ctrl + V (Windows/Linux) or ⌘ + V (Mac OS X).

The model appears in the selected view.

## Editing Gradients and Textures




If you paint a zone with a gradient or texture colour, you can use the Edit Gradient/Texture tool to modify its position in the zone. You can move, scale, rotate and skew. If you want to match the colour to the animation, set the first texture position and copy the Edit Gradient/Texture position. When moving to the next drawing, you can select the next texture and paste the previous position to continue the modifications.

If you are painting a hand-drawn animation or if you want the Brush tool and Paint tool to use your gradient's position, angle and scale settings instead of the default ones, you can store your own settings and reuse them afterward.

This way of editing a texture using the Edit Gradient/Texture tool also works with pencil lines drawn with textured "brushes". If you then paint your textured pencil line with a gradient, you can do so and then edit both elements independently at the same time.

### How to use Edit Gradient/Texture tool

1. Do one of the following:
  - ▶ In the Tools toolbar, click the Edit Texture  tool.
  - ▶ From the Camera or Drawing View menu, select **Drawing Tools > Edit Gradient/Texture**.
  - ▶ Press Shift + F3.
2. Click the gradient or texture colour to modify.






Erik, Di-Gata Defenders © Nelvana Limited, Corus Entertainment

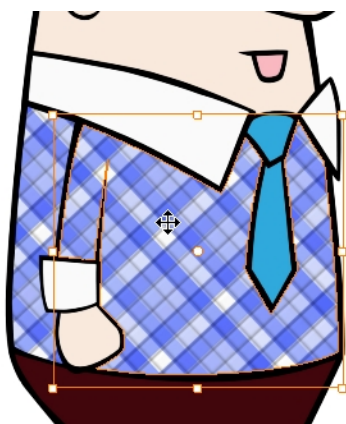
A blue selection frame surrounds the selected gradient or texture.




3. Edit the gradient or texture by adjusting the control handles around the selection frame.




### How to store gradient and texture settings

1. In the Tools toolbar, select the Select  tool or press Alt + S.
2. In the Camera or Drawing view, select the gradient or texture zone to store.




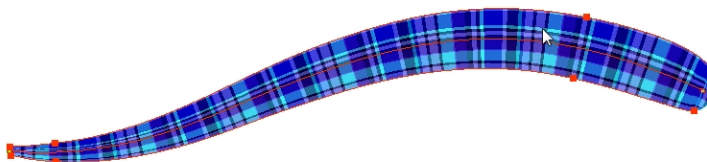
3. In the Tool Properties view, click the Store Colour Gradient  button.

### How to use the stored gradient and texture settings

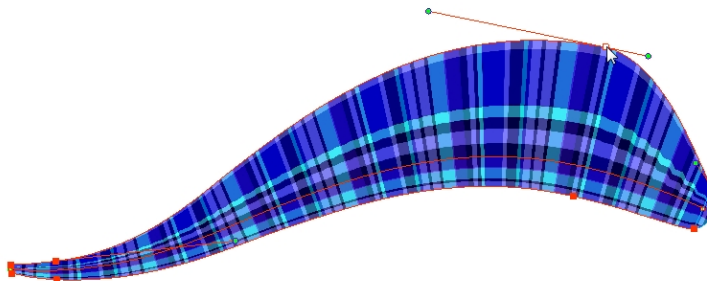
1. In the Tools toolbar, select the Brush  or Paint  tool.
2. In the Tool Properties view, click the Use Stored Colour Gradient  button.
3. In the Camera or Drawing view, draw and paint.

### How to use Pencil Editor tool to edit the texture or gradient on a pencil line

1. Do one of the following:
  - In the Tools toolbar, select the Pencil Editor  tool.
  - From the top menu, select **Drawing > Drawing Tools > Pencil Editor**.
  - Press Alt + W.
2. Click on the pencil line to be modified to bring up its contour envelope.

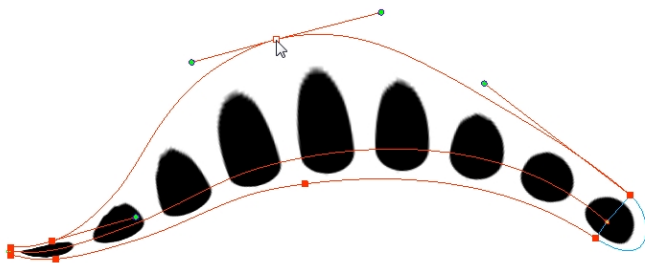


3. Select one of the contour points around the envelope and move its position to change the size of the tiled texture or gradient. You can also pull directly on the lines of the contour envelope or play with the Bezier handles of any given point in order to continue to modify the envelope form.




Expanding the width of the envelope parallel to the pencil line's central vector will cause the tiled texture to be stretched. Conversely, reducing the envelope's width will cause the tiled texture to look squashed.

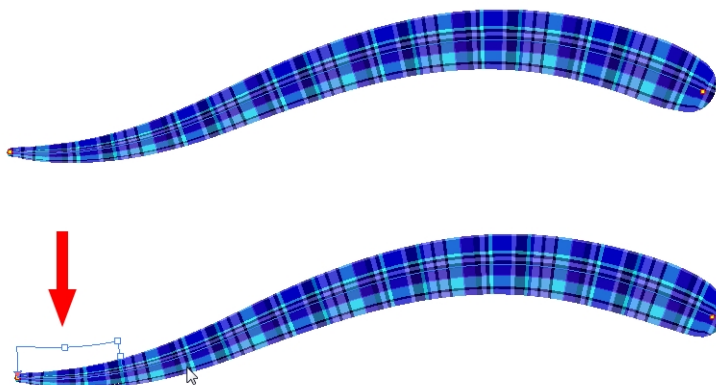
Reducing the contour's width perpendicular to the pencil line's central vector will reduce the number of tiles, while expanding it will increase the number of tiled images.



This editing technique does not just work on texture fills, but can also be applied to pencil lines drawn with a textured “brush”.

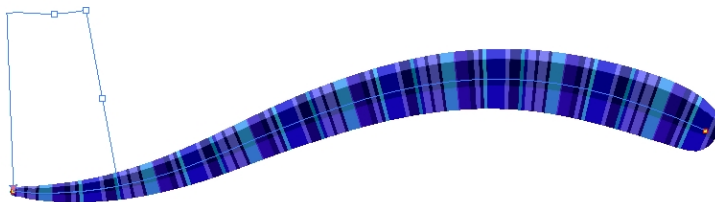
### How to use Edit Gradient/Texture tool to edit the texture or gradient on a pencil line

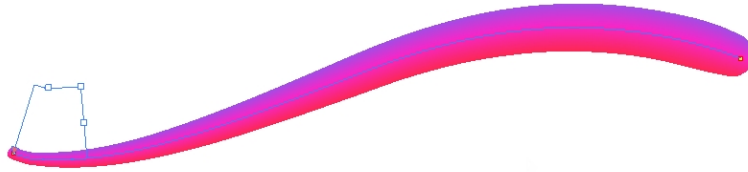
1. Do one of the following:
  - ▶ In the Tools toolbar, select the Edit Gradient/Texture  tool.
  - ▶ From the top menu, select **Drawing > Drawing Tools > Edit Gradient/Texture**.
  - ▶ Press Shift + F3.
2. Click on the pencil line to be modified to bring up the editor controls.



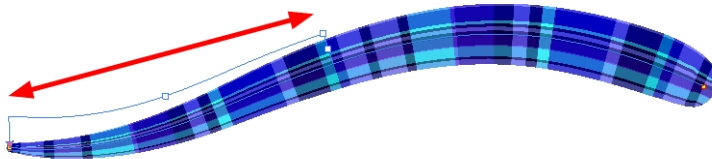
3. The editor controls delineate a single tile in the texture. For gradients, this is less applicable. Pull on the top of the editor controls to stretch the tiled texture throughout the length of the stroke.

As gradients are parallel to the stroke’s central vector, this will stretch the way that the gradient is distributed in the pencil line’s envelope. The envelope still acts as a boundary for the texture or gradient.




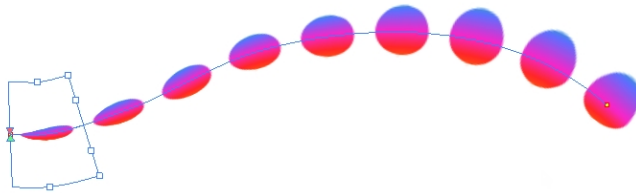


4. Drag the editor control perpendicular to the stroke. You will feel it glide along the stroke's central vector line. This is another way to resize the texture tile. Instead of stretching or shrinking it vertically, this motion stretches or shrinks it horizontally. As gradients are parallel to the pencil line's central vector, stretching them vertically gives no visual result.

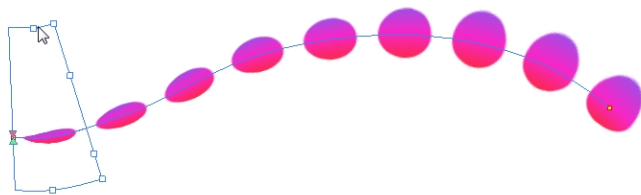


#### How to use Edit Gradient/Texture tool to edit the texture and gradient of a pencil line

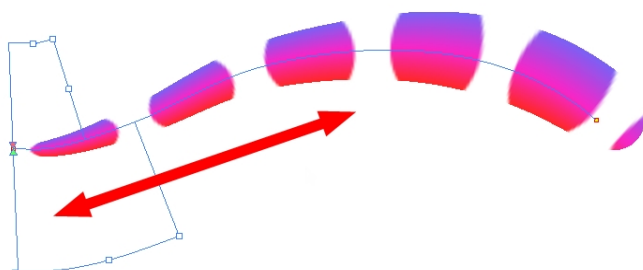
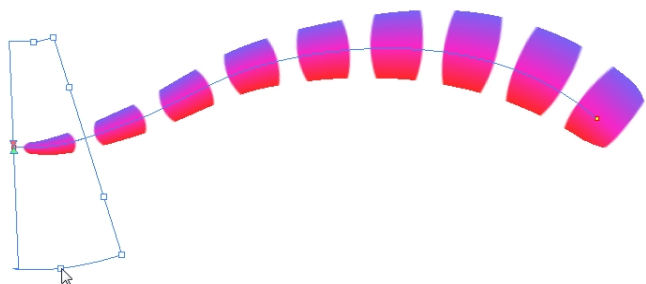
1. Do one of the following:
  - ▶ In the Tools toolbar, select the Edit Gradient/Texture  tool.
  - ▶ From the top menu, select **Drawing > Drawing Tools > Edit Gradient/Texture**.
  - ▶ Press Shift + F3.
2. Click on the pencil line to be modified to bring up the editor controls.



3. Use the top editor controls edit the gradient.



4. Use the bottom controls edit the "brush" texture.




## Closing Gaps



When painting, you may notice that some drawing areas are not closed. To close the zone, you can draw the missing line with the Brush or Pencil tool, or close the gap with an invisible line using the Close Gap tool.

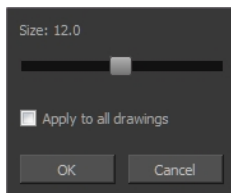
The Close Gap tool lets you close small gaps in a drawing by creating small, invisible strokes between the two closest points to close the colour zone. You do not need to trace directly over the gap. You can draw it a few millimeters away. The two closest points automatically close the gap.


## How to close gaps

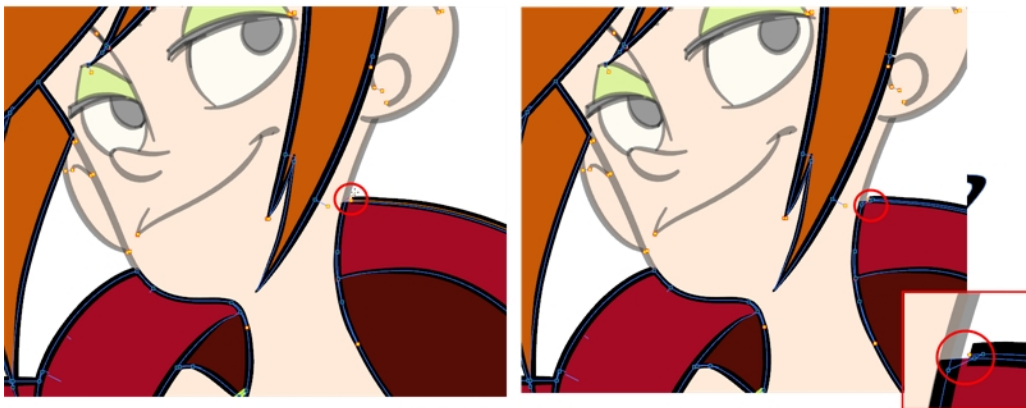
1. From the top menu, select **View > Show > Show Strokes** or press K to see a preview of the result.
2. If you want the strokes you draw to be flattened in your drawing instead of being on top, click the Auto-Flatten  button in the Tool Properties view.
3. From the top menu, select **Drawing > Clean Up > Close Gaps** or press Shift + F10 (Windows/Linux only).

The Close Gaps dialog box opens.

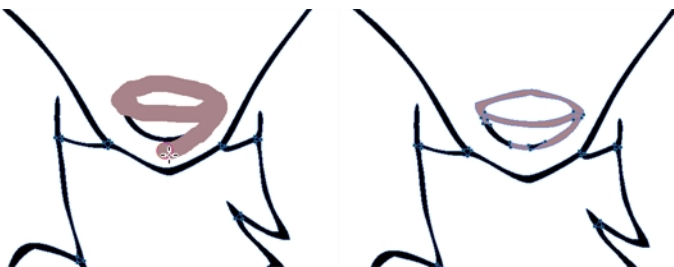
4. Adjust the slider to set the size of the gap you want to be closed.



5. To close all gaps in the drawings of the selected layer, select the **Apply to all drawings** option and click **OK**.
6. In the Tools toolbar, select the Close Gaps  tool.
7. In the Camera or Drawing view, trace a line near the gap to be closed. Your strokes will be invisible  
The gap automatically closes.



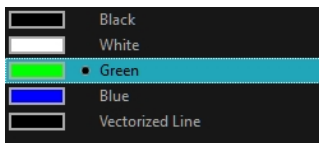
## Protecting Colours



When you are finished inking one colour, you can lock it so if you ever paint over it accidentally, the work already done will not be affected. You can also use the Protect Colour feature to block the filling colours if you painted all of the animation in Line Art and you plan to repaint the lines.

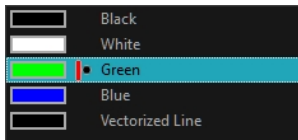
### How to protect colours

1. In the Colour view, select the colour to be protected.




2. Do one of the following:
  - ▶ Right-click and select **Protect Colour**.
  - ▶ From the Colour view menu, select **Colours > Protect Colour**.

A red bar appears beside the colour to indicate that it is locked.



## Respecting Protected Colours

When painting, the Respect Protected Colour  option is enabled by default. In the Colour view, you can protect In the Colour view, you can protect a colour swatch to avoid repainting or unpainting the zones linked to that swatch. If you using the Paint tool and this option is deselected, you will repaint or unpaint the protected colours on your drawings until you enable the option again.

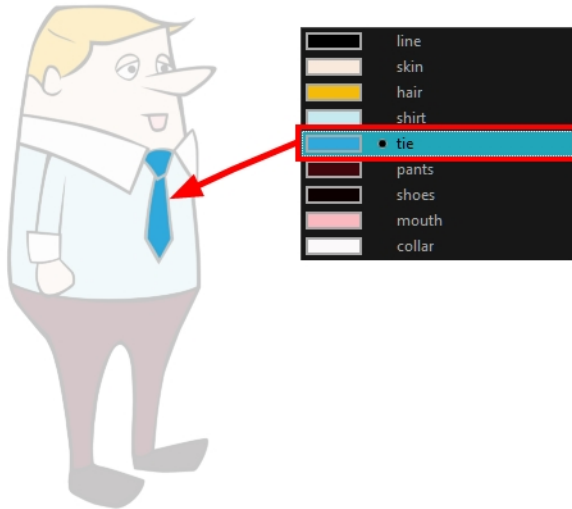
### How to enable the Respect Protected Colours option

Do one of the following:

- ▶ In the Paint tool properties, click the Respect Protected Colour  button.
- ▶ From the top menu, select **Drawing > Colour Protection > Respect Colour Protection**.
- ▶ Press Shift + S.

## Highlighting a Selected Colour

If there are unnamed colours in your palette and you want to know if a particular colour was used on the current model or drawing, you can select a colour and it will be used to highlights the parts that use that colour. The rest of the colours are dimmed, so you can easily identify the highlighted colour. You can then rename it accordingly.



### How to highlight a selected colour

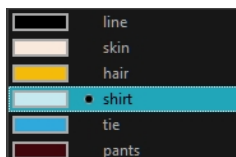
1. In the Colour view, select the colour to highlight.
2. From the Camera or Drawing menu, select **View > Show > Highlight Selected Colour**.

## Inverting a Colour Selection

When you need to select all colour swatches but one, or select only a few swatches here and there, it might be faster to select the only colour you do not need in order to select and invert the selection.

### How to invert a colour swatch selection in the Colour view

1. In the Colour view, select the colour swatch you **DO NOT** want to have in your final selection.



2. Do one of the following:
  - From the Camera or Drawing View menu, select **Edit > Invert Selection**
  - Press **Ctrl + Shift + I**.

## Inking the Lines

Unless you're repainting all the lines in the entire animation sequence, do not use the Apply Tool to All Drawings option. Since the line positions change a lot over time, you risk painting lines that should not be painted.

These are the main tools and techniques used to ink lines:

- [Repaint Tool](#) on page 209

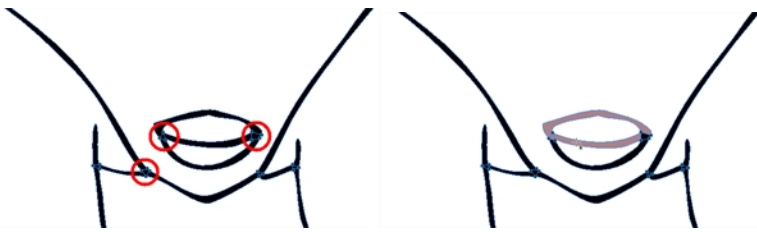


- [Repaint Brush Mode](#) on page 209
- [Inking the Lines](#) on page 208
- [Protecting Colours](#) on page 211
- [Breaking Triangles](#) on page 211

## Repaint Tool

The main tool used to ink the lines is the Repaint tool. As the colour filling is probably done in the Colour Art, you will not have to worry about not touching it. The Repaint tool will not paint empty zones either.

During the vectorization process on traditional scanned drawings, triangles are added on the lines' intersections to break the artwork in segments. This way, when you paint a line, it will not repaint the whole drawing, only the relevant segment.



### How to access the Repaint Tool



1. In the Tools toolbar, select the Repaint  tool located in the Paint tool drop-down menu.

## Repaint Brush Mode

The Repaint Brush mode is used to paint a section by manually painting over the lines. This is useful when the vectorization triangles are not placed as you would like or you simply need to repaint a section of a segment. It is also useful for paperless animation, where there are no triangles. So, the Repaint Brush is used to paint a certain area. It acts like the Brush tool, but will only show on painted areas that are already painted.

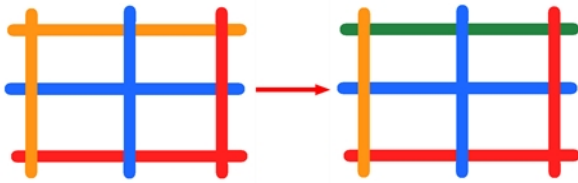
Unlike the Brush tool, the Repaint Brush mode flattens automatically. The brush strokes are not added one on top of each other.


### How to enable the Repaint Brush mode

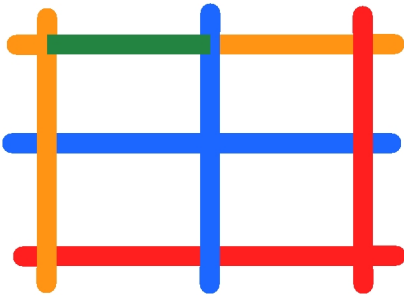
1. In the Tools toolbar, select the Brush  tool.
2. In the Tool Properties view, enable the Repaint Brush  mode.

## Ink Tool

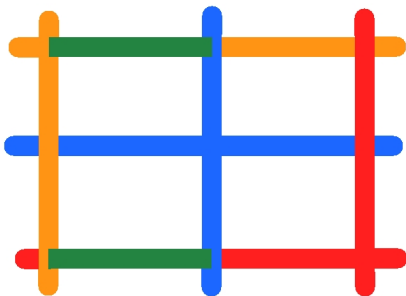
Although pencil lines can be painted in much the same way as closed zones, you can use the Paint, Repaint, Repaint Brush, and Ink tools to make painting segmented lines easier. Normally when you have a drawing, such as the one below, and you use the Paint tool to paint one of the lines, the entire line is painted.



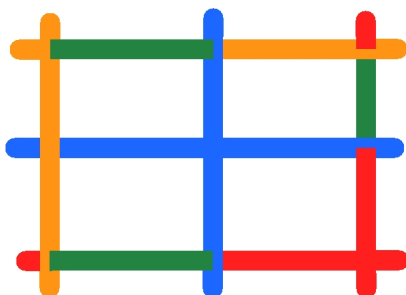
However, if you select the Ink  tool instead and click on the same pencil line, only the segment that you clicked on between two intersections will be painted.



The newly inked segment will always be moved to the front of all other pencil strokes, even if it was behind all other pencil strokes before it was inked.



That is, unless you hold down Alt while clicking a segment. Then the opposite happens. The inked segment will be sent to the back, even if it was in front of all other segments to begin with.

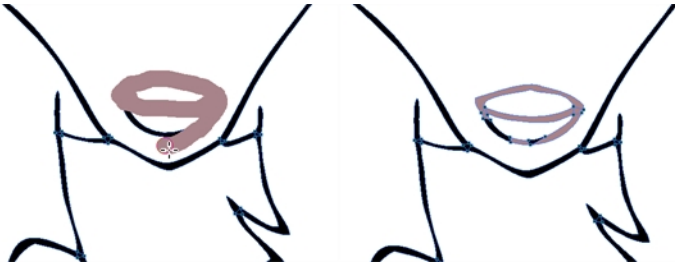


Painting and inking can be used in combination depending on what you need to paint. If you need to ink a character's outline in black, it might be easier to use the Paint tool. If you need to paint the outline of a character's neck with a tan colour and its shirt outline blue and both the neck and shirt belong to the same continuous outline, then the Ink tool might prove more useful.

## How to access the Ink tool

1. In the Tools toolbar, select the Ink  tool located in the Paint tool drop-down menu.

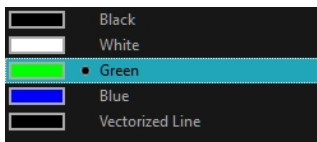
## Protecting Colours



When you are finished inking one colour, you can lock it so if you ever paint over it accidentally, the work already done will not be affected. You can also use the Protect Colour feature to block the filling colours if you painted all of the animation in Line Art and you plan to repaint the lines.

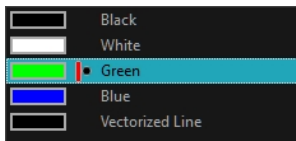
## How to protect colours

1. In the Colour view, select the colour to be protected.



2. Do one of the following:
  - ▶ Right-click and select **Protect Colour**.
  - ▶ From the Colour view menu, select **Colours > Protect Colour**.

A red bar appears beside the colour to indicate that it is locked.



## Breaking Triangles

The Brush tool is often the most intuitive and rapid tool for creating rough sketches and clean lines. A single colour, such as black, is often used when tracing a clean version of a rough sketch. However, when it comes time to soft trace the lines in different colours, the flattened or unflattened clean brush strokes can suddenly become time consuming to ink.

Toon Boom Harmony lets you create triangular breaks at natural line intersections. These intersections are the probable locations where colour line breaks may occur, such as where a sleeve meets a hand.


### How to create breaking triangles on a drawing

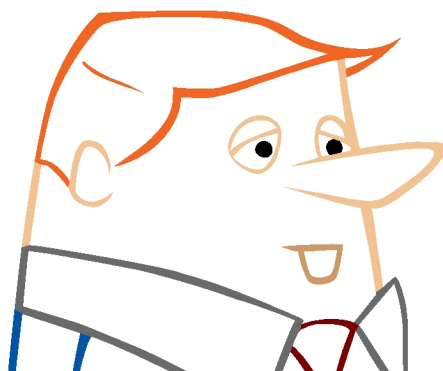
1. In the Drawing or Camera view, use the Select  tool to select part or all of the drawing to be broken.



2. From the top menu, select **Drawing > Create Breaking Triangles**. If your brush strokes are not flattened, they will be flattened automatically before the breaking occurs.



3. Use the Repaint tool  to paint the outline of different colour zones with different colours.




## Verifying the Zones are Painted

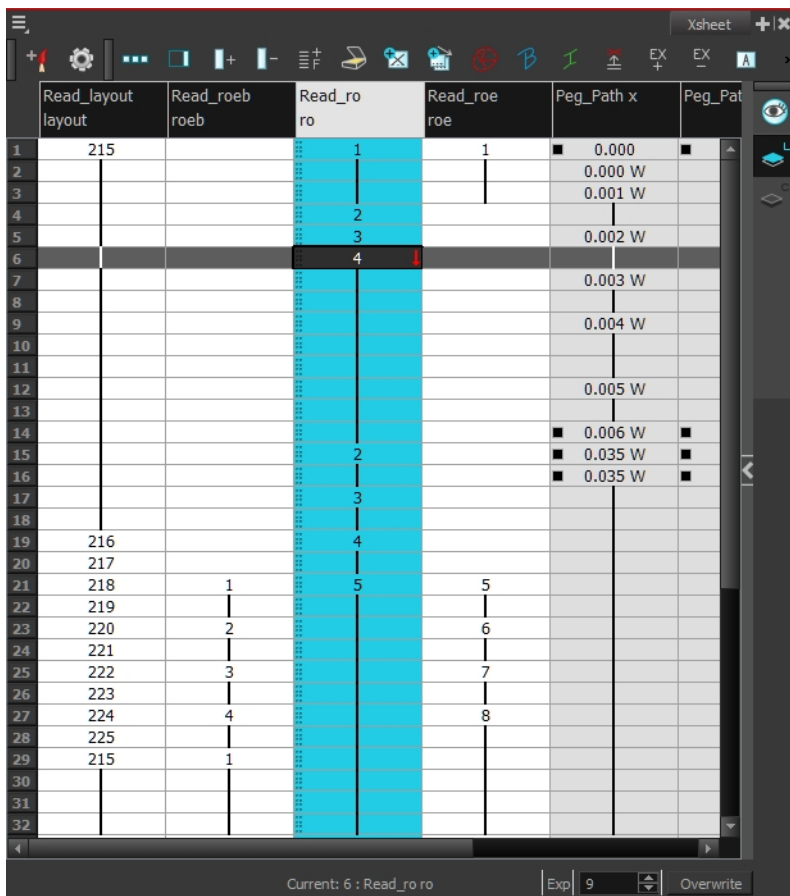
When the ink and paint process is completed, it's always a good idea to verify that every zone was painted properly.

The first step to check your ink and paint is to go through all your drawings and verify that there are no colour mistakes. You can use the F and G keyboard shortcuts or the Preview option available in the Xsheet.

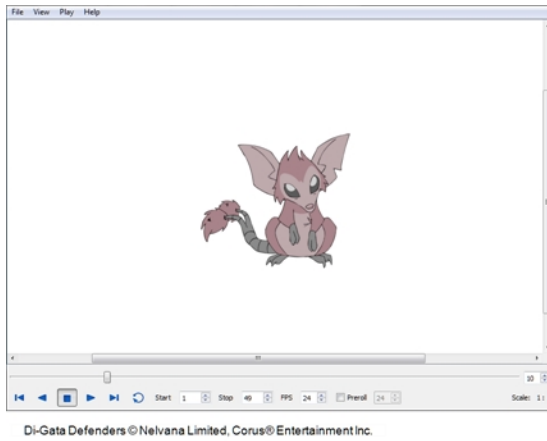
The backlight produces a silhouette effect by changing the drawing's coloured areas into a single dark, solid colour. Use this to verify the completeness of the ink and paint process. Any unpainted zones can be seen as the light shows through the unpainted areas of the silhouetted drawing.

### How to preview drawings from the Xsheet

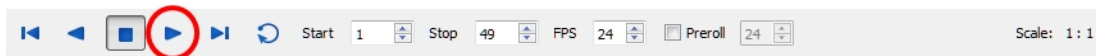
1. First, save your scene.
2. Do one of the following:
  - ▶ From the top menu, select **File > Save**.
  - ▶ Click the Save  button.
  - ▶ Press Ctrl + S (Windows/Linux) or ⌘ + S (Mac OS X).
3. In the Xsheet view, select the range of drawings or the whole column to preview.



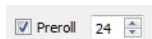
4. In the Xsheet View menu, select **View > Preview Selected Drawings** or press Alt + P.  
The Play window opens.



5. Play your drawings.




6. Select the **Preroll** option to see blank frames at the beginning and end of the animation sequence while looping the playback.



## How to use the backlight

**NOTE:** This feature is only available in the Drawing view.

1. Do one of the following:
  - ▶ From the top menu, select **View > Backlight**.
  - ▶ Press Alt + Shift + B.
2. Verify the drawings in the Colour Art to make sure that all the areas are painted. From the Camera or Drawing View menu, select **View > Switch to Colour Art** or press L.
1. In the Art Layer toolbar, click the Preview All Art Layers  button to see the colour zones with lines to ensure that you did not forget any spots between the colour filling and lines.



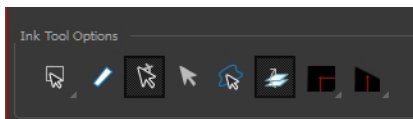
## Ink and Paint Tool Properties




The Ink and Paint tool properties contain many options that will help you along with your task.




- [Ink Tool Properties](#) on page 215
- [Paint Tool Properties](#) on page 216

### Ink Tool Properties

When you select the Ink tool, its properties and options appear in the Tool Properties view.

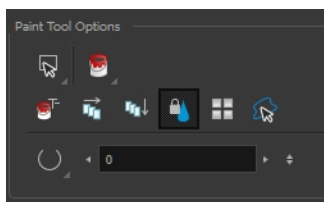






Icon	Tool Name	Tool
	Lasso and Marquee	<p>The Lasso and Marquee options let you choose the type of selection the current tool will perform. The default selection mode is Marquee.</p> <ul style="list-style-type: none"> <li>• Lasso lets you draw a custom selection box around zones.</li> <li>• Marquee makes a rectangle selection box.</li> </ul> <p><b>NOTE: NOTE:</b> Hold down the Alt key to switch to toggle between the selection modes.</p>
	Show Inkable Lines	Highlights all pencil lines (no brush strokes) on the selected layer. Pencil line segments that are already inked with the selected swatch colour from the colour palette are also not highlighted.
	Be Smart on Connecting Lines	As you hover and move the cursor across

		<p>intersecting pencil lines, the path that you create will be highlighted. When you click on your mouse or stylus the highlighted segments are inked. With this option disabled, all the intersecting segments that your cursor comes near will be highlighted and become part of the selection, even if they were not situated in the direction of the chosen path.</p> <p><b>NOTE: NOTE:</b> This option only works if the Ink tool is in Hover mode.</p>
	Select Mode	Use this mode instead of the Hover Mode. In the Hover Mode, any potentially inkable pencil line will have its central vector line highlighted as the Ink tool's cursor hovers over it. Use Ctrl (Windows/Linux) or ⌘ (Mac OS X) to toggle between the two modes.
	Mitre	As you hover over two perpendicular or nearly perpendicular segments, a highlighted path with a corner is created. Clicking on these highlighted segments inks both segments and makes them appear as a single stroke with a corner or bend. Options include: As Is, Round, Miter, and Bevel.
	Tip Style	Lets you customize the edge of the Ink tool. Options include: Round, Flat, and Bevel.






## Paint Tool Properties

When you select the Paint tool, its properties and options appears in the Tools Properties view.





Icon	Tool Name
	<a href="#">Lasso and Marquee</a> on page 217
	<a href="#">Painting Modes</a> on page 217
	<a href="#">Paint and Remove Texture</a> on page 219
	<a href="#">Apply to Multiple Drawings</a> on page 219



	<a href="#">Apply to All Visible Drawings</a> on page 219
	<a href="#">Respect Protected Colour</a> on page 220
	<a href="#">Use Stored Colour Gradient</a> on page 220
	<a href="#">Select Newly Painted, Repainted and Unpainted Contours/Lines</a> on page 220
	<a href="#">Close Gap</a> on page 220

## Lasso and Marquee

The Lasso and Marquee options let you choose the type of selection the current tool will perform. The default selection mode is Marquee.

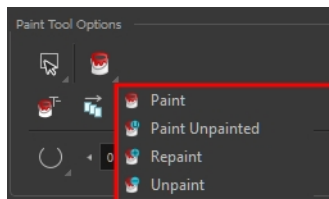
- Lasso  lets you draw a custom selection box around zones.
- Marquee  makes a rectangle selection box.

### NOTE:

Hold down the Alt key to switch to toggle between the selection modes.

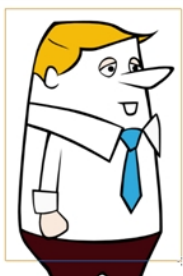
## Painting Modes


The Paint tool has four different modes available:



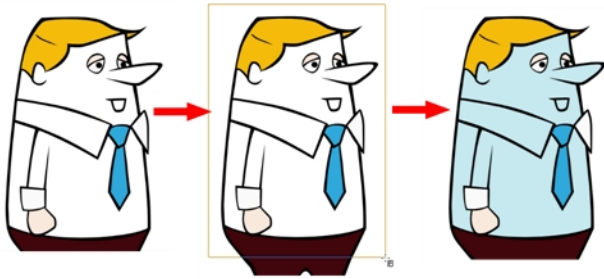
You can also find these tools directly in the Tools toolbar and in the Drawing Tools menu.

### Paint Mode



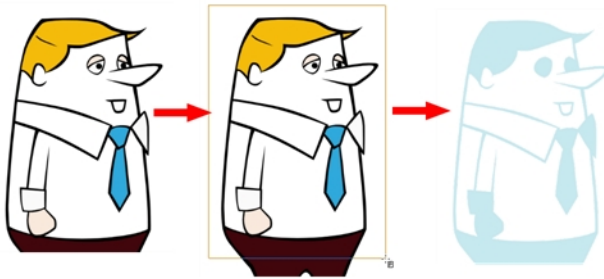
The Paint  mode paints everything it touches, including empty and filled zones—see [Painting Using the Paint Tool](#) on page 190.


### Paint Unpainted Mode



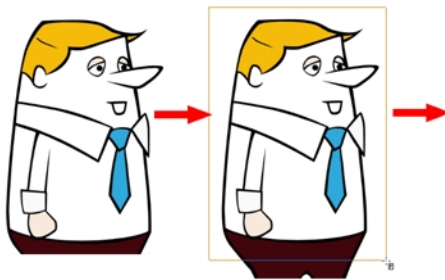
The Paint Unpainted  mode paints only empty zones. Any line or filled zone will remain unchanged.


### Repaint Mode



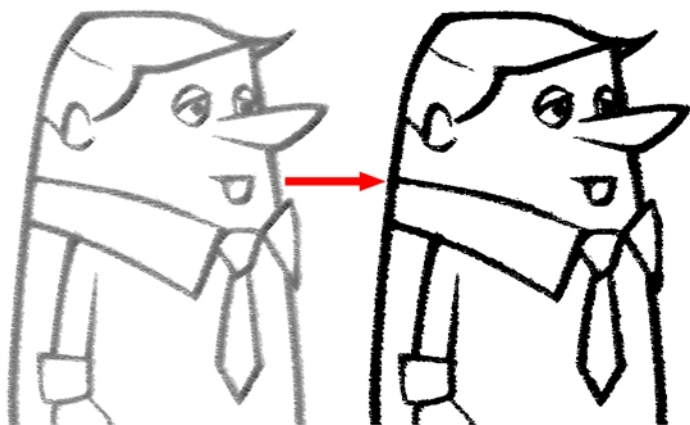
The Repaint  mode paints everything it touches except empty zones. Any zone that is not painted will remain intact.


### Unpaint Mode



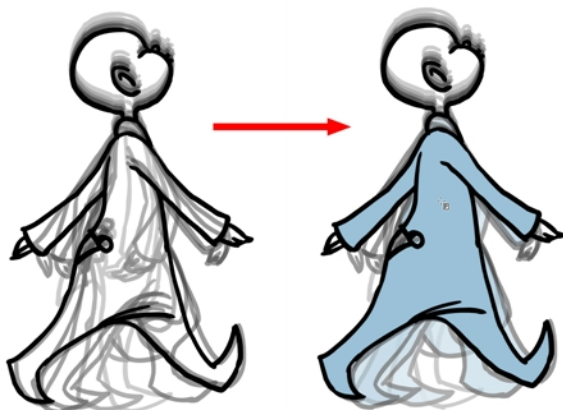
The Unpaint  mode unpaints everything it touches, including empty and filled zones.


## Paint and Remove Texture



The Paint and Remove Texture  option is used when you vectorized images as greyscale texture style. An image vectorized as texture is a mix of bitmap filling encapsulated in a vector-based frame. Painting a textured zones with the Paint tool will change the tint of the textured lines. Painting the textured zones using the Paint and Remove Texture option transforms the bitmap filling into a 100% vector based zone and fills it with a solid colour.


## Apply to Multiple Drawings



The Apply to Multiple Drawings  option is used for fast painting in hand-drawn animation. When you want to paint several drawings in a same layer at once, such as a walk cycle, you can enable this option and make a selection in the Camera or Drawing view. All the closed zones located within your Paint tool selection are painted with the selected colour swatch.


You do not need to enable the Onion Skin preview to use this option. The option will stay enabled only for the next action. If you want to use it again, you must click on the Apply to Multiple Drawings button again, or press Alt + A.

## Apply to All Visible Drawings

The Apply to All Visible Drawings  option is used to paint several drawings on separated layers on the current frames. If you have a character broken in several layers, you can enable this option to paint all your layers at once. The operation is only applied on the current frame. This option will stay enabled only for the next action. If you want to use it again, you must click on the Apply to All Visible Drawings button again.

**NOTE:** This option is only available in the Camera view and does not affect symbols.



### Respect Protected Colour

The Respect Protected Colour  option is enabled by default. In your Colour view, you can protect some colour swatches to avoid repainting or unpainting the zones linked to that swatch.

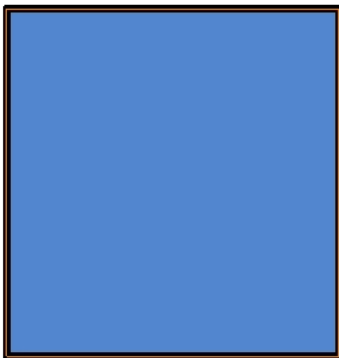
If you disable this option the Paint tool will not follow the protect colour rule and will repaint or unpaint the protected colours on your drawings until you enable the option again—see [Protecting Colours on page 206](#).


### Use Stored Colour Gradient



When you paint a zone with a gradient or textured colour swatch, the gradient or texture's position is set relative to the size of the zone you are painting. If you want the Paint tool to use a particular size and position, you must first store your desired position and size using the Select  tool and then enable the Use Stored Colour Gradient  option in the Paint tool properties—see [Editing Gradients and Textures on page 200](#).

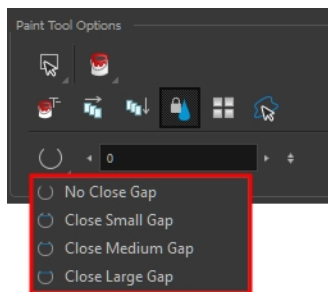
### Select Newly Painted, Repainted and Unpainted Contours/Lines



In the Paint tool properties, this option  keeps a selection highlighted around the latest painted zone after using the Paint, Repaint, Unpaint, or Paint Unpainted tool.

### Close Gap

The Close Gap option has four modes available:



When painting, you may notice that some drawing areas are not closed. To close the zone, you can draw the missing line with the Brush or Pencil tool, or close the gap with an invisible line using the Close Gap tool.

The Close Gap tool lets you close small gaps in a drawing by creating small, invisible strokes between the two closest points to close the colour zone. You do not need to trace directly over the gap. You can draw it a few millimeters away. The two closest points automatically close the gap.

For more information, see [Closing Gaps on page 205](#).

## Glossary

<b>alpha channel</b>	An image channel that carries transparency information. An image already has three channels: red, green and blue (RGB). The alpha channel is the fourth channel (RGBA). The matte, or the transparency information, is stored in this fourth channel. An image without an alpha channel is always opaque.
<b>animatic</b>	A movie with sound that is developed from the storyboard. The storyboard panel is exposed for the duration of the scene and at times, the characters are placed on a trajectory to indicate motion. The camera moves are also animated. The animatic is used to determine the rhythm of a project and provides a good overview of the project before beginning production.
<b>animation</b>	A simulation of movement created by displaying a series of pictures or frames.
<b>anime</b>	An animation style known for its sinister and dark feel; popular in Japan.
<b>arc</b>	Action rarely occurs in a straight-forward manner; rather it typically unfolds in what storytellers refer to as an arc. The purpose of a story arc is to move a character or situation from one state or scenario to the next.
<b>aspect ratio</b>	The relationship between the width and height dimensions for any scene, frame or film format. Television ratio is 4:3 and widescreen ratio is 16:9.

<b>auto-feed</b>	An automated method of feeding drawings into a scanner in which multiple drawings are stacked into a sheet feeder. When the scanner is activated, the drawings are scanned consecutively, without further user intervention.
<b>automatic lip-sync detection</b>	Automatically mapping drawings in an element to the mouth chart generated for a sound. This can save time when lip-syncing a voice track.
<b>axis</b>	An imaginary line around which an object rotates. For 2D graphics, there are two axes: X (horizontal) and Y (vertical). For 3D graphics, there are three axes: X (horizontal), Y (vertical) and Z (depth).
<b>background</b>	The part of a scene that is farthest to the rear. The background is the artwork, or decor, against which the animation takes place.
<b>Bézier</b>	A method of defining curved lines invented by French mathematician Pierre Bézier. A Bézier curve is a mathematical or parametric curve. Bézier curves use at least three points to define a curve.
<b>bitmap</b>	An image composed of pixels with a single resolution (size). If it is enlarged too much, it will lose definition and pixels will begin to appear. This is known as <i>pixelation</i> .
<b>breakdown</b>	In cut-out animation, breakdown is the action of breaking a character into pieces to create a puppet with articulations. To break down a character, the artist cuts parts, such as the hands and arms, from the character's model and pastes them in separate layers. Next, the joints are fixed and the pivots set. In traditional animation, a breakdown is an animation pose generally found between two key poses. The key poses are the main poses in an animation and the breakdowns are secondary poses, ones that help describe the motion and the rotation curve (usually referred to as an <i>arc</i> ).
<b>camera shake</b>	Camera shake occurs in a scene when the camera moves slightly and quickly in several directions. This gives the impression of an impact, vibration or, for example, bumps on the road.
<b>caption</b>	A text field containing dialogue, effects, sound, or slugging information in a storyboard.
<b>cel</b>	In traditional animation, a cel (also known as <i>celluloid</i> ) is a transparent sheet on which the animation is inked and painted before being sent to the camera. The picture's outline is drawn on the front of the cel and then coloured along the back. In Harmony, a cel is an individual space in an Xsheet column from which you can expose a drawing or a function's coordinate.
<b>character design</b>	Each character in an animated film is drawn from multiple angles in poster-style format, called a <i>model sheet</i> , which serves as a reference for the animators.
<b>clean up</b>	After rough drawings have been tested and approved, all the noise in the image (excess lines, notes, etc) is removed to create final drawings which can be inked, painted and shot. The cleanup process refers to either tracing a clean line over a rough drawing to achieve the final version, or removing dirt and extra lines left by the scanning process.

<b>CMYK</b>	Cyan, Magenta, Yellow, Black. Refers to the process used by printers to define colour on the printed page.
<b>colour card</b>	A colour card is a solid colour card that is the same size as the camera. The colour card can be used to fill the background with a solid colour when there is no background image included.
<b>colour model</b>	The official colour design that must be used to paint the animation. A model is the definitive character, prop, or location design that each artist must follow for the production.
<b>colour wheel</b>	A display of the colour spectrum in the form of a circle.
<b>compositing</b>	Compositing is the action of incorporating all of a scene's elements to create the final result prior to rendering. For example, the compositing artist will import all the animation sequences, background, overlays and underlays in the scene and position them correctly. The artist will then set the camera frame and animate it, if needed. Finally, the animator will create all the computer-generated effects for the project.
<b>cross dissolve</b>	An effect used to fade two scenes, one into the other.
<b>cut</b>	A direct transition between two scenes. When a cut is used, there are no transition effects inserted to pass from one scene to the next. The first scene ends and the second one starts immediately.
<b>cut-out animation</b>	The action of animating characters made of several pieces by moving them around frame by frame. Cut-out animation can either be computer generated or done traditionally using paper.
<b>cycle</b>	A group of images that together make up an action, such as walking. A cycle is an action repeated as a loop over a period of time. It can be a series of animated drawings or keyframes.
<b>dialogue</b>	The text spoken by a character in a movie or animation.
<b>dope sheet</b>	Used by animators, directors and other members of a crew to track the sequence and timing of images, dialogue, sound effects, sound tracks and camera moves. Also known as an <i>exposure sheet</i> or <i>Xsheet</i> .
<b>doping</b>	To assign a particular drawing to a range of frames.
<b>DPI</b>	Dots per inch is the standard measure of resolution for computerized printers. It is sometimes applied to screens, in which case it should more accurately be referred to as <i>pixels per inch</i> . Either way, the dot is the smallest discrete element making up the image.
<b>ease/velocity</b>	In animation, the ease, also known as <i>velocity</i> , is the acceleration and deceleration of a motion. It can be a motion created by a function curve, or a series of animated drawings. Other common terms for ease-in and ease-out are slow-in and slow-out.
<b>ease-in</b>	Gradual acceleration in the action. Also known as <i>slow-in</i> .
<b>ease-out</b>	Gradual deceleration in the action. Also known as <i>slow-out</i> .
<b>establishing shot</b>	A scene in which the viewer can see the whole area in which a sequence is happening. For example, if a child is playing on the ground in front of his house, the establishing shot would be a scene where the viewer can see the

	house, the ground, a part of the street and the buildings around the central point of action. This helps the viewer understand the story location and scene orientation.
<b>exposure</b>	In animation, an exposure is the number of cels on which a drawing appears in the scene. For a drawing to appear longer, the exposure must be extended over a greater number of cels.
<b>exposure sheet</b>	<p>A sheet with several vertical columns and horizontal frames used to indicate a scene's timing. Each column represents a scene layer. The drawing numbers in each column are indicated and repeated over the particular amount of frames they need to appear.</p> <p>The exposure sheet is used by animators, directors and other members of a crew to track the sequence and timing of images, dialogue, sound effects, sound tracks and camera moves. Also known as a <i>dope sheet</i>.</p>
<b>fade in/fade out</b>	Fade in or fade out is a transition effect used to open or close a sequence. A fade in occurs when the first scene appears progressively, from complete transparency to its complete opacity. A fade out occurs when the last scene progressively disappears, going from complete opacity to complete transparency.
<b>fast-in</b>	Dramatic acceleration at the start of the action.
<b>fast-out</b>	Dramatic acceleration at the end of the action.
<b>field</b>	In animation, a field is a measurement unit used to calculate motion, registration and camera positioning. A standard animation scene will vary between 6 to 12 fields.
<b>field chart</b>	A guide containing all the field units that animation and layout artists use to determine a scene size or camera motion.
<b>film-1.33</b>	A resolution that is ideal for the widescreen film format that conforms to the standard 4:3 pixel aspect ratio.
<b>film-1.66</b>	A resolution that is ideal for the widescreen film format that conforms to the 16:9 pixel aspect ratio. (The pixels are wider than they are high).
<b>flipping</b>	In traditional animation, flipping is the action of going through the drawings of an animation sequence very quickly in order to see the animation in motion. Flipping can also be the action of creating a mirror transformation of an object.
<b>follow-through</b>	The secondary motion caused by the main action. For example, a character wearing a cloak is running. The main action is the body running. This will cause the cloak to follow the motion, although it will not move at the same time, but react a few frames later and follow the main motion curve.
<b>forward kinematics</b>	Forward kinematics is a feature used to animate principally 3D characters and cut-out puppets with hierarchy. It is used to animate a puppet from one of parent parts, such as a shoulder, and make the rest of the arm move with it as a single piece.
<b>frame</b>	A single photographic image in a movie. In traditional animation, the North American standard generally contains 24 frames per second, while in Europe the standard is 25 frames per second.



<b>frame rate</b>	<p>The frame rate is the speed at which the frames are played. They are generally calculated by frame per second. For example, a scene could be played back at 12, 24, 25, 30 or 60 frames per second or any other number.</p> <p>This is the measurement of the frequency (rate) at which an imaging device produces unique consecutive images, called <i>frames</i>. The term applies equally to computer graphics, video cameras, film cameras, and motion capture systems.</p> <p>Frame rate is most often expressed in frames per second (fps) and in progressive-scan monitors as hertz (Hz).</p>
<b>functions</b>	A computer-generated motion, trajectory or path on which elements, other trajectories and effects parameters can be attached. The function can be controlled by adding keyframes and control points on the function curve.
<b>gamut</b>	The range of colours that a particular device can represent.
<b>HDTV</b>	High Definition Television delivers a higher quality image than standard television does because it has a greater number of lines of resolution. To take advantage of the superior quality and make full use of your resolution setting, the output device must be compatible with HDTV technology.
<b>hold</b>	A frame in the animation in which the character maintains its position without moving. A hold can be created between any two keyframes.
<b>HSV</b>	Hue, Saturation, Value. A method of defining colours in terms of hue (tint), saturation (shade) and value (tone or luminance).
<b>in-between</b>	The drawings that exist between the key poses. These are drawn to create fluid transitions between poses.
<b>ink and paint</b>	The ink and paint process is the action of painting the empty zones and colouring the lines on the final animation drawings, while following a colour model.
<b>interpolation</b>	The computer-generated motion created between two keyframes. You have the choice to create interpolation, or not, between your keyframes.
<b>jump cut</b>	A jerky cut between two scenes. Typically, a jump cut is not visually pleasing. It is generally caused by one scene ending, and a second one starting, with a similar image. The lack of difference causes the eye to see a little jump between the two scenes.
<b>key pose</b>	Important positions in the action defining the starting and ending points of any smooth transition. Keys, or key poses, are the main drawings in an animation sequence describing the motion. For example, if an arm is waving, the keys will be of the arm at one extremity of the wave motion and the other extremity. By flipping those drawings, the animator can see the skeleton of the motion without having all the drawings.
<b>keyboard shortcuts</b>	One or more keyboard keys which, when used, cause an operation to be performed.
<b>keyframe</b>	Important positions in the action defining the starting and ending points of any action. A keyframe is a computer-generated position at a specific moment (frame) on a given trajectory.

<b>layers</b>	In animation, a layer is an individual column, level or character. A scene's layers are superimposed to form the final image.
<b>layout</b>	The communication step between the storyboard and the animation. It is the action of putting the storyboard on model. That is, drawing the character by following the design in the model pack, so the animator can start working.  The layout artist draws the background, creates the camera and field guide matching the scene and camera motion. Lastly, the animator draws on model the main action poses.
<b>layout and posing</b>	The action of putting on model. That is, at the right scale, the storyboard for the animator to start working.
<b>library</b>	A storage area containing templates and assets that can be reused in any project or scene.
<b>light table</b>	A device that allows you to see other layers in transparency while you are working on a particular layer.
<b>line of action</b>	The direction that the action will follow. Also known as <i>path of action</i> .
<b>lip-sync</b>	The character's mouth synchronization with the dialogue sound track. Frame by frame, the mouth will be adjusted to fit the sound to give the illusion of the character is speaking.
<b>low resolution</b>	A format that is ideal for videos destined for the web, where size and fast download of a video file take precedence over quality. A low-resolution image is one that lacks fine detail.
<b>manual lip-sync detection</b>	The manual swapping of mouth position drawings to match a voice track. For this process, both sound scrubbing (listening to a sound wave broken up frame-by-frame) and drawing substitutions are used.
<b>master palette</b>	A group of colours attributed to a character or prop. The palette is used throughout the entire production to maintain consistency in the look and to ensure that the same colours are used throughout the production. Also known as <i>palette</i> .
<b>model/colour model</b>	The definitive character, prop or location design each artist must follow for a production. A colour model is the official colour design that must be used to paint the animation.
<b>motion keyframe</b>	A keyframe with computer-generated interpolation.
<b>mouth chart</b>	A chart based on the eight animation phonemes (A, B, C, D, E, F, G, and X, which is used to represent silence) used for lip-sync.
<b>multiplane</b>	The effect of passing through multiple levels of drawings to create a sense of depth in a shot. A multiplane is a scene in which the layers are placed at different distances from the camera so that when the camera moves, a depth illusion occurs. With a multiplane, all the perspective and scale is calculated automatically.
<b>NTSC</b>	The standard analogue television broadcasting system used in North America. NTSC conforms to North American standards on how rectangular pixels are displayed for computer and television screens.
<b>nudge</b>	A small push (left, right, up, down, forward or backward) done with the

	keyboard arrow keys on a selected element. Nudging is used to move a selection very slightly and precisely.
<b>onion skin</b>	A feature that lets you see the previous and next drawings of a sequence.
<b>overlay</b>	A part of the scene environment, such as a chair or a bush, that is placed in front of the main animation.
<b>PAL</b>	A resolution that works best with the European format for television and computer screens, as the rectangular pixels are displayed at a different orientation.
<b>palette/master palette</b>	A palette or master palette is a group of colours attributed to a character or a prop. The palette is used throughout the entire project to maintain a consistency in the look and avoid the colour changing during the animation. Also referred to as a master palette.
<b>palette style</b>	A palette style is a second version of an existing palette with a slight change in the tint and value. A palette style can be used to create the night version of a palette. It may also be called a clone palette.
<b>pan</b>	To move the camera across the scene in any direction.
<b>panel</b>	In a storyboard, a panel is a frame in a shot. A shot can be composed of one or several panels.
<b>paperless animation/tradigital</b>	The paperless animation process is the action of animating digitally. The main paperless animation process is to draw, frame by frame, the animation directly in the software.
<b>passing position</b>	When drawing a walk sequence for a character, the passing position is the point at which one leg passes the other.
<b>path of action</b>	Direction that the action will follow. Also known as <i>line of action</i> .
<b>peg</b>	In traditional animation, a tool used to ensure accurate registration of action as cel layers move. In digital animation, in which you are doing a more advanced puppet rigging, you can use peg layers. Peg layers are trajectory layers that do not contain drawings. They are motion paths that you can use to add path articulations. For the latter, you can also use the Inverse Kinematics tool.
<b>phoneme</b>	A unit of sound in a language.
<b>pivot</b>	The point around which a peg or drawing rotates.
<b>pixel</b>	The smallest element of an image displayed on a monitor or TV screen.  Pixel, short for <i>picture element</i> , is a single point in a graphic image. It is a small sample of an image, a dot, a square, or a very small section made out of smooth filtering. If you zoom in close enough on a digital image, you will see the pixels, which look like small squares of different colours and intensity.
<b>pose-to-pose animation</b>	The pose-to-pose animation process is the action of creating all the main action poses, called <i>key poses</i> , and then placing the secondary poses between the keys. The secondary poses are called <i>breakdown</i> . Finally, the animator fills the gaps with the in-between drawings to achieve a smooth animation.
<b>rendering</b>	The final step when animating by computer. During rendering, the computer

	takes each pixel that appears on screen and processes all of the components, as well as adding motion blur before it produces a final image. The process of calculating the final images after the compositing process.
<b>resolution</b>	The size of a scene, generally calculated in pixels. For example, the NTSC resolution is 720 x 480. The resolution should match the final output: HDTV, film-1.33, film-1.66, NTSC, PAL, low.
<b>RGB</b>	Red, Green, Blue. A method of defining colour by specifying amounts of these three colour components.
<b>rigging</b>	The process of attaching the various parts of a cut-out puppet.
<b>rotary table</b>	Equivalent to the animation disk/table, a device that allows you to rotate the workspace for greater comfort while drawing.
<b>rotoscoping</b>	An animation technique in which animators trace over live-action film movement, frame by frame, for use in animated films. The act of sketching over live-action footage to create an animated sequence.
<b>roughs</b>	The skeleton sketch of an animation or design. Roughs mainly consist of sketch lines and shapes, though they can also contain design details.
<b>safe area</b>	The zone at the center of a scene's frame that is safe from being cropped by the TV frame. As a TV frame cuts a margin off the original frame size, maintaining a safe area ensures that the scene's main action will remain clearly visible once the film is screened on television.
<b>scene</b>	A shot in a movie or show. A sequence is composed of several scenes. A scene changes to another scene by a simple cut or transition.
<b>script</b>	The original text containing all the movie or show information. In animation, the script contains all of the location descriptions, dialogue, time and more. A project starts with a script.
<b>sequence</b>	A series of scenes or shots forming a distinct part of the story or movie, usually connected by unity of location or time.
<b>shot</b>	A scene in a movie or show. A sequence is composed of several shots. A shot changes to another shot by a simple cut or transition.
<b>slow-in</b>	The gradual acceleration in the action. Also known as <i>ease-in</i> .
<b>slow-out</b>	The gradual deceleration in the action. Also known as <i>ease-out</i> .
<b>slugging</b>	To indicate the start and stop times of dialogue and relevant actions.
<b>sound scrubbing</b>	A process that lets you hear sound in real time while you move the playhead forward or backward. This is very useful for finely-tuning a lip-sync.
<b>stop-motion keyframe</b>	A keyframe with no computer-generated interpolation.
<b>storyboard</b>	A visual plan of all the scenes and shots in an animation. The storyboard indicates what will happen, when it will happen and how the objects in a scene are laid out.
<b>straight-ahead</b>	A technique in which an entire sequence is drawn from the first position to the last, in order. There is very little planning in this methodology. Where the character ends up and how it gets there can be a surprise for both the

	audience and the animator. While this approach is spontaneous and creative, it can create inaccurate results.
<b>strokes</b>	Invisible vector lines forming the drawing zones. They can be adjusted with Bézier handles.
<b>tablet/pen</b>	A device used in conjunction with, or instead of, a mouse to move a mouse pointer (sometimes referred to as the <i>cursor</i> ) around the computer screen.
<b>template</b>	An asset stored in the library that can be reused in any project. A template can be a drawing, a series of keyframes, a sound file, a panel, a cut-out character, an effect, a trajectory, an animation, or anything else used in the animation.
<b>thumbnails</b>	A very small image used as a reference or indicator.
<b>timecode</b>	The timing information printed on a movie clip to indicate the scene, hour, minute and second that is currently displayed on the screen.
<b>timeline</b>	A horizontal representation of a scene's elements, timing and keyframes.
<b>trace and paint</b>	After the rough animations have gone through cleanup and a final line or pencil test, each drawing is traced and painted for the final animation. In today's digital world, this may be done in a variety ways other than the traditional celluloid or acetate methods.
<b>track breakdown</b>	The break down of an animated film's soundtrack into individual sounds to produce the precise frame-by-frame position of each sound.
<b>traditional animation</b>	A type of animation process whereby all the animation sequences are drawn by hand on paper before scanning or inking them on cels.
<b>trajectory</b>	A computer-generated path or trajectory that elements can follow. The trajectory can be controlled by control points, keyframes and velocity.
<b>transition</b>	An effect placed between two scenes as they pass from one to the other. Common transition effects are cross-dissolve and wipe.
<b>underlay</b>	In animation, an underlay is a specific part of the decor placed behind the main animation.
<b>aspect ratio</b>	The aspect ratio describes the shape of the grid unit. A square grid unit would have a 1:1 ratio , whereas a grid unit of aspect ratio 4:3 is a unit with one side 1.33 times as big as the other side.
<b>vector</b>	A vector-based image is composed of points and Bézier curves. The computer reads the points and traces the segments, linking them to reproduce the image shape. There is no fixed size or resolution in a vector image. The graphic can be enlarged and distorted as much as desired and the system will simply recalculate the segments and rebuild the shapes. Vector images are translated and displayed in pixels once the calculation is done.
<b>velocity</b>	In animation, the velocity, also known as <i>ease</i> , is the acceleration or deceleration of a motion. This can be achieved by a function curve, or via a series of animated drawings. Other common terms for ease-in and ease-out are <i>slow-in</i> and <i>slow-out</i> .
<b>walk cycle</b>	A series of drawings "on the spot" that describe the walk for a character. The illusion of movement is created by the use of background pans. To avoid making innumerable drawings, animators routinely make a walk cycle for a

	character.
<b>Xsheet (exposure sheet)</b>	<p>The Xsheet or exposure sheet, is a sheet with several vertical columns and horizontal frames used to indicate a scene's timing.</p> <p>Each column represents a scene's layer. In each column, the drawing numbers are indicated and spread over the specific number of frames in which they appear.</p> <p>The exposure sheet is used by animators, directors and other members of the crew to track the sequence and timing of images, dialogue, sound effects, sound tracks and camera moves. Also known as <i>dope sheet</i>.</p>
<b>zone</b>	An area which can be painted with colour.

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