TOON BOOM HARMONY 12.2.1

- Essentials Edition -

Traditional Animation Guide

Legal Notices

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Publication Date

7/6/2018

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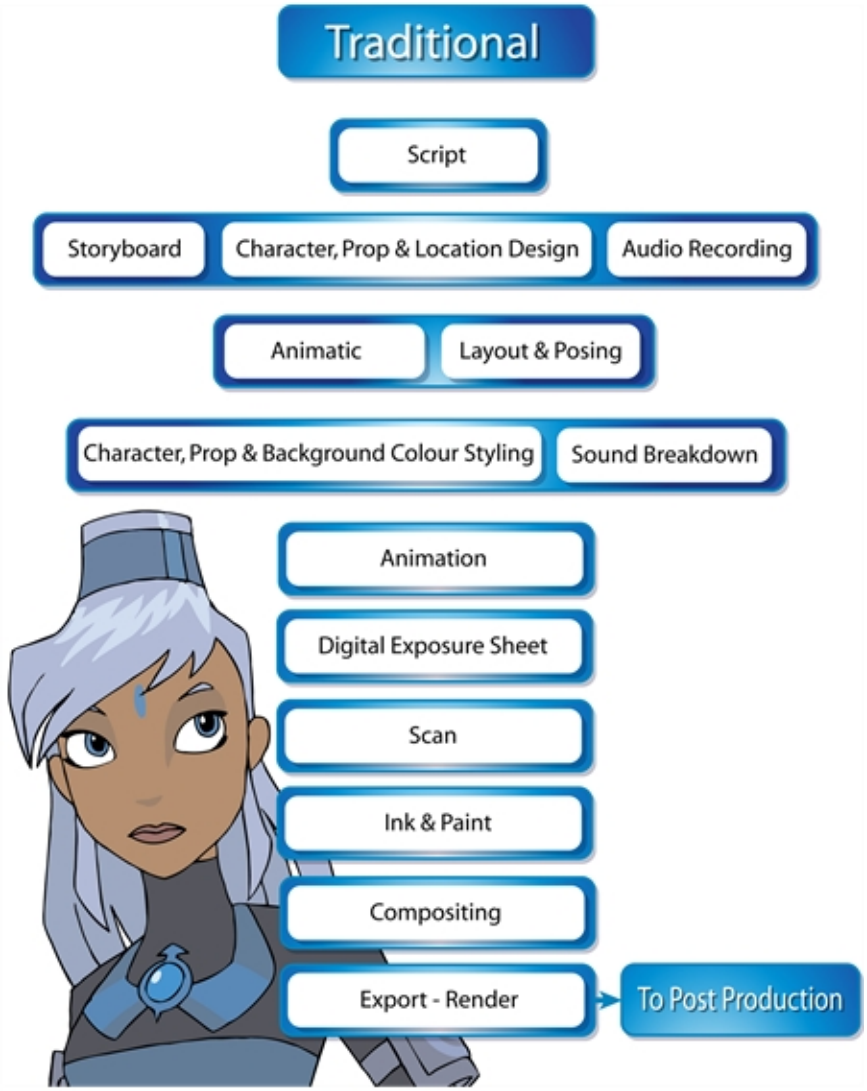
Chapter 1: Traditional Animation - An Introduction

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.



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

Topics in this section:

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

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.

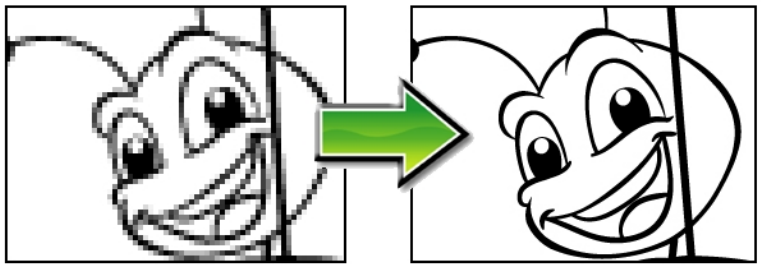
You must install a TWAIN driver for your device in order to access its contents. Refer to the manufacturer of your device to get a TWAIN driver. Once all the animation layers are scanned in, you can set the timing in the digital exposure sheet.

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.

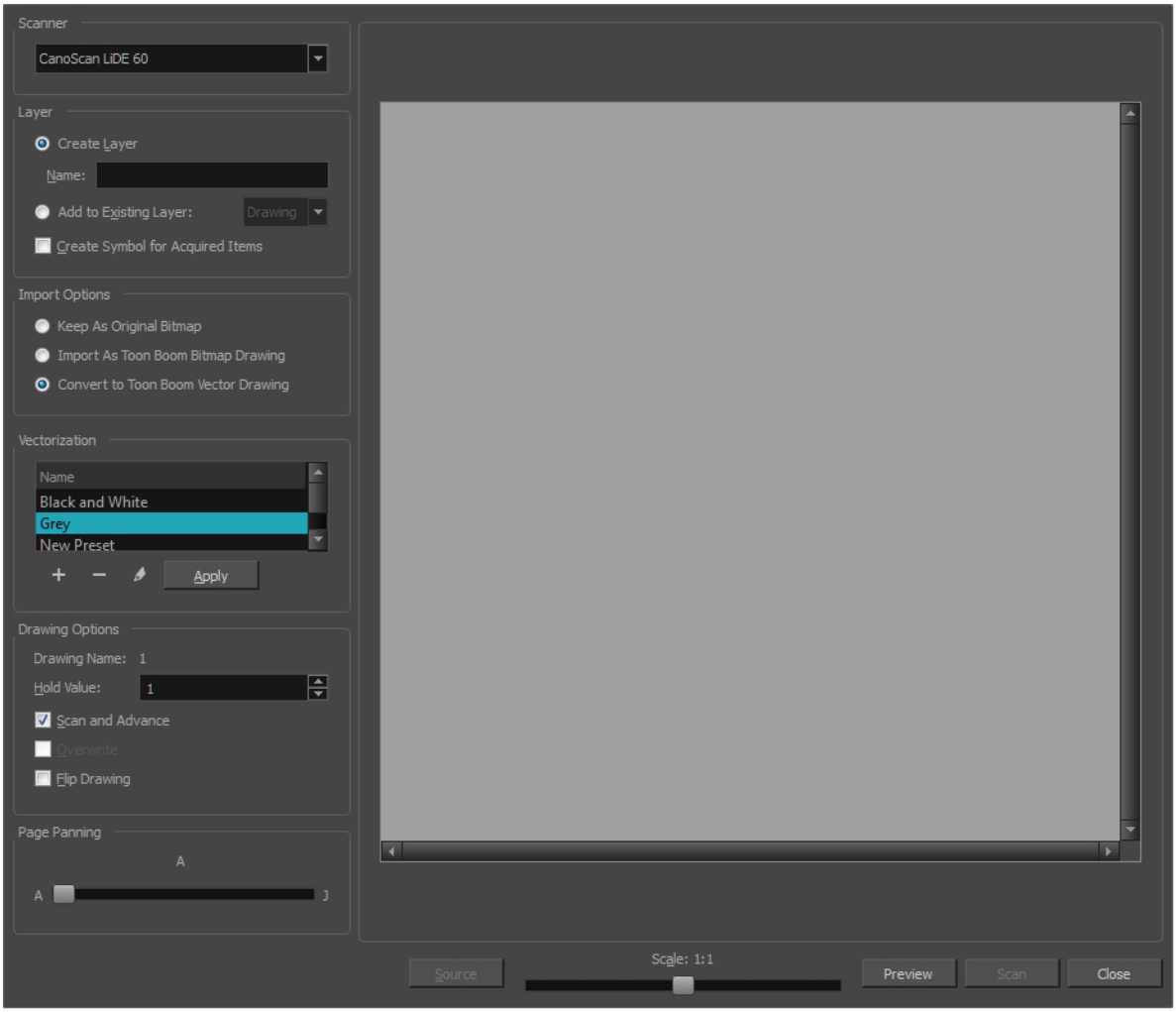
You can turn bitmap images into vector drawings, while maintaining the sketchiness of a pencil line or into vector images with a bitmap fill. Both options can add life to an animation, which straight vectorization with smoothing does not usually afford.



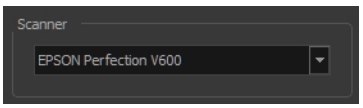
How to scan images as bitmap drawings

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

   The Scan Drawings window opens.



2. Select your scanner from the Scanner list.



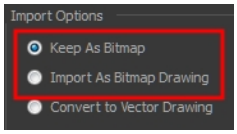
3. In the Layer section, decide if the scanned or imported image will be placed on a new layer or existing layer.
   - **Create Layer**: Scans or imports the image into a new layer. Select one of the following options:

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.

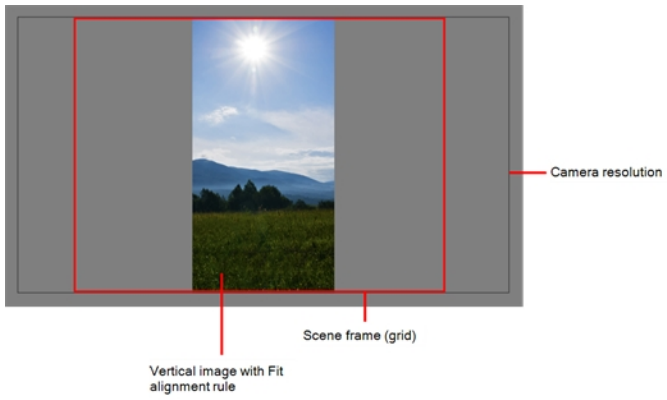
   - **Add to Existing Layer**: Scans or imports the image into an existing layer. Select a layer from the Layer list. You must scan into the same layer type if you're using an existing layer.

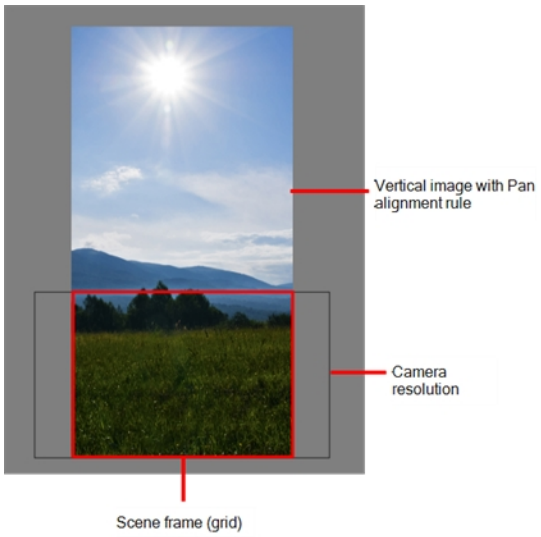
- **Create Symbol for Acquired Items**: Encapsulates the bitmap image in a symbol. To mix bitmap images with vector drawings on the same layer, the bitmap image must be encapsulated in a symbol and vice versa. Symbols will also be automatically added to the Symbol folder in the Library view.

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



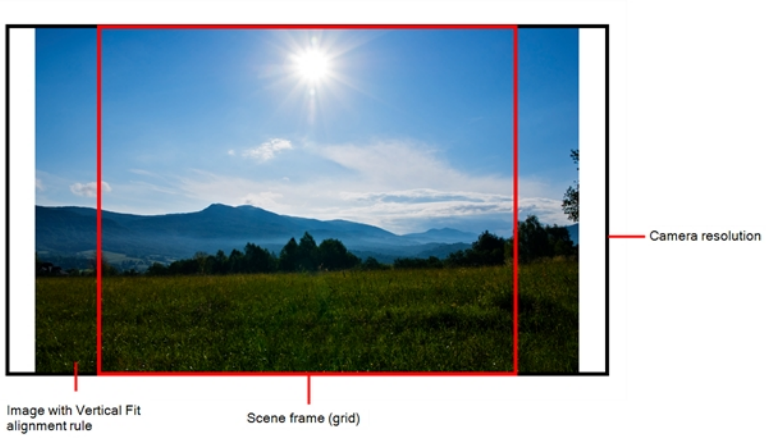
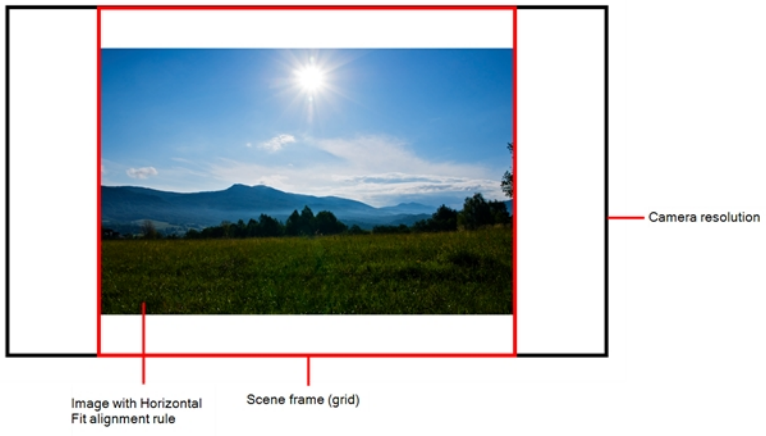
- **Keep As Bitmap**: Retains the imported image as a bitmap. In the Alignment section, decide on the size and placement of your image within the camera frame. Depending on the Scene Settings (the height and width in pixels that you chose for your project), an image that you import may get scaled to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

Parameter	Description
Fit	Enlarges or shrinks (but not distorts) the image height to match the full height of the scene grid.  If the image orientation is landscape, this will enlarge or shrink (but not distort) the image width to match that of the scene grid.  Note that the Fit alignment rule equals the Center Fit rule in the layer properties.
Pan	This is the opposite of the Fit parameter. If the image orientation is portrait, its

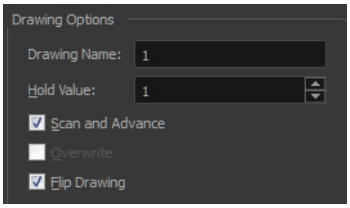
	width will be made to match the width of the scene grid. As a result, part of the image's height will extend beyond the height of the frame. This can be useful if you want to make your background move up and down, or from left to right to make it appear as if the camera is panning or to actually perform a camera pan.  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.  Note that the Pan alignment rule equals the Center First Page rule in the layer properties.
Project Resolution	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. 

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

- **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
Vertical Fit	Enlarges or shrinks (but not distort) to your image height to match the full height of the scene frame (alignment grid). 
Horizontal Fit	Enlarges or shrinks (but not distort) to your image height to match the full width of the scene frame (alignment grid). 
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.

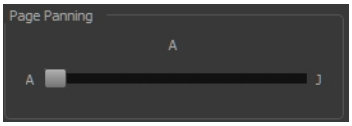
5. In the Drawing Options section, set the following options if desired:



- **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.

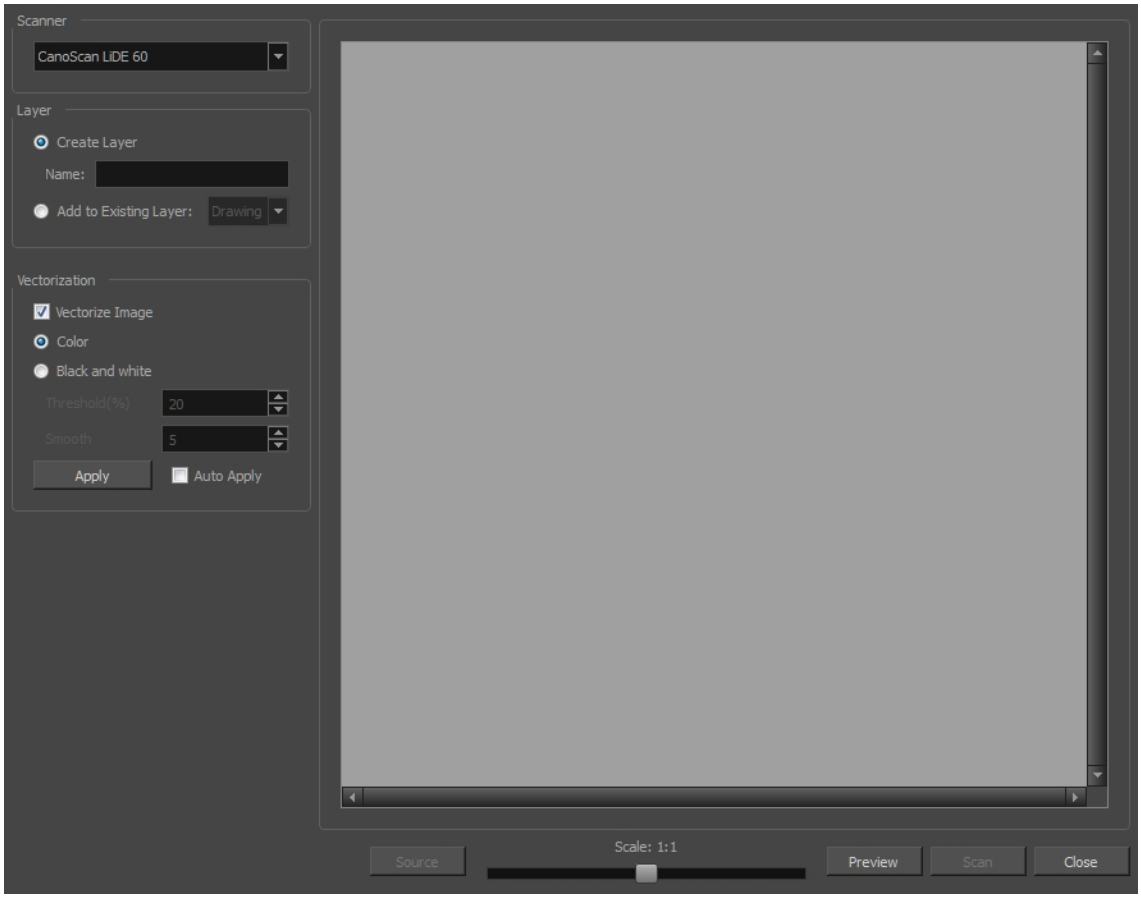


9. If you have more than one drawing, set the next drawing in place and click **Scan** again. Repeat until you have finished scanning all your drawings.

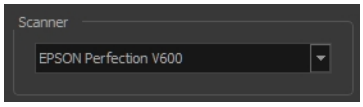
How to import and vectorize bitmap drawings

1. From the top menu, select **File > Acquire from TWAIN** or press Ctrl + Shift + S (Windows/Linux) or ⌘ + Shift + S (Mac OS X).

   The Acquire from scanner 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 Vectorization section, select the **Vectorize Image** option and then set the following:
   - **Colour**: Creates a vector rectange with the bitmap as a texture inside.
   - **Black and White**: Vectorizes drawings as a solid black line; creates a 100% vector-based drawing. Set the Threshold and Smooth parameters.

     Threshold: Determines which black, white or grey pixels become a black line. 0% means all the light pixels will be kept as black vector line. A value of 100% means only the very dark pixels become a black line.

     Smooth: Determines the smoothness of lines. The higher the value, the less angular and bumpt the resulting lines will be.

     Auto Apply: Automatically applies the colour or black and white settings to the scanned images.

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

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

8. 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.

Creating 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.

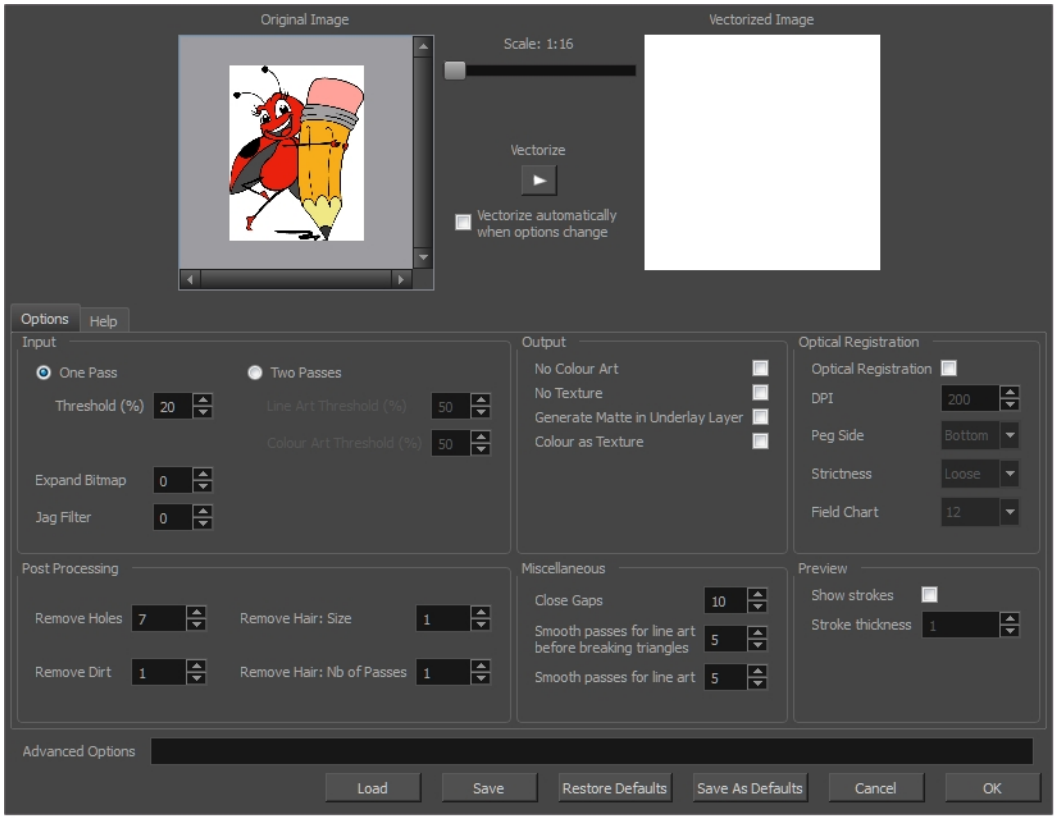
How to open the Vectorization Parameters dialog box

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.

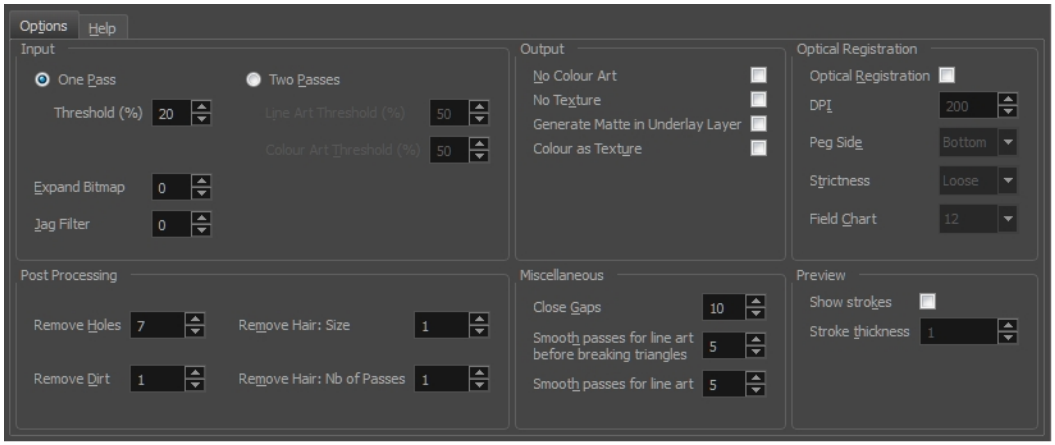
   The Vectorization Parameters dialog box opens.



- *Options Tab* on page 16
- *Help Tab* on page 18

Options Tab

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



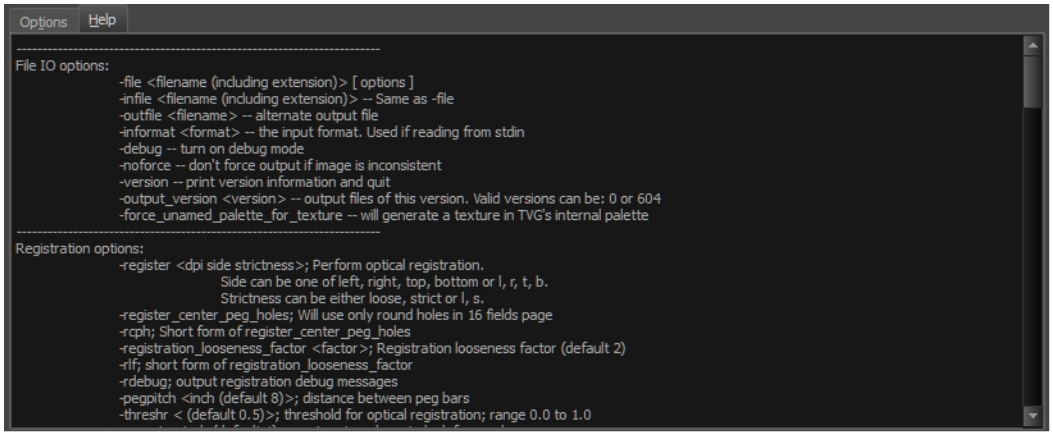
Parameter	Description

Input	The input filters are applied to the bitmap image before it is vectorized.
	One Pass: 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.
	Two Passes: 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.
	Threshold: 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.
	Expand Bitmap: 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.
	Jag Filter: 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.
	No Colour Art: Does not generate filling zones in the Colour Art layer.
	No Texture: 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.
	Generate Matte in Underlay Layer: Creates an opaque zone behind your drawing's lines to avoid seeing through the layers.
	Colour as Texture: 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.
	DPI: 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.
	Peg Side: Lets you select the position of the peg holes on your drawings. Identify whether they are on the top, bottom, left or right.
	Strictness: Determines how exact the location of the peg holes must be for the software to recognize them. There are two values to choose from: • **Strict**: The peg holes must be in a tightly defined area to be recognized. • **Loose**: The peg holes can be recognized somewhere in a larger area. This is the recommended setting.
	Field Chart: 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.
	Remove Holes: Removes holes of a specified value that might make painting difficult.
	Remove Dirt: Removes stray marks and dirt of a specified value. Try a value around 500.
	Remove Hair Size: Removes small strokes that have no line art.
	Remove Hair: Number of Passes: The number of times the drawing will be analyzed to identify hair marks.
Miscellaneous	**Close Gaps**: Closes gaps in the Colour Art so you can paint it.
	Smooth Passes for Line Art Before Breaking Triangles: 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.
	Smooth Passes for Line Art: The number of times the smoothing operation is performed after the triangles have been created. This further smooths the line art.
Preview	**Show Strokes**: Shows the strokes in the Vectorized Image panel.
	Stroke Thickness: 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.



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_unamed_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_errorl** <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

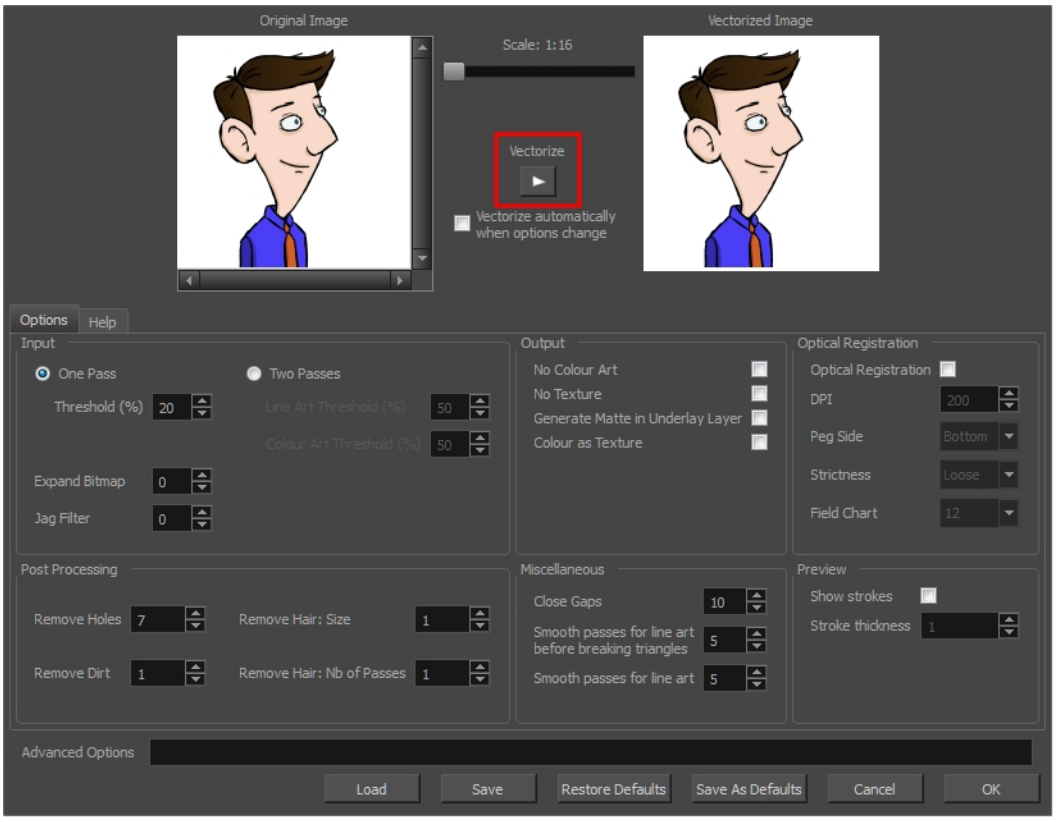
With Harmony, you can create custom vectorization parameters that can be saved, reused, shared, or used to set the Scan module vectorization style list.

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 *Creating Custom Vectorization Parameters* on page 15.

How to create or modify the vectorization parameters

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



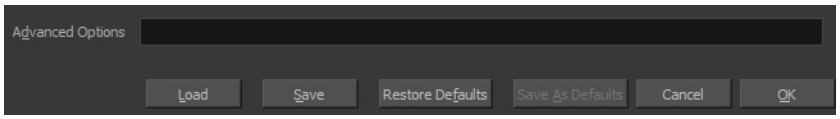
2. Click the **Vectorize** button to update the Vectorized Image preview.

   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

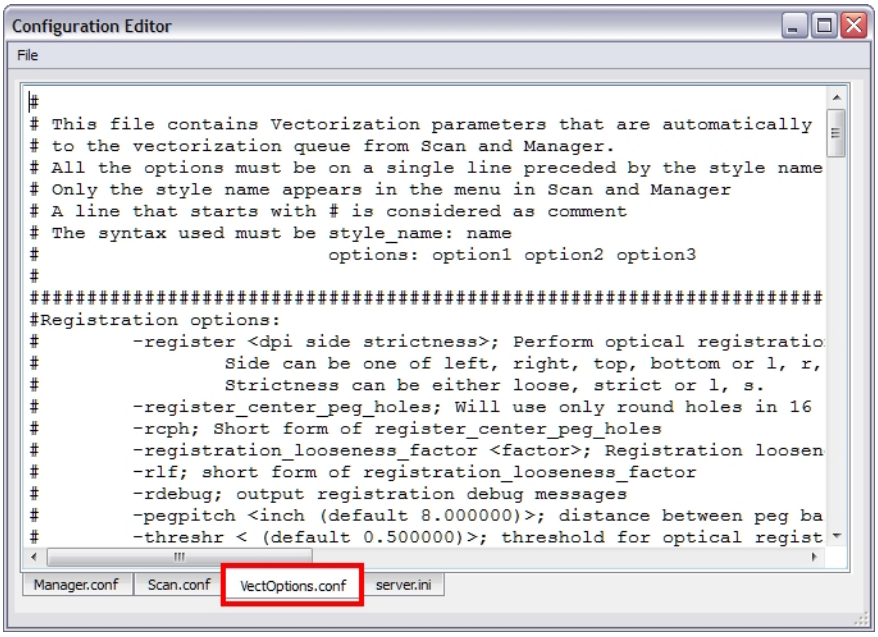
Toon Boom Harmony Server uses a file called **`vectOptions.conf`** to get the vectorization style when batch vectorizing a series of drawings. A series of default styles is available in this file, but you will certainly want to create your own to fit your production style.

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 12.2 > Tools > Configuration Editor**.
   - Mac OS X: Select **Applications > Harmony 12.2 > Tools > Configuration Editor**.

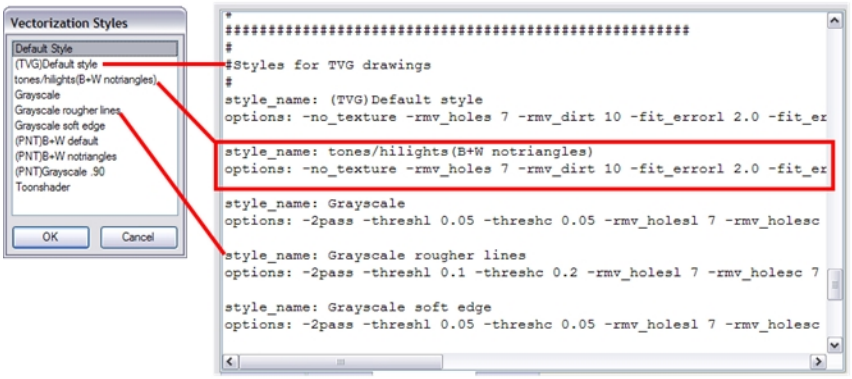
   The Configuration Editor window opens.



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 1.

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.



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

   `style_name:`

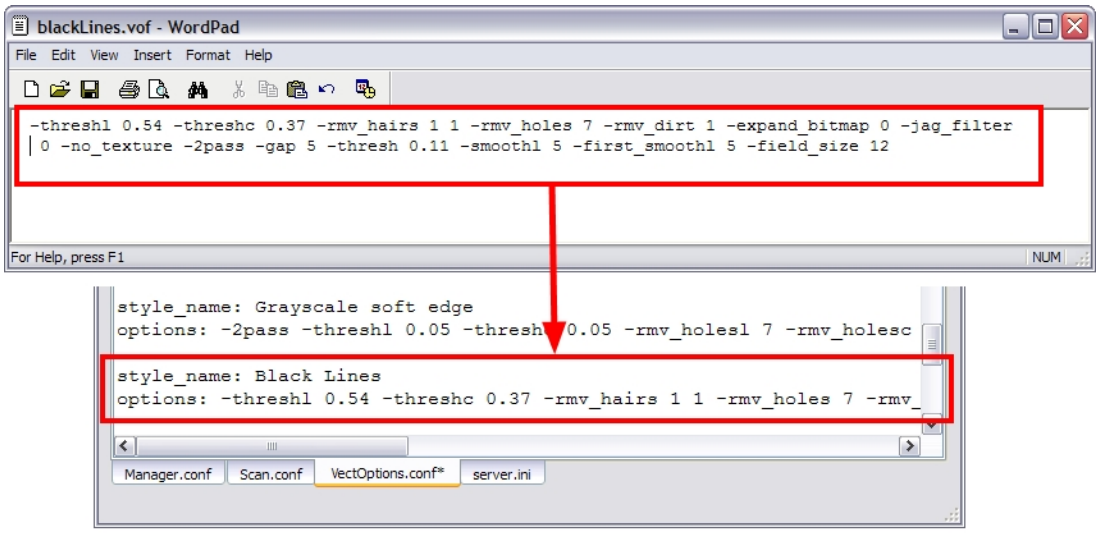
   This should be followed by the name of your new style. For example: **`style_name: Black Lines`**.

6. Under the style name line, type the following:

   `options:`

7. 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.

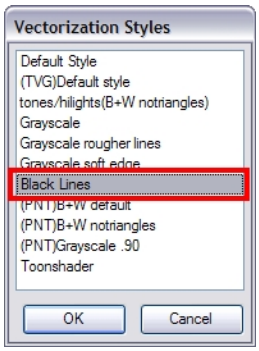


8. In the Configuration Editor's top menu, select **File > Save**.

9. 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_12.2/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!
```

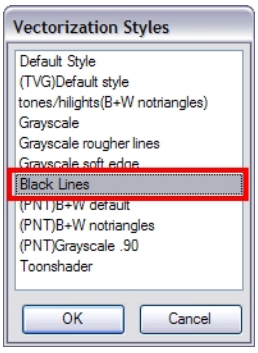
9. To exit the vi editor and return to the Terminal, type the following and press Enter/Return:

```
$ :q
```

10. 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

1. Open a Terminal window:

Menu: **Applications > System Tools > Terminal**

2. Open the `etc` folder inside the installation directory:

```
$ cd /usr/local/ToonBoomAnimation/harmony_12.2/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 gedit VectOptions.conf
```

4. Enter the root password.

5. Open the `VectorOptions.conf` file:

```
$ gedit VectOptions.conf
```

6. Edit the parameters of the `VectOptions.conf` file as you would do in most text editor applications.

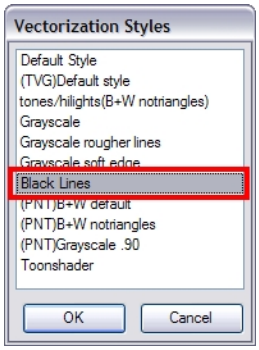
7. Select **File > Save.**

8. Select **File > Quit**.

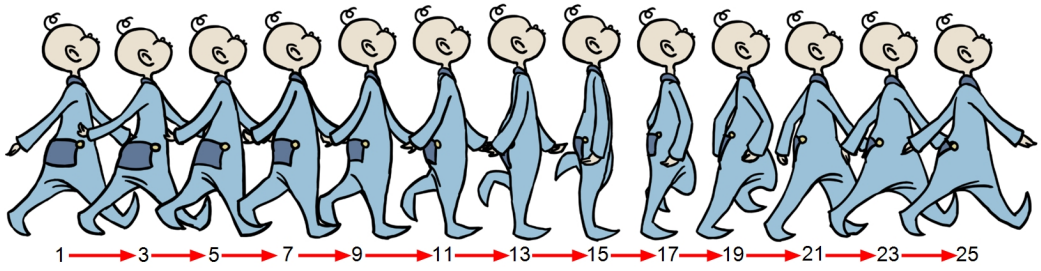
9. If you have Toon Boom Harmony Scan module on your computer, start the application and verify that the new style appears in the Vectorization Style list under **Edit > Vectorization Style**.

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

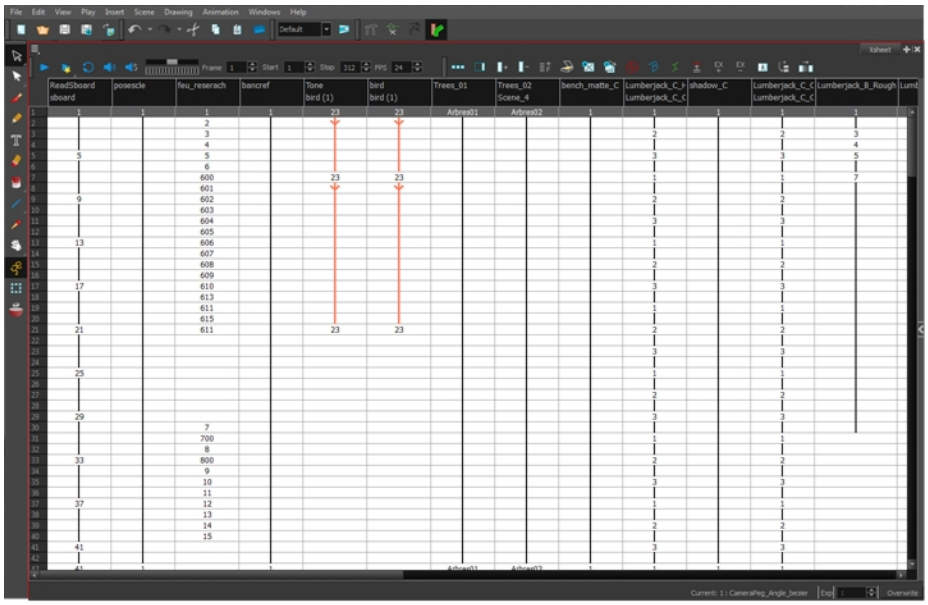
The scene is generally created during a previous step, such as scanning (in a traditional animation workflow), scene

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.

Setting the Scene Length

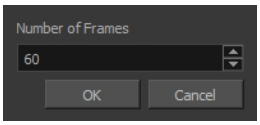
Once the references are ready, you need to set the scene length by adding the right number of frames to your scene. You can set the global scene length from the top menu.

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.

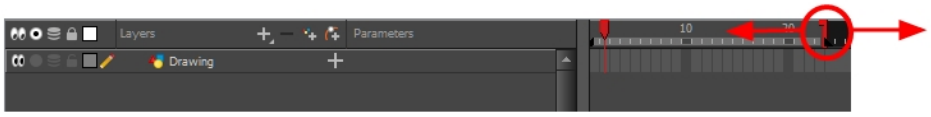
   

2. In the Number of Frames field, enter the number of frames needed.

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.

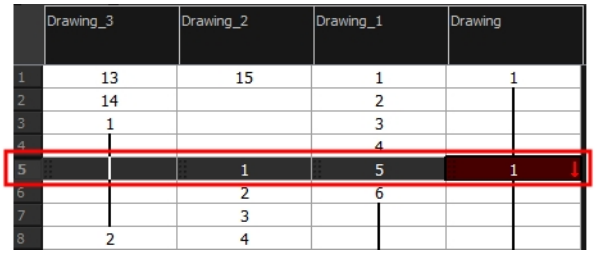
1. In the Timeline view, drag the scene length bracket:
   - **Right**: To add more frames to your scene.
   - **Left**: To reduce the number of frames in your scene.

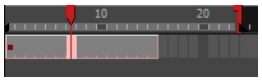
How to add frames in the middle of a scene

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

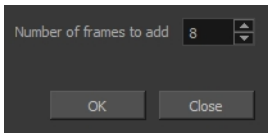


- In the Timeline view, select the frame to which you want to add frames before or after.



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.

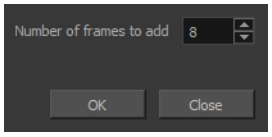


3. In the Number of Frames to Add field, enter the number of frames needed in the scene.
4. Click OK.

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.



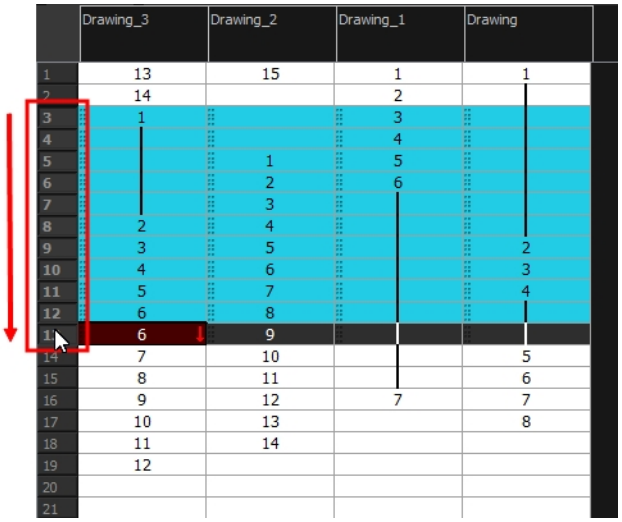
2. In the Number of Frames to Add field, enter the number of frames needed in the scene.

3. Click OK.

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

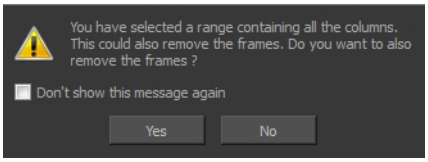
In the Xsheet view, you can remove any selected frame range, such as the last frame.

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.



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.

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, 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 Basics

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.

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 the Timeline view. 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.

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
- Expression
- Annotation

Adding Layers and Columns

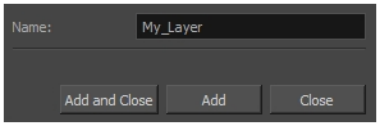
There are different ways to add a drawing layer to your project. By default, when you create a new scene there is one Drawing column in the Xsheet view and one corresponding Drawing layer in the Timeline view.

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.

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.



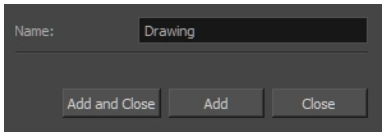
2. In the Name field, name your new layer.
3. Do one of the following:
   - Click **Add** to add a first layer and keep the window open to add more layers.
   - Click **Add and Close** to add a new layer and close the window.

   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**.

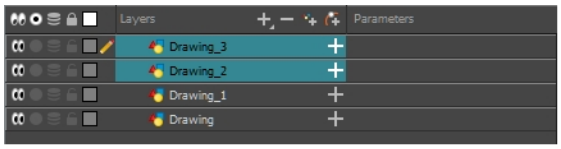
   The new drawing element appears in your scene.

Deleting Layers and Columns

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

How to delete layers in the Timeline view

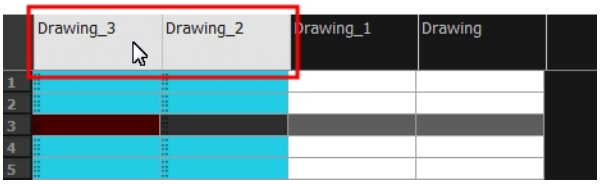
1. In the Timeline view, select the layers to delete.

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**.

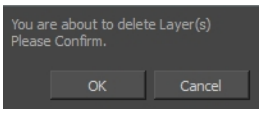
How to delete columns in the Xsheet view

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.



3. To complete the operation:
   - Click **OK** to delete the selected layers.
   - Click **Cancel** to cancel the operation.

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. 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

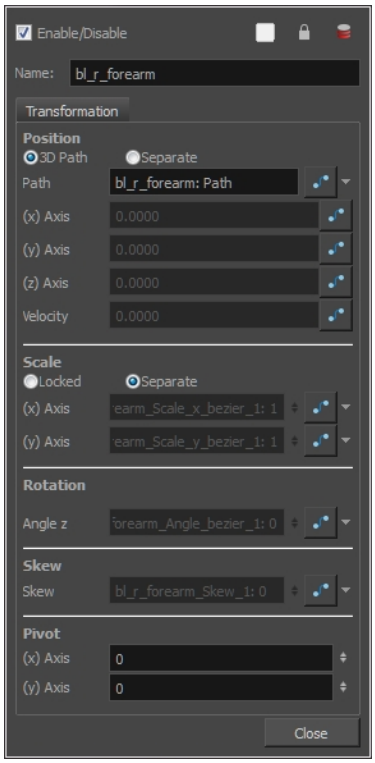
The Column Properties editor allows you to:

- 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.

The properties display.



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.

How to rename a layer in the Timeline view

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

How to rename a layer in the Layer Properties editor

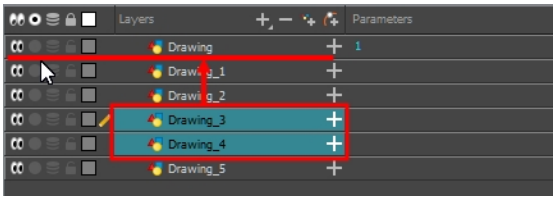
1. In the Timeline view, double-click anywhere on the layer except the layer name to rename.

   The Layer Properties editor opens.
2. In the Name field, rename the layer.

3. Click **Close**.

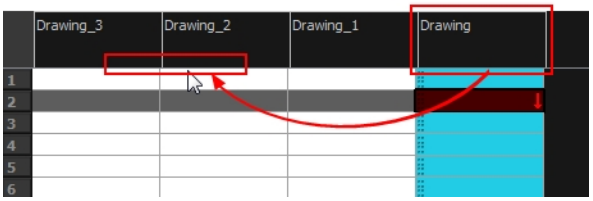
How to reorder layers in the Timeline view

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.

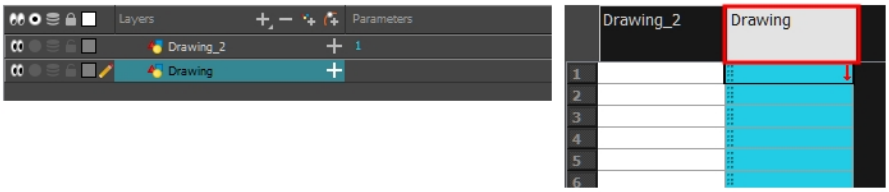


Duplicating Layers and Columns

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 to duplicate.



2. Do one of the following:
   - (Xsheet) Right-click on the column and select **Duplicate Selected Columns**.
   - (Timeline) Right-click on the layer and select **Duplicate Selected Layers**.

   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.

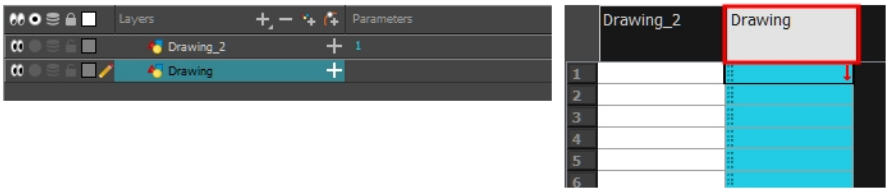
- You can modify the column timing independently from each other, but the drawings remain linked.
- You can copy the columns timing, so drawings and timings remain linked.

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 to clone.



2. Do one of the following:
   - From the top menu, select **Edit > Clone: Drawings Only** to clone only the layer or column drawings.

   The new cloned layer or column appears.

Filling Exposure

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

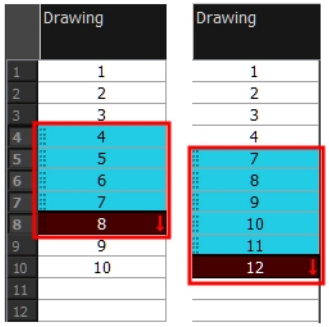
This section is divided as follows:

- *Filling Exposure Mode* on page 43
- *Typing Exposure* on page 44
- *Holding Exposure* on page 45

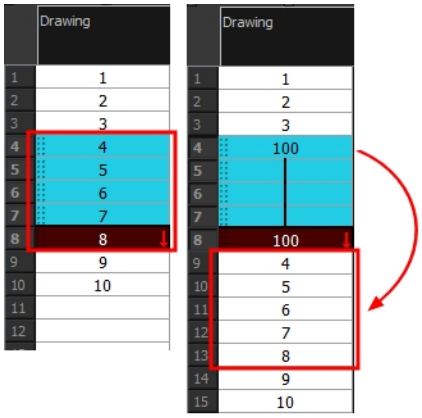
Filling Exposure Mode

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.



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.



How to switch between Overwrite and Insert modes

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

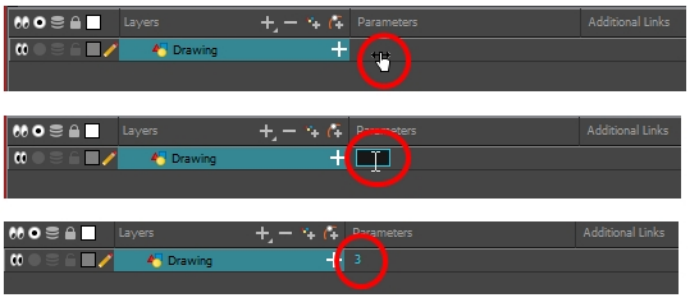
Typing Exposure

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.



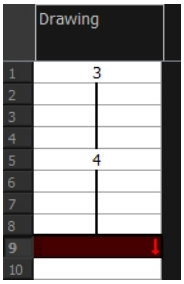
2. Press Enter/Return to validate the value.

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

1. Do one of the following:
   - From the top menu, select **Animation > Cell > Hold Exposure > the desired option**.
2. 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.

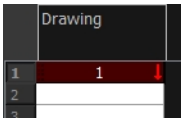


Extending a Single Exposure

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

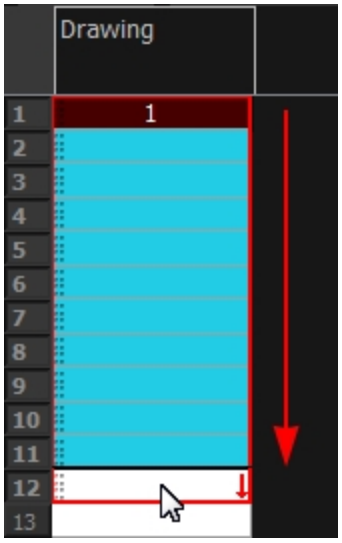
How to extend a cell exposure gesturally

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. Select a cell and do one of the following:
   - From the top menu, select **Animation > Cell > Extend Exposure**.
   - Press F5.

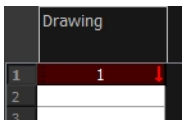
   The Extend Exposure dialog box opens.
2. Enter the frame number you want to extend the cell to.

Extending an Exposure Sequence

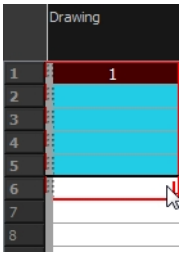
When working with a sequence that contains only numbers, you can extend an exposure sequence in a similar manner to extending a single exposure.

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.

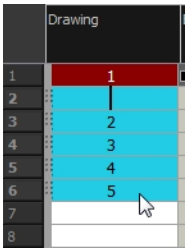


3. Hold down the Shift key. Make sure a plus sign (+) appears.
4. Pull down the selection box to the desired frame.



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

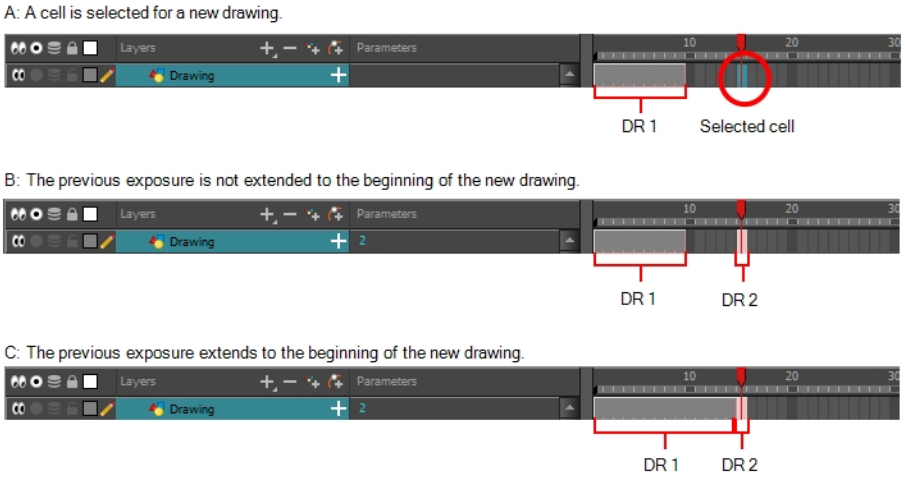
5. First release the Shift key, then release the mouse button.



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.

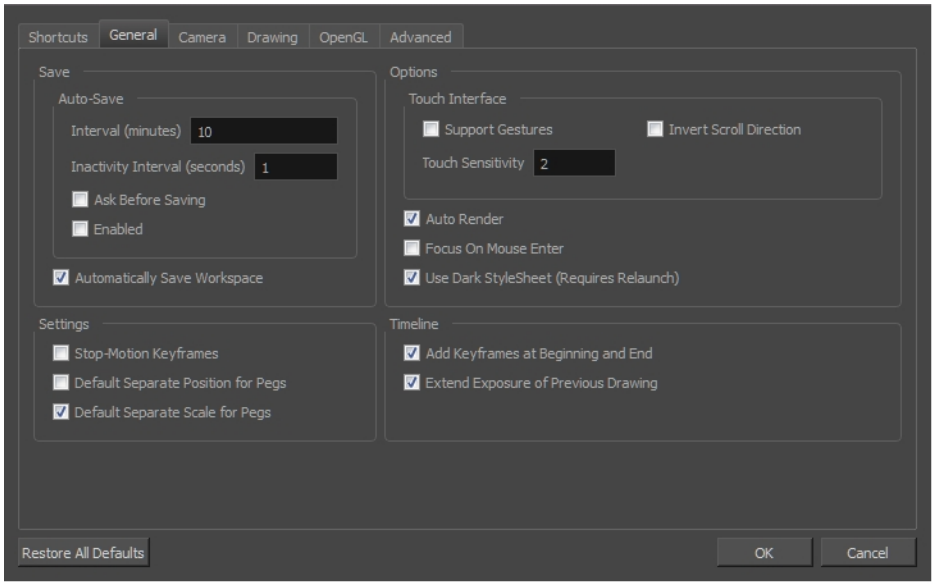
In the following example, a cell is selected on the timeline for creating a new drawing in image A. In image B, the previous exposure does not extend to the new drawing, while in image C, it does.



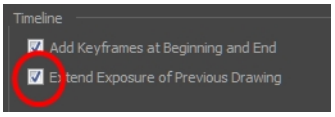
How to extend the exposure of previous drawings

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 **General** tab.



3. In the Timeline 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.

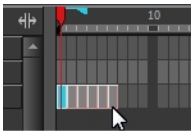
Dragging Cells

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.

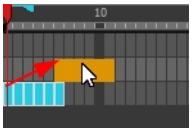
You can turn off the Gestural Drag mode for the Xsheet view to prevent drawings from being dragged from one location to another. This feature does not apply to Annotation columns.

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

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

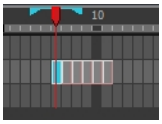


2. Drag the cells to the new location.

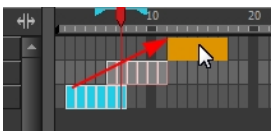


3. Drop the selection by doing one of the following:

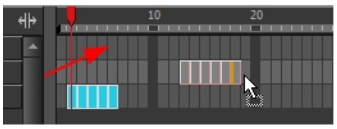
   - Drop by simply releasing the mouse or pen.

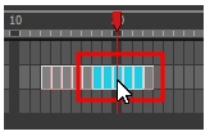


   - Hold Ctrl (Windows/Linux) or ⌘ (Mac OS X) while dropping the selection to copy the cells. The original cells will not be moved.



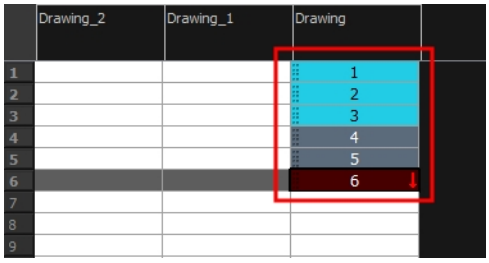
   - Press Shift while dropping the selection to insert them between existing frames.



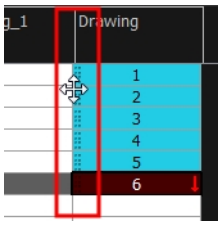


How to drag a cell to another location in the Xsheet view

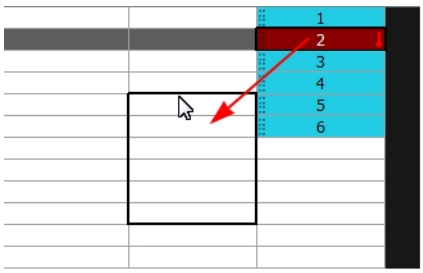
1. In the Xsheet view, select one or more cells.

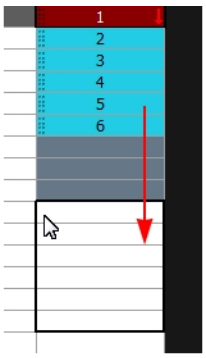


2. In the Xsheet view, position the pointer over the small dotted area on the left side of the selected cells.

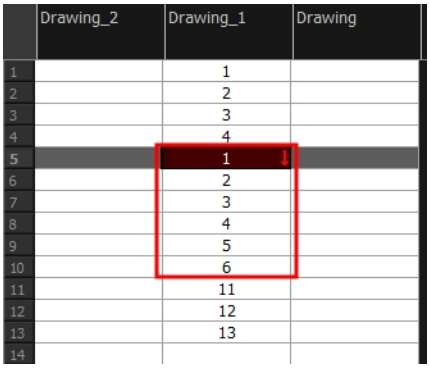


3. Drag the selection to any other cell in the same column or in another column.

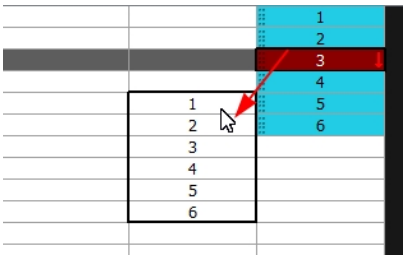




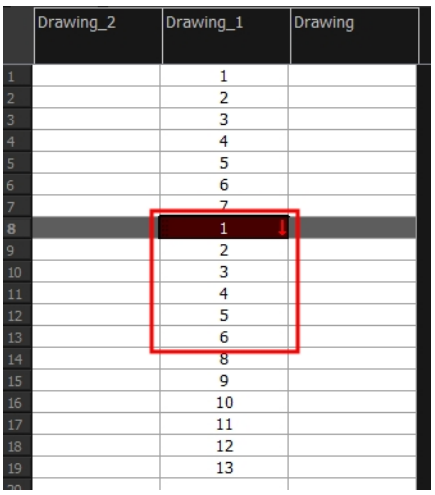
4. Do one of the following:
   - Drop the selection to overwrite the existing cells.



- 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.



Increasing and Decreasing Exposure

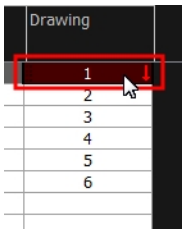
Once a value is entered in the Timeline or Xsheet view, you can increase and decrease its exposure.

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.

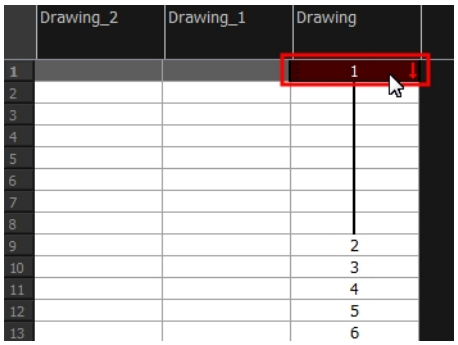


2. Do one of the following:
   - From the top menu, select **Animation > Cell > Increase Exposure**.
   - In the Xsheet toolbar, click the Increase Exposure button.
   - At the bottom-right corner of the Xsheet view, set the number of cells over which the drawing will be exposed.

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

How to decrease exposure

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



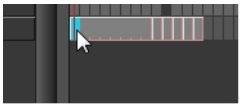
2. Do one of the following:
   - From the top menu, select **Animation > Cell > Decrease Exposure**.
   - In the Xsheet toolbar, click the Decrease Exposure button.

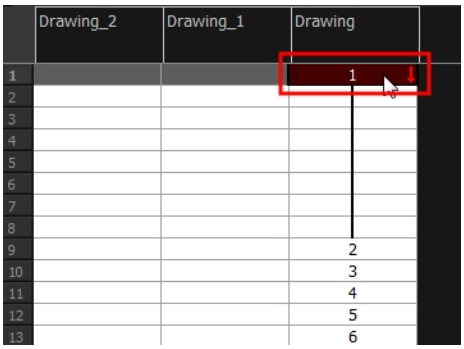
- At the bottom-right corner of the Xsheet view, set the number of cells over which the drawing will be exposed.

- 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.





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

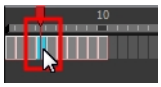
1. In the Timeline or Xsheet view, select a cell of a drawing exposed over several cells.
2. Do one of the following:
   - From the top menu, select **Animation > Cell > Clear Exposure**.
   - In the Timeline view, right-click and select **Exposure > Clear Exposure**.

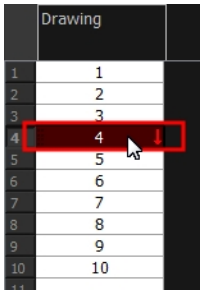
Inserting Blank Cells

You can place an empty cell between other cells.

How to insert blank cells

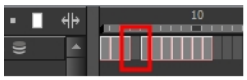
1. In the Timeline or Xsheet view, select the cell in which you want to insert a blank cell.

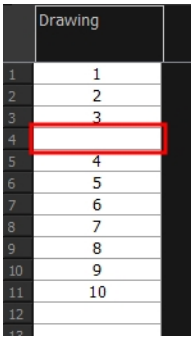




2. Do one of the following:
   - In the top menu, select **Animation > Cell > Insert Blank Cell**.
   - Right-click and select **Exposure > Insert Blank Cell**.
   - In the Timeline or Xsheet toolbar, click the Insert Blank Cell button (you may have to customize the toolbar to display it).
   - Press Shift + J.

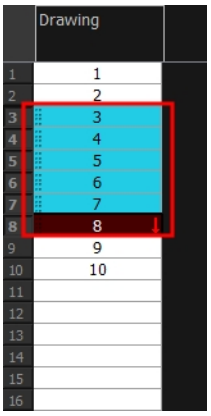
   A blank cell is inserted.



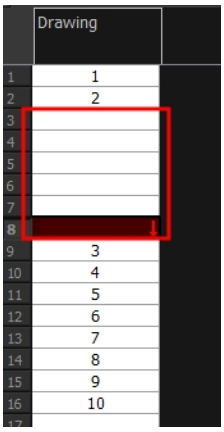


How to clear a selected cell range without changing the exposure and timing

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



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

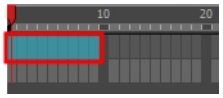


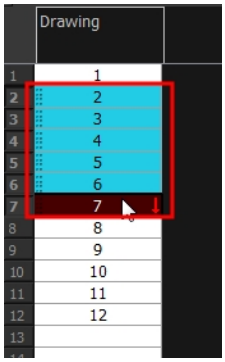
Setting the Exposure

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

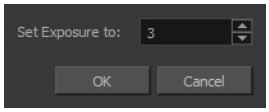
How to set the exposure

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

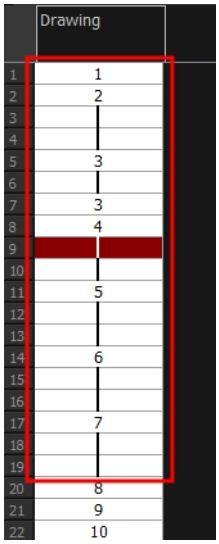




2. Do one of the following:
   - From the top menu, select **Animation > Cell > Set Exposure to > Set Exposure to 1**, **2**, **3**, or **Set Exposure**.
   - In the Timeline toolbar, click one of the Set Exposure buttons (you may have to customize the toolbar to display them).
   - In the Xsheet view, right-click and select **Exposure > Set Exposure to > Set Exposure to 1**, **2**, or **3**, or **Set Exposure**.
3. 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**.



The new timing is displayed in the Xsheet view.

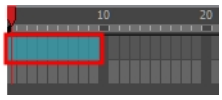


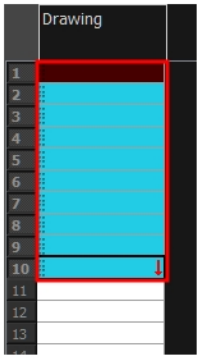
Filling a Selection with a Single Exposure

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

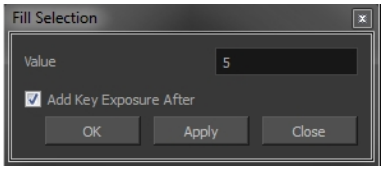
1. In the Timeline or Xsheet view, select a cell range.



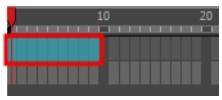


2. Do one of the following:
   - From the top menu, select **Animation > Cell > Fill Selection**.
   - Press Ctrl + T (Windows/Linux) or ⌘ + T (Mac OS X)).

   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**.



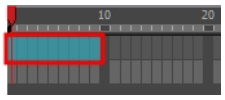
Filling a Selection with a Sequence

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.

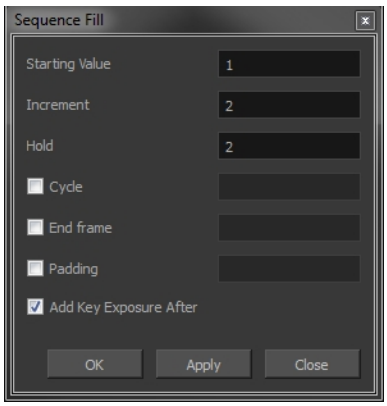
How to fill a selection with a sequence

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**.
   - Press Ctrl + M (Windows/Linux) or ⌘ + M (Mac OS X)).

   The Sequence Fill dialog box opens.



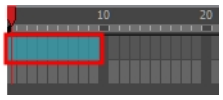
3. In the Starting Value field, type the first number in the sequence.
4. In the Increment field, type the number by which the drawing number will increase from frame to frame. For example, an increment of 1 gives you: `1-2-3-4`; an increment of 2 gives you: `1-3-5-7`; and -2 gives you this: `8-6-4-2`.

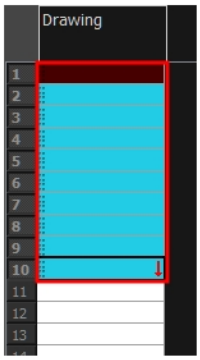
Filling a Selection Randomly

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

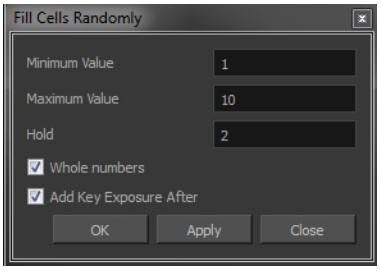
1. In the Timeline or Xsheet view, select a cell range.



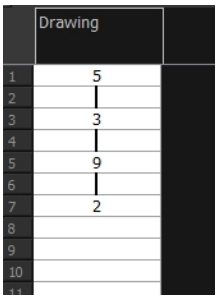


1. In the Xsheet view, click the Fill Cells Randomly button (you may have to customize the toolbar to display it).

   The Fill Cells Randomly dialog box opens.



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

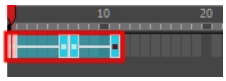


Filling Empty Cells

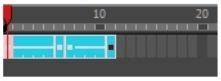
You can fill empty cells to extend the exposure of single frame drawings to fill the range of empty cells after each one.When creating drawings on cells that are not side-by-side, the exposure of the first drawing no longer fills automatically. You must select the frame range where you want your drawings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



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.

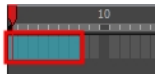
You can loop your drawings using the following command:

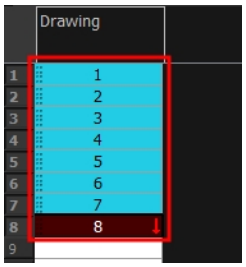
- Create Cycle

When you create a drawing cycle, all the repeated drawings are linked to the same original files. When 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

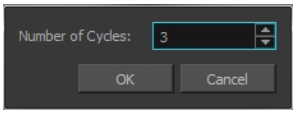
1. In the Timeline or Xsheet view, select the cell range to loop.





2. 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.

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 be 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.

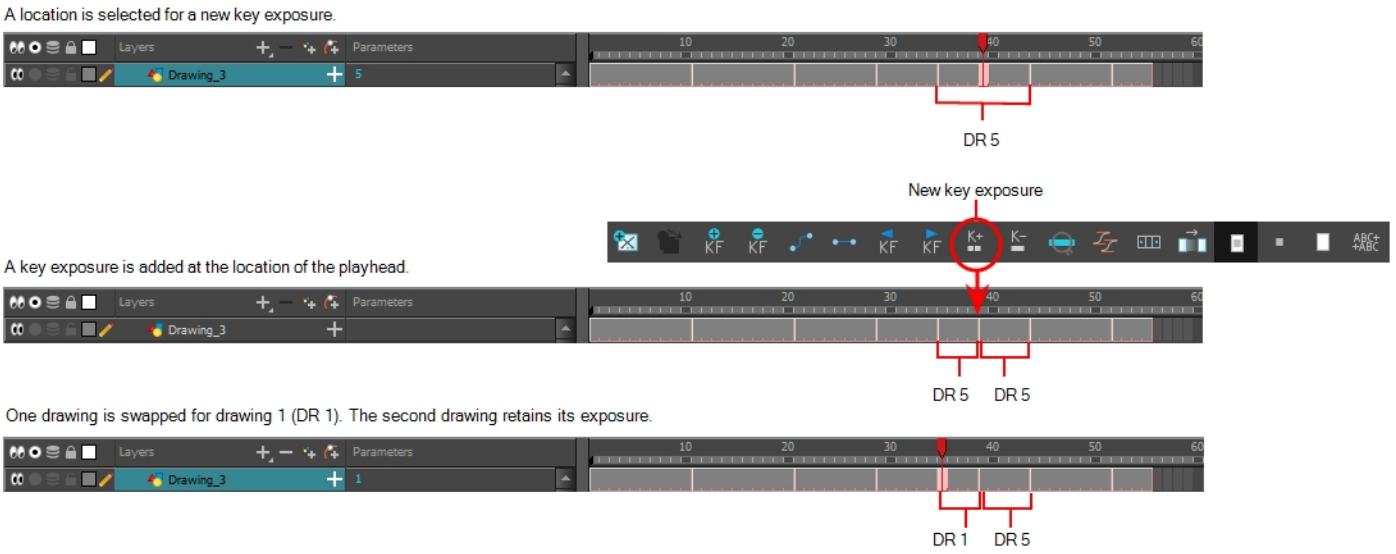
Example: Swapping a drawing with no key exposure

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.



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 button.
   - In the Timeline toolbar, click the Add Key Exposure button.
   - 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 know 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).

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.
   - 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).

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.

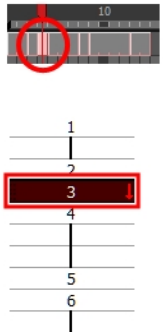
You can navigate through:

- Drawings
- Frames

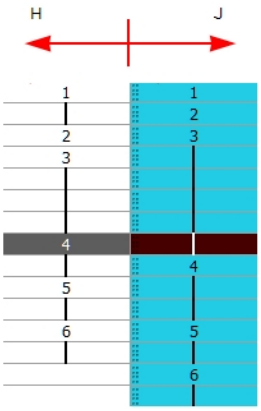
- Columns

How to navigate through drawings, and frames and columns

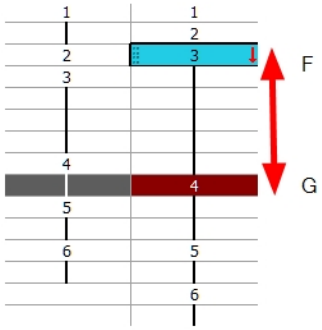
1. In the Timeline or Xsheet view, select a cell.



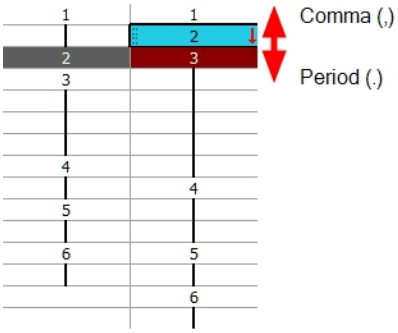
2. Once the cell is selected, you can navigate between:
   - **Previous and next layers**: From the top menu, select **Drawing > Previous Layer** and **Next Layer** or press H and J.



   - **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.

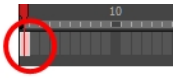
This section is divided as follows:

Renaming a Drawing

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

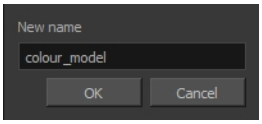
How to rename a drawing

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.

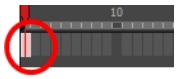
Deleting a Drawing

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

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



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

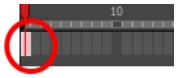
Duplicating a Drawing

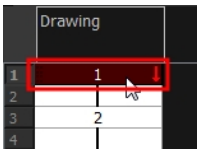
If you want to modify a drawing that already exists, but keep the original drawing intact, you can duplicate the drawing and work on the copy. When duplicating a drawing, the selected cell is replaced with the new drawing. The exposure of the original drawing that was on the current cell is removed. 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

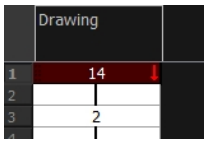
1. In the Timeline or Xsheet view, select the drawing to duplicate.





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:

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.

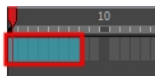
> **Tip**: If you don't want to lose the existing animation when pasting a template, such as when placing new drawings after the animation, then delete the template's animation. It will still have updated the drawings but not override the existing animation.

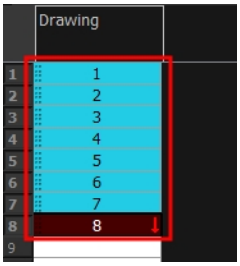
Always create drawing files: When adding exposures to a drawing layer, new drawings will always be created. If drawing files with the same name already exist, Harmony will create a new name for the drawing.

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.

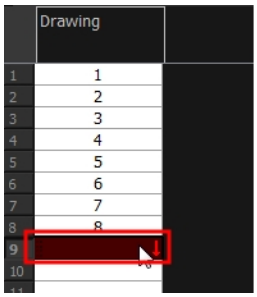
How to paste drawings with the Paste Special command

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





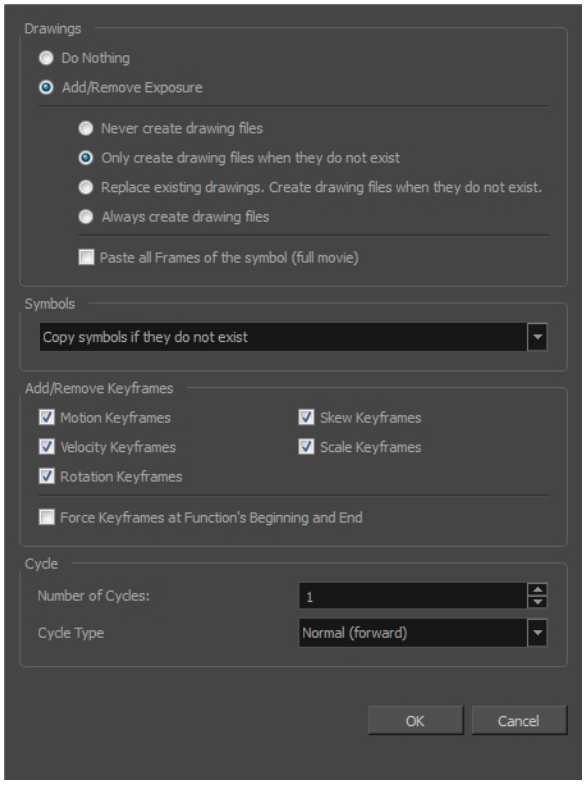
2. In the Timeline or Xsheet view, select the cell where you want your pasted selection to start.



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. 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

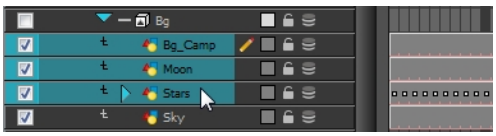
1. Do one of the following:
   - From the top menu, select **Edit > Paste Special Again**.
   - Right-click and select **Paste Special Again**
   - In the Timeline or Xsheet toolbar, click the Paste Special Again button (you may have to customize the toolbar to display it).
   - Press Ctrl + Shift +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

Merging Drawings

Combines all drawings. Unused columns and layers will be deleted, but the original drawing files are still accessible.

How to merge drawings in entire layers or columns

1. In the Timeline view, select the layers you want to merge.



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

Customizing Layers and Columns

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:

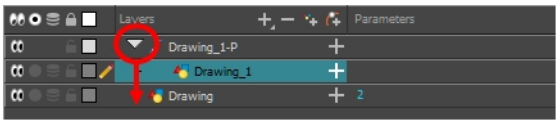
- *Expanding and Collapsing Layers and Columns* on page 69
- *Showing or Hiding Layers* on page 70
- Showing and Hiding Columns on page 1
- Xsheet Thumbnails on page 1
- *Changing the Layer or Column Colour* on page 72

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**.

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 > Collapse All** or **Expand All**.
- Press 0 and 9.

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:

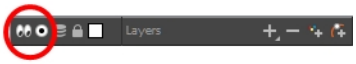
- If you have anything selected, it is not affected.
- When multiple layers are selected and you enable/disable the Solo mode on any of those layers, it is applied to all the selected layers.
- When multiple layers are selected and you enable/disable the Solo mode on layers that are not part of the selection,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

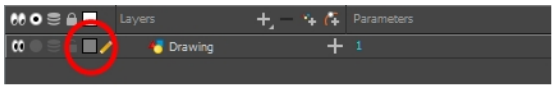
   In the Timeline view, you can hide or show certain types of layers such as Effect.

Changing the Layer or Column Colour

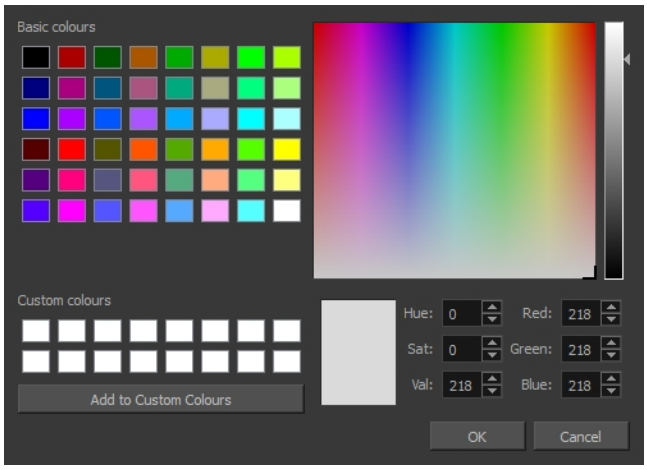
To easily identify elements in the Timeline or Xsheet view, you can change the colour of layers and columns.

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.

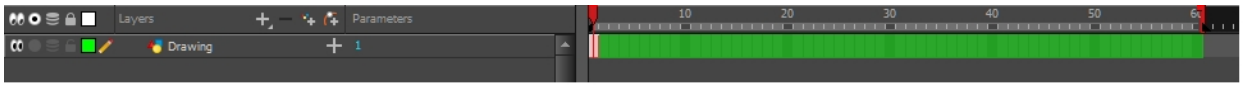


2. In the Select Colour dialog box, select a new colour for your layer.



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.

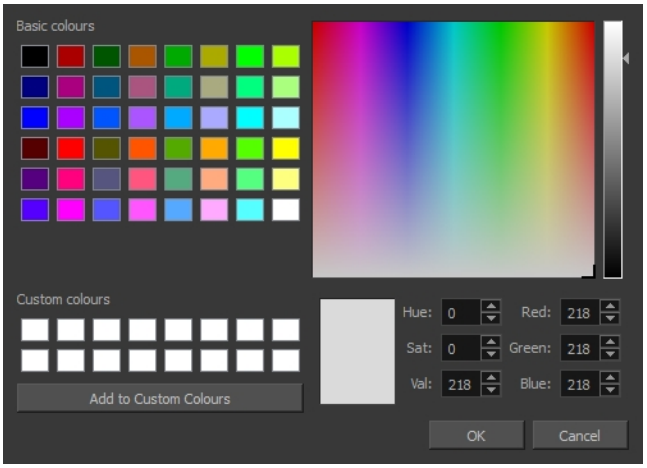


How to reset a layer's colour in the Timeline view

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).

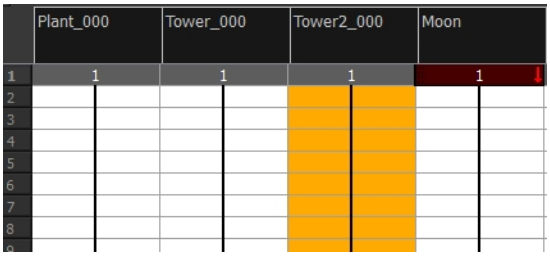
How to change a column's colour in the Xsheet view

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**.

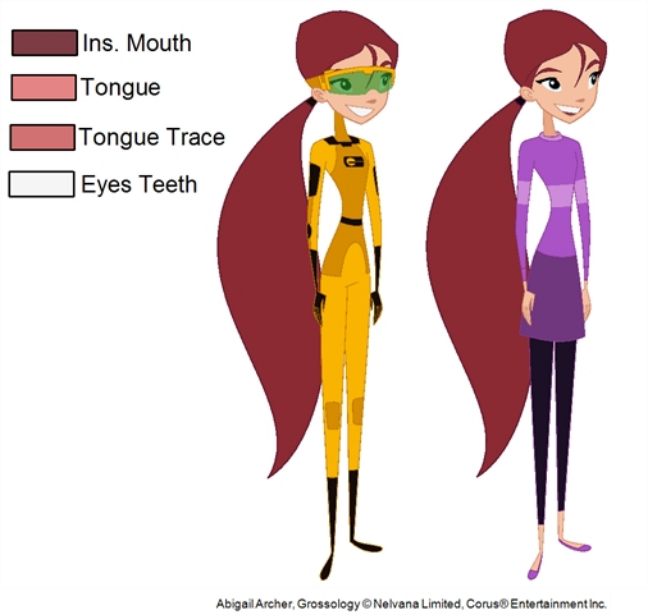
   The column's colour is updated. The corresponding column colour is also updated.



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**.

Chapter 4: Colour Styling



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.

NOTE: Throughout this section, there may be slight differences between your interface and the illustrations in this guide. This is because the images are taken from Harmony Premium.

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

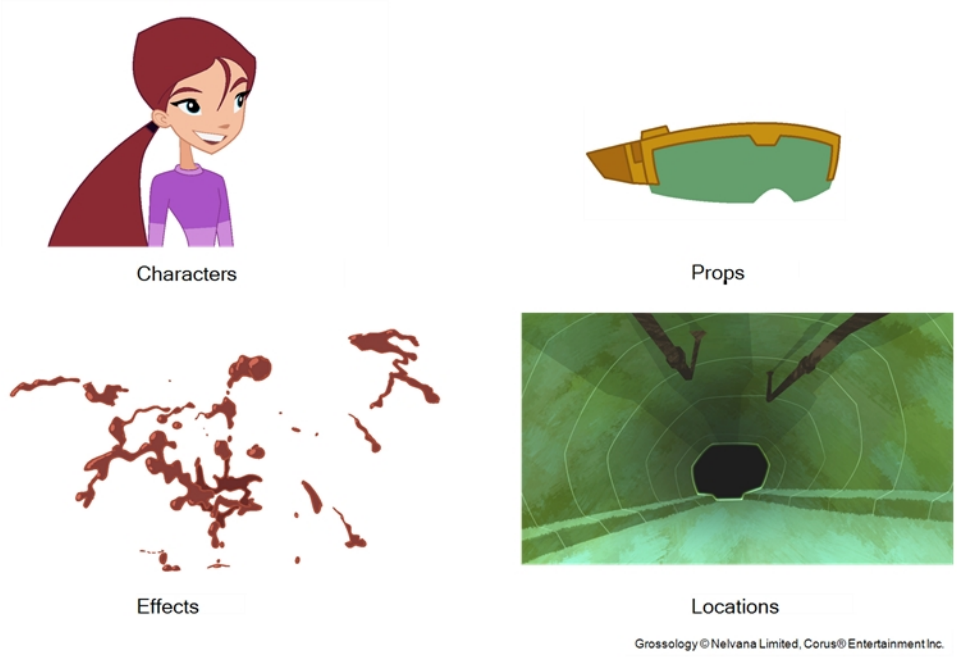
Preparation

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

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

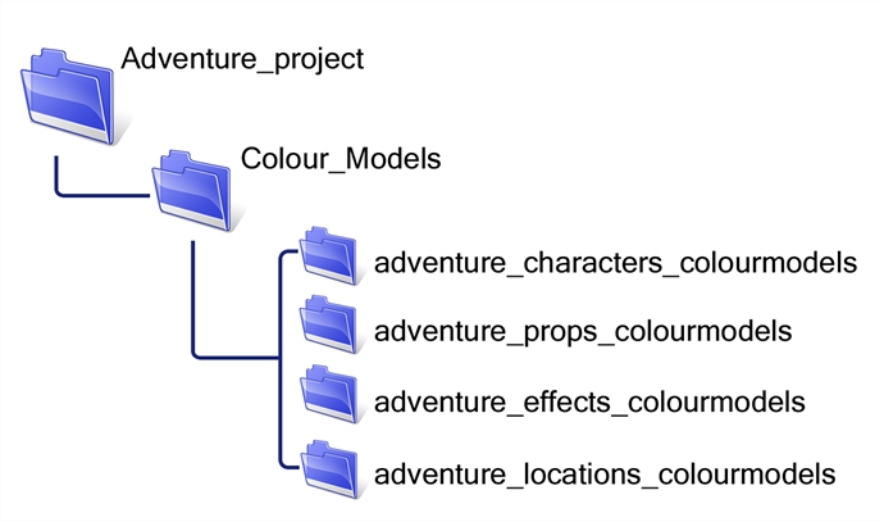
In order to create colour models, you need to create your scenes.

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 **`colourmodel`**. For example, a character colour model scene

for the Adventure project would be named **`adventure_characters_colourmodel`**. 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

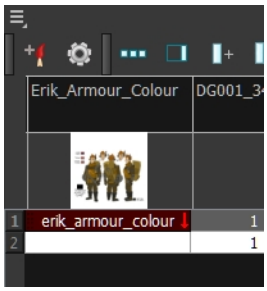
Now that your scenes are created and structured, you can open the corresponding colour model scene. For the optimal workspace for inking and painting, set up your workspace with these views:

- Xsheet
- Camera
- Drawing
- Colour

Naming

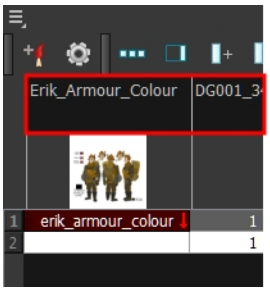
Now that your models are imported, you can rename them appropriately. You should rename elements (layers) and drawings corresponding to the model. This will help keep the work organized and make it easy for others to follow.

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`**.

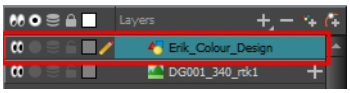


How to rename a drawing element

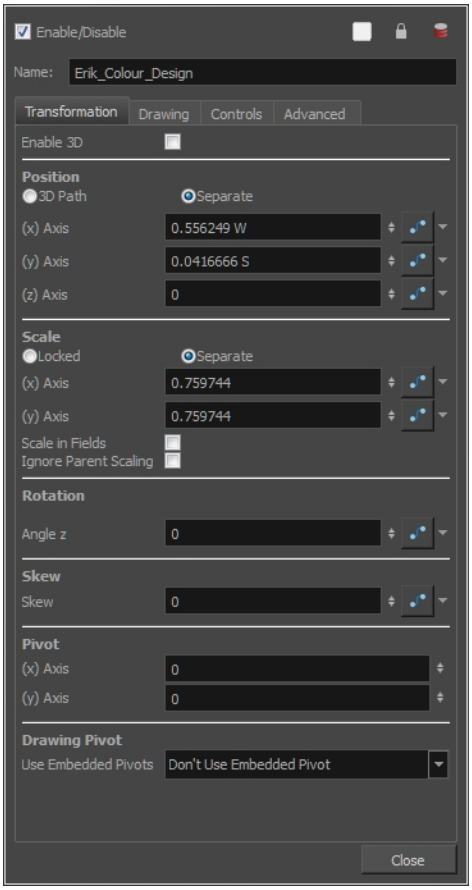
1. Do one of the following:
   - In the Xsheet view, double-click on the column header of the drawing element.



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



The Layer Properties window opens.



2. Type in a new name.

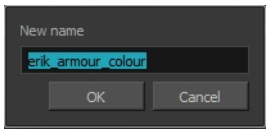
How to rename a drawing

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

2. Do one of the following:

   - 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*.

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.

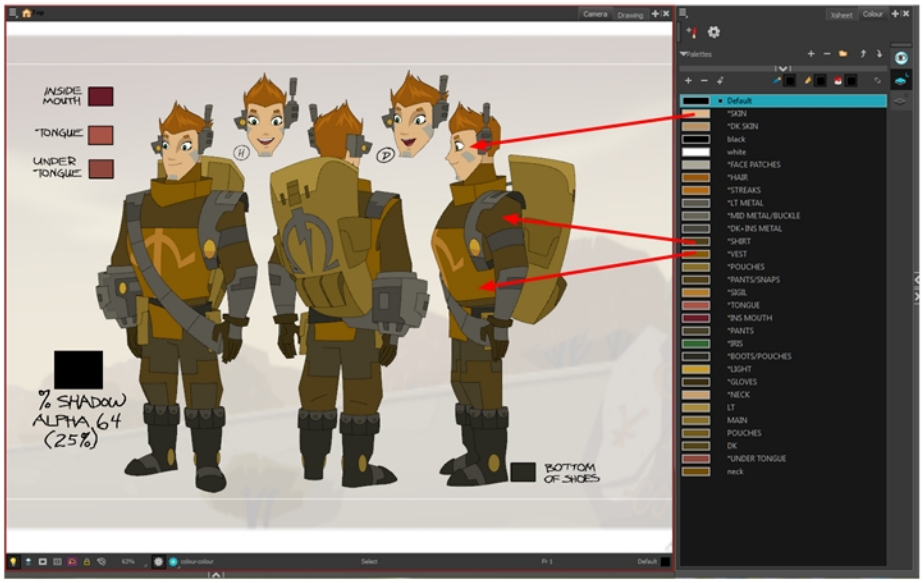
Toon Boom Harmony uses palettes to hold all the colours needed to paint your elements, allowing complete control and consistency in your painting process.

A palette 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.

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.



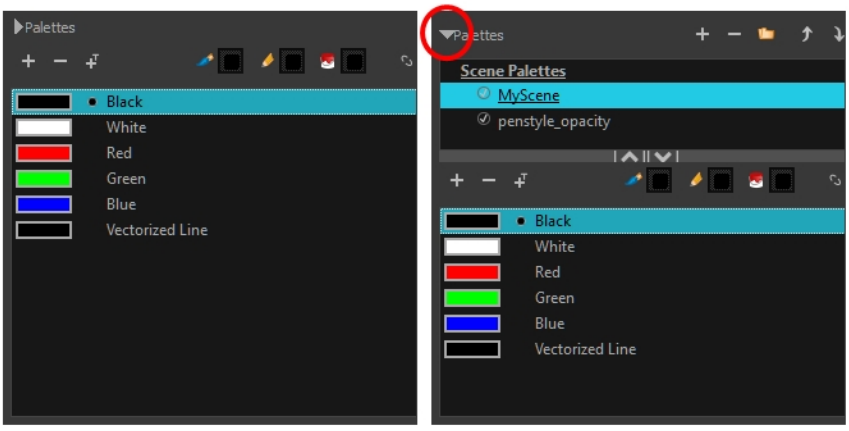
Erik, Di-Gata Defenders © Nelvana Limited, Corus® Entertainment Inc.

This section is divided as follows:

- Palette Lists
- Palette File Storage
- *Creating a Colour Palette* on page 85
- *Duplicating a Colour Palette* on page 89
- *Cloning a Colour Palette* on page 90
- *Importing and Linking Palettes* on page 92

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.

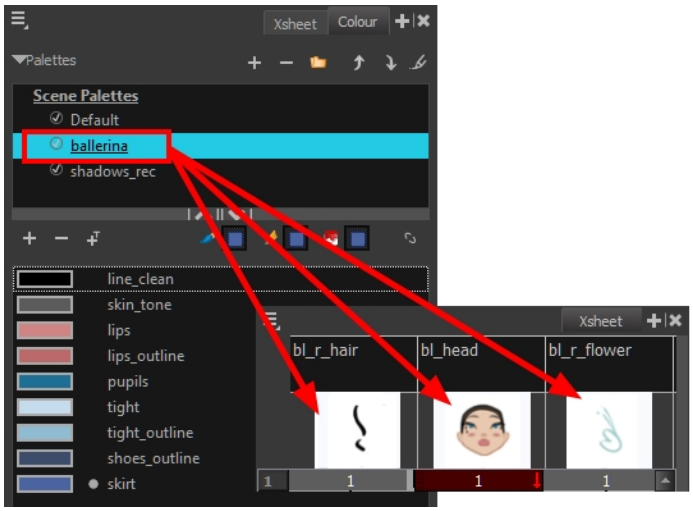
There are two types of palette lists:

- **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.

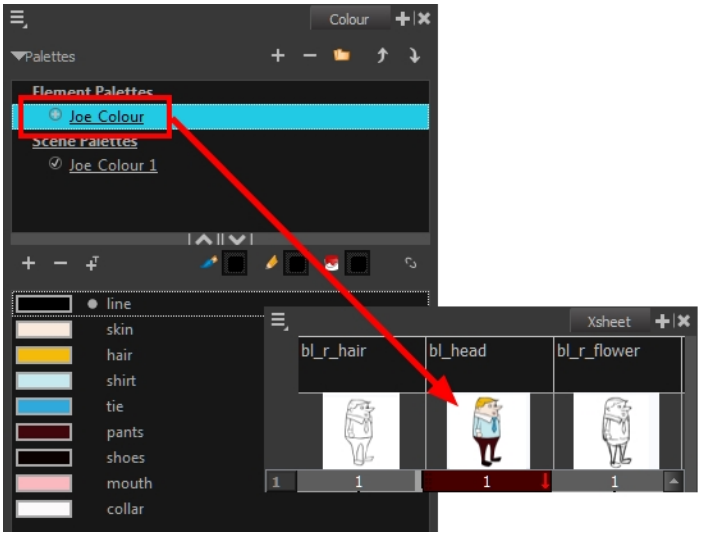
  The Scene Palette list is the simplest one to use. By default, Toon Boom Harmony is set to use only Scene Palette lists.



- **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.

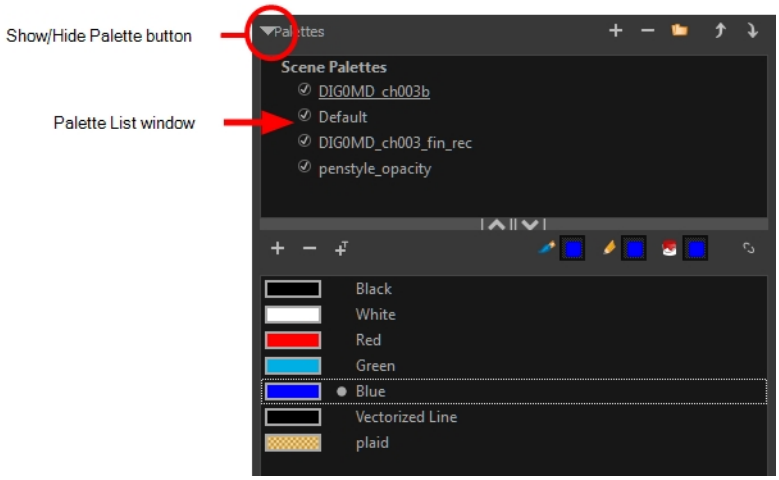


When you are using several cloned palettes that are related to the same original palette, Toon Boom Harmony uses the palette located highest in the list to determine the colour of the painted zones–see Cloning a Colour Palette .

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.



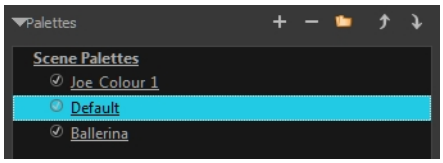
How to set the Advanced Palette Lists mode

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

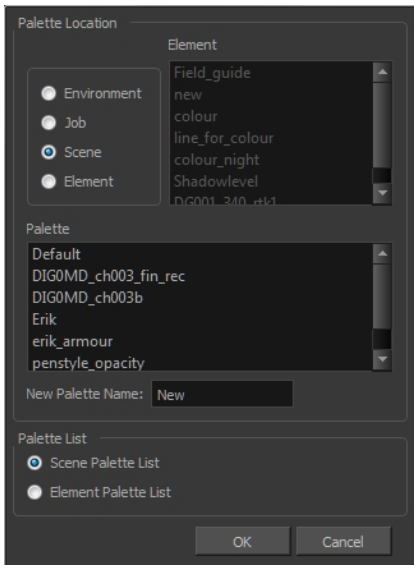
How to reorder palettes in the Palette list

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.

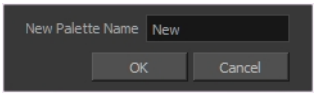
How to set the Advanced Palette Lists mode

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

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

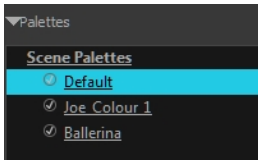
1. From the Colour view menu, select **Palettes** > **New** or click the New Palette button.

   The Create Palette dialog box opens.
2. Enter the palette name according to the model.



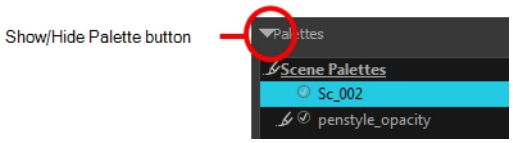
3. Click **OK**.

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



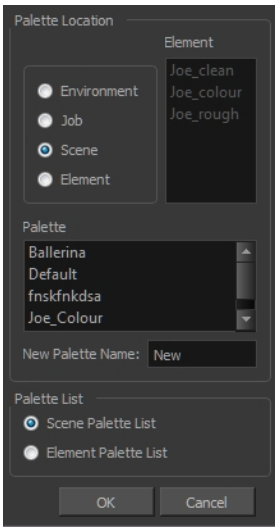
How to create a palette from the Advanced Palette Lists mode

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.

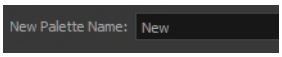
   The Palette Browser: Create Palette dialog box opens.



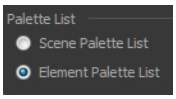
4. Select the level to store the palette file.
   - **Environment**: The palette-library folder is stored in the scene's parent environment folder.
   - **Job**: The palette-library folder is stored in the scene's parent job folder.
   - **Scene**: The palette-library folder is stored directly in the 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.

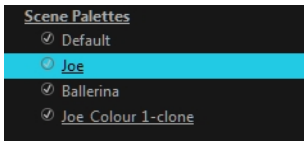
The palette list is stored in the drawing element's directory instead of directly in the Scene level. This ensures that the links to the palettes appear only in the appropriate element. If you prefer to access a global palette list, link your palettes to the Scene Palette List.

7. Click **OK**.

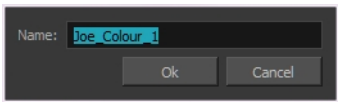
   The new palette appears in the palette list.

How to rename a palette

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

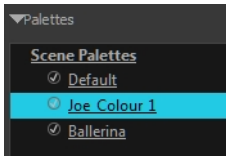


2. Do one of the following:
   - Right-click and select **Rename**.
   - From the Colour View menu, select **Palettes** > **Rename**.
3. In the Rename dialog box, give the palette a new name and click **OK**.



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.

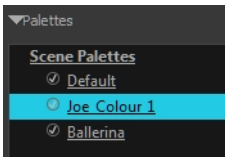
   If the palette was used in your scene, the zones painted with its colours turn red.

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

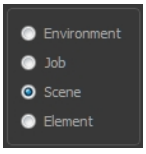
1. In the Colour view, select the palette to be duplicated.



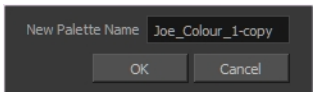
2. Do one of the following:
   - From the Colour menu, select **Palettes** > **Duplicate**.
   - Right-click on the selected palette and select **Duplicate**.

   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 .



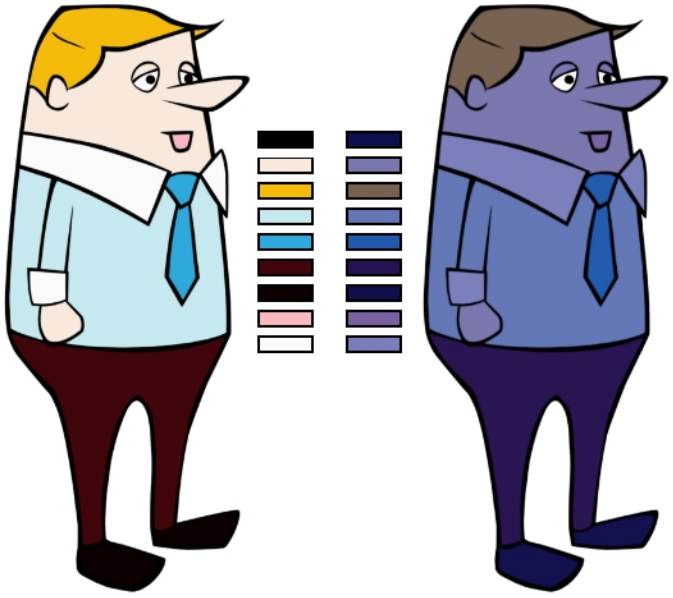
4. In the New Palette Name field, name the palette.



5. In the New Palette Name field, name the palette.
6. Click **OK**.

   The palette appears in the palette list.

Cloning a Colour Palette

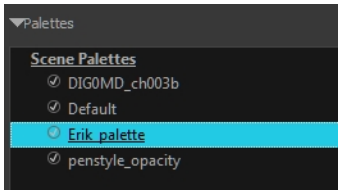


A character usually has only one master palette, although there are times when the characters are placed in different lighting conditions and require a different colour shading. The night palette is a popular choice when a scene or sequence changes from day to night. It can be difficult and time-consuming 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).

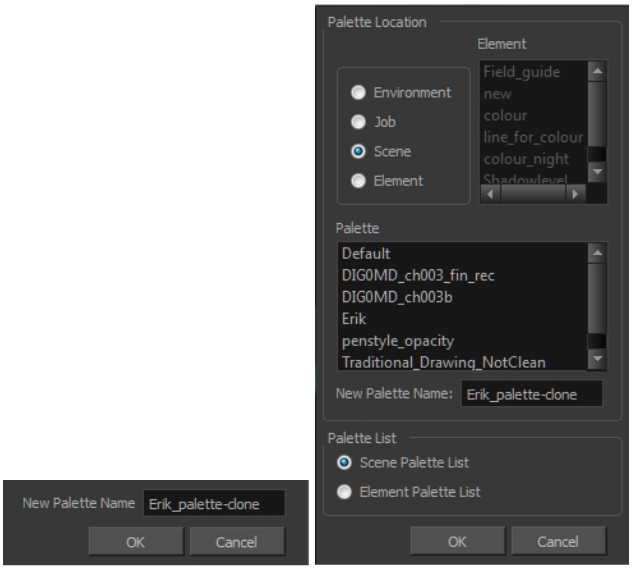
How to clone a palette

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



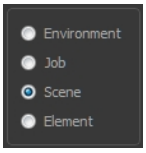
2. From the Colour menu, select **Palettes > Clone** or right-click and select **Clone**.

   The Palette Browser: Clone Palette dialog box opens.



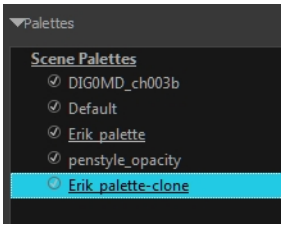
Basic palette Advanced Palette List mode

3. If you're in Advanced Palette List mode, select the palette storage level–see *Palette File Storage* on page 84.



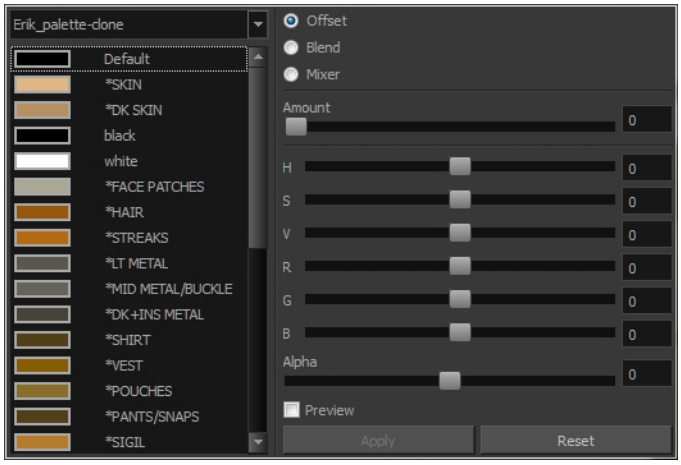
4. In the New Palette Name field, name the palette. We recommend keeping the "-clone" in the name.
5. Click **OK**.

   The cloned palette appears in the palette list.



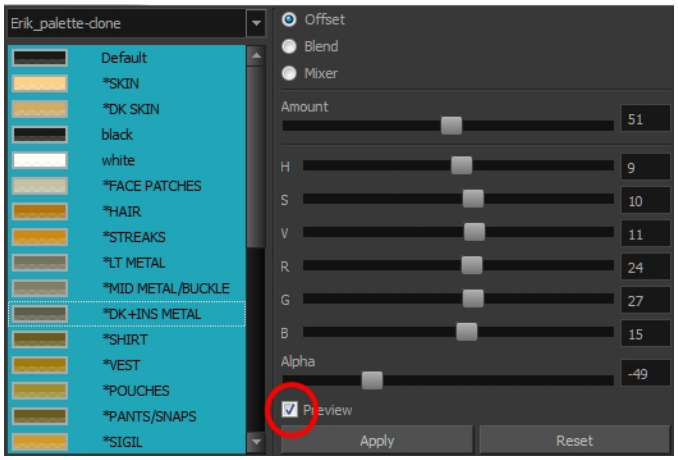
6. In the Palette list, select the clone palette you created to offset or blend colours–see *Mixing Colours* on page 106.
7. From the Colour View menu, select **Palettes > Tint Panel** or right-click and select **Tint Panel**.

   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.

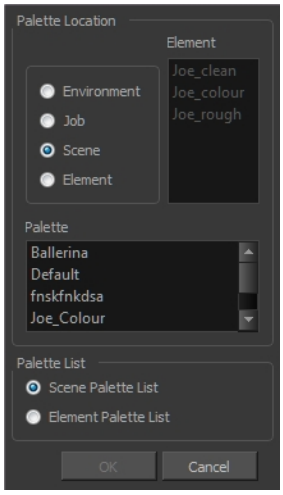
You will notice that when you create or link a palette, a small icon appears on its left. These icons represent the palette's link status.

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 loose 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

1. 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 84.
3. Select the palette list linking level by enabling either **Scene Palette List** or **Element Palette List**–see *Palette Lists* on page 81.

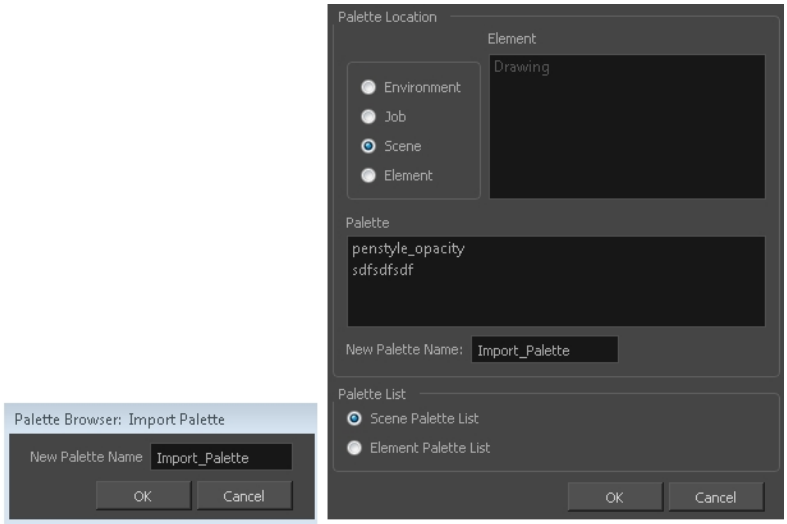
   The palette appears in the Colour view.

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 (`*.plt`) 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

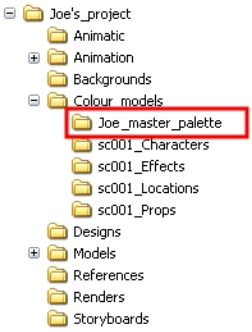
Advanced Palette List mode

4. If you're in Advanced Palette mode, select the level where the palette file is stored–see Palette File Storage .
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.
6. In the New Palette Name, name the imported palette.

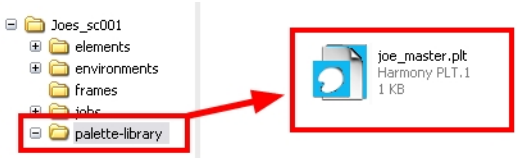
   The palette appears in the Colour view and the file is copied in your project.

How to link to an external palette

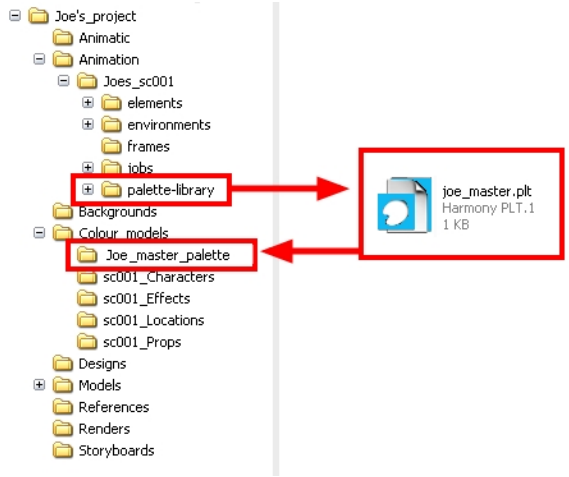
1. In the Colour view, click on the **Create Palette** button to create a palette to be used as external.
2. Save your scene by selecting **File > Save** from the top menu or by clicking the Save button or press Ctrl + S (Windows/Linux) or ⌘ + S (Mac OS X).
3. On your computer or server, create a master 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`**.
5. From your operating system, browse to your Toon Boom Harmony scene and open the palette-library folder.



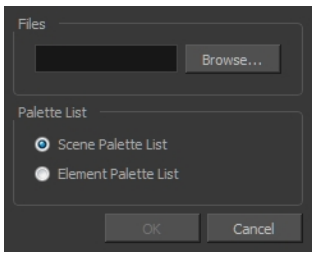
6. Select and copy your palette `*.plt` file to copy it to the master palette directory.



7. Create a new Toon Boom Harmony scene or open the scene where you will link this palette.
8. In the Timeline or Xsheet view, select the element to link the palette to.

9. From the Colour View menu, select **Palettes > Link to External.**

   The Link to External Palette dialog box opens.



10. Click **Browse** to search for your master palettes folder and select the palette `*.plt` file you want to link.
11. In the Palette list section, select how you want to load the palette; at the scene or element level.
12. 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.

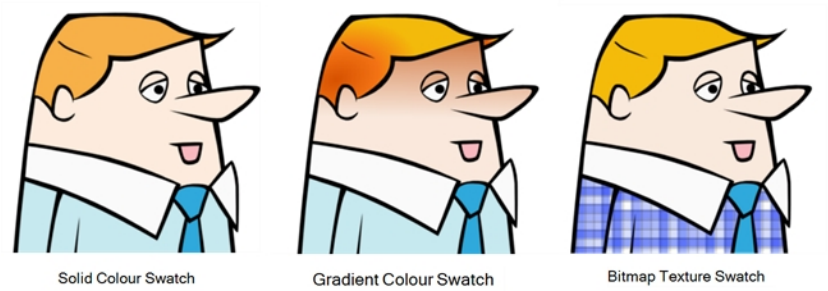
In the Colour view, you choose a different colour swatch for each colour you want to paint in your drawing. You can add as many swatches as you want. You can also rename them and modify existing ones.

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

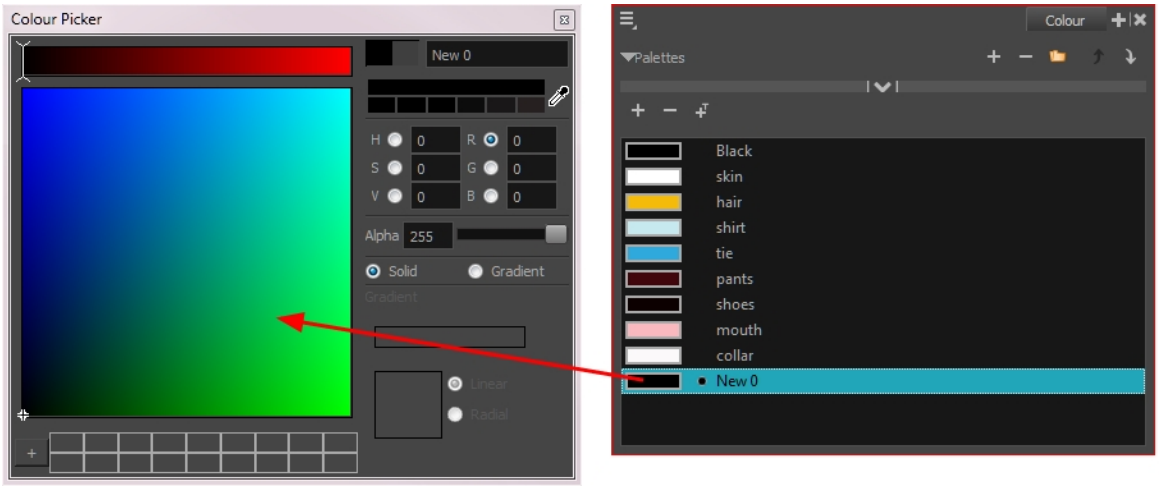
You can use several different types of colour swatches, including solid colour, gradient colour and bitmap texture swatches.



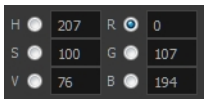
How to add or modify a solid colour swatch

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.

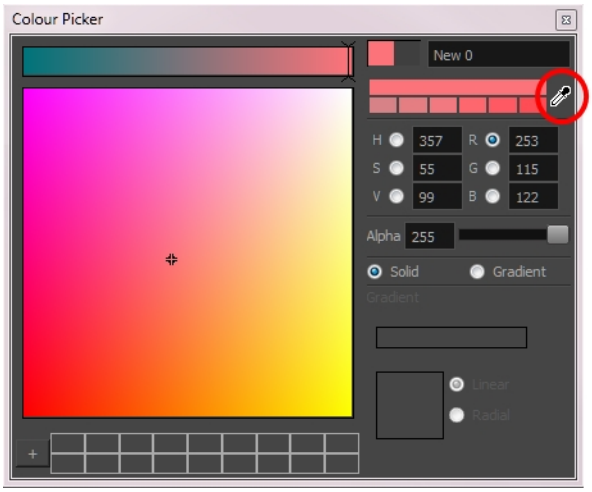
   The Colour Picker window opens.



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.



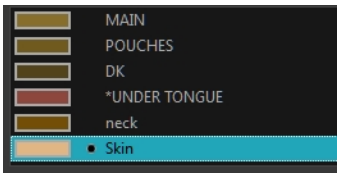
How to add a new colour swatch using the default colour

- From the Colour View menu, select **Colours > New**.

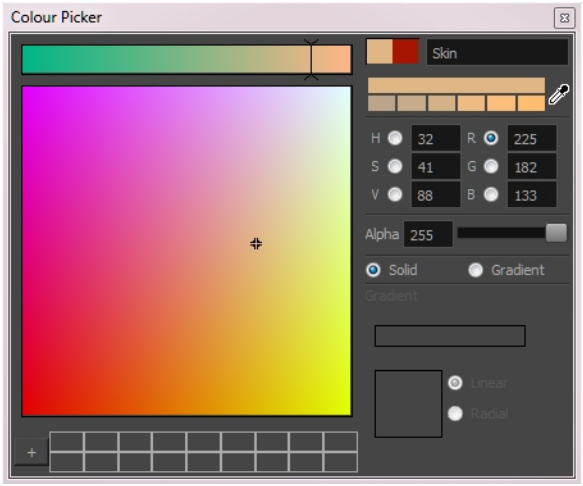
A new swatch is added to your palette using the default colour swatch colour. The new swatch created with the New command will be named **`New 0`**.

How to create a gradient colour swatch

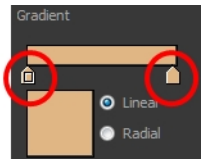
1. In the Colour view, select a colour to modify .
2. Do one of the following:
   - Click the new colour and from the Colour View menu, select **Colours > New**.
   - Double-click on the colour swatch.



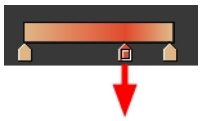
The Colour Picker window opens.



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 115.

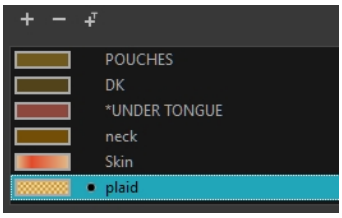
How to create a texture colour

1. From the Colour menu, select **Colours > New Texture** or click the New Texture button.

   The Browser window opens.

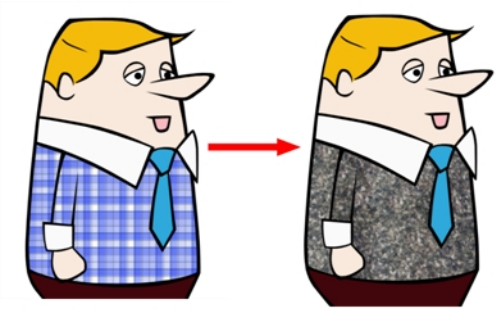
2. Browse for a PSD or TGA bitmap file created with a third party software and click **Open**.

   The texture is added to the colour list.



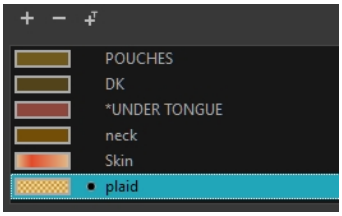
NOTE:
To learn how to reposition the textured zones in your drawings, see *Editing Gradients and Textures* on page 115.

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.

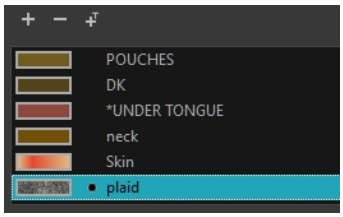


2. From the Colour View menu, select **Colours > Edit Texture** or double-click on the swatch.

   The Browser window opens.

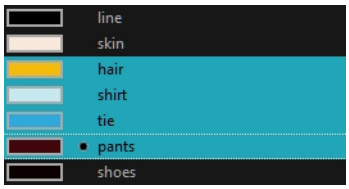
3. Browse for the new PSD or TGA bitmap file created in a third party software.

4. Click **Open** to update the colour swatch.



How to delete a colour swatch

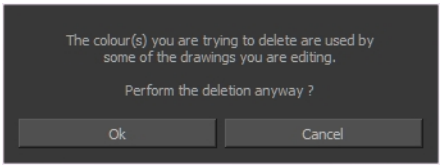
1. In the Colour view, select the colour swatches to delete.



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 your 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.
   - Press Shift + F3.
2. Click the gradient or texture colour to modify.

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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.

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.

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.

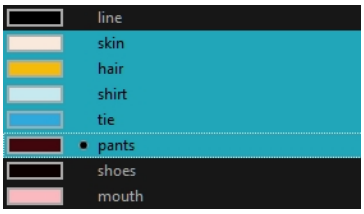
You can copy a selected colour swatch and paste it as a clone. Since it produces a clone colour swatch, it is impossible to use the Paste as Clone command in the same palette as you copied the original colour swatch from.

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`**.

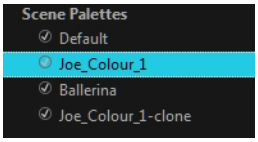
```
ToonBoomAnimationInc PaletteFile 2
Solid    Black                    0x075cf5b15fe006a1   0   0   0 255
Solid    White                    0x075cf5b15fe006a3 255 255 255 255
Solid    Red                      0x075cf5b15fe006a5 255   0   0 255
Solid    Green                    0x075cf5b15fe006a7   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

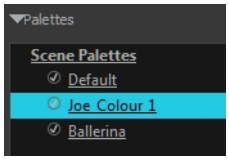
1. In the Colour view, select the colour swatch you want toget the ID from.
2. From the Colour View menu, select **Colours > Copy Colour ID** or press Ctrl + C (Windows/Linux) or ⌘ + C (Mac OS X).
3. Paste the copied value as plain text in the desired document.

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.

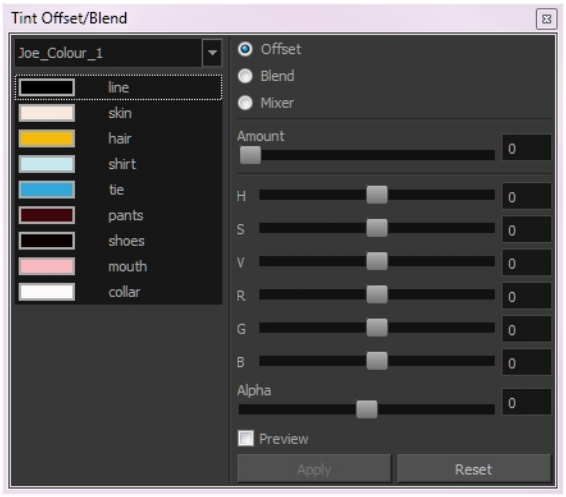
How to mix colours

1. In the Colour view, select the palette that contains the colours you want to offset or blend.

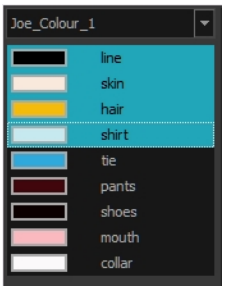


2. Do one of the following:
   - From the Colour View menu, select **Palettes** > **Tint Panel**.
   - Right-click and select **Tint Panel**.

   The Tint Blend/Offset panel opens.

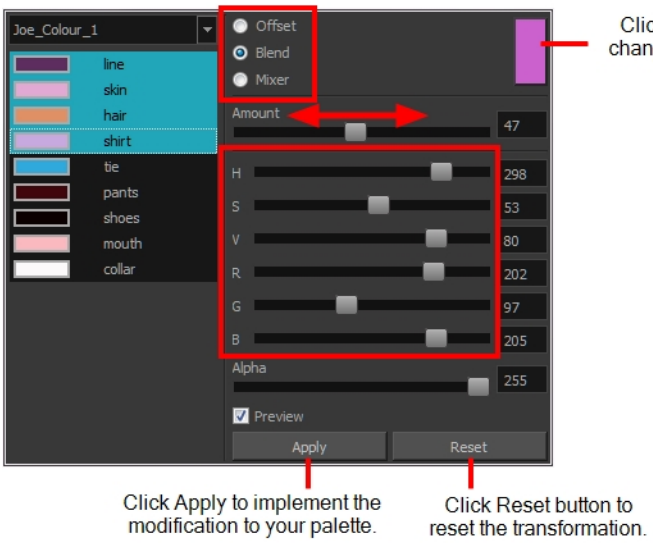


3. Select one or more colours to modify in the colour list. To select all the colours, press Ctrl + A (Windows/Linux) or ⌘ + A (Mac OS X).



4. Select **Preview** option.

5. Select the **Offset**, **Blend**, or **Mixer** option.



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.

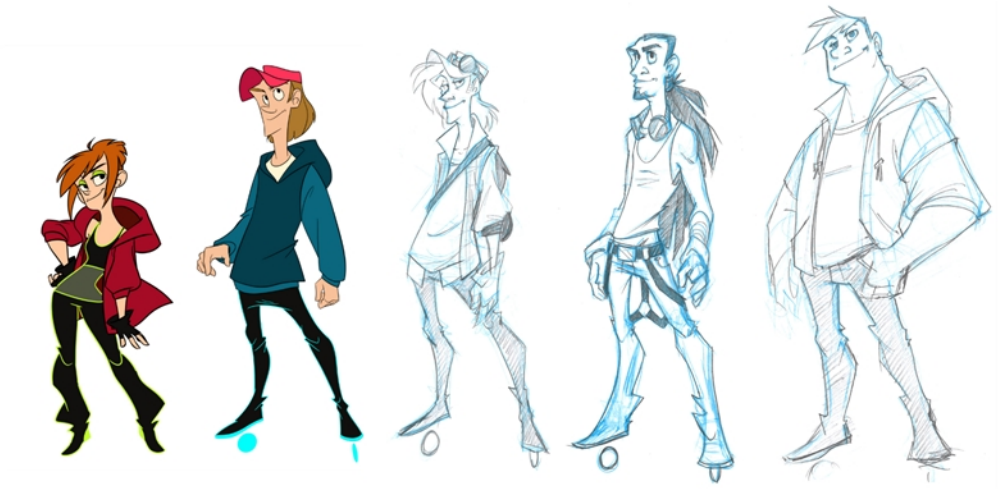
6. Click **Apply**.

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.

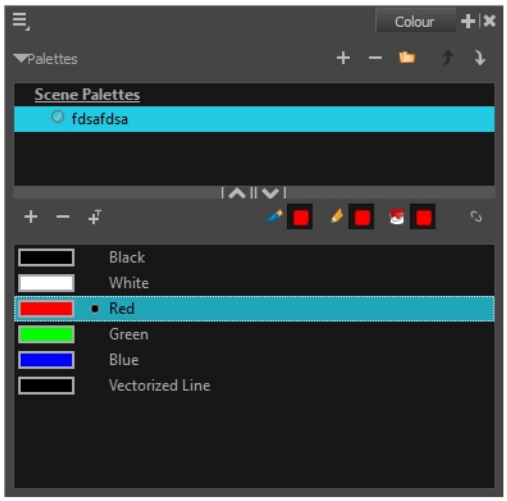
For paperless and cut-out animation, it's a good idea to provide a line-up template with the colour model to show the scale ratio between the characters, props and backgrounds.



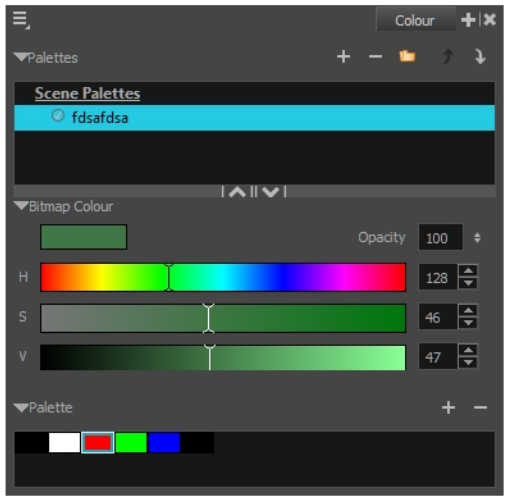
Once your colour model is completed, create a line-up template by pasting one of the production's main characters, or even just a hand, beside the colour model to show the relative size. This allows the animator, layout artist, or scene setup artist to retain the correct scaling throughout the entire project when setting the elements in the scene. You can store your template in the Library.

How to paint a colour model

1. Create your master colour palette–see *Creating a Colour Palette* on page 85
2. Add new colours to the palette–see *Adding a Colour Swatch* on page 98.
3. Select your Paint Bucket tool. We recommend the Paint Unpainted tool.
4. In the Colour view, select a colour to paint your drawing.

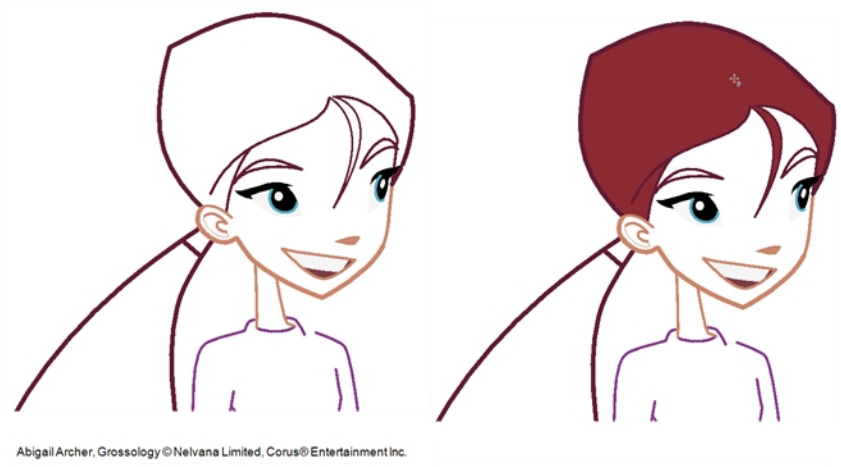


Colour view when working with vector layers



Colour view when working with bitmap layers

5. 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.



6. Adjust the colours–see *Mixing Colours* on page 106.

Chapter 5: Ink and Paint

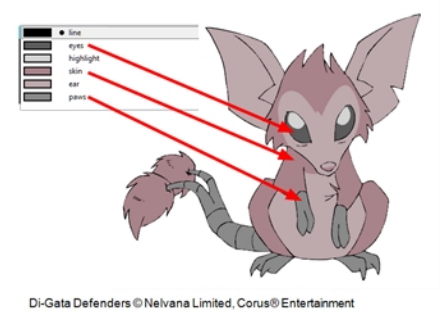
When traditional animation is traced, cleaned up, scanned in and properly exposed, it's time for the ink and paint process. This consists of cleaning all dirt and hair (for example, dust that was in the scanner, dots that do not belong in the drawing, extra floating artwork around the drawing that must 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 80.



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.

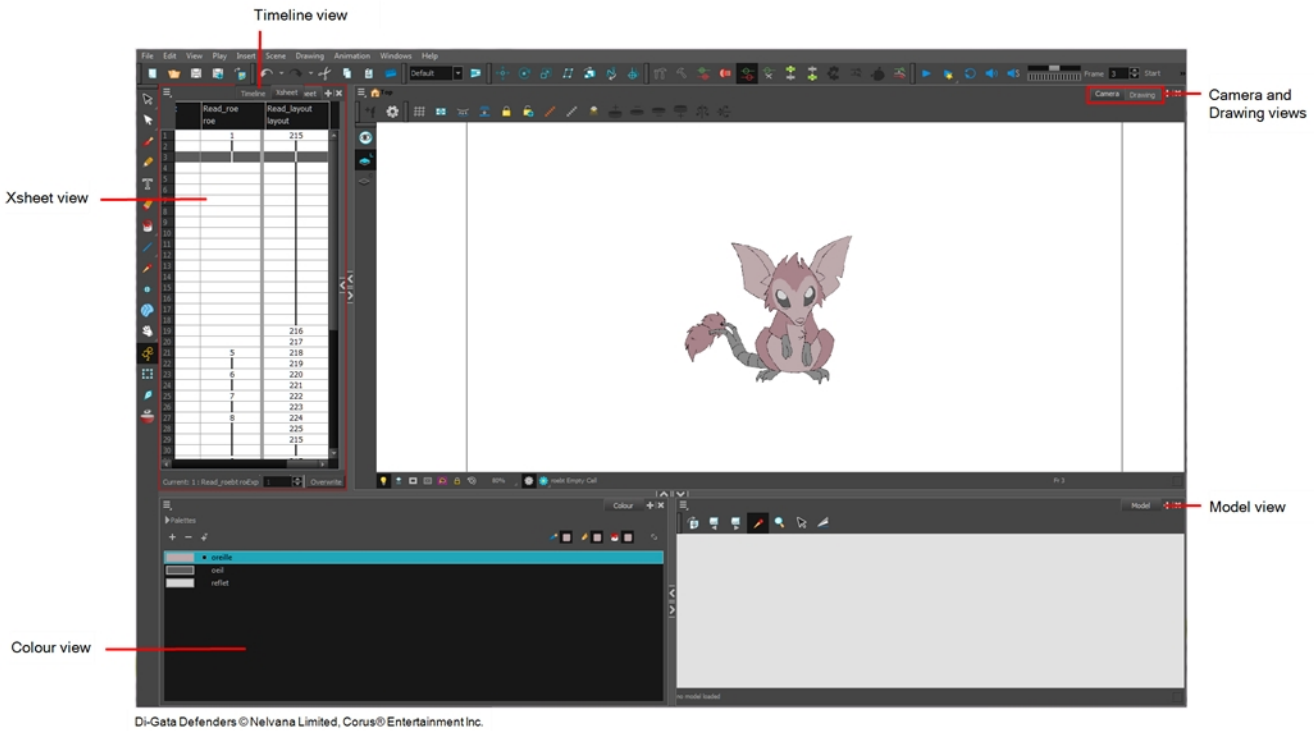
The ink and paint process is divided into the following steps:

Preparation

The optimal workspace for creating colour models and inking/painting in traditional animation includes the following views:

- Xsheet
- Camera
- Drawing
- Colour

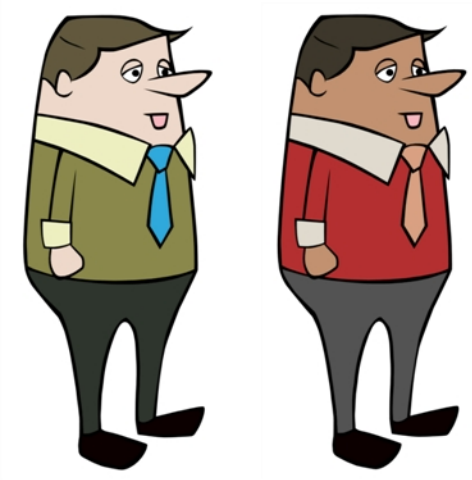
As there is no default workspace for these tasks, you will need to create a custom workspace for yourself–see the Fundamentals Guide.



Painting

This section is divided as follows:

Painting Using the Paint Tool

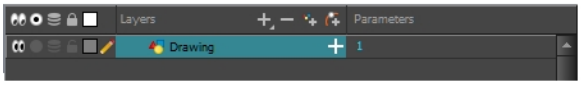


The main tool you will use to paint your drawings with is the Paint tool. The Paint tool can be used in several different modes, which can be customized in the Tool Properties view.

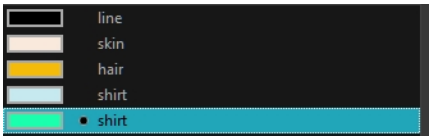
The Paint tool paints closed zones, including brush strokes and pencil lines. If there are gaps in the lines defining a zone, you must close them using the Brush, Pencil, or Close Gap tools or the Automatic Close Gap option.

How to paint with the Paint tool

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



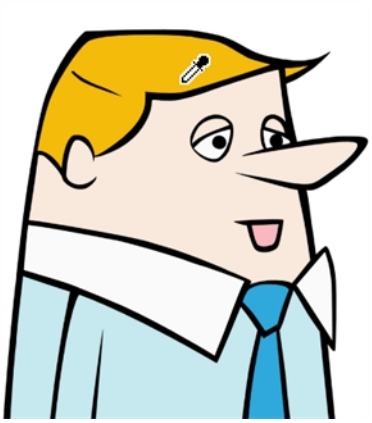
2. Do one of the following:
   - In the Tools toolbar, click the Paint tool.
   - Press Alt + I.
3. In the Colour view, select a colour.



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.

Selecting a Colour in a Drawing



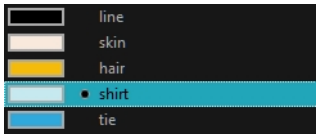
While working in the Camera or Drawing view, you can use the Dropper tool to pick a colour from your drawing without going to the Colour view.

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, 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).

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 your 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.
   - Press Shift + F3.
2. Click the gradient or texture colour to modify.

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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.

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:

Inking the Lines

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.

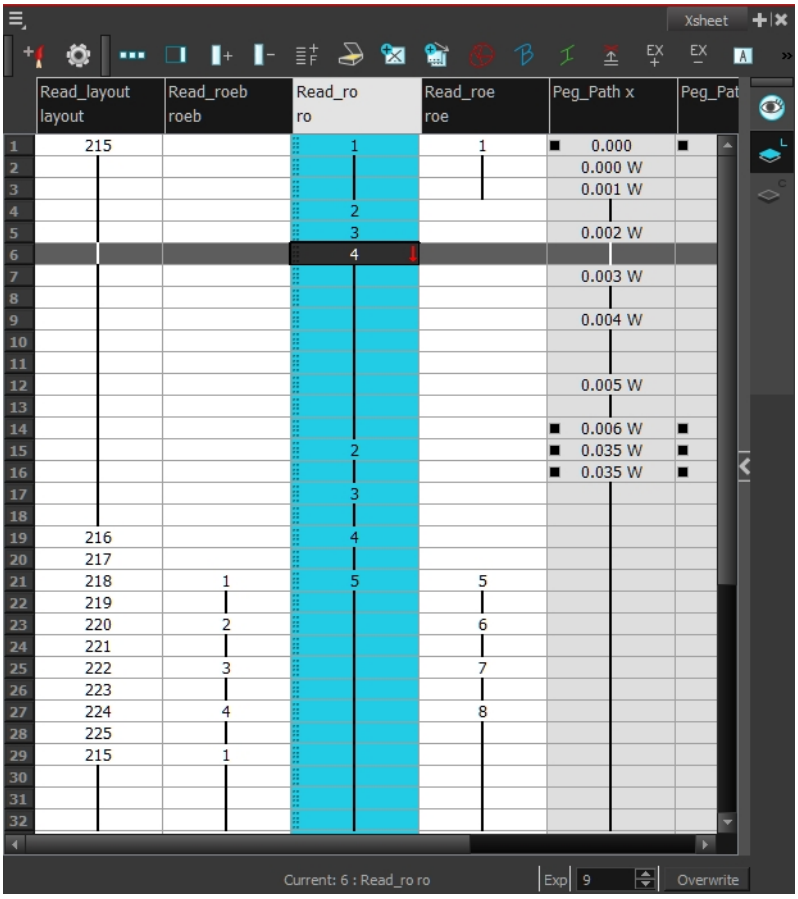
Verifying the Zones are Painted

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.

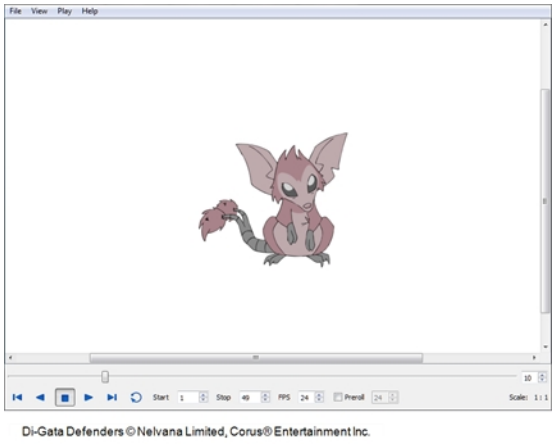
How to preview drawings from the Xsheet

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.

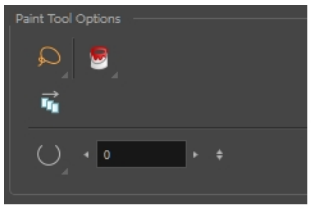


5. Play your drawings.

6. Select the **Preroll** option to see blank frames at the beginning and end of the animation sequence while looping the playback.

Paint Tool Properties

When you select the Paint tool, its properties and options appears in the Tools Properties view.



Icon	Tool Name
	Lasso and Marquee on page 119
	Painting Modes on page 119
	Apply to Multiple Drawings on page 120
	Select Newly Paintedand Unpainted Contours/Lines on page 121
	Close Gap on page 121

Lasso and Marquee

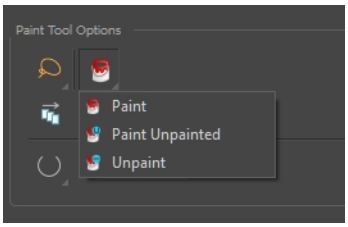
The Lasso and Marquee options let you choose the type of selection the current tool will perform. The default selection mode is Marquee.

- 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:

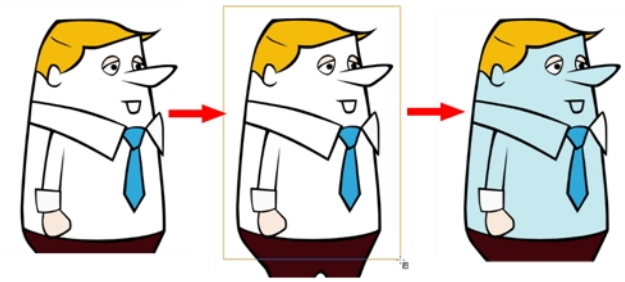


You can also find these tools directly in the Tools toolbar and in the Drawing Tools menu.

Paint Mode

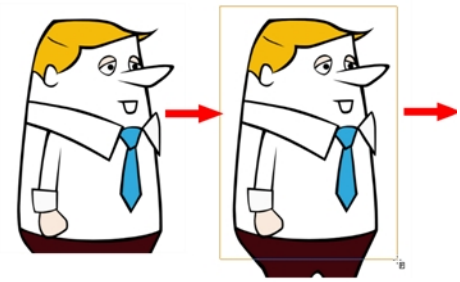
The Paint mode paints everything it touches, including empty and filled zones–see *Painting Using the Paint Tool* on page 113.

Paint Unpainted Mode



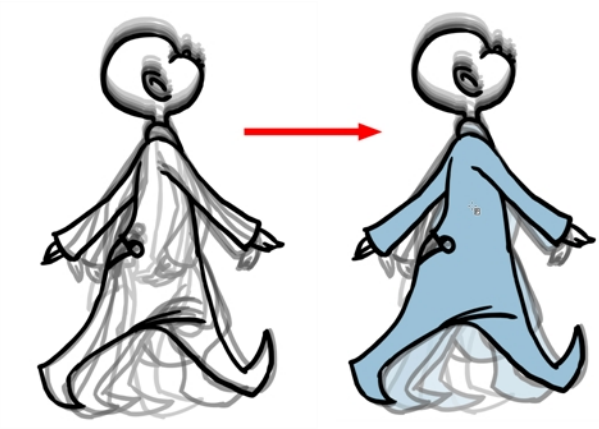
The Paint Unpainted mode paints only empty zones. Any line or filled zone will remain unchanged.

Unpaint Mode



The Unpaint mode unpaints everything it touches, including empty and filled zones.

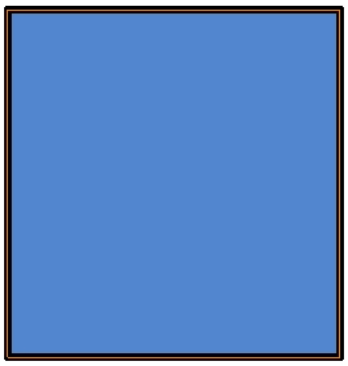
Apply to Multiple Drawings



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.

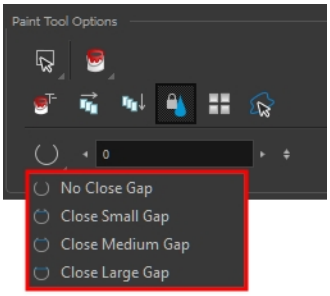
Select Newly Paintedand Unpainted Contours/Lines



In the Paint tool properties, this option keeps a selection highlighted around the latest painted zone after using the Paint, 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.

Glossary

3D stereoscopic	The ability to create stereo images which, when animated and viewed through 3D active shutter glasses or using glasses with one red and one blue lens, will appear as a three-dimensional movie.
alpha channel	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 (A). The matte, or the transparency information, is stored in this fourth channel. An image without an alpha channel is always opaque.
animatic	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.
animation	A simulation of movement created by displaying a series of pictures or frames.
anime	An animation style known for its sinister and dark feel; popular in Japan.
arc	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.
aspect ratio	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.
auto-feed	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.
automatic lip-sync detection	Automatically mapping drawings in an element to the mouth chart generated for a sound. This can save time when lip-syncing a voice track.
axis	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). In animations that constantly rotate, the axis element specifies what axis the object rotates around. A negative number causes an animation to rotate counter clockwise whereas a positive number causes an animation to rotate clockwise.
background	The part of a scene that is farthest to the rear. The background is the artwork, or decor, against which the animation takes place.
Bézier	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.
bitmap	An image composed of pixels with a single resolution (size). If it is enlarged too much, it will lose definition and individual pixels will begin to appear. This is known as *pixelation*. Bitmap image files are defined as a standard rectangular mesh of individual pixels. Each individual pixel contains a value that represents a specific colour.

breakdown	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 *arc*).
camera shake	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.
caption	A text field containing dialogue, effects, sound or slugging information in a storyboard.
cel	In traditional animation, a cel (also known as *celluloid*) 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.
character design	Each character in an animated film is drawn from multiple angles in poster-style format, called a *model sheet*, which serves as a reference for the animators.
chromatic aberration	In optics, chromatic aberration (CA), achromatism or chromatic distortion, is a type of distortion in which there is a failure of a lens to focus all colours to the same convergence point.
clean up	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 clean up 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.
CMYK	Acronym for Cyan, Magenta, Yellow, Black. These colours are the standard model used in a process called offset *printing*.
colour card	A colour card is a card containing one solid colour that is the same size as the camera. The colour card fills the background with a solid colour when there is no background image included.
colour model	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.
colour wheel	A display of the colour spectrum in the form of a circle.
compositing	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.
cross dissolve	An effect used to fade two scenes, one into the other.
cut	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.
cut-out animation	The process known as *cut-out animation* is the action of animating characters made out

	of several pieces by moving them around frame by frame. Cut-out animation can either be computer generated or done traditionally using paper.
cycle	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.
dialogue	The text spoken by a character in a movie or animation.
dope sheet	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 *exposure sheet*.
doping	To assign a particular drawing to a range of frames.
double bounce walk	In the key frames and passing positions in a double bounce walk, the body is lower than a reference line drawn in the upright position. During the in-betweens, the body is above this line giving the appearance of a bounce.
DPI	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 *pixels per inch*. Either way, the dot is the smallest discrete element making up the image.
ease	In animation, the ease, also known as *velocity*, 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.
ease-in	Gradual acceleration in the action. Also known as *slow-in*.
ease-out	Gradual deceleration in the action. Also known as *slow-out*.
establishing shot	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.
exposure	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.
exposure sheet	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. 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 *dope sheet*.
fade in/fade out	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.
fast-in	Dramatic acceleration at the start of the action.
fast-out	Dramatic acceleration at the end of the action.
field	A measurement unit used to calculate motion, registration and camera positioning. A

	standard animation scene will vary between 6 to 12 fields.
field chart	A guide containing all the field units that animation and layout artists use to determine a scene size or camera motion.
film-1.33	A resolution that is ideal for the widescreen film format that conforms to the standard 4:3 pixel aspect ratio.
film-1.66	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).
flipping	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.
follow-through	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.
forward kinematics	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.
frame	An animation frame is 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.
frame rate	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. This is the measurement of the frequency (rate) at which an imaging device produces unique consecutive images, called *frames*. The term applies equally to computer graphics, video cameras, film cameras, and motion capture systems. Frame rate is most often expressed in frames per second (fps) and in progressive-scan monitors as hertz (Hz).
function	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.
gamut	The range of colours that a particular device can represent.
HDTV	Acronym for High Definition Television which delivers a higher quality image than standard television 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.
hold	A frame in the animation in which the character maintains its position without moving. A hold can be created between any two keyframes.
HSV	Hue, Saturation, Value. A method of defining colours in terms of hue (tint), saturation (shade) and value (tone or luminance).
in-between	The drawings that exist between the key poses. These are drawn to create fluid transitions between poses.

ink and paint	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.
interpolation	The computer-generated motion created between two keyframes. You have the choice to create interpolation, or not, between your keyframes.
inverse kinematics (IK)	A feature used mainly to animate 3D characters and cut-out puppets with hierarchy. Inverse kinematics will animate a puppet from one of the extremities, such as a hand, and make the rest of the body follow naturally.
jump cut	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.
key pose	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.
keyboard shortcuts	One or more keyboard keys which, when used, cause an operation to be performed.
keyframe	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.
layer	In animation, a layer is an individual column, level or character. A scene's layers are superimposed to form the final image.
layout	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.
layout and posing	The action of putting on model (at the right scale) the storyboard for the animator to start working.
layout artist	The artist who draws the background, and creates the camera and field guide to match the scene and camera motion. They will draw on model the main action poses.
layout planning	Drawing of the main features of the scene used as reference when planning the animation and executing the initial stages of it.
layout process	The communication step between the storyboard and the animation.
library	A storage area containing templates and assets that can be reused in any project or scene.
light table	A device that allows you to see other layers in transparency while you are working on a particular layer.
line of action	The direction that the action will follow. Also known as *path of action*.
lip-sync	The process of synchronizing a character's mouth to sounds in the dialogue soundtrack. The mouth is adjusted frame-by-frame to match the sound of the dialogue and provide the

	illusion that the character is speaking. Lip-sync can be used for any sound sequence, not only speech, you could for instance have a bird chirping or a wolf howling at the moon.
low resolution	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.
manual lip-sync detection	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.
master palette	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 *palette*.
model/colour model	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.
morphing	A feature for creating computer-generated drawings between a source drawing and a destination drawing. Animation created with the morphing feature can be reused in different projects.
motion keyframe	A keyframe with computer-generated interpolation.
mouth chart	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.
multiplane	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.
NTSC	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.
nudge	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.
onion skin	A feature that lets you see the previous and next drawings of a sequence.
overlay	A part of the scene environment, such as a chair or a bush, that is placed in front of the main animation.
PAL	A resolution that works best with the European format for television and computer screens, as the rectangular pixels are displayed at a different orientation.
palette/master palette	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.
palette style	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.
pan	To move the camera across the scene in any direction.
panel	In a storyboard, a panel is a frame in a shot. A shot can be composed of one or several

	panels.
paperless animation/tradigital	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.
passing position	When drawing a walk sequence for a character, the passing position is the point at which one leg passes the other.
path of action	Direction that the action will follow. Also known as *line of action*.
peg	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 an inverse kinematics tool.
phoneme	A unit of sound in a language.
pivot	The point around which a peg or drawing rotates.
pixel	The smallest element of an image displayed on a monitor or TV screen. Pixel, short for *picture element*, 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.
pose-to-pose animation	The pose-to-pose animation process is the action of creating all the main action poses, called *key poses*, and then placing the secondary poses between the keys. The secondary poses are called *breakdown*. Finally, the animator fills the gaps with the in-between drawings to achieve a smooth animation.
rendering	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.
resolution	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.
RGB	Red, Green, Blue. A method of defining colour by specifying amounts of these three colour components.
rigging	The process of attaching the various parts of a cut-out puppet.
rotary table	Equivalent to the animation disk/table, a device that allows you to rotate the workspace for greater comfort while drawing.
rotoscoping	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.
roughs	Rough is a common name in an animation movie for a drawing that is used as a reference but which does not form part of the final image. A layout is a rough. The skeleton sketch of an animation or design. Roughs mainly consist of sketch lines and shapes, but can also contain design details.

safe area	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.
scene	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.
script	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.
sequence	A series of scenes or shots forming a distinct part of the story or movie, usually connected by unity of location or time.
shot	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.
slow-in	The gradual acceleration in the action. Also known as *ease-in*.
slow-out	The gradual deceleration in the action. Also known as *ease-out*.
slugging	To indicate the start and stop times of dialogue and relevant actions.
sound scrubbing	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.
stop-motion keyframe	A keyframe with no computer-generated interpolation.
storyboard	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.
straight-ahead animation	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.
strokes	Invisible vector lines forming the drawing zones. They can be adjusted with Bézier handles.
symbol	A symbol combines animation, artwork or layers into a single object that you can control in one layer. You can also create symbols out of each body part in your cut-out puppets. You can place whatever you want in a symbol. You can use symbols to animate a puppet or create reusable animations such as blinking.
tablet/pen	A device used in conjunction with, or instead of, a mouse to move a mouse pointer (sometimes referred to as the *cursor*) around the computer screen.
template	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.
thumbnail	A very small image used as a reference or indicator.
timecode	The timing information printed on a movie clip to indicate the scene, hour, minute and second that is currently displayed on the screen.

timeline	A horizontal representation of a scene's elements, timing and keyframes.
trace and paint	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.
track breakdown	The break down of an animated film's soundtrack into individual sounds to produce the precise frame-by-frame position of each sound.
traditional animation	A type of animation process whereby all the animation sequences are drawn by hand on paper before scanning or inking them on cels.
trajectory	A computer-generated path or trajectory that elements can follow. The trajectory can be controlled by control points, keyframes and velocity.
transition	An effect placed between two scenes as they pass from one to the other. Common transition effects are cross-dissolve and wipe.
underlay	In animation, an underlay is a specific part of the decor placed behind the main animation.
vector	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.
velocity	In animation, the velocity, also known as *ease*, 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 *slow-in* and *slow-out*.
walk cycle	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.
zone	An area which can be painted with colour.

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