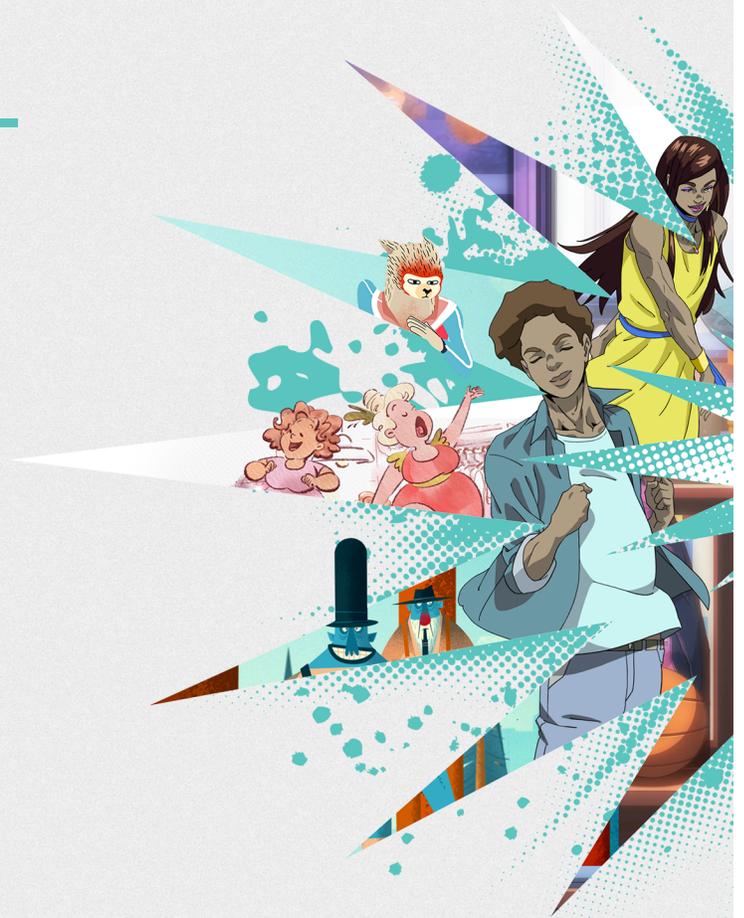


Harmony20

Toon Boom Harmony 20 Utilities Guide



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Publication Date

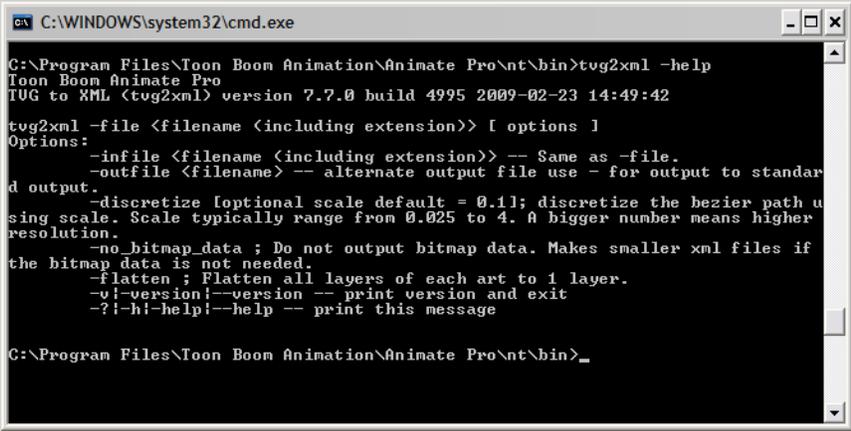
03-11-2021

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Introduction to Utilities



```
C:\WINDOWS\system32\cmd.exe
C:\Program Files\Toon Boom Animation\Animate Pro\nt\bin>tvg2xml -help
Toon Boom Animate Pro
TUG to XML (tvg2xml) version 7.7.0 build 4995 2009-02-23 14:49:42
tvg2xml -file <filename (including extension)> [ options ]
Options:
  -infile <filename (including extension)> -- Same as -file.
  -outfile <filename> -- alternate output file use - for output to standard output.
  -discretize [optional scale default = 0.1]; discretize the bezier path using scale. Scale typically range from 0.025 to 4. A bigger number means higher resolution.
  -no_bitmap_data ; Do not output bitmap data. Makes smaller xml files if the bitmap data is not needed.
  -flatten ; Flatten all layers of each art to 1 layer.
  -v|-version|--version -- print version and exit
  -?|-h|-help|--help -- print this message

C:\Program Files\Toon Boom Animation\Animate Pro\nt\bin>_
```

Toon Boom provides utilities that you can use in a Command Prompt and Shell to provide more flexibility and control over the different command options in Toon Boom Harmony.

Chapter 1: Adding the Path to Harmony Utilities to the System's List of Paths

By default, to run a Harmony utility, you must type its full path followed by its name in the command line. The full path of the utility includes the path in which Harmony was installed. If you installed Harmony in its default installation directory, the path will be as follows:

- **Windows:** C:\Program Files (x86)\Toon Boom Animation\Toon Boom Harmony 20 [Edition]\win64\bin
- **macOS:** /Applications/Toon Boom Harmony 20 [Edition]/Harmony [Edition].app/Contents/tba/macosx/bin
- **GNU/Linux:** /usr/local/ToonBoomAnimation/harmony[Edition]_20/lnx86_64/bin

So, for example, if you wish to run **utransform** on Windows, you would have to type **C:\Program Files (x86)\Toon Boom Animation\Toon Boom Harmony 20 [Edition]\win64\bin\utransform** into the command line. This can get tedious and time consuming, especially if you intend to run utilities routinely.

If you prefer, you can add the path to Harmony's command line utilities to your system's list of default paths for commands. When you attempt to run a command without specifying its path, the operating system looks for an utility that matches the name of the command in every folder in the list of paths, and if it finds it, it runs that utility. This is why most command line utilities bundled with your operating system can be launched by simply typing their name. By adding the path to Harmony's command line utilities to this list, merely typing the name of the utility into a command line will be enough to run it.

How to add Harmony to the system path list on Windows

1. Open the Start menu and, in the list of programs, select **Harmony 20 [Edition] >  Configuration Wizard**.
2. In the main menu of the Configuration Wizard, select **Add Harmony to Path**.
3. In the next panel, select the scope to which to add the path to:
 - **Single User:** This will only add Harmony to your list of paths when you're logged in as the user you are currently logged into.
 - **All Users:** The path to Harmony will always be in the list of system paths, regardless of which user is logged on.
4. Select **Next**.
5. Click on **Finish**.

The next time you open a Command Prompt, the path to Harmony will be included in the system's list of paths and you will be able to launch Harmony command line utilities by only typing their file name rather than their full file path.

**TIPS**

- You can quickly see what is in your list of paths by typing **echo %PATH%** in the command prompt. Each path in the list will be separated by a semicolon.
- You can also edit the content of the PATH environment variable, in which those paths are stored, for your logged in user and for the whole system by using the Environment Variables panel. To access it, from the Start menu, in the programs list, select **Windows System > Control Panel > System and Security > System > Advanced system settings > Advanced tab > Environment Variables**.

**IMPORTANT**

If you upgraded from a previous version of Harmony, and added the path to that version of Harmony in the past, both the paths for the old and current version will be in the list. Then, it will be difficult to determine if you are running the latest version of Harmony's command line utilities. It is recommended to remove old versions of Harmony from your paths when you upgrade to a new version.

How to add Harmony to the system path list on macOS

1. In Finder, proceed to **Applications >  Toon Boom Harmony 20 [Edition]** and double-click **Harmony [Edition]**.

The main Harmony application launches.

2. In the top menu, select **Harmony [Edition] > Tools > Configuration Assistant**.
3. In the main menu of the Configuration Assistant, check the **Register console application in the path** option. Uncheck all other options and select **Continue**.
4. In the next panel, select the scope to which to add the path to:
 - **Register Path for all users:** The path to Harmony will always be in the list of system paths, regardless of which user is logged on.
 - **Register Path for my user only:** This will only add Harmony to your list of paths when you're logged in as the user you are currently logged into.

5. Click on **Create**.

The next time you open a Terminal, the path to Harmony will be included in the system's list of paths and you will be able to launch Harmony command line utilities by only typing their file name rather than their full file path.

**TIPS**

- You can quickly see what is in your list of paths by typing **echo \$PATH** in the command prompt. Each path in the list will be separated by a colon.
- If you want to remove Harmony from your path, you must manually edit out the configuration file in which it was stored:
 - If you added Harmony to the path for all users, open `/etc/profile` in an editor.
 - If you added Harmony to the path for your own user, open `~/.profile` in an editor.

Then, remove the block between **# BEGIN HARMONY PATH REGISTRATION** and **# END HARMONY PATH REGISTRATION**.

How to add Harmony to the system path list on GNU/Linux

1. Locate the installer package that was used to install Harmony on your machine. If you deleted it, download it and unpack it again with the following command:

```
tar -xvzf <name of package>
```

2. Switch to the directory in which the installer package was unpacked:

```
cd <path to extracted installer package>
```

3. Type in the following command:

```
sudo ./install -e
```

The installer will launch.

4. In the installer, read and agree to the End User License Agreement.
5. Confirm that you want to add Harmony to the PATH environment variable.
6. Once the operation is done, reboot the machine.

The path to Harmony will be included in the system's list of paths.

**TIP**

You can quickly see what is in your list of paths by typing **echo \$PATH** in the command prompt. Each path in the list will be separated by a colon.

**TIP**

If you want to remove Harmony from your path, simply run **./uninstall -e** from the installer package directory and follow the same procedure.

Chapter 2: Running a Command Line Utility

Toon Boom includes a number of command line utilities that you can use to convert image formats, bitmap or vector, into other image formats.

To run an utility, you must open your operating system's terminal or command prompt, then type the file path to the utility followed by arguments.

The command line utilities for Harmony are located in the bin directory of its installation folder. Based on the default installation path, it should be in the following location:

- **Windows:** C:\Program Files (x86)\Toon Boom Animation\Toon Boom Harmony 20 [Edition]\win64\bin
- **macOS:** /Applications/Toon Boom Harmony 20 [Edition]/Harmony [Edition].app/Contents/tba/macosx/bin
- **GNU/Linux:** /usr/local/ToonBoomAnimation/harmony[Edition]_20/lnx86_64/bin

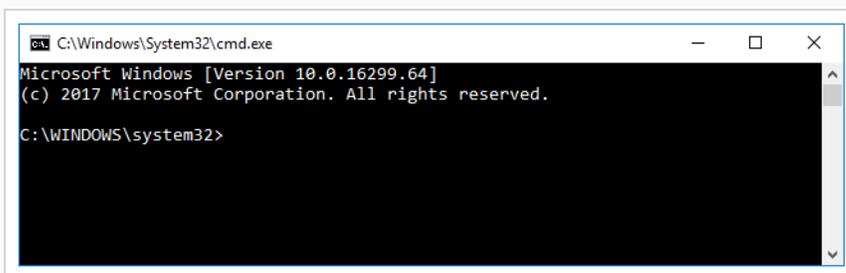


NOTE

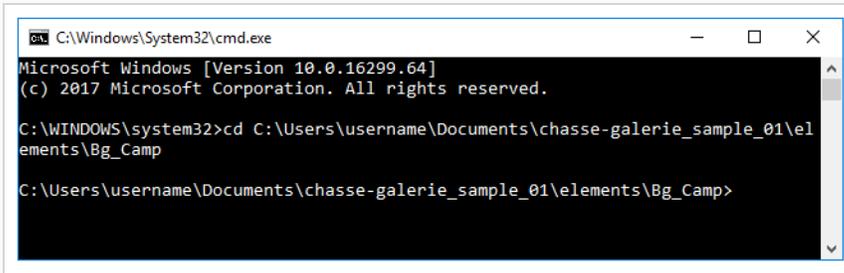
By default, to run an utility, you must type its full path followed by its name in the command line. To circumvent this, you can add the path to Harmony's command line utilities to your system's list of default paths for commands—see [Adding the Path to Harmony Utilities to the System's List of Paths](#) on page 6.

How to run a command line utility

1. Open a terminal or command prompt by doing one of the following:
 - **Windows:** Open the Start menu and, in the programs list, select **Windows System > Command Prompt**.
 - **macOS:** Open LaunchPad, then select **Other > Terminal**.
 - **GNU/Linux:** Open the Applications menu, then select **Utilites > Terminal**.



2. In the command line, type `cd` followed by the path to the folder containing the file(s) you want to process, then press ENTER.



```

C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.16299.64]
(c) 2017 Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd C:\Users\username\Documents\chasse-galerie_sample_01\elements\Bg_Camp
C:\Users\username\Documents\chasse-galerie_sample_01\elements\Bg_Camp>

```

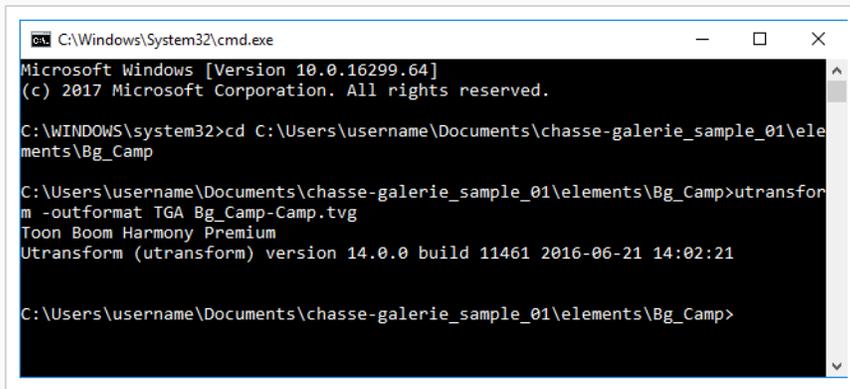
**TIP**

When typing paths in a command line:

- You can type the first few characters of the name of a file or folder in the current directory, then press TAB to make the command line auto-complete the name. If several files or folders match the characters you typed, you might have to press TAB repeatedly to cycle through matching files and folders until the right one is selected.
- Command lines use spaces as a way to separate the parameters sent to a command. If a path contains spaces, you must enter the path between quotes, or add a backslash \ before each space, to indicate that the spaces are part of the path.
- Windows uses backslashes \ to separate the name of directories in a path. macOS and GNU/Linux use forward slashes /.
- Absolute file paths on Windows begin with a drive letter followed by a colon. By default, the drive on which Windows and your documents are located is C. Hence, most paths in Windows will start with `C:\`. On macOS and GNU/Linux, absolute file paths begin with a forward slash /.
- You can type file paths that are relative to the current directory by starting the path with the name of the first folder name to navigate to. For example, if you're in the **Documents** folder and want to go to its **MyScene** subfolder, simply typing `cd MyScene` will work. You can also navigate to folders that are parent of the current folder by referring to a folder named with two consecutive periods `..`. For example, to navigate from the **MyScene** folder back to its **Documents** parent folder, typing `cd ..` will work.

3. Type the name of the utility you wish to use, followed by its parameters. Each parameter will start with a dash -. Some parameters take extra information, such as file names or colour values. The following example launches **utransform** to convert the file **Bg_Camp-Camp.tvg** into a Targa (.tga) bitmap image:

```
utransform -outformat TGA Bg_Camp-Camp.tvg
```



```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.16299.64]
(c) 2017 Microsoft Corporation. All rights reserved.

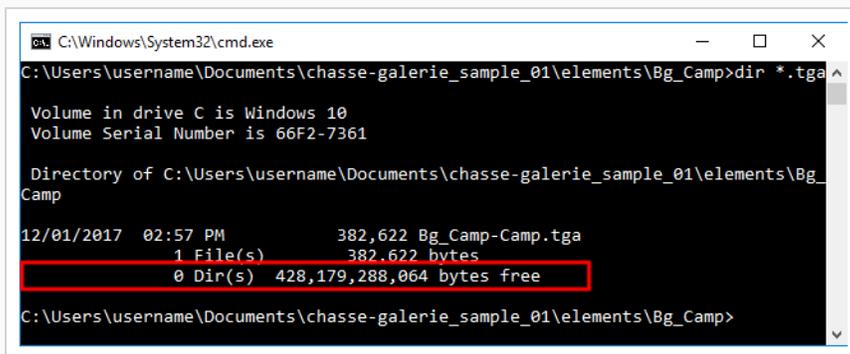
C:\WINDOWS\system32>cd C:\Users\username\Documents\chasse-galerie_sample_01\elements\Bg_Camp

C:\Users\username\Documents\chasse-galerie_sample_01\elements\Bg_Camp>utransform -outformat TGA Bg_Camp-Camp.tvg
Toon Boom Harmony Premium
Utransform (utransform) version 14.0.0 build 11461 2016-06-21 14:02:21

C:\Users\username\Documents\chasse-galerie_sample_01\elements\Bg_Camp>
```

The command will launch. If no errors are encountered, it will simply display its version information, then exit.

1. Check if the file you expected the command to output is present. On Windows, you can use the **dir** command followed by a file name or pattern to query which files are in the current directory. On macOS or GNU/Linux, you can do that with the **ls** command:



```
C:\Windows\System32\cmd.exe
C:\Users\username\Documents\chasse-galerie_sample_01\elements\Bg_Camp>dir *.tga

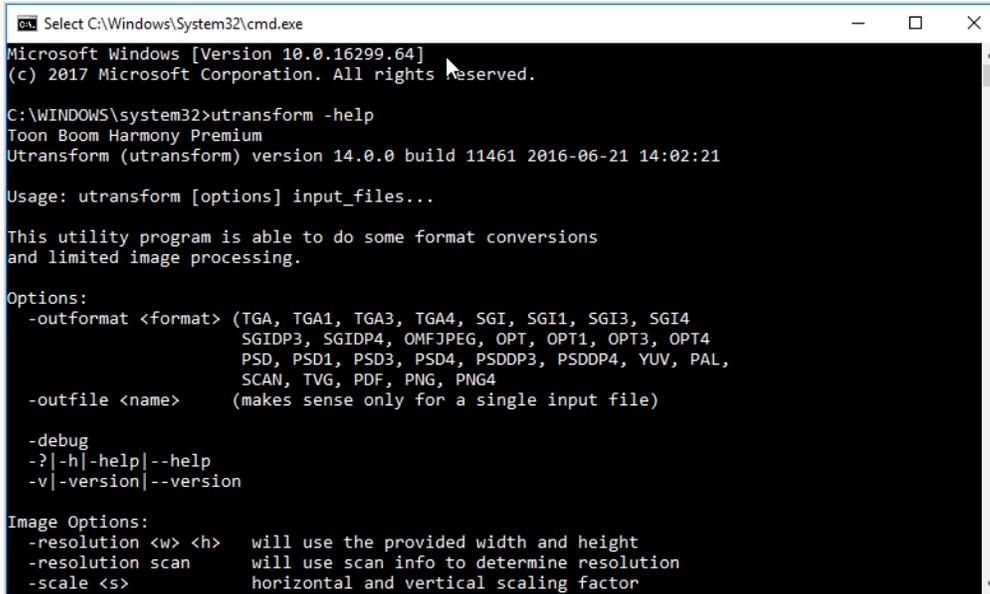
Volume in drive C is Windows 10
Volume Serial Number is 66F2-7361

Directory of C:\Users\username\Documents\chasse-galerie_sample_01\elements\Bg_Camp

12/01/2017  02:57 PM                382,622 Bg_Camp-Camp.tga
               1 File(s)                382,622 bytes
               0 Dir(s)  428,179,288,064 bytes free

C:\Users\username\Documents\chasse-galerie_sample_01\elements\Bg_Camp>
```

2. At any time, you can obtain information on how to use an utility by launching it followed with the **-help** parameter.

utransform -help

```
Select C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.16299.64]
(c) 2017 Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>utransform -help
Toon Boom Harmony Premium
Utransform (utransform) version 14.0.0 build 11461 2016-06-21 14:02:21

Usage: utransform [options] input_files...

This utility program is able to do some format conversions
and limited image processing.

Options:
  -outformat <format> (TGA, TGA1, TGA3, TGA4, SGI, SGI1, SGI3, SGI4
                      SGIDP3, SGIDP4, OMFJPEG, OPT, OPT1, OPT3, OPT4
                      PSD, PSD1, PSD3, PSD4, PSDDP3, PSDDP4, YUV, PAL,
                      SCAN, TVG, PDF, PNG, PNG4)
  -outfile <name>    (makes sense only for a single input file)

  -debug
  -?|-h|-help|--help
  -v|-version|--version

Image Options:
  -resolution <w> <h> will use the provided width and height
  -resolution scan    will use scan info to determine resolution
  -scale <s>          horizontal and vertical scaling factor
```

Chapter 3: Utilities Reference

The following chapter lists the utilities available for processing image and describes all their parameters.

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Pdfimport Utility

PDF Import (**Pdfimport**) allows you to import a Portable Document File (.pdf) or Adobe Illustrator (.ai) file as a Harmony template without going through the user interface, allows more control and flexibility over the results.



NOTE

Since a Harmony template is a folder containing a scene, this command outputs several files inside a folder. If the target folder exists, it will not overwrite the whole folder, but it will overwrite the files inside it.

Syntax

```
Pdfimport [options] <.pdf or .ai files>
```

Example

```
Pdfimport -PDF_GENERATE_COLOUR_ART -outdir "C:\Users\username\Documents\Toon Boom Harmony [Edition] Library" BG-1.ai BG-2.ai
```

Parameters

Parameter	Description
-outdir output_folder	<p>The path to the directory where to store the template. A new directory will be created in the specified directory, named after the imported .pdf or .ai file followed with the extension .tpl. The template files will be stored in that new directory.</p> <div data-bbox="625 1276 690 1348" data-label="Image"> </div> <div data-bbox="699 1285 781 1314" data-label="Section-Header"> <h3>NOTE</h3> </div> <div data-bbox="699 1333 1370 1425" data-label="Text"> <p>You should use this option to specify the output directory if you're specifying several .ai or .pdf files, as their final output directory will be automatically named based on their original file names.</p> </div>
-outtemplate output_folder.tpl	<p>The path to the template directory in which to store the template. The template files will be stored directly inside the specified directory.</p> <div data-bbox="625 1633 690 1705" data-label="Image"> </div> <div data-bbox="699 1642 781 1671" data-label="Section-Header"> <h3>NOTE</h3> </div> <div data-bbox="699 1690 1377 1782" data-label="Text"> <p>Since this option does not use the name of the imported file to determine the output directory, you can only specify a single .ai or .pdf file when using this option.</p> </div>

	<div style="border: 1px solid green; padding: 5px;">  NOTE The <code>-outdir</code> and <code>-outtemplate</code> options are mutually exclusive. </div>
<code>-PDF_SUPPORT_CMYK</code>	<p>This option will automatically convert CMYK colours to RGB. By default CMYK colours are imported as solid red.</p> <div style="border: 1px solid green; padding: 5px;">  NOTE If this option is not enabled and CMYK colours are in the .pdf or .ai file, they will be imported as solid red, and the utility will output the following warning: <p style="text-align: center;">CMYK: Unsupported colorSpace</p> </div>
<code>-PDF_SEPARATE_LAYERS</code>	Uses the Illustrator top level groups as separate layer names.
<code>-PDF_FLATTEN</code>	Flattens each drawing.
<code>-PDF_LINE_ART_STROKE</code>	Makes the contours of vector shapes "strokes". Contrary to a regular contour, a stroke will remain in the drawing even if it is unpainted.
<code>-PDF_BREAK_LINE_ART</code>	<p>Breaks the brush strokes composing the line art at their intersection, making a separate colour zones for each segment of the line art. This allows the ink & paint artist to easily paint different parts of the lineart with different colours.</p> <div style="border: 1px solid green; padding: 5px;">  NOTE This option implies <code>-PDF_GENERATE_COLOUR_ART</code>. </div>
<code>-PDF_GENERATE_COLOUR_ART</code>	Creates strokes based on the centrelines of the line art and stores them in the colour art layer, making empty colour zones that can easily be filled with the Paint tool.
<code>-PDF_ALLOW_UNICODE</code>	Allows the use of Unicode-exclusive characters in layer names.
<code>-usage</code>	Displays a list of parameters with their description.
<code>-? -h -help --help</code>	Displays the help information.
<code>-v -version --version n</code>	Displays the version information.

Pix2vec Utility

Pix2vec is an highly flexible and versatile utility for converting scanned drawings and lineart images to Toon Boom Vector Graphic (. **tv**g) files that are ready to be inked and painted. It can be used to vectorize Toon Boom Scan (. **s**can) files as well as any type of bitmap supported by Toon Boom Harmony.

Syntax

```
Pix2vec -file INPUT_FILE [OPTIONS]
```

Example

The only option that is mandatory for **Pix2vec** is **-file** or **-infile**. It will generated a Toon Boom Vector Graphic (. **tv**g) drawing based on the input file, with the bitmap drawing vectorized in the line art layer and colour zones generated in the colour art layer. The default parameters for vectorization are used for every unspecified parameter. The filename of the output file will be based on the input file, but with the extension **.tv**g.

```
Pix2vec -file A-1.scan
```

If the default parameters are not giving the expected results, you can try using **Pix2vec** with its extensive set of options.

```
Pix2vec -infile A-1.scan -outfile B-1.tvg -register 150 b 1 -no_texture -  
rmv_holes 10 -rmv_dirt 10 -rmv_hairs 30 3 -rmv_triangles 90
```

Pix2vec can only process one file at a time. If you want to use **Pix2vec** on a series of file, you can script a loop in your command line. A loop repeats a command while counting from one number to another number in a specified increments, and that number is stored in a variable to be used by the command, allowing you to iterate through several drawings that have the same base name, but are numbered in a series.

For example, you can iterate through drawings on to 13, numbered on twos, with the following command:

- On Windows, in Command Prompt:

```
> FOR /L %I IN (1,2,13) DO Pix2vec -file A-%I.scan
```

- On macOS and GNU/Linux, in a Bash terminal:

```
$ for I in {1..13..2}; do Pix2vec -file A-$I.scan; done
```

You can also loop through every file of a given type in a directory using the following syntax:

- On Windows, in Command Prompt:

```
> FOR %I IN (*.scan) DO Pix2vec -file %I
```

- On macOS and GNU/Linux, in Bash:

```
$ for I in *.scan; do Pix2vec -file $I; done
```

Parameters

General Options

Parameter	Description
<code>-help--help-?</code>	Displays the list of the sections on which you can obtain usage information.
<code>-help <section></code>	<p>Displays usage information on the specified section. The following sections are available:</p> <ul style="list-style-type: none"> • all: Displays help on all parameters. • io: Displays help about the input/output parameters. • register: Displays help about the peg registration parameters. • filter: Displays help about the filtering parameters. • rgb: Displays help about the red/green/blue keying parameters. • 4colours: Displays help about four colours vectorization parameters. • bubble: Displays help about bubble generation parameters. • color: Displays help about colour vectorization parameters.
<code>-debug</code>	Use this option to turn on the debug mode.
<code>-version</code>	This option will display the version information.

Input/Output Parameters

Parameter	Description
<code>-file <filename> -infile <filename></code>	Use this option to define the file you want to perform Pix2vec on.
<code>-outfile <filename></code>	<p>Use this option to rename the output file.</p> <div style="border: 1px solid green; padding: 10px; margin-top: 10px;">  <p>NOTE The filename must include the extension.</p> </div>

Parameter	Description
<code>-informat <format></code>	This option defines the input format. Used if reading from standard input.
<code>-noforce</code>	This option will prevent the output image from being forced if the image is inconsistent.
<code>-force_unamed_palette_for_texture</code>	Generates textures in the TVG's internal palette.
<code>-output_version <version></code>	Sets the version of the output files. Valid versions are 0 or 604 . The TVG format version is 604 .

Peg Registration Parameters

The following parameters configure how the drawing is registered. Registration is the process of analyzing the position of the drawing's peg holes and aligning it relative to its field.

Parameter	Description
<code>-register <dpi> <side> <strictness></code>	Use this option to perform optical registration. <dpi> : The resolution of the scan. <side> : The side of the sheet on which the pegs are to be registered. Can be one of the following: <ul style="list-style-type: none"> • b or bottom • t or top • l or left • r or right <strictness> : The strictness with which the registration is evaluated. Can be one of the following: <ul style="list-style-type: none"> • l or loose • s or strict
<code>-registration_center_peg_holes-rcph</code>	Only uses round (center) peg holes in 16 fields pages.
<code>-registration_looseness_factor <factor> -rlf <factor></code>	The registration looseness factor. This is used for optical registration

Parameter	Description
	<p>only.</p> <p>By default, the looseness factor is 2.</p>
<code>-rdebug</code>	Outputs debug information about the registration.
<code>-pegpitch <inches></code>	<p>The distance between peg bars, in inches.</p> <p>By default, this is set to 8.</p>
<code>-threshr <value></code>	<p>The threshold used for optical registration. This can be set to a decimal value ranging from 0 to 1.</p> <p>By default, this is set to 0.5.</p>
<code>-rmargin <inches></code>	<p>The distance between the edge of the paper and its peg holes.</p> <p>By default, this is set to 1.</p>
<code>-peg_distance_from_center <inches> -pdfc <inches></code>	<p>The distance between the center of the page and the peg holes.</p> <p>By default, this is set to 5.25.</p>
<code>-out_peg_position <side></code>	<p>Defines the desired side of the pegs on the drawings. If it is different from the side of its actual registration (passed with the <code>-register</code> parameter), the drawing will be rotated accordingly.</p> <ul style="list-style-type: none"> • same: The same side as the drawing's actual registration. • b or bottom • t or top • l or left • r or right <p>By default, this is set to same.</p>
<code>-output_peg_matrix</code>	Outputs the information about the peg matrix to the terminal.
<code>-scanner_calibrate <x scale> <y scale></code>	<p>Sets the horizontal and vertical scale factor to be applied on the scanned image. The scale factors are 1-based, meaning that 1 represents the image's original size.</p> <p>By default, this is set to 1 1.</p>

Filtering Options

The following parameters configure the way the line art is converted to vector outlines, and how its centreline is converted to colour zones.

Parameter	Description
<code>-pixel <pixel shape></code>	<p>Defines the shape of pixels. The only valid value for this is 4x3.</p> <p>By default, this is set to 4x3.</p>
<code>-gap <length></code>	<p>Automatically close gaps that are up to a certain size with invisible strokes, to make closed shapes that can be painted.</p> <p>The value sets the maximum length of gaps to close, in world units.</p> <p>By default, this is set to 10.</p>
<code>-pencil</code>	<p>Generate pencil lines for the line art.</p> <p>This should not be used with the <code>-no_color_art</code> parameter.</p>
<code>-vectorize_alpha-use_alpha</code>	<p>Properly vectorizes line art drawn on a transparent background.</p> <p>By default, Pix2vec expects line art to be on an opaque background and will not properly vectorize line art drawn on a transparent background. Use this parameter if you are vectorizing drawings with a transparent background.</p>
<code>-keep_dirt</code>	<p>Disables filtering dirt out from the drawing.</p>
<code>-thresh <value></code>	<p>The threshold used for vectorization. This can be set to a decimal value ranging from 0 to 1.</p> <p>The default threshold is 0.2.</p>
<code>-rmv_hairs <length> <passes></code>	<p>Removes hair, which are short useless strokes extending from closed shapes.</p> <p>The length determines the maximum length of hairs to remove, in world units. The passes determines the amount of times to remove hairs from the whole drawing. Adding extra passes will remove hair that branched into several hairs.</p> <p>The default length is 1 and the default number of passes is 1.</p>
<code>-rmv_holes <size></code>	<p>Remove holes that are smaller than the defined area, in world units squared, from the artwork.</p>

Parameter	Description
	<p>The default size of holes to remove is 7.</p>
<p><code>-rmv_dirt <size></code></p>	<p>Removes dirt that is smaller than the defined size, in world units squared, from the artwork.</p> <p>The default size of dirt to remove is 1.</p> <div data-bbox="657 525 1429 693" style="border: 1px solid #add8e6; padding: 5px;">  <p>TIP Try removing holes and dirt with a size ranging from 100 to 500.</p> </div>
<p><code>-rmv_triangles <size></code></p>	<p>Removes triangles at the defined distance from one another, in world units.</p> <p>By default, the distance of triangles to remove is 30.</p> <div data-bbox="657 903 1429 1165" style="border: 1px solid #90ee90; padding: 5px;">  <p>NOTE Triangles are used to break the strokes in line art into different colour zones to help paint different zones of the line art with different colours. You can use the <code>-no_break</code> parameter to remove all triangles and make all adjacent line art into single colour zones.</p> </div>
<p><code>-no_texture</code></p>	<p>Disables the generation of textured strokes.</p>
<p><code>-color_as_texture</code></p>	<p>Converts the entire image to a coloured bitmap texture and stores it in a vector rectangle.</p> <p>This does not create editable line art nor does it create any colour zones, but it preserves the image exactly as is.</p>
<p><code>-noclosegap</code></p>	<p>Disables closing gaps. All gaps in the artwork will remain open regardless of how small they are.</p>
<p><code>-no_break</code></p>	<p>Disables breaking the line art into triangles, making all adjacent line art into single colour zones.</p>
<p><code>-jag_filter <pixels></code></p>	<p>This reduces the jaggedness in line art by expanding the lines by the specified amount of pixels (using the same mechanism as the <code>-expand_bitmap</code> parameter), then contracting the lines by the same amount,</p>

Parameter	Description
	<p>resulting in smoother outlines. It is recommended to use values such as 1 or 2.</p> <p>By default, the jag filter is set to 0.</p>
<p><code>-expand_bitmap <pixels></code></p>	<p>Expands the outlines of the line art by the set amount of pixels, resulting in thicker outlines.</p> <p>By default, this is set to 0.</p>
<p><code>-fit_errorc <value></code></p>	<p>Defines the fit error level for the colour art.</p> <p>The fit error is the process by which three points segments, which make corners, are interpreted as curves. This means that instead of drawing a segment from point 1 to point 2, then from point 2 to point 3, a single segment is drawn from point 1 to point 3, with Bezier curves adjusted for the line to go over point 2. A higher fit error will cause more corners to be interpreted as curves. A lower fit error will cause the artwork to have more points. Some fit error is required to avoid having too many control points.</p> <p>The default fit error is 1.</p>
<p><code>-fit_errorl <value></code></p>	<p>Defines the fit error level for the line art.</p> <p>The fit error is the process by which three points segments, which make corners, are interpreted as curves. This means that instead of drawing a segment from point 1 to point 2, then from point 2 to point 3, a single segment is drawn from point 1 to point 3, with Bezier curves adjusted for the line to go over point 2. A higher fit error will cause more corners to be interpreted as curves. A lower fit error will cause the artwork to have more points. Some fit error is required to avoid having too many control points.</p> <p>The default fit error is 1.</p>
<p><code>-smoothl <passes></code></p>	<p>Sets the amount of smoothing passes to perform on the line art.</p> <p>By default, this parameter is set to 1.</p>
<p><code>-smoothc <passes></code></p>	<p>Sets the amount of smoothing passes to perform on the colour art.</p> <p>By default, this parameter is set to 1.</p>
<p><code>-first_smooth <passes></code></p>	<p>Defines the number of smooth passes to perform on the line art before breaking the triangles.</p>

Parameter	Description
	By default, this parameter is set to 0.
<code>-support_thin_lines</code>	Do not erode thin lines when generating colour art.
<code>-2pass</code>	<p>Using this parameter allows you to set two sets of parameters, one for vectorizing the line art and one for creating the colour art.</p> <p>With this option, you can use the following parameters with the suffix <code>l</code> or <code>c</code> to define its value differently for the line art and for the colour art:</p> <ul style="list-style-type: none"> • <code>-treshl</code> and <code>-treshc</code> • <code>-jag_filterl</code> and <code>-jag_filterc</code> • <code>-expand_bitmapl</code> and <code>-expand_bitmapc</code> • <code>-rmv_holesl</code> and <code>-rmv_holesc</code> • <code>-rmv_dirtl</code> and <code>-rmv_dirtc</code> • <code>-first_smoothl</code> and <code>-first_smoothc</code>
<code>-treshl <value></code>	<p>The threshold used for vectorization for the line art. This can be set to a decimal value ranging from 0 to 1.</p> <p>The default threshold is 0.5.</p> <div data-bbox="656 1152 1430 1388" style="border: 1px solid #c8e6c9; padding: 10px; margin-top: 10px;">  NOTE This threshold is higher than the default value for single-pass vectorization, which may erode thin or light outlines. If you want to obtain results similar to single-pass vectorization, set this to 0.2. </div>
<code>-threshc <value></code>	<p>The threshold used for vectorization for the colour art. This can be set to a decimal value ranging from 0 to 1.</p> <p>The default threshold is 0.5.</p> <div data-bbox="656 1593 1430 1829" style="border: 1px solid #c8e6c9; padding: 10px; margin-top: 10px;">  NOTE This threshold is higher than the default value for single-pass vectorization, which may erode thin or light outlines. If you want to obtain results similar to single-pass vectorization, set this to 0.2. </div>

Parameter	Description
<code>-jag_filterl <pixels></code>	This option expands the pixels in the vectorization bitmap for line art. To smooth and straighten jagged lines.
<code>-jag_filterc <pixels></code>	This option expands the pixels in the vectorization bitmap for colour art. To smooth and straighten jagged lines.
<code>-expand_bitmapl <pixels></code>	Expands the outlines of the line art by the set amount of pixels, resulting in thicker outlines for the line art. By default, this is set to 0.
<code>-expand_bitmapc <pixels></code>	Expands the outlines of the line art by the set amount of pixels, resulting in thicker outlines for the colour art. By default, this is set to 0.
<code>-rmv_holesl <size></code>	Remove holes that are smaller than the defined area, in world units squared, for the line art. The default size of holes to remove is 7.
<code>-rmv_holesc <size></code>	Remove holes that are smaller than the defined area, in world units squared, for the colour art. The default size of holes to remove is 7.
<code>-rmv_dirtl <size></code>	Removes dirt that is smaller than the defined size, in world units squared, for the line art. The default size of dirt to remove is 1.
<code>-rmv_dirtc <size></code>	Removes dirt that is smaller than the defined size, in world units squared, for the colour art. The default size of dirt to remove is 1.
<code>-first_smoothl <passes></code>	Defines the number of smooth passes to perform on the line art before breaking the triangles, for the line art. By default, this parameter is set to 0.
<code>-first_smoothc <passes></code>	Defines the number of smooth passes to perform on the line art before breaking the triangles, for the colour art.

Parameter	Description
	By default, this parameter is set to 0.
<code>-margins <inches></code>	Removes a margin all around the bitmap. The size of the margin must be specified in inches. By default, this parameter is set to 0.25.
<code>-top_margin <inches></code>	Removes a margin from the top edge of the bitmap. The size of the margin must be specified in inches. By default, this parameter is set to 0.25.
<code>-bottom_margin <inches></code>	Removes a margin from the bottom edge of the bitmap. The size of the margin must be specified in inches. By default, this parameter is set to 0.25.
<code>-left_margin <inches></code>	Removes a margin from the left edge of the bitmap. The size of the margin must be specified in inches. By default, this parameter is set to 0.25.
<code>-right_margin <inches></code>	Removes a margin from the right edge of the bitmap. The size of the margin must be specified in inches. By default, this parameter is set to 0.25.
<code>-remove_peg_bars</code>	Removes the peg bar holes from the drawing.
<code>-field_size <fields>-fs <fields></code>	Sets the field size of the output drawing. By default, this is set to: <ul style="list-style-type: none"> • 12 if the input image is a regular bitmap. • The internal field size of the scan file, if the input image is a Toon Boom Scan file.

Parameter	Description
	<div style="border: 1px solid green; padding: 10px;">  <p>NOTE</p> <p>Scan files have their own field size. If the field size of the scan file is different than the field size of the TVG that is generated from it, its scaling will be affected. Regular bitmap files do not have a field size, therefore, their dots per inch (DPI) resolution is automatically adjusted to fit the field, unless the -dpi parameter is used.</p> </div>
-peg_bar_size <inches>	Sets the size of the region reserved for the peg bar, from the edge of the drawing, in inches.
-noframe	Disables adding a frame around the colour art.
-frame_fields <fields>	<p>Adds a frame of the specified size around the colour art. The size must be specified in fields.</p> <p>If the frame is made to match the drawing, its element and its scene's field size, it will fit the scene's camera field perfectly. By default, all of these are 12 fields in size.</p> <p>The default value of this parameter is -1, which uses the drawing's field size.</p>
-downscale_input <factor>	<p>Downscales the input image before processing it. This does not affect the dimensions of the vectorized drawing in the scene, only its display quality. In other words, this is equivalent to <i>pixelating</i> the drawing.</p> <p>The scale factor is an integer used as the denominator. For example, the default value is 1, which does not downscale the image, 2 would downscale the image by half, etc.</p>
-downscale_texture <factor>	<p>Downscales the output texture. This is very similar to -downscale_input, except that the downscaling is performed on the line art's texture after the original drawing has been vectorized. This means that the contours of the outlines and the strokes in the colour art are not affected, only the texture in the outline is.</p> <p>Just like -downscale_input, the dimensions of the vectorized drawing are not affected, so this is equivalent to <i>pixelating</i> the vectorized drawing's texture.</p> <p>The scale factor is an integer used as the denominator. For example, the default value is 1, which does not downscale the texture, 2 would downscale the texture by half, etc.</p>

Parameter	Description
<code>-buildmatte</code>	Generates a filled matte based on the line art and stores it in the underlay art layer.
<code>-buildmatte_colourart</code>	Generates a filled matte based on the line art and stores it in the color art layer. <div style="border: 1px solid green; padding: 5px; background-color: #e6f2e6;">  NOTE <code>-buildmatte</code> and <code>-buildmatte_colourart</code> are mutually exclusive. </div>
<code>-copystrokes</code>	When generating a matte, copies the strokes from the line art layer onto the matte so as to preserve the defined colour zones.

Options for Bitmap with no Registration Information

The following options can be used if you are vectorizing regular bitmaps, rather than Toon Boom Scan (.scan) files.

Parameter	Description
<code>-pixel_margins <pixels></code>	Removes a margin all around the bitmap. The size of the margin must be specified in pixels. By default, this parameter is set to 0.
<code>-top_pixel_margin <pixels></code>	Removes a margin from the top edge of the bitmap. The size of the margin must be specified in pixels. By default, this parameter is set to 0.
<code>-bottom_pixel_margin <pixels></code>	Removes a margin from the bottom edge of the bitmap. The size of the margin must be specified in pixels. By default, this parameter is set to 0.
<code>-left_pixel_margin <pixels></code>	Removes a margin from the left edge of the bitmap. The size of the margin must be specified in pixels. By default, this parameter is set to 0.
<code>-right_pixel_margin <pixels></code>	Removes a margin from the right edge of the bitmap. The size of the

Parameter	Description
	margin must be specified in pixels. By default, this parameter is set to 0.
<code>-dpi <dots per inch></code>	Sets the resolution of the input image, in dots per inches. The default value for this parameter is <code>-1</code> , which makes Pix2vec automatically adjust the DPI resolution of the drawing to make it fit the field of the drawing.
<code>-layer <layer name></code>	When vectorizing a multi-layer Photoshop Document (<code>.psd</code>) file, this parameter allows you to select which layer to vectorize. If the layer is inside one or several groups, its group hierarchy must be specified with the layer name, using colons (<code>:</code>) as separators. For example, if the layer is named <code>layer1</code> and is inside <code>group1</code> at the root of the layers list, you would use this notation: <code>-layer group1:layer</code> The default value for this parameter is <code>' '</code> .

Red/Green/Blue Keying Options

The following options allow you to vectorize red, green and blue lines as they are coloured, instead of in greyscale, which is the default behaviour. This can be especially useful if you are using certain line colours for specific purposes. For example, red lines are traditionally used in animation to close colour zones outside of the camera field or to trace an outline that is meant to match the outline of a background element.

Parameter	Description
<code>-rgb</code>	Generates separate zones for red, green and blue lines. <div style="border: 1px solid green; padding: 5px;">  NOTE By default, the red, green and blue lines will have an alpha of 1. You can set their alpha to a different value with the <code>-rgb_alpha</code> parameter. </div>
<code>-rgb_alpha <value></code>	Specifies the alpha of the red, green and blue lines generated with the <code>-rgb</code> parameter. By default, this parameter is set to 1.

Parameter	Description
<code>-rgb_alpha_texture</code>	<p>When enabled, red, green and blue lines generated with the <code>-rgb</code> parameter will also have texture.</p> <p>Contrary to the <code>-flatten</code> parameter, this will still vectorize the colour line in gray first, then add the coloured vectorized line over it.</p>
<code>-rgb_separate</code>	<p>Separates the colour zones used for red, green and blue lines from the colour zones used for the black lines instead of overlaying them.</p> <div data-bbox="657 596 1429 732" style="border: 1px solid #c8e6c9; padding: 10px; margin-top: 10px;">  NOTE This parameter also requires the <code>-2pass</code> parameter to work. </div>
<code>-no_red</code>	Ignores red lines during vectorization.
<code>-no_green</code>	Ignores green lines during vectorization.
<code>-no_blue</code>	Ignores blue lines during vectorization.
<code>-flatten</code>	<p>Instead of adding the vectorized colour lines over the vectorized line art as separate drawing strokes, this applies the colour of the colour lines to the existing texture of the vectorized line art.</p> <p>This option is useful if you don't want black lines to appear behind the colour lines, should you choose to remove the colour lines later.</p>
<code>-rmv_rgb_dirt <size></code>	<p>Removes red, green or blue spots smaller than the specified area, in world units squared.</p> <p>The default value for this parameter is 0.</p>
<code>-expand_bitmap_rgb <pixels></code>	<p>Expands the red, green and blue outlines of the line art by the set amount of pixels, resulting in thicker coloured outlines.</p> <p>By default, this is set to 0.</p> <div data-bbox="657 1650 1429 1881" style="border: 1px solid #bbdefb; padding: 10px; margin-top: 10px;">  TIP Using this with the <code>-flatten</code> parameter can help overwrite black lines generated from the coloured lines during regular vectorization with the vectorized coloured lines, as they may not otherwise overwrite those black lines completely. </div>

Parameter	Description
<code>-threshrgb <value></code>	<p>The threshold for RGB vectorization. This can be set to a decimal value ranging from 0 to 1.</p> <p>By default, this is set to 0.2.</p>
<code>-threshsv <saturation threshold> <value threshold></code>	<p>The saturation and value threshold required for a pixel to be considered coloured rather than grey or black. Both can be set to a decimal value ranging from 0 to 1.</p> <p>The default saturation threshold is 0.5 and the default value threshold is 0.5.</p>

Four Colours Vectorization

The following options allow you to vectorize a drawing with red, green, blue and black lines. This is very similar to the Red/Green/Blue keying vectorization parameters, except that this approach is a mode of its own. Contrary to Red/Green/Blue vectorization, this will not generate the black line art and add coloured lines on top. It will generate a single layer of non-textured vector shapes that are either solid red, solid green, solid blue or solid black, without them overlapping each other. Most of the parameters for this mode are used to determine how to differentiate red, green, blue, black and white in the source drawing.

Parameter	Description
<code>-4colours <key:value> ... <key:value></code>	<p>Performs four colour vectorization using the specified parameters.</p> <p>You can specify zero or as many parameters as needed. Each parameter must be expressed by its key followed by a colon and then its value. Parameters must be separated by spaces, but there should be no spaces between a key and its value. For example:</p> <pre><code>-4colours rgbdiff:20 dark:20 grey:120 white:250 dirt:200 rt:240 gt:240 bt:240</code></pre> <p>Here are the available keys:</p> <ul style="list-style-type: none"> • rgbdiff: The threshold for tolerating mixed colours. A lower value means mixed colours are interpreted as their dominant primary colour. A higher value means mixed colours are interpreted as either black or white, depending on their value. This parameter can be set to a value between 0.0 and 1.0 or between 0 and 255. • dark: The threshold for differentiating black. A higher value means lighter shades of dark colours and dark greys are vectorized as black. A lower value means only very dark areas are vectorized as black. Can be set to a value between 0.0 and 1.0

Parameter	Description
	<p>or between 0 and 255.</p> <ul style="list-style-type: none"> • grey: The threshold for the interpretation of greys. Greys below this threshold are vectorized as black, and greys above this threshold are vectorized as white. Can be set to a value between 0.0 and 1.0 or between 0 and 255. • white: The threshold for differentiating white. A lower value means darker shades of light colours and light greys are vectorized as white. A higher value means only very light areas are vectorized as white. This parameter can be set to a value between 0.0 and 1.0 or between 0 and 255. • rt: The threshold differentiating red from black. A lower value means dark red is vectorized as red. A higher value means dark red is vectorized as black. This parameter can be set to a value between 0.0 and 1.0 or between 0 and 255. • gt: The threshold differentiating green from black. A lower value means dark green is vectorized as green. A higher value means dark green is vectorized as black. This parameter can be set to a value between 0.0 and 1.0 or between 0 and 255. • bt: The threshold differentiating blue from black. A lower value means dark blue is vectorized as blue. A higher value means dark blue is vectorized as black. This parameter can be set to a value between 0.0 and 1.0 or between 0 and 255. • dirt: The size of dirt to remove, in world units squared. The suggested value to use is 200.

Bubble options

Bubbles are bumps added along the outlines, giving the impression that the outline was drawn quickly with a pressure sensitive marker or fountain pen. They are made of streaks of circles that increase in size as the bump appears then decrease in size as the bump subsides. The size of bubbles and the distance between them can be configured.



NOTE

To learn more about the Bubble command, see [How to Vectorize With Bubbles](#) on page 40.

Parameter	Description
<code>-create_bubbles</code>	Randomly adds bubble shapes along the line art.

Parameter	Description
<code>-bubble_gap <value></code>	Sets the maximum number of colour art points between two bubbles. By default, this parameter is set to 3.
<code>-bubble_length <value></code>	Sets the maximum number of circles in a bubble. A bubble is a streak of circles drawn along the outline. The more circles, the bigger the bubbles appear. By default, this parameter is set to 10.
<code>-min_radius <factor></code>	Defines the minimum radius of a circle in a bubble. This radius is a factor relative to the line thickness, where 1.0 is equal to the original thickness of the line. Hence, its value must be at least 1.0. By default, this parameter is set to 1.5.
<code>-max_radius <factor></code>	Defines the maximum radius of a circle in a bubble. This radius is a factor relative to the line thickness, where 1.0 is equal to the original thickness of the line. Hence, its value must be at least 1.0. By default, this parameter is set to 3.5.
<code>-uniform_gap</code>	Lays out the bubbles at an equal distance from each other.
<code>-uniform_height</code>	Ensures every circle in bubbles has the same height. <div style="border: 1px solid green; padding: 5px; margin-top: 10px;">  NOTE This option is deprecated. Instead, you can accomplish this by setting <code>-min_radius</code> and <code>-max_radius</code> to the same value. </div>

Colour Vectorization Options

This approach vectorizes each pixel individually, merging pixels of the same colour in the same colour zones. Hence, it is important to only use it with image files that have very few solid colours with no antialiasing.



NOTE

Colour vectorization is experimental.

Parameter	Description
<code>-color_vectorize</code>	Performs a colour vectorization.
<code>-file2 <color art filename></code>	Allows you to specify a bitmap file for the generation of colour art.
<code>-penstyle <center alpha> <edge alpha> <gamma> <centre pressure effect> <edge pressure effect> <texture bitmap downscaling> <texture bitmap file></code>	<p>Generates a brush texture for the line art.</p> <p>The parameters are as follows:</p> <ul style="list-style-type: none"> • <centre alpha>: The alpha value in the middle of the line. Can be set to a value between 0.0 and 20.0, although the greatest difference is visible between 0.0 and 3.0. • <edge alpha>: The alpha at the edge of the line. Can be set to a value between 0.0 and 1.0. Setting this to 1.0 will yield a solid line. • <gamma>: The gamma of the texture. A higher value will make the edge darker, a lower value will make the edge lighter. This can be set to a value between 0 and 10. • <centre pressure effect>: The pressure at the centre of the line. Can be set to a value between 0.0 and 1.0. • <edge pressure effect>: The pressure at the edge of the line. Can be set to a value between 0.0 and 1.0. • <texture bitmap scaling>: The scaling factor of the bitmap texture. Can be set to a value between 0.2 and 20. • <texture bitmap file>: The path to a bitmap image to use as the texture. Set this to "" to not use a bitmap texture.
<code>-pressure_variation <strategy> <min pressure> <max pressure> <max variation></code>	<p>Configures the pressure variation strategy for the centreline.</p> <p>The parameters are as follows:</p> <ul style="list-style-type: none"> • <strategy>: The strategy to for the distribution of pressure variation. Can be set to either 0, 1 or 2. • <min pressure>: The minimum pressure used. Can be set to a value between 0.0 and 1.0. • <max pressure>: The maximum pressure used. Can be set to a value between 0.0 and 1.0. • <max variation>: The maximum pressure variation. Can be set to a value between 0.0 and 1.0.
<code>-blur_radius <pixels></code>	Blurs the generated brush texture. The size of the blur must be specified

Parameter	Description
	<p>in pixels.</p> <p>By default, this parameter is set to 0.</p>
<pre>-color_contour_smooth_ passes <passes> -ccsp <passes></pre>	<p>Sets the amount of smoothing passes to perform on the contour before computing the line texture.</p> <p>By default, this parameter is set to 3.</p>
<pre>-color_rmh_holes1 <size></pre>	<p>Removes holes that are smaller than the defined size, in world units squared, from the line art, when computing the line texture.</p> <p>By default, this parameter is set to 0.</p>
<pre>-color_fill_holes1 <size></pre>	<p>Fills holes that are smaller than the defined size, in world units squared, in the coloured line art.</p> <p>By default, this parameter is set to 0.</p>

Vectorization

The options that are used during the vectorization process are based on vectorization styles. You can select a preset from a list, or customize your own.

Some of the commonly used vectorization styles displayed in the Custom Vectorization Parameters, and the Import Drawings dialog boxes, use parameters similar to the following examples:

- Black and White
- Tones/highlights (B+W notriangles)
- Greyscale Rougher Lines
- Greyscale Soft Edge

Black and White

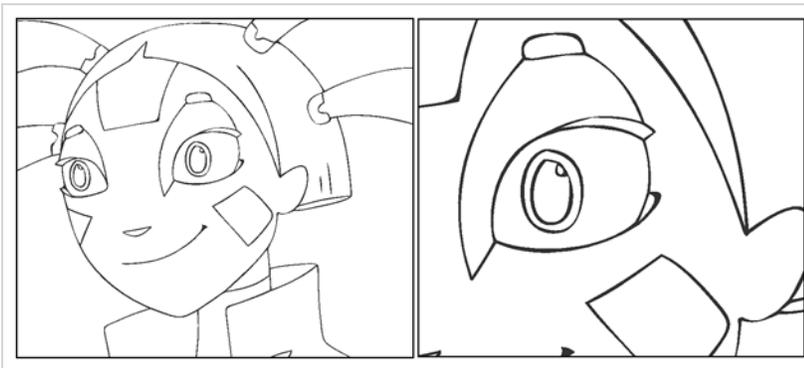
Use this style to vectorize black and white (1-bit) SCAN, or any other black and white files. Black and white 1-bit files include no texture information.

```
options: -no_texture -rmv_holes 7 -rmv_dirt 10 -fit_errorl 2.0 -fit_errorc 2.0
```

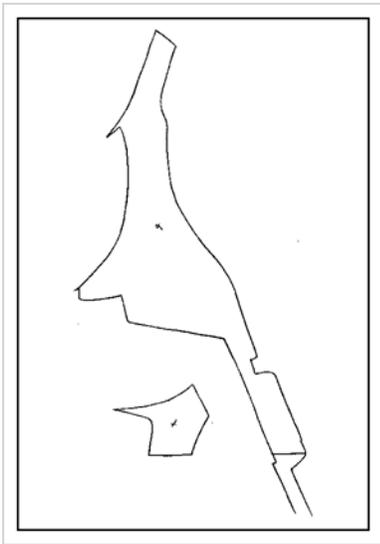
When you vectorize black and white drawings with these options, the vector files will contain no texture (**-no_texture**); all lines will be solid.

These options also remove holes, (**-rmv_holes 7**) and dirt, (**-rmv_dirt 10**) of specific sizes.

The **fit_errorl** and **fit_errorc** options also filter the contours that form ink lines and colour art so that they are smoother.



Tones/highlights (B+W notriangles)



This style vectorizes black and white 1-bit files that will be used as mattes to build tone and highlight effects.

```
options: -no_texture -rmv_holes 7 -rmv_dirt 10 -fit_errorl 2.0 -fit_errorc  
2.0 -no_break
```

These options prohibit the creation of line textures, remove holes and dirt, and smooth final drawings. These options also remove triangles (**-no_break**) at the intersection of lines in the line art.

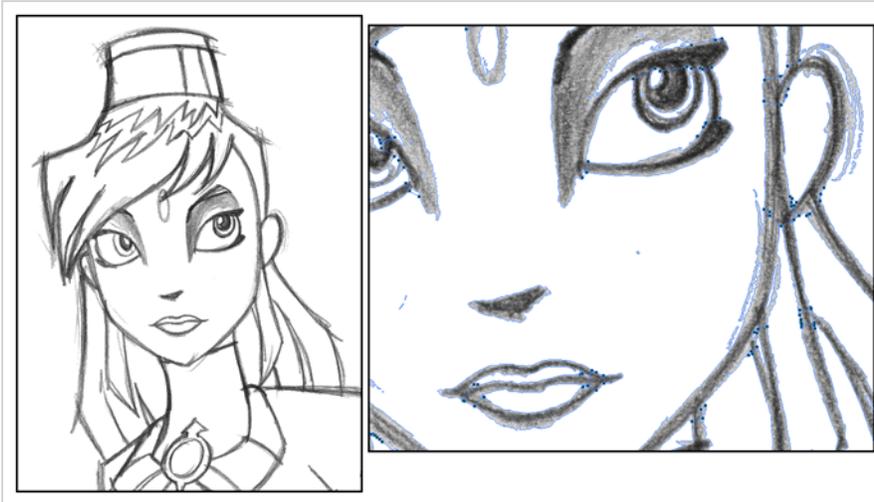
Triangles are useful at intersections if the intersecting lines are to be painted using different colours. This is unnecessary in drawings, like mattes, that will be painted a solid colour.

Greyscale rougher lines

This style vectorizes greyscale drawings, maintaining the rough textures in the lines.

```
options: -2pass -threshl 0.1 -threshc 0.2 -rmv_holesl 7 -rmv_holesc 7 -rmv_  
dirtl 10 -rmv_dirtc 10 -expand_bitmap 0 -fit_errorc 3.0 -fit_errorl 3.0 -  
jag_filterc 1 -rmv_hairs 30 3 -rmv_triangles 90
```

As you can see in the example below, the drawing gets its character from the roughness of its lines. You would not want to lose the distinctness of the line during the vectorization process.



The options in this style force two passes of the vectorization process to apply different values to the line art and colour art (**-2pass**). You must specify values for the line art and colour art when you use this option.

For drawings with specific vector-style lines or mattes, you only need one pass. For greyscale drawings, you may want to pass through the vectorization process twice to apply different values to the line art and colour art.

The colour art (**-threshc**) and line art (**-threshl**) thresholds determine what values in the scanned image will be considered as part of the drawing, and what will be ignored and eliminated in the vectorized drawing. Zero (0) is white and one (1) is black. The threshold is between these two values.

The **expand_bitmap** and **jag_filter** options work together so that you can pick up noise, or small pencil lines and marks, during the vectorization process. The **expand_bitmap** option expands the bitmap to pick up the noise. When used with **jag_filter**, the bitmap is shrunk down by the value of the option. You use these two options together to maintain the size of your line art.

The **fit_error** options smooth ink lines and colour art strokes.

The **rmv_holes** and **rmv_dirt** options remove hair and dirt of a specific size from the line art and colour art. The **rmv_hairs** option removes tiny strokes that extend from main colour art strokes. And, **rmv_triangles** option removes triangles and intersections that are less than the specified distance apart.

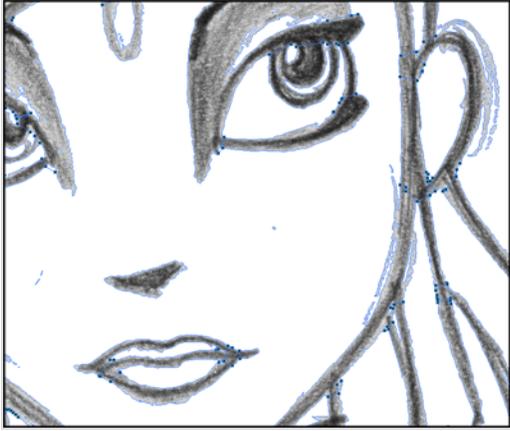
Greyscale soft edge

Use this vectorize style when you want to create a vector image with fine, textured strokes. Unlike the Grayscale rougher lines style, this style is meant for more subtle line variations.

style_name: Grayscale soft edge

options: -2pass -threshl 0.05 -threshc 0.05 -rmv_holesl 7 -rmv_holesc 7 -rmv_dirtl 10 -rmv_dirtc 10 -fit_errorl 2.0 -fit_errorc 2.0 -expand_bitmapl 1

Compare these options to the Grayscale rougher lines style. You will notice that the **-thresh** values are smaller; therefore, fewer pixels will be filtered out. This contributes to the fluffier appearance of the lines. You will also notice that the **fit_error** value is smaller and the **-expand_bitmap** value is larger. All of these options contribute to the smoother appearance of the final line.



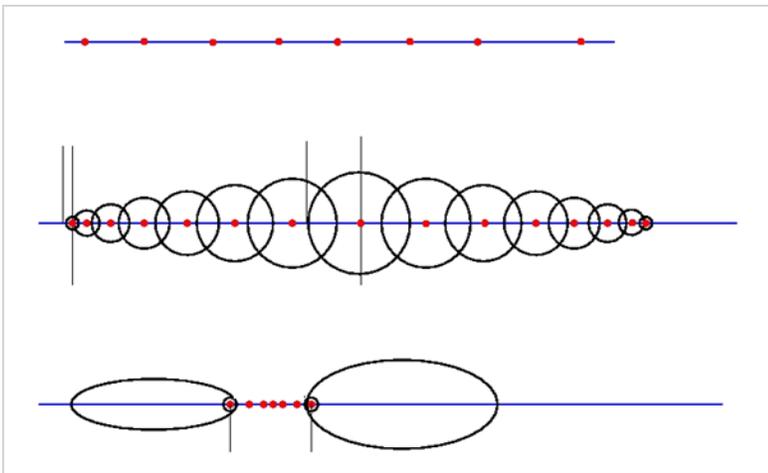
How to Vectorize With Bubbles

Vectorizing with bubbles allows the user to modify the original LineArt of a drawing by randomly inserting bubble shapes.

The command inserts bubbles starts from the circle with the smallest radius (`min_radius`), with the centre on one colour art point. The command then adds subsequent circles on the remaining colour art points, increasing their radius each time. The command adds new circles in ascending order of radius until the bubbles reach the maximum size specified by the `max_radius` parameter.

The command inserts the first and last circle at the minimum radius (specified by the `min_radius` parameter) and randomly assigns the height of the middle circle based on the `bubble_length` parameter.

For each bubble that appears, the command selects a random number of colour art points to set the distance between bubbles. The `bubble_gap` specifies the maximum number of such points, with the minimum being zero.



Examples

Drawing With Uniform Line Thickness

The initial drawing has a uniform thickness. Use it to view and compare the results of the following bubbles options.



- **Example 1**

The drawing has been vectorized using the command options:

```
-create_bubbles -bubble_gap 3 -bubble_length 16 -max_radius
```



- **Example 2**

The drawing has been vectorized using the command options:

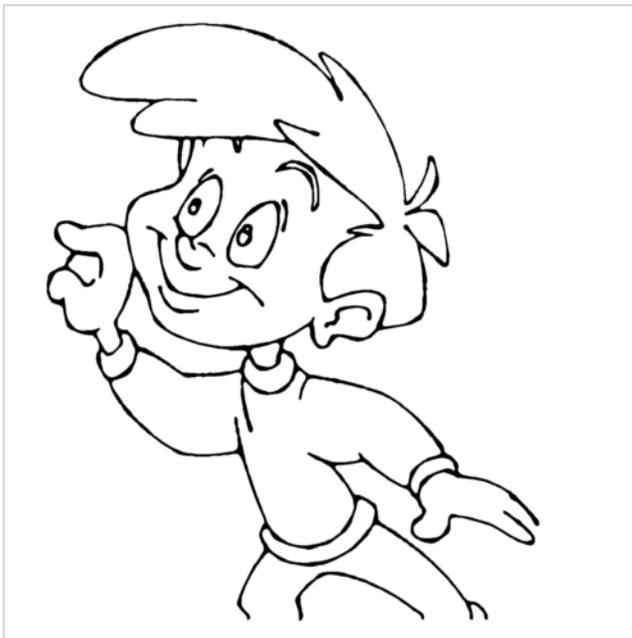
```
-create_bubbles -bubble_gap 3 -bubble_length 4 -max_radius 3.5
```



- **Example 3**

The drawing has been vectorized using the command options:

```
-create_bubbles -bubble_gap 3 -bubble_length 16 -max_radius 3.5
```



- **Example 4**

The drawing has been vectorized using the options:

```
-create_bubbles -bubble_gap 3 -bubble_length 4 -max_radius 3.0 -uniform_gap  
-uniform_height
```



Swf2tvg Utility

The Swf2tvg utility is used to import an SWF file into your scene without using the interface. This will create a .tvg file for each frame. Use the different commands to control the options.

Here is the format you must follow when using Swf2tvg:

```
Swf2Tvg -palette <palette_file> -usage -help -use_different_palettes
-base_name <base_out_name> -outdir <output_directory> -bbox_recenter
-ignore_position -start_index <number> file1 [file2] [file3]
```

Here are the available Swf2tvg options:

COMMAND	ACTION
DESCRIPTION OF SWITCHES	
-palette <palette_file>	This option is used to add the colours of the SWF file to the palette file and save it.
-use_different_palettes	This option is used to create a new palette for each SWF file and DOES NOT save any palette.
-base_name <name>	Use this option to automatically rename all generated drawings name-x.tvg where x is an increasing index.
-start_index <index>	Use this option to define the starting index to name the drawings. The default value is 1.
-outdir <dir>	Use this option to define the output directory for all generated drawings.
-use_place_objects	This option will transform and position the imported drawings following the position on the stage in the Flash project. This option uses the information that is contained in the SWF PLACE_OBJECT record. Note: this option does not use -start_index.
-frame_alias <list>	This option uses the comma separated list of names to generate timing information. This is mainly to convert models.

COMMAND	ACTION
	e.g. -frame_alias FR_%.2d,3Q_%.2d,BK_%.2d"
-base_color_index <index>	Use this option to base the colour index in higher 32 bits.
-bbox_recenter	This option centres drawings according to their bounding box. This option implies -ignore_position.
-ignore_position	Use this option to ignore all scenepanning information.
-usage	This option will display the usage.
-? -h -help --help	This option will display the help information.
-v -version --version	This option will display the version information.

**NOTE**

- If -outdir is not specified, the files will be written in the SWF file current directory.
- You can specify any SWF file or PLT file. The PLT files will be read and used to match colours but will not be modified. The only palette modified is the palette specified by the -palette switch.

Swfimport Utility

The Swfimport utility is used to create a template from a SWF file.

Here is the format you must follow when using Swfimport:

```
SwfImport [options] swf_files
```

Here are the available Swfimport options:

COMMAND	ACTION
AVAILABLE OPTIONS	
-outdir output_folder	This option specifies the output folder for the generated templates
-applycolourtransform	This option will apply colour transforms from SWF onto the drawings.
-paletteName name_of_palette	Use this option to specify the name of the palette file to use with colour recovery.
DESCRIPTION OF SWITCHES	
-outdir dir	This option specifies the output folder for the templates (The specified folder must already exist.)
-usage	This option will display the usage.
-? -h -help --help	This option will display the help information.
-v -version --version	This option will display the version information.



WARNING

Swfimport does not overwrite templates.

tv2xml Utility

The tv2xml utility is used for debugging purposes; it will convert your TVG files to an XML file format that you can read.

Here is the format you must follow when using tv2xml:

```
tv2xml -file <filename (including extension)> [ options ]
```

Here are the available tv2xml options:

COMMAND	ACTION
OPTIONS	
-infile <filename (including extension)>	Use this option to define the file to perform tv2xml on.
-outfile <filename>	This option is used to define an alternate output file. Use - for output to standard output.
-discretize [optional scale default = 0.1]	<p>This option discretizes the Bezier path using scale. Scale typically range from 0.025 to 4. A larger number means a higher resolution.</p> <p>NOTE: Discretize is a process where each pixel of an image is converted into the black foreground or the white background. The colours and grays of the original image are lost. By controlling discretizing, unwanted parts of the original image can be removed. This process of converting colour images into black foreground and white background is called discretizing.</p>
-no_bitmap_data	This option will prevent the output of bitmap data. This will produce a smaller XML files if the bitmap data is not needed.
-flatten	This option will perform a flatten on the layers.
-v -version --version	This option will display the version information.
-? -h -help --help	This option will display the help information.

uinfo Utility

The uinfo utility is used to display the following information about a specified bitmap file.

- Name
- Resolution
- Format
- Channels
- Bites per Channels

Here is the format you must follow when using uinfo:

uinfo program input_files

COMMAND	ACTION
AVAILABLE OPTIONS	
-? -h -help --help	This option will display the help information.
-v -version --version	This option will display the version information.

utransform Utility

The **utransform** utility can convert regular bitmap images to Toon Boom Vector Graphic (. **tv**g) images and vice-versa, and perform certain image processing routines at the same time.

Syntax

```
utransform [OPTIONS] INPUT_FILES
```

Example

```
utransform -outformat PNG4 -outfile layout.png -scale 0.5 -bgalpha 0 BG-1.tv
```

```
utransform -outformat SCAN -bgcolor 255 255 255 A-1.tv A-2.tv A-3.tv
```

Parameters

- [General Parameters on page 49](#)
- [File Output Parameters on page 49](#)
- [Image Processing Parameters on page 51](#)
- [Vector to Bitmap Parameters on page 54](#)
- [Vector to Vector Options on page 58](#)

General Parameters

Parameter	Description
<code>-debug</code>	This option will display information on the different steps of the process as well as the messages related to errors that might have occurred.
<code>-?-h-help--help</code>	This option will display the help information.
<code>-v-version--version</code>	This option will display the version information.

File Output Parameters

The following parameters are used to set the file name and file type of the output files.

Parameter	Description
<code>-outformat <format></code>	This is the image format that you want to output with utransform . The following output image formats are supported:

Parameter	Description
	<ul style="list-style-type: none"> • TGA (TGA1, TGA3 and TGA4) • SGI (SGI1, SGI3, SGI4, SGIDP3 and SGIDP4) • OPT (OPT1, OPT3 and OPT4) • PSD (PSD1, PSD3, PSD4, PSDDP3 and PSDDP4) • YUV • PAL • SCAN • TVG • PDF • PNG (PNG4) <p>Some of these image formats have variants, the notation of which is composed of:</p> <ul style="list-style-type: none"> • Their file extension. For example, the format PSDDP4 will output a Photoshop Document (.psd) file. • Their colour depth, if applicable. The format PSDDP4 specifies "DP", which means double-precision. This means each channel has a colour depth of 16 bits. Formats that do not have this notation use the standard depth of 8 bits per channel. • If they support different amounts of channels, the amount of channels they use. For example: <ul style="list-style-type: none"> • 1 means 1 colour channel, which renders in greyscale. • 3 means 3 colour channels, which renders in solid colours. • 4 means 3 colour channels + 1 alpha channel, meaning the format supports transparency values.

Parameter	Description
	<div style="border: 1px solid green; padding: 10px;"> <p> NOTES</p> <ul style="list-style-type: none"> • It is important to specify the output format. If no output format is specified, utransform will not use the output format specified in the extension of the output file. Instead, it will either output in TGA or TVG format, depending on the parameters. • For formats that have variants, merely specifying the file extension will also work. It will output images with standard colour depth (8 bits per channel) in solid colour (3 channels). • Some of these formats are Toon Boom formats: <ul style="list-style-type: none"> • VAR is a legacy Toon Boom format for greyscale bitmap images. • OPT is a legacy Toon Boom format for bitmap images with various channel configurations. • SCAN is the format in which the Scan application records image data from a scanner. It is a greyscale bitmap format that also contains scanning metadata such as the registration, resolution and field chart of the drawing. • TVG is the standard image format used by Toon Boom applications for vector drawings as well as Toon Boom bitmap drawings. </div>
<p>-outfile <file name></p>	<p>The path and name of the file to output. By default, output files will have the same name as their input files and will be output in the same directory, with the only difference being their file extension.</p> <div style="border: 1px solid green; padding: 10px;"> <p> NOTE</p> <p>If processing multiple files, this option will be ignored.</p> </div>

Image Processing Parameters

The following options can perform routine transformations on images.

Parameter	Description
<p>-resolution <width> <height></p>	<p>The dimensions of the output image, in pixels.</p>

Parameter	Description
	<div data-bbox="656 285 1430 422" style="border: 1px solid #c8e6c9; padding: 10px;">  NOTE This option only works if the output file is a regular bitmap. </div>
<p><code>-resolution scan</code></p>	<p>Determines the dimensions of the output image based on its scan metadata. This is useful when unvectorizing images that were initially vectorized after being scanned, as Harmony records the dimensions of scanned images in the drawing's metadata.</p> <div data-bbox="656 646 1430 814" style="border: 1px solid #c8e6c9; padding: 10px;">  NOTE This option only works if the input file is a Toon Boom Vector Graphic (. tvg) file and the output file is a regular bitmap. </div>
<p><code>-move <x> <y></code></p>	<p>Offsets the input image from the centre of the frame. x is the horizontal offset and y is the vertical offset. Both values are in pixels. A positive x offset will move the image towards the right, and a positive y offset will move the image towards the top.</p>
<p><code>-scale <factor></code></p>	<p>The scale factor to apply to the input image. The default value is 1 (no scaling).</p> <div data-bbox="656 1171 1430 1371" style="border: 1px solid #c8e6c9; padding: 10px;">  NOTE This will not affect the dimensions of the output image. Hence, when scaling up, the image is liable to be cropped, and when scaling down, the image may have padding around it. </div>
<p><code>-xscale <factor></code></p>	<p>The horizontal scale factor to apply to the input image.</p>
<p><code>-yscale <factor></code></p>	<p>The vertical scale factor to apply to the input image.</p>
<p><code>-turn <angle></code></p>	<p>Rotates the input image by the specified angle in degrees. A positive value will rotate the image counterclockwise, and a negative value will rotate it clockwise.</p> <div data-bbox="656 1745 1430 1881" style="border: 1px solid #c8e6c9; padding: 10px;">  NOTE This option only works if the output file is a regular bitmap. </div>

Parameter	Description
<pre>-ps <input format> <output format></pre>	<p>Converts the shape of the pixels in the image for use with analog television formats. The pixel shape of the input image and of the output image must be specified to make the conversion. The following formats are supported:</p> <ul style="list-style-type: none"> • square • NTSC • PAL
<pre>-bgcolor <red> <green> <blue></pre>	<p>The background colour to apply to the background if the input image has transparent pixels. By default, the output image will be laid on solid white.</p> <p>The colour values can be expressed in integers ranging from 0 to 255 or in decimals ranging from 0.0 to 1.0.</p> <div data-bbox="657 863 1429 1003" style="border: 1px solid #c8e6c9; padding: 5px;">  <p>NOTE This option only works if the output file is a regular bitmap.</p> </div>
<pre>-bgalpha <alpha></pre>	<p>The alpha value of the background if the input image has transparent pixels. By default, the background will be fully opaque.</p> <p>The alpha value can be expressed in an integer ranging from 0 to 255 or a decimal ranging from 0.0 to 1.0.</p> <div data-bbox="657 1247 1429 1413" style="border: 1px solid #c8e6c9; padding: 5px;">  <p>NOTE This option only works if the output file is a regular bitmap and its format supports alpha.</p> </div>
<pre>-premultiply <mode></pre>	<p>The way the colour values of pixels is encoded relative to their alpha value. This parameter has two possible uses:</p> <ul style="list-style-type: none"> • To indicate the premultiplication type of the source image when converting a regular bitmap image to a Toon Boom bitmap (. tvb). • To set the premultiplication type of the output image when converting a Toon Boom Bitmap (. tvb) to a regular bitmap image (with the -bitmaponly option). <p>This parameter supports the following premultiplication modes:</p> <ul style="list-style-type: none"> • straight: The colour values are not encoded raw regardless of

Parameter	Description
	<p>their opacity ratio.</p> <ul style="list-style-type: none"> • black: The colour values are multiplied by their opacity ratio, meaning they are encoded as darker if they are semi-transparent. • white: The colour values are divided by their opacity ratio, meaning they are encoded as lighter if they are semi-transparent. <div data-bbox="657 520 1429 688" style="border: 1px solid green; padding: 5px;">  <p>NOTE When exporting Portable Network Graphics (.png) files, the image is always encoded with no premultiplication (straight).</p> </div>

Vector to Bitmap Parameters

Rendering Parameters

The following parameters affect how a Toon Boom Vector Graphic (.tvg) image is rendered into a bitmap.

Parameter	Description
<pre>-antialiasing <quality> <exponent></pre>	<p>Specify the antialiasing quality and exponent when converting vector images to bitmaps.</p> <p>The quality determines the method used to apply antialiasing:</p> <ul style="list-style-type: none"> • low: Disables antialiasing, but renders transparency. • medium-low: Renders vector artwork with basic antialiasing. • medium: Renders vector shapes with improved antialiasing. Bitmap texture fills will appear blurred. • high: Renders vector shapes with improved antialiasing, without blurring bitmap texture fills. <p>The exponent determines how much the image is scaled up before antialiasing is applied onto it, to then be scaled down. The higher the value, the sharper the edges will come out. This value can range between 0 and 3. This value is only applied with medium or high quality antialiasing.</p>
<pre>-nolinetexture</pre>	<p>Ignores the bitmap texture in brush strokes and vectorized line art, rendering them solid.</p>

Parameter	Description
	<div style="border: 1px solid green; padding: 5px;">  NOTE This does not affect textured pencil lines. </div>
-nolineart	Does not render the line art layer.
-nocolorart	Does not render the colour art layer.
-bitmapartonly	<p>Only renders bitmap art layers. This can be used when converting from a Toon Boom Bitmap to a regular bitmap.</p> <p>If the input file only has one art layer and this art layer is of Toon Boom bitmap type, the artwork is converted as-is, with its output resolution matching its canvas size.</p> <p>If the input file has multiple art layers of the Toon Boom bitmap type, the art layers are merged together before the final conversion. The resolution of the output image will be based on either one of the following:</p> <ul style="list-style-type: none"> • The canvas size of the line art layer in the input file, if there is one and if it is a bitmap art layer. • The bottom most bitmap art layer in the input file, if there is no line art layer or if the line art layer is not bitmap. <div style="border: 1px solid green; padding: 5px;">  NOTE This parameter ignores the -resolution parameter. </div>

Show Strokes Parameters

The following parameters can be used to render invisible strokes, the contour of brush strokes and the centrelines of pencil lines with a colour to make them visible.

Parameter	Description
-showstrokes	Renders the contour of line art and centrelines in colour so that it's visible in the output image.
-thickness	<p>Sets the thickness of the contours of line art and centerlines.</p> <p>If unspecified, the default thickness is 1.</p>

Parameter	Description
<pre>-lineartstrokescolor <red> <green> <blue> <alpha></pre>	<p>Sets the colour in which to render the strokes in the line art. The colour is defined in red, green, blue and alpha values.</p> <p>If unspecified, the default colour of line art strokes is green (0 255 0 255).</p>
<pre>-colorartstrokescolor <red> <green> <blue> <alpha></pre>	<p>Sets the colour in which to render the strokes in the colour art. The colour is defined in red, green, blue and alpha values.</p> <p>If unspecified, the default colour for colour art strokes is cyan (0 255 255 255).</p>

Alignment Parameters

The following parameters affect how a Toon Boom Vector Graphic (. **tv**g) file is aligned and proportioned when rendered into a bitmap canvas.

Parameter	Description
<pre>-align <rule></pre>	<p>Determines how the vector artwork is laid out within its canvas.</p> <p>The following rules are available:</p> <ul style="list-style-type: none"> • AS_IS • CENTER_TB • CENTER_LR • CENTER_FIRST_PAGE_HORIZONTAL • CENTER_FIRST_PAGE_VERTICAL • TOP • BOTTOM • LEFT • RIGHT • AUTO_ALIGN <p>The bitmap will be made to fit inside a Harmony scene in a drawing layer with this alignment rule in its properties.</p> <p>While most of these options will align the drawing relative to their internal canvas, AUTO_ALIGN will automatically centre the artwork inside a canvas that is adjusted to its size and add a margin around it.</p>

Parameter	Description
<code>-dpi <dpi></code>	<p>Use this option to define the output resolution for the bitmap image in dots per inch.</p> <p>The default resolution is 75 DPI.</p>
<code>-paper_size <inches></code>	<p>The size of the paper in inches.</p> <p>The default size is 12.</p>
<code>-margin <fields></code>	<p>The number of fields to add as margin around the output Toon Boom drawing (. <code>tvgn</code>) file. If unspecified, this is set to 8.</p> <div data-bbox="657 705 1429 873" style="border: 1px solid green; padding: 5px;"> <p> NOTE This parameter only affects the output when used with the <code>-align</code> parameter set to <code>AUTO_ALIGN</code>.</p> </div>
<code>-element_size <fields></code>	<p>The field size of the element.</p> <div data-bbox="657 995 1429 1163" style="border: 1px solid green; padding: 5px;"> <p> NOTE This parameter only affects the output when used with the <code>-align</code> parameter set to <code>AUTO_ALIGN</code>.</p> </div>
<code>-sar <scene aspect ratio></code>	<p>The aspect ratio of the scene to use for processing drawings.</p> <p>The default aspect ratio is 1.33333. You should use 1.77777 for 16:9 scenes.</p> <div data-bbox="657 1373 1429 1604" style="border: 1px solid green; padding: 5px;"> <p> NOTE This parameter only affects the output when used with the <code>-align</code> parameter set to <code>CENTER_FIRST_PAGE_HORIZONTAL</code>, <code>CENTER_FIRST_PAGE_VERTICAL</code> or <code>AUTO_ALIGN</code>.</p> </div>
<code>-printbox</code>	<p>Outputs the coordinates of the input drawing's bounding box to the terminal, in the following format:</p> <p style="text-align: center;"><code>x1 y1 x2 y2</code></p> <p>Where <code>x1</code> and <code>y1</code> are the <code>x</code> and <code>y</code> coordinates of the bottom-left corner of the box, and <code>x2</code> and <code>y2</code> are the <code>x</code> and <code>y</code> coordinates of the top-right corner of the box.</p>

Parameter	Description
	<div style="border: 1px solid green; padding: 10px;">  <p>NOTE</p> <p>These coordinates are in <i>model</i> coordinates. In a 4:3 12 fields grid, a horizontal field is equal to 208.333 units and a vertical field is equal to 156.25 units.</p> </div>
<code>-box <x1> <y1> <x2> <y2></code>	The bounding box to use when aligning the drawing before rendering it, instead of its normal bounding box. The box is drawn using the x and y coordinates of its bottom-left corner followed by the x and y coordinates of its top-right corner.
<code>-crop</code>	<p>Adjusts the canvas of the output image to include all of the artwork in the input drawing and to trim out the negative space.</p> <p>Also outputs the information about the cropping of the image in XML format. The information is output to the terminal, as well as in an <code>.xml</code> file named after the output file with the suffix <code>.xml</code>.</p>

PDF Output Parameters

The following parameter is the only parameter that will affect the output when outputting Portable Document Files (`.pdf`).

Parameter	Description
<code>-fieldsize <field size></code>	<p>Sets the amount of fields to render PDF files in. This will crop or extend the canvas of the image inside the PDF document if the value is different than the source image's field size.</p> <p>The default field size is 12.</p>

Vector to Vector Options

Centerline Parameters

The following parameters are for extracting the centerline from a drawing's line art layer and storing it as strokes in the colour art layer.

Parameter	Description
<code>-centerline</code>	Extracts the centreline of the drawing's line art and store it as strokes in the colour art, so that they can be painted.
<code>-keepcolorart</code>	When extracting the centreline from the line art, preserve the artwork in the colour art layer and put the extracted centreline over it.
<code>-nofitcolorart</code>	Does not generate Bezier curves for the colour art. The resulting colour art will be made of straight line segments.
<code>-closegap</code>	Automatically adds strokes to close small gaps in the colour art.
<code>-gaplength</code>	Defines the maximum size of gaps to close. The default value is 10.
<code>-hairpasses</code>	The amount of passes to perform on the colour art to remove its hair. Hairs are useless strokes extending from closed shapes. The default value is 2.
<code>-hairlength</code>	The maximum length of hair to remove from the artwork. The default value is 20.

Colour Art Generation Parameters

Like `-centerline`, the following options will extract the centreline from an art layer and store it in another layer. This option has more flexibility on which art layers are used and how the centreline is generated.

Parameter	Description
<pre>-arttoart <source art> <destination art> <max resolution> <threshold> <fitting error></pre>	<p>Creates colour art based on the selected source art layer, and outputs it to the selected destination art layer, removing any existing artwork in that layer prior.</p> <p>To reproduce the effect of the Create Colour Art from Line Art command in Harmony, simply use it with the following parameters:</p> <pre style="text-align: center;">-arttoart 4 2 2500 0.25 1</pre> <p><source art>: The art layer containing the line art to base the colour art on. The value is one of the numbers used in the back-end to identify art layers:</p> <ul style="list-style-type: none"> • 1: Underlay Art • 2: Colour Art

Parameter	Description
	<ul style="list-style-type: none"> • 4: Line Art • 8: Overlay Art <p><destination art>: The art layer in which to remove existing line art and output the generated colour art. Uses the same numbering system as the one for the source art parameter.</p> <p><max resolution>: The maximum size in pixels, of either dimension of the rasterized image that is created to generate the colour art. If too low, thin lines will either be ignored or cut up along their length. This setting should be at least as high as the width at which the drawing is intended to be rendered. In Harmony, this parameter is set to 2500 by default.</p> <p><threshold>: The factor that determines the level of detail to take in account to create the colour art. The higher this setting is, the less detailed but the more manageable the colour art will be. The lower it is, the more details will be included in the colour art. In Harmony, this parameter is set to 0.25 by default.</p> <p><fitting error>: Reduces the amount of detail in the colour art by converting sequences of points fit curvilinear shapes into curved segments. In Harmony, this parameter is set to 1 by default.</p>

Matte Generation Parameters

The following parameters can be used to generate a matte. A matte is a shape that matches the outlines of the artwork and is filled with a solid colour. Contrary to typical colour art, a matte does not have different colour zones for a single drawing, and does not require the line art to have a closed shape, so it is useful to fill sketches.

Parameter	Description
<pre>-automatte <source art> <destination art> <radius></pre>	<p>Generates a matte based on the source art layer and puts it in the destination art layer.</p> <p>The radius is the size of the sample used to generate the matte. A lower radius means the matte will be generated with higher precision.</p> <div data-bbox="657 1629 1430 1837" style="border: 1px solid green; padding: 10px;"> <p> NOTE</p> <p>The radius is expressed in <i>model coordinates</i>. On a 4:3 12 fields grid, a horizontal field is equal to 208.333 units and a vertical field is equal to 156.25 units.</p> </div> <p>The source and destination art layers can be specified with the following</p>

Parameter	Description
	<p>keywords:</p> <ul style="list-style-type: none"> • overlayart • lineart • colorart • underlayart <div style="border: 1px solid green; padding: 5px; margin-top: 10px;">  <p>NOTE The matte will be filled with a non-indexed colour. You will hence be prompted to perform colour recovery when viewing the drawing in Harmony.</p> </div>
-copystrokes	When generating a matte, copy the strokes from the source layer onto the matte in the destination layer, preserving the defined colour zones.

Art Layer Parameters

The following parameters can be used to manipulate the different art layers in a Toon Boom Vector Graphic (. **tv**g) file.

Parameter	Description
-addlineart <drawing>	<p>Adds the specified drawing to the output file's line art layer.</p> <p>If the drawing is a Toon Boom Vector Graphic (. tvg) file, it will use that drawing's line art layer by default.</p>
-uselayer <art layer>	<p>When using the -addlineart option to add a Toon Boom Vector Graphic (. tvg) file to a drawing's line art layer, this parameter can be used to specify which art layer in the source drawing to add to the target drawing's line art layer. Otherwise, the source drawing's line art layer will be used.</p> <p>The following values are supported:</p> <ul style="list-style-type: none"> • overlayart • lineart • colorart • underlayart

Parameter	Description
<code>-addcolorart <drawing></code>	<p>Adds the specified drawing to the output file's colour art layer.</p> <p>If the drawing is a Toon Boom Vector Graphic (. tvg) file, it will use that drawing's line art layer by default.</p>
<code>-usecolorartlayer <art layer></code>	<p>When using the <code>-addcolorart</code> option to add a Toon Boom Vector Graphic (. tvg) file to a drawing's colour art layer, this parameter can be used to specify which art layer in the source drawing to add to the target drawing's colour art layer. Otherwise, the source drawing's line art layer will be used.</p> <p>The following values are supported:</p> <ul style="list-style-type: none"> • overlayart • lineart • colorart • underlayart
<code>-addoverlay <drawing></code>	<p>Adds the specified drawing to the output file's overlay art layer.</p> <p>If the drawing is a Toon Boom Vector Graphic (. tvg) file, it will use that drawing's line art layer by default.</p>
<code>-useoverlaylayer <art layer></code>	<p>When using the <code>-addoverlay</code> option to add a Toon Boom Vector Graphic (. tvg) file to a drawing's overlay art layer, this parameter can be used to specify which art layer in the source drawing to add to the target drawing's overlay art layer. Otherwise, the source drawing's line art layer will be used.</p> <p>The following values are supported:</p> <ul style="list-style-type: none"> • overlayart • lineart • colorart • underlayart
<code>-addunderlay <drawing></code>	<p>Adds the specified drawing to the output file's underlay art layer.</p> <p>If the drawing is a Toon Boom Vector Graphic (. tvg) file, it will use that drawing's line art layer by default.</p>
<code>-userunderlaylayer <art layer></code>	<p>When using the <code>-addunderlay</code> option to add a Toon Boom Vector Graphic (. tvg) file to a drawing's overlay art layer, this parameter can be</p>

Parameter	Description
	<p>used to specify which art layer in the source drawing to add to the target drawing's underlay art layer. Otherwise, the source drawing's line art layer will be used.</p> <p>The following values are supported:</p> <ul style="list-style-type: none"> • overlayart • lineart • colorart • underlayart
<code>-keep_birmap_transform</code>	<p>When replacing the artwork in a bitmap art layer, this option preserves the geometric transformations that were done on this bitmap art layer with the  Select tool.</p>
<code>-clearlayers <art layers></code>	<p>Removes the artwork from the specified art layer.</p> <ul style="list-style-type: none"> • overlayart • lineart • colorart • underlayart <p>More than one art layer can be specified by separating them with commas, like so:</p> <pre>-clearlayers overlayart,underlayart</pre>

Vector Transformation Parameters

The following parameters can make specific types of transformations to Toon Boom Vector Graphic (. **tv**g) files.

Parameter	Description
<code>-change_color_ids <json file></code>	<p>Replaces colour IDs in the source file with the specified colour IDs.</p> <p>This parameter must be specified with the path to a .json file that specifies the ID of each colour you want to change, followed by the ID you want to replace it with, in the following format:</p> <pre>[{</pre>

Parameter	Description
	<pre> "from" : "source ID", "to" : "destination ID" }, { "from" : "source ID", "to" : "destination ID" }, { "from" : "source ID", "to" : "destination ID" }] </pre>
<pre> -reduce_tvg_texture_ resolution <dots per field> <max size> </pre>	<p>Reduces the internal resolution of textures in Toon Boom drawing (.tvg) files.</p> <ul style="list-style-type: none"> • <dots per field>: The maximum resolution of textures in dots per field, based on horizontal fields. By default, this is set to 72. • <max size>: The maximum size (horizontal or vertical dimension) of textures, in pixels. You can set this to -1 if you do not want to set a maximum size for textures.
<pre> -adjustpencil <multiple> <addition> </pre>	<p>Multiplies the width of pencil lines by <multiple>, then adds <addition> to their width.</p>
<pre> -flatten </pre>	<p>Flattens the artwork, making superposed drawing strokes into single drawing objects, and merging superposed textures together.</p>
<pre> -flatten_scale <scale factor> </pre>	<p>Scales the artwork up by the specified scale factor, flattens it, then scales it back to its original size.</p> <p>This can be useful when attempting to flatten artwork with superimposed textured brush strokes. If the pixels in their bitmap textures are not aligned properly, flattening them may cause some loss of texture quality. Scaling them up before flattening them can circumvent this problem.</p> <p>If using the -flatten option on your artwork causes your bitmap textures to become blurry, it is recommended to use this parameter with at scale factor of at least 4.</p>
<pre> -setfieldsize <field> </pre>	<p>Changes the internal field size of the input drawing.</p>

Parameter	Description
	<p>Typically, a drawing's field size should match the field size of the element that contains it in order to appear the right size in the scene. By default, both drawings and elements have a field size of 12. If the field size of the element is bigger than the field size of the drawing, the drawing will appear bigger. If the field size of the drawing is bigger than the field size of the element, the drawing will appear smaller.</p>
-normalize	<p>Normalizes the size of the drawing relative to its field size. This scales the artwork up or down so that it fits an element that is 12 fields in size, then sets the internal scaling of the drawing to 1. If the drawing's field size is bigger than 12, it will be scaled up. If the drawing's field size is smaller than 12, it will be scaled down.</p>
-bboxvgincrease <percentage>	<p>A legacy option that would increase the bounding box of vector artwork. It is only left in to preserve for compatibility with legacy scripts.</p>

About Exporting Layouts as Bitmap Using utransform



If you wish to export a layout in bitmap format

Once your backgrounds are done in a Toon Boom application, you are ready to paint them. You can paint your backgrounds within the software, or export them to a third-party bitmap software to paint.

There are two techniques for exporting vector black and white backgrounds:

- Render Network
- utransform and Exporting a Panoramic Background

Render Network

To export your background image, you can add a Write node to your network and use the Render Write Node option to export the frame where your background is. The background image will be exported and cropped to the scene resolution.

If you have a panoramic background, use the utransform utility to export your image.

utransform and Exporting a Panoramic Background

The utransform utility is able to do some format conversions and limited image processing.

By default, the utransform utility will convert the strokes and colour zones that are within the 12 field chart. If you have extra artwork outside of the 12 field, you will have to scale down the drawing using the utransform utility in order to fit it in the 12 field zone, and enlarge the bitmap export resolution.

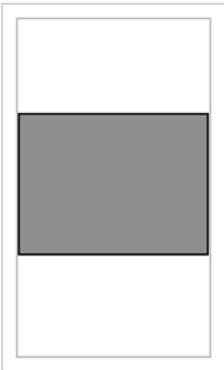
The panoramic background export will work with the alignment rule of your background drawing in your Toon Boom software.

There are several alignment rules to consider:

- Centre Top and Bottom
- Centre Left and Right

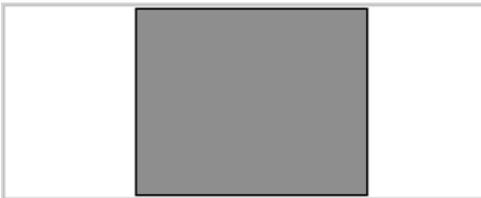
- Centre First Page Horizontal
- Centre First Page Vertical
- Left
- Right
- Top
- Bottom

Centre Top and Bottom



The Centre Top and Bottom rule is used for a vertical pan background where the default scene's 12 field is placed at the centre of the drawing.

Centre Left and Right



The **Centre Left and Right** rule is used for a horizontal pan background where the default scene's 12 field is placed at the centre of the drawing.

Centre First Page Horizontal



The Centre First Page Horizontal rule is used for a horizontal pan background where the default scene's 12 field is placed at the far left of the drawing.

Centre First Page Vertical

The Centre First Page Vertical rule is used for a vertical pan background where the default scene's 12 field is placed at the very bottom of the drawing.

Left

The Left rule is the default alignment for drawings. It aligns the drawings with the left side of the scene's alignment rectangle. Harmony scales the drawings to match their heights to the alignment rectangle of the scene.

Right

The Right rule aligns the drawings with the right side of the alignment rectangle. Harmony scales the drawings to match their heights to the alignment rectangle of the scene.

Top



The Top rule aligns with drawings with the top of the alignment rectangle. Toon Boom Animate scales the drawings to match their widths to the width of the alignment rectangle of the scene.

Bottom



The Bottom rule aligns the drawings with the bottom of the alignment rectangle. Toon Boom Animate scales the drawings to match the drawings' width to the width of the alignment rectangle of the scene.

How to Export a Layout as Bitmap Using utransform

The As Is alignment rule is used when you have artwork outside every edge of the 12 field size, such as a Safety Paint edge.

To properly export your background and re-import it so that it fits precisely into your scene, you have to provide utransform with the exact resolution that you want the file to be, since you are passing from a vector based image to a bitmap image.

There are a few rules that will help you understand the calculation that you must perform:

- 1 field width equals one inch.
- A 12 field chart has a twelve inch width.
- If you scale your drawing down to fit in the 12 field, you will have to enlarge the output resolution so that the final image has the same size as the original drawing (*which is not problematic since the source is vector-based*).
- When you re-import your painted background, the bitmap file will be fitted in the 12 field size. You will have increased the field size so that it fits the original image size.

To find the scale and DPI that you will need to export your image, you will need the following information:

- The field size of the drawing.
- The scene resolution.

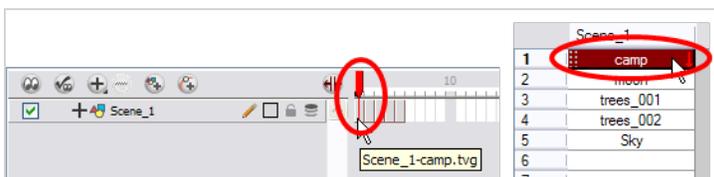


NOTE

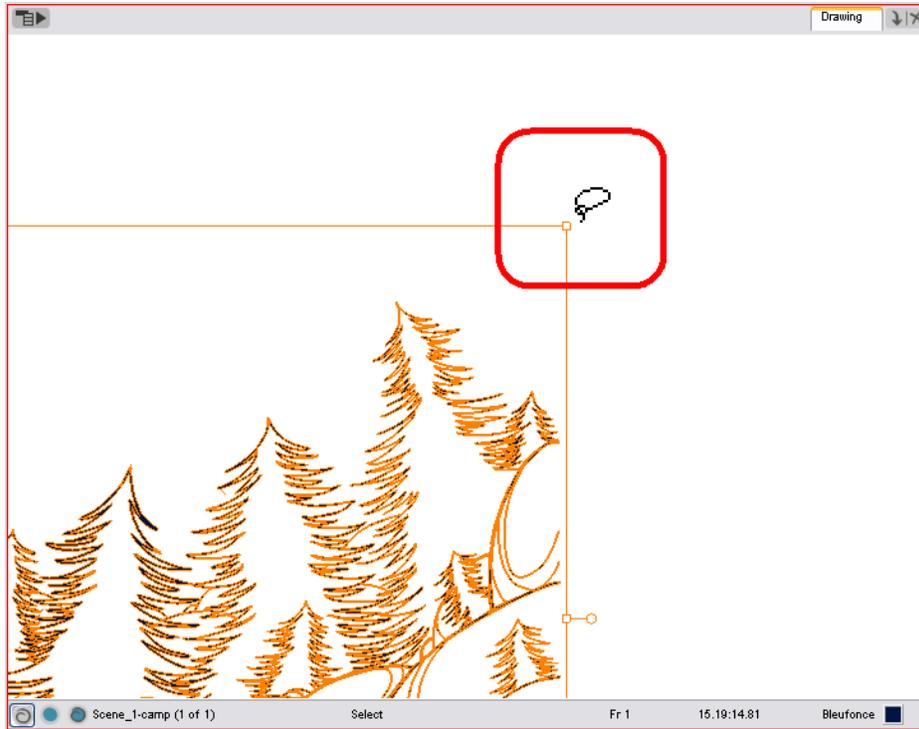
Note that this process will work with a 12x12 scene alignment and when using Harmony.

To export a .tvg file to bitmap using the As Is alignment:

1. In the Timeline or Xsheet view, select the cell that contains the drawing that you want to export.



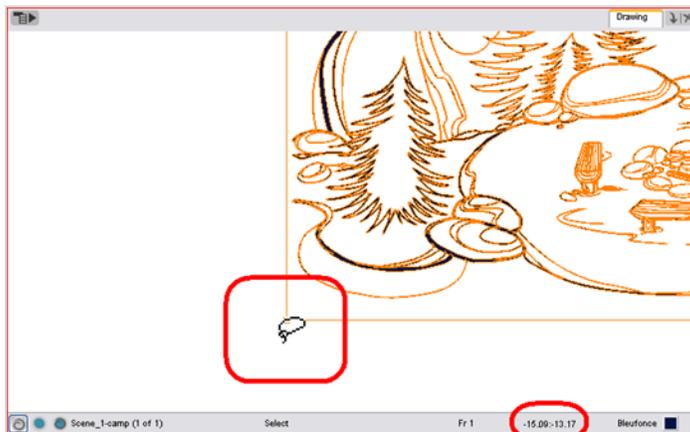
2. In the Tools toolbar, choose the **Select**  tool. The default keyboard shortcut is [Alt]+[V].
3. In the Drawing view, select all of your drawing strokes. Select **Edit > Select All**. The Ctrl + A (Windows/Linux) or ⌘ + A (macOS).
4. In the Drawing view, place your mouse cursor over the top, right corner.



5. From the Drawing view's bottom toolbar, note the X and Y field chart information.



6. Repeat steps 4 and 5 for the bottom, left corner.



7. Once you have all of your field information, select the greatest X and Y values. These will give you the total field size of your drawing. This also tells you the width of your drawing, in inches (1 field width is

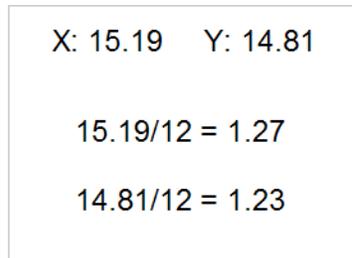
equal to one inch).



8. Divide the X and Y field values by 12 to know how much to scale the image to fit it in the 12 field.

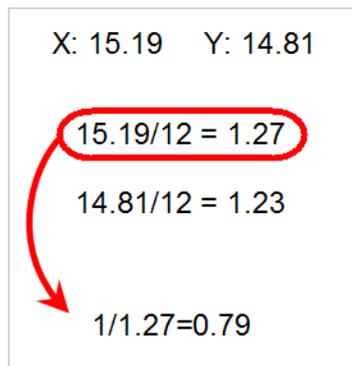
$X/12$ = how much bigger your drawing is than the 12 field

$Y/12$ = How much bigger your drawing is than the 12 field



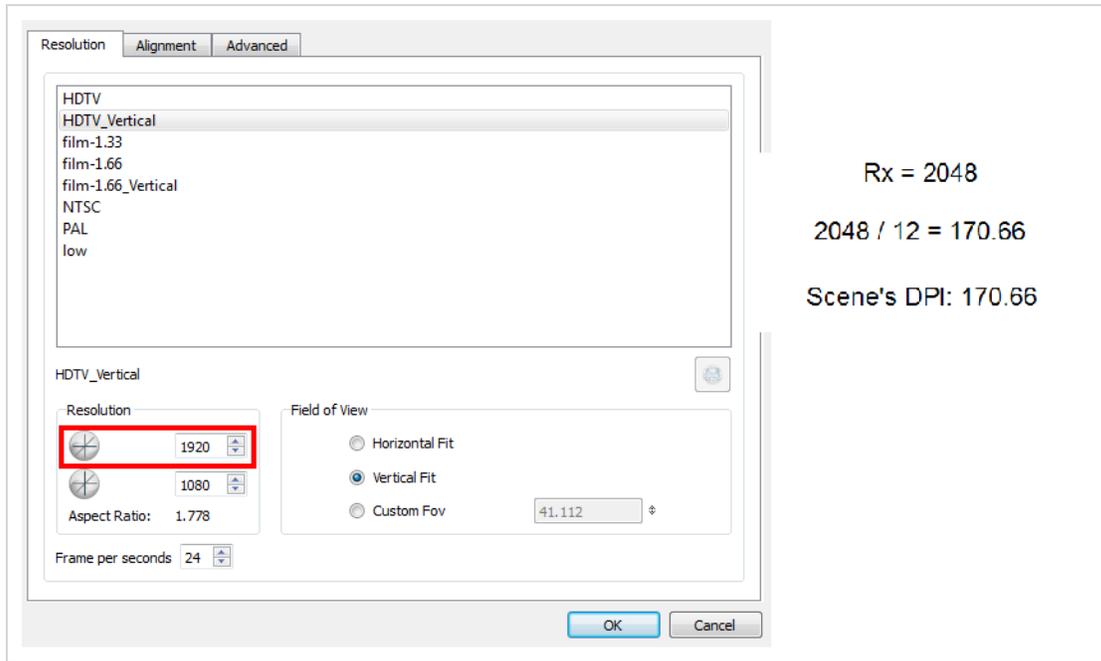
9. Once you have both scaling values, calculate your official scaling value by dividing 1 by the greater of the two values. This will give you the official scaling value to enter into your utransform command line.

$1/(X/12)$ or $1/(Y/12)$ = Scaling Value



10. To enlarge the output resolution, you will have to give a precise amount of DPI. In this case, divide your scene resolution width (Rx) by 12 (fields) to know how many pixels per inch you have.

$Rx/12$ = Pixels per inch.



- Once you have your scene's DPI, you need to enlarge it to re-scale your output to the correct size, since we scaled down the drawing strokes. To do so, multiply the scene's DPI by how much larger the drawing is than the 12 field (X/12) or (Y/12).

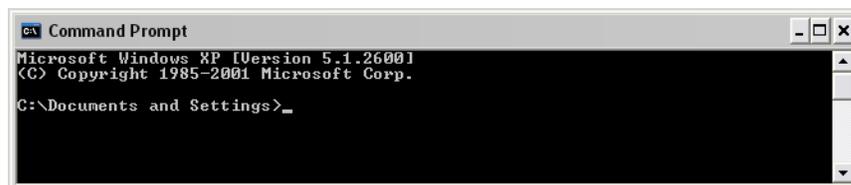
$(Rx/12) \times (X/12)$ or $(Y/12) =$ Amount of DPI needed for the drawing output

$Rx / 12 = 170.66$
 $X / 12 = 1.27$

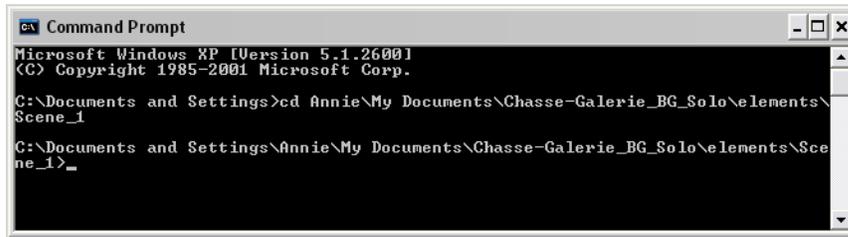
 $170.66 \times 1.27 =$
 216.74

 amount of DPI
 needed for drawing
 output : 216.74

- Once the values are calculated, open the command prompt to launch utransform.



- In the Command Prompt, go to the scene's element directory that contains the *.tvg drawing that you want to convert.



```

Command Prompt
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

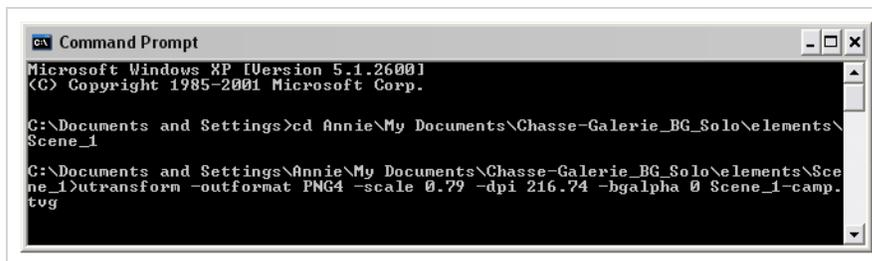
C:\Documents and Settings>cd Annie\My Documents\Chasse-Galerie_BG_Solo\elements\
Scene_1
C:\Documents and Settings\Annie\My Documents\Chasse-Galerie_BG_Solo\elements\Sc
ene_1>_

```

- ▶ Use the `cd` command to go back up one directory.
- ▶ Use the `cd \directory name` command to enter a new directory.
- ▶ Use the `dir` command to see the directories available.

14. Once in your scene's element directory, type:

- ▶ For Windows/Linux: `utransform -outformat file_format_you_need -scale scale_value -dpi dpi_value -bgamma 0 file_name.tvg`



```

Command Prompt
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings>cd Annie\My Documents\Chasse-Galerie_BG_Solo\elements\
Scene_1
C:\Documents and Settings\Annie\My Documents\Chasse-Galerie_BG_Solo\elements\Sc
ene_1>utransform -outformat PNG4 -scale 0.79 -dpi 216.74 -bgamma 0 Scene_1-camp.
tvg

```

- ▶ For macOS: `./utransform -outformat file_format_you_need -scale scale_value -dpi dpi_value -bgamma 0 file_name.tvg`

Here is an example of what your command line should look like:

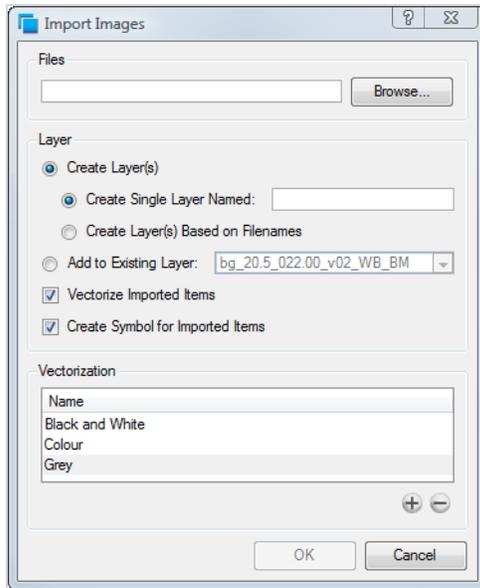
- ▶ For Windows/Linux: `utransform -outformat PNG4 -scale 0.75 -dpi 227.55 -bgamma 0 bg-1.tvg`
- ▶ For macOS: `./utransform -outformat PNG4 -scale 0.75 -dpi 227.55 -bgamma 0 bg-1.tvg`

15. In the operating system, browse to the scene's element folder and open the new bitmap file to paint in third-party software.

To import a `utransform` bitmap background back in Toon Boom Harmony:

1. Open the Toon Boom Harmony scene where the background needs to be imported.
2. To import a bitmap:
 - ▶ In the top menu, select **File > Import > Images**.

The Import Drawings dialog box opens.



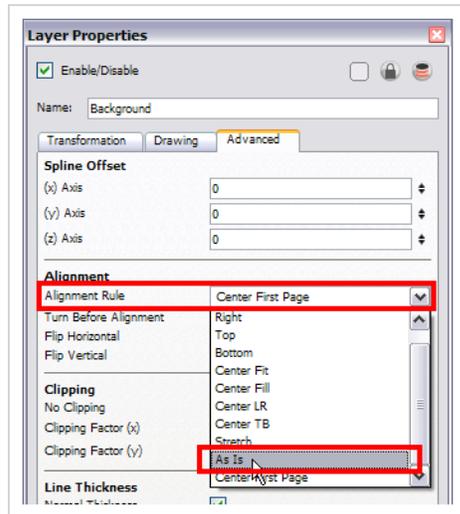
3. Click on the **Browse** button and select your bitmap background file.
4. Click on the **Open** button.
5. You can import the image into an existing element or create a new element.
 - ▶ To import the image into an existing layer, select **Add to Existing Layer** and select the appropriate element from the list.
 - ▶ To import the image into a new element, select **Create Layer(s) > Create Single Layer Named** and type a name for the element in the Name field.
6. Disable the **Vectorize Imported Items** option.
7. Click on the **OK** button.
8. Open the background's layer properties:



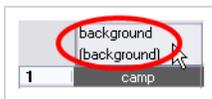
- ▶ In the **Timeline** view, double-click on the background's node.
- ▶ In the **Network** view, click on the background node's yellow square.

The **Layer Properties** dialog box opens.

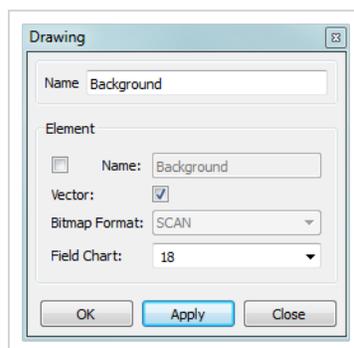
9. In the **Advanced** tab, set the alignment rule to **As Is**.



10. Click on the **OK** button.
11. Open the column editor:
 - ▶ In the **Timeline** view, select the background's layer, right-click and select **Column Properties**.
 - ▶ In the **Xsheet** view, double-click on the background column's header



12. Take your previous (X/12) or (Y/12) value and multiply it by the scene's field to find the correct field size. Enter this into the Field Chart field.
 - ▶ $(X/12)$ or $(Y/12) \times \text{Scene's field}$
 - ▶ To see the Field Chart field, you must enable the **Advanced Element Mode** preference found in the Advanced section of the Preferences panel.



Here is an example of what it should look like: $1.5 \times 12 = 18$

13. Click on the **OK** button.

ConsolidateDb Utility

The ConsolidateDb command line utility allows you to reduce the amount of drawings in your scene by merging the elements that have the same drawings together.

ConsolidateDb works by going through the target scene's elements to detect any pair of elements that contain the same drawings, which typically occurs when importing a template several times or when duplicating layers. If it finds two elements that have the same drawings, it will merge both elements together into a single element.

Merging elements is done by keeping the original element, deleting the duplicate element, and linking the column that was originally linked to the duplicate element to the original element. If the duplicate element has any extra drawings that are not in the original element, those drawings are moved to the original element so that they do not get removed from the scene.

By default, ConsolidateDb will not merge two elements that appear to match if they have at least one drawing with the same name, but different artwork, as it would require renaming one of the drawings to keep both of them in the same element. With the **-renameTiming** option, ConsolidateDb will merge elements even if it has to rename some drawings to keep all of the drawings in both elements. It will also update the Xsheet columns with the new names of the renamed drawings to avoid affecting the rendered image.



NOTE

- This utility only works on one scene at a time. Shell scripts must be used to run ConsolidateDb on an entire job, environment or database.
- ConsolidateDb can also be used on Harmony Stand Alone scenes.
- This utility can also clean up unused elements in the target scene. Refer to the [Parameters](#) table below for a list of available options.



IMPORTANT

- It is possible to add palettes to individual elements, which makes it possible to make two elements with the same drawings use different colours. If two elements have the same drawings but have different palettes, ConsolidateDb will merge them together regardless, which will cause them to use the same palette and may affect the colours of the merged element in the rendered image.
- ConsolidateDb will delete files permanently from the target scene. Although it is designed to avoid affecting the rendered image and to only remove files that are unnecessary, it is highly recommended to make a backup of a scene before running ConsolidateDb on it.

Syntax

When using Harmony Server:

```
ConsolidateDb [options] -env <environment> -job <job> -scene <scene> -user  
<username>
```

When using Harmony Stand Alone:

```
ConsolidateDb [options] <path to scene folder>
```

Examples

```
ConsolidateDb -renameTiming -removeEmptyElements -env myProject -job S03E05  
-scene SC0015 -user jdoe
```

```
ConsolidateDb -removeUnusedElements -verbose 2  
C:\Users\jdoe\Documents\MyScene
```

Parameters

Parameter	Description
Database Scene Location	
-env <environment>	The environment in which the target scene is located.
-job <job>	The job in which the target scene is located.
-scene <scene>	The name of the target scene.
-user <username>	The Harmony user who will perform the consolidation.
Consolidation Options	
-renameTiming	<p>By default, ConsolidateDb will not merge two elements if they contain drawings with the same name, but not the same artwork. With this option enabled, ConsolidateDb will merge elements as long as they have at least one drawing in common.</p> <p>When two drawings have the same name but not the same artwork, one of the drawings is renamed before it is moved to the merged element. This allows ConsolidateDb to keep all the drawings in the both elements without causing any naming conflict.</p> <p>The Xsheet columns will be updated to preserve the exposure of drawings getting renamed. Hence, the rendered image will not be affected.</p>
-removeEmptyElements	By default, even if ConsolidateDb removes all the drawings from an element to merge it into another element, it will not

Parameter	Description
	<p>remove the element's directory. Use this option to delete element directories emptied by ConsolidateDb.</p>
<p>-verbose 1 -verbose 2</p>	<p>Increases the amount of information reported to the terminal while the scene is being consolidated.</p> <p>Verbose mode 1 will output the following information:</p> <ul style="list-style-type: none"> • The origin of each drawing in duplicate elements followed by their destination in the original element. • Each drawing file it deletes. • Whether it deletes each element and why. <p>Verbose mode 2 will output the following information:</p> <ul style="list-style-type: none"> • The origin and destination of each drawing in both the original element and its duplicate elements. • Each drawing it removes from or adds to each column. • Each drawing files it deletes. • Whether it deletes each element and why.
<p>Miscellaneous</p>	
<p>-? -h -help --help</p>	<p>Displays the usage information in the terminal.</p>
<p>-v -version --version</p>	<p>Displays the version information in the terminal.</p>