

# SewArt User's Guide

S & S COMPUTING

# **SewArt User's Guide**

---

© S & S Computing  
100 Winston Lane  
Oak Ridge, TN 37830  
**August 17, 2008**

---

# Table of Contents

<b>INTRODUCTION .....</b>	<b>3</b>
GETTING STARTED: A TUTORIAL FOR DIGITIZING IMAGES WITH SEWART .....	3
CONTACTING US .....	4
FAQ (FREQUENTLY ASKED QUESTIONS) .....	5
<b>MENUS .....</b>	<b>6</b>
FILE MENU COMMANDS .....	6
EDIT MENU COMMANDS .....	6
VIEW MENU COMMANDS .....	7
IMAGE MENU COMMANDS .....	7
OPTIONS MENU COMMANDS .....	7
WINDOW MENU COMMANDS .....	8
HELP MENU COMMANDS .....	8
<b>FILE MENU .....</b>	<b>9</b>
FILE NEW .....	9
FILE OPEN .....	9
FILE CLOSE .....	11
FILE SAVE .....	11
FILE SAVE AS .....	11
FILE EXIT .....	12
<b>EDIT MENU .....</b>	<b>13</b>
UNDO .....	13
PASTE .....	13
<b>VIEW MENU .....</b>	<b>14</b>
GRID .....	14
MAGNIFY .....	15
ZOOM-IN .....	15
ZOOM-OUT .....	15
MAIN TOOLBAR .....	15
STATUS BAR .....	15
TITLE BAR .....	16
<b>IMAGE MENU .....</b>	<b>17</b>
CROP .....	17
ROTATE .....	18
RESIZE .....	19
WIZARD .....	20
REDUCE COLORS .....	25

---

MERGE COLORS .....	27
PAINT BRUSH.....	31
PENCIL .....	32
BUCKET FILL .....	33
CONVERT TO REDWORK .....	36
CONVERT TO STITCHES .....	37
<b>OPTIONS MENU.....</b>	<b>42</b>
UNITS.....	42
PARITY.....	42
<b>WINDOWS MENU .....</b>	<b>43</b>
ALL WINDOWS.....	43
NEW WINDOW .....	43
CASCADE .....	43
TILE .....	43
<b>HELP MENU.....</b>	<b>44</b>
HELP TOPICS.....	44
ABOUT SEWART .....	44
ORDER INFORMATION .....	44
<b>DIGITIZING TOPICS.....</b>	<b>45</b>
AVOID SEWING BACKGROUND .....	45
BLANK CANVAS.....	45
CHANGE FILL PATTERN .....	46
CHANGE COLOR OF PAINT (OR PENCIL) TOOL .....	46
REMOVE SPECKLES FROM AN IMAGE .....	47
RESIZE OR CHANGE DENSITY OF AN EMBROIDERY PATTERN.....	50
<b>TOOLBARS.....</b>	<b>51</b>
SEWART (MAIN) TOOLBAR.....	51
STITCH TOOLBAR.....	53

---



## Introduction

To save time in the future, print a copy of this document. Choose Print from the File menu

### Getting Started: A Tutorial for Digitizing Images with SewArt

**SewArt** is software for converting digital graphics images - which may be stored either in raster (bitmap) or vector format - to a *stitch* file that can be sewn on an embroidery machine. For a list of image formats that **SewArt** can read, see [File Open](#). This process will be referred to as *embroidery digitizing* and the software for doing that (**SewArt**) is called an *auto-digitizer*.

It is advisable to familiarize yourself with the **SewArt** [toolbar](#) buttons. Most of the important operations for the conversion process are accessible by clicking these buttons. The key to obtaining a high-quality embroidery file is to first create an image comprised of uniformly-colored regions. For that reason, **SewArt** has numerous image-processing tools on its toolbar to help in creating images suitable for sewing. Such images will be called *clean images*.

The steps below outline the general procedure for using **SewArt** to convert a digital image into an embroidery file. By clicking the following links in order, you can follow the step-by-step process of image conversion, starting from an image file and ending with an embroidery pattern file. When using this help in such a tutorial fashion, remember to click on the *Home* symbol at the top right of each subtopic page to return to this main page and then proceed to the next step.

#### Steps for converting a digital image to an embroidery file

**Step 1.** From the File menu, click [Open](#) (or from the Edit menu, [paste](#) from the clipboard) to *import* the graphics image to be converted. You may also draw your own graphic image on the [blank canvas](#).

## SEWART USER'S GUIDE

**Step 2.** Use graphics editing tools to process the image to make it suitable for sewing. There are three groups of image processing tools:

**A. Size and position tools**

- [Resize](#) the image. This allows you to work with an image of the same size as the embroidery pattern size to be sewn.
- [Rotate](#) the image (by 90-degree increments) if it is more conveniently viewed in a different orientation.
- [Crop](#) the image if it has excessive white space around it. Working with a smaller image is usually easier.

**B. Color reduction tools**

- [Reduce](#) the number of colors in the image.
- [Merge](#) colors individually or in specified ranges based on the amount of area in the image covered.

**C. Image editing tools**

All these tools can also be used in conjunction with the [magnifier](#) to allow editing of very localized regions of the image.

- Use the [paintbrush](#) to fill small regions of isolated pixels or gaps in the image
- Use the [pencil](#) to darken lines and fill individual pixels in the image
- [Bucket fill](#) larger regions of the image to uniformly blend colors and avoid any fine-scaled (dithering) effects.

**Step 3.** [Save](#) the edited graphic image to a file on disk

**Step 4.** [Convert](#) the graphics image to stitches by clicking on the different color regions to be sewn, possibly using the auto-sew feature, and save the stitch list to an embroidery pattern file

**Step 5.** Edit the embroidery file to join or reorder color blocks, or eliminate short thread runs (this can to be done with an embroidery editor, such as **SewWhat-Pro**©).

## Contacting Us

If you have any questions or comments about the **SewArt** auto-digitizing application, please contact us at the following support email:

[support@sandscomputing.com](mailto:support@sandscomputing.com)

Some frequently asked questions about **SewArt** are answered below:

## SEWART USER'S GUIDE

*How can I tell if I have the latest version of Sew Art?*

Go to the Help/About menu item and compare the version there with the one that is available for download on our website. You can use to *Update* button to go to our website and check there for the most recent version.

*Can I install **SewArt** on more than one computer?*

Yes, the license grants you that privilege, as long as you are the sole user of **SewArt** on all the computers.

*How do I put a copy of **SewArt** onto a laptop that has no internet capability?*

Transfer the installer file (the file you downloaded originally) onto the laptop, using a USB or other transferable drive. Then double-click that file on the laptop and enter your registration information. Alternatively you can purchase **SewArt** on a CD.

*If my computer crashes, how do I get **SewArt** working again?*

You can always download a current version of **SewArt** from the S & S website at <http://sandscomputing.com>. Just download from the Update link there. In such a case, it would have been a good idea to keep a copy of your registration information in a separate, safe location.

## FAQ (Frequently Asked Questions)

### See “How To . . .” Topics in Chapter 10

- [Avoid Sewing the Background Color](#)
- [Change the color of a painting tool](#)
- [Change the fill pattern](#)
- [Get help if you have questions about SewArt](#)
- [Remove speckles to create an image suitable to be sewn](#)
- [Resize or change the density of a design created by SewArt](#)
- [Undo a previous operation](#)
- [Use a "Blank Canvas" to draw your own images](#)

## Menus

To save time in the future, print a copy of this document. Choose Print from the File menu

### File Menu Commands

The File menu offers the following commands:

<a href="#">New</a>	Creates a new blank sewing pattern file.
<a href="#">Open</a>	Opens an existing sewing pattern file.
<a href="#">Close</a>	Closes the presently active pattern file.
<a href="#">Save</a>	Saves an opened image file, using the same file name.
<a href="#">Save As</a>	Saves an opened image file to a specified file name.
<a href="#">Exit</a>	Exits the <b>SewArt</b> application.

### Edit Menu Commands

The Edit menu offers the following commands:

<a href="#">Undo</a>	Reverse (undo) previous editing operation.
<a href="#">Paste</a>	Pastes an image from the Windows clipboard into the <b>SewArt</b> workspace.

## View Menu Commands

The View menu offers the following commands:

<a href="#">Grid</a>	Displays a grid over the image
<a href="#">Magnify</a>	Magnifies around a selected region of the image
<a href="#">Zoom In</a>	Magnifies image on screen
<a href="#">Zoom Out</a>	Shrinks image on screen
<a href="#">Main Toolbar</a>	Shows or hides the main toolbar.
<a href="#">Status bar</a>	Shows or hides the status bar.

## Image Menu Commands

The Image menu offers the following image-manipulation commands:

<a href="#">Rotate</a>	Rotate image in 90-degree increments
<a href="#">Crop</a>	Remove unwanted areas of an image for easier editing.
<a href="#">Resize</a>	Resize image to width of desired embroidery pattern
<a href="#">Reduce Colors</a>	Reduce number of distinct colors in image
<a href="#">Merge Colors</a>	Merge individual colors in the image
<a href="#">Paint Brush</a>	Blends existing colors
<a href="#">Pencil</a>	Fills in single pixels or lines
<a href="#">Fill Region</a>	Fills in a large region with a uniform color
<a href="#">Convert to Redwork</a>	
<a href="#">Convert to Stitches</a>	Converts the graphics image to an embroidery pattern file

## Options Menu Commands

The Options menu offers the following commands for setting project options:

<a href="#">Units</a>	Choose to use metric or Imperial units of length
<a href="#">Parity</a>	Choose between left- and right-handed tool icons

## Window Menu Commands

The Window menu offers the following commands, which enable you to arrange multiple views of multiple documents in the application window:

<a href="#">New</a>	Creates a new window that views the same document.
<a href="#">Cascade</a>	Arranges windows in an overlapped fashion.
<a href="#">Tile</a>	Arranges windows in non-overlapped tiles.
<a href="#">Windows 1, 2, ...</a>	Goes to specified window.

## Help Menu Commands

The Help menu offers the following commands, which provide assistance for using **SewArt**:

<a href="#">Help topics</a>	Offers you an index to topics on which you can get help.
<a href="#">About SewArt</a>	Displays the version number of this application.
<a href="#">Order Information</a>	Describes how to order the commercial version of this software.

## File Menu

Use these menu items to open and save both image files and sewn embroidery files.

### File New



Use this command to create a new document workspace for opening a new [blank canvas](#). You can open an existing image with the [Open command](#).

### File Open



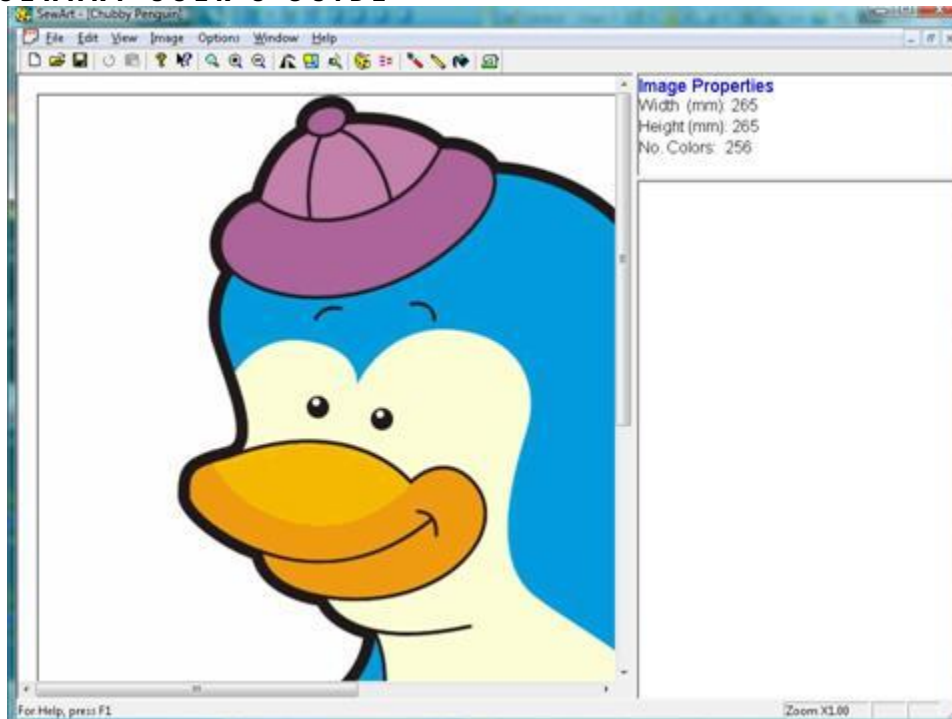
Use this command to open an existing graphic file in a new window. You can open multiple files at once, and each will occupy a separate window. Use the Window menu to switch among the multiple open images.

**SewArt** will allow you to open several raster file types (\*.bmp, \*.png, \*.jpg, \*.gif, \*.tif) as well as vector formats (\*.emf, \*.wmf). When you use this command, **SewArt** displays a file open dialog so you can select the pattern file(s) to open.

Alternatively, you can open an existing document by selecting it from the most recently used (MRU) file list in the File menu, if it was recently opened.

The figure below shows the image file *Chubby Penguin.jpg* after it has been opened by **SewArt**. (This image is used here with permission from [Clipartpolis](#)). The image is surrounded by a *bounding rectangle* which shows the editable region of the image. We have chosen a (*raster*) JPG file because it illustrates many of the necessary image reduction features that **SewArt** can apply. Beginning users might want to consider simpler *vector* graphics files that are available for free download - and without copyright restrictions - from several websites. They will require less image manipulation to produce a suitable image for sewing.

## SEWART USER'S GUIDE



On the right of the **SewArt** workspace is the Information pane which displays the image dimensions (265 mm X 265 mm for this example) and the number of colors initially present in the image. Automatic [color reduction](#) to 256 or fewer colors is done by **SewArt** when the file is opened.

Note the vertical and horizontal scroll bars that appear automatically when the image size is larger than the active workspace. These are used to move (scroll) to a part of the image that is not visible on the screen. The scroll bars will disappear whenever the image size is equal to, or less than, the workspace dimensions. The actual image may be [resized](#) (which is recommended) to the desired size of the final pattern. Also, the screen size of the image can be changed by using the [magnifier glass](#) or the [Zoom In/Zoom Out](#) tools on the toolbar.

If you have a graphics file in a format that is not currently supported by **SewArt**, you can still import it into **SewArt** by using the Edit menu [paste](#) command. For example, you may use MS Paint® to open a TIFF file, select it, and then copy it to the clipboard at which time it can be pasted into an empty **SewArt** workspace.

You can create a new blank workspace with the [File New command](#).

## File Close



Use this command to close all windows containing the active document. **SewArt** suggests that you save changes to your document before you close it. If you close a document without saving, you lose all changes made since the last time you saved it. Before closing an untitled document, **SewArt** displays the file save-as dialog and suggests that you name and save the document.

You can also close a document by using the Close icon on the document's window.

## File Save



Use this command to save both image files and stitch files. Which one gets saved depends on the active mode of operation of **SewArt** at the time the Save command is issued.

1. For any **SewArt** mode *except* the stitching mode, *Save* will write the edited image to either a compressed image (png) file or a Windows bitmap (\*.bmp) file. When you save a document for the first time, **SewArt** displays the [File Save As](#) dialog so you can name your image file and select the type to save to.
2. When **SewArt** is in *Stitch Mode*, *Save* will write the stitches you have created to an embroidery pattern file. You may choose from one of three popular file formats Brother® (\*.pes), Janome® (\*.jef) or Singer® (\*.xxx): (This can be converted later in an embroidery file editor to whatever convenient format you need.) Along with this embroidery file, a file containing the stitch list information will also be saved with the extension \*.saf. When you reopen the image file at some later time, the previous stitch listed can be loaded, too. The first time that *Save* is used from *Stitch Mode*, **SewArt** will display a special form of the [File Save As](#) dialog to allow you to choose the name for the pattern file and select its format and its size (if it should be different from the image size).

## File Save As

In **SewArt**, the Save As command performs a dual role, depending on the active *mode* at the time the command is issued.

1. When **SewArt** is in any mode *except* for the *Stitch Mode*, use this command to save and name the image as either a compressed image file (\*.png) or a Windows bitmap

## SEWART USER'S GUIDE

(\* .bmp) file. **SewArt** displays the standard file save-as dialog box so you can name your image file and select its file type. It is **strongly** recommended to save using the \*.png (portable network graphics©) format, which compresses the file by as much a 100 times, compared to the \*.bmp bitmap format.

2. When **SewArt** is in *Stitch Mode*, use this command to save and name the stitch pattern file (see the dialog below). Both the File name and its type (\*.pes, \*.jef, or \*.xxx) can be set here. In addition there are two further options that effect how the pattern file is saved:

- specify a *Design Scale Factor* for scaling the pattern file relative to the image file. The pattern size will be displayed next to the box where you enter this numerical factor. A value larger than 1.0 will create a pattern file larger than the image file, and vice versa.
- specify the minimum number of stitches in a color block that **SewArt** will sew out to the pattern file. The default is 4.



To save an image or a pattern file with its existing name and directory, use the [Save command](#).

## File Exit



Use this command to end your **SewArt** session. You can also use the Close command on the application Control menu. **SewArt** prompts you to save documents with unsaved changes.

## Edit Menu

Use these menu items to Undo image editing operations and to paste images from the Windows clipboard into SewArt.

### Undo



Use this command to reverse the last editing action, if possible. **Important:** The Undo command is dimmed on the menu or toolbar (it is unavailable) if there are no actions to reverse *or* if you are in Stitch Mode. In **SewArt**, the following operations may be undone (the last several - usually up to 10 - operations can be reversed this way):

Undo Operation	Effect of Undo
Rotate	Rotate image back by -90 degrees
Resize	Restore image to previous size
Reduce Colors	Restore previous number of colors
Merge Colors	Restore color state prior to merge
Paint Brush	Erase last paint operation
Pencil	Erase last pencil click (or line drag)
Bucket Fill	Erase last filling operation

Type Ctrl-Z as a short-cut for this common operation.

### Paste



Use this command to insert a graphic of an image that was *copied* to the clipboard from another application (like MS® Paint). This command is unavailable (dimmed out) if the clipboard is empty or if there is already an image in the workspace.

This command may be used to copy an image from a file type that is not supported by **SewArt** into an empty (new) workspace.

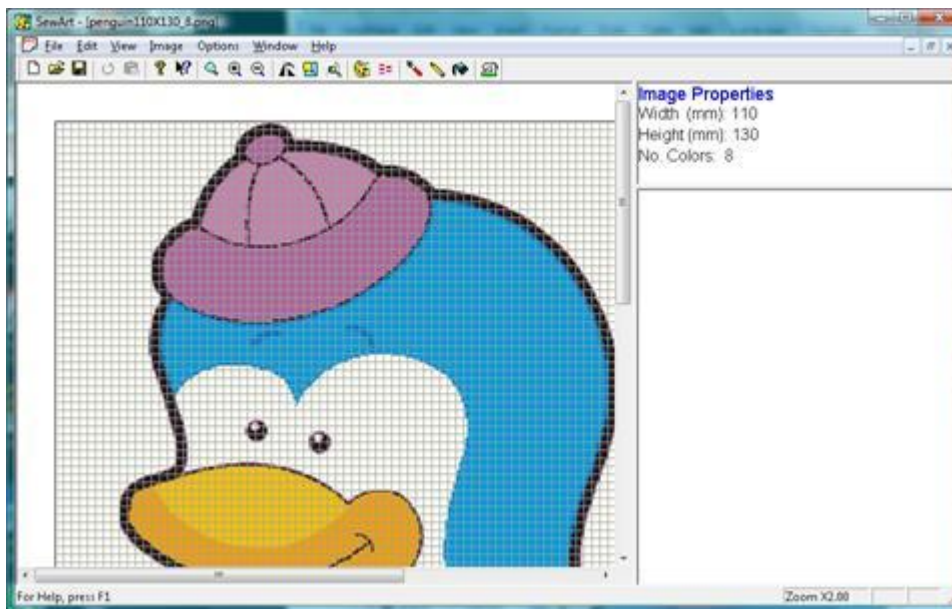
## View Menu

Use these menu items to help view the images in various formats and sizes in SewArt.

### Grid

When checked, this command displays a grid on top of the image. The spacing between grid lines is about 4 pixels. In the tutorial figure below, the penguin image has been magnified 4X and the grid option has been checked. The presence of the grid is useful for editing individual pixels or regions of an image with the [Paint Brush](#) or [Pencil](#) tools, and for drawing lines to fill-in borders and boundaries.

The grid is drawn on top of the image on the screen and will not be sewn.



## Magnify

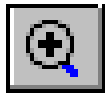


Left-click on this tool to magnify ("zoom-in") the size of the image displayed on the screen while keeping the part of the image under the glass always visible on the screen. Right-click to reduce ("zoom-out") the image size on screen.

The active state of this tool is toggled: if you click the magnifier icon on the toolbar once, it will remain active until you click it a second time to deactivate it.

This is useful for editing individual pixels or regions of an image with the [Paint Brush](#) or [Pencil](#) tools.

## Zoom-In



Click this toolbar command to magnify the size of the image displayed on the screen. This is useful for editing individual pixels or regions of an image with the [Paint Brush](#) or [Pencil](#) tools.

## Zoom-Out



Click this toolbar command to reduce the size of the image displayed on the screen.

## Main Toolbar

Use this command to display and hide the main [Toolbar](#), which includes buttons for some of the most common commands in **SewArt**, such as File Open. A check mark appears next to the menu item when the Toolbar is displayed. It is checked by default.

## Status Bar

Use this command to display and hide the status bar. A check mark appears next to the menu item when the Status Bar is displayed. It is checked by default.

## **Title Bar**

The title bar is located along the top of a window. It contains the name of the application and document. To move the window, drag the title bar. Note: You can also move dialog boxes by dragging their title bars.

A title bar may contain the following elements:

- Application Control-menu button
- Document Control-menu button
- Maximize button
- Minimize button
- Name of the application
- Name of the document
- Restore button

## Image Menu

Use these menu items to apply various image-processing methods in SewArt.

### Crop



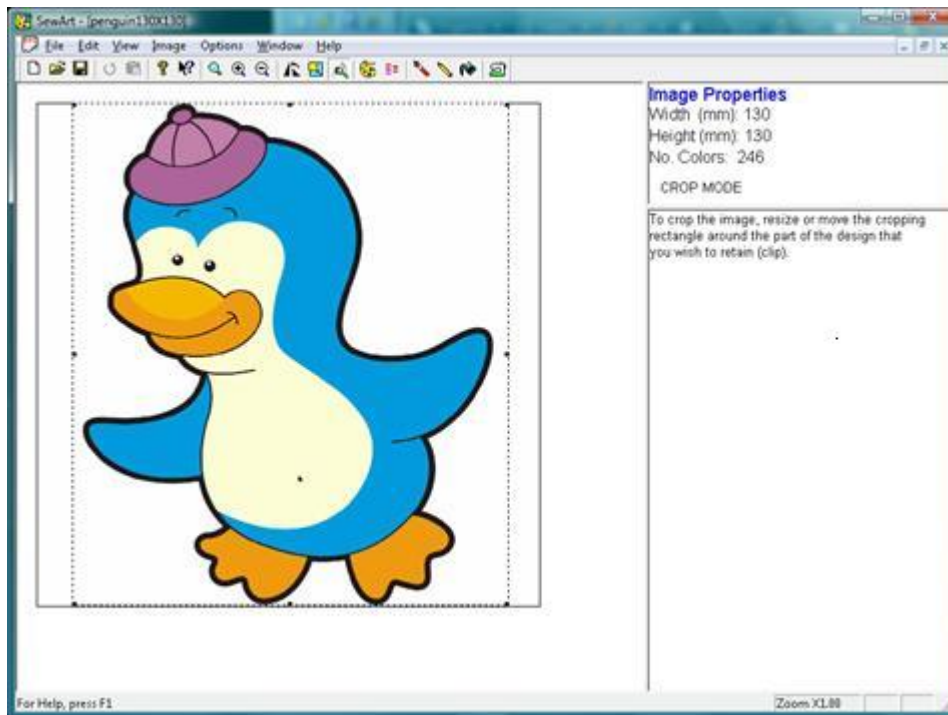
Use this toolbar command to crop (remove) parts of the image that are not desired. For example, if there is a white space around the image that is not to be sewn, it can be cropped with this tool.

After clicking this toolbar button, a moveable and resizable cropping-rectangle will appear surrounding the image. Drag the corner or side handles to resize the rectangle, and click *inside* it to move it to the desired position. When the part of the image you wish to retain appears inside the cropping rectangle, press the *Crop Image* button in the Information pane to perform the cropping operation on the image. If the cropped image is *not* what you wanted, press *Ctrl-Z* (or click the *Edit/Undo* menu item) to reverse the cropping operation. Exit the cropping mode by clicking the *Cancel* button.

The tutorial example shown in the figure below shows the cropping rectangle (dashed line) around the original image. The width of the cropping rectangle has been reduced to fit tightly around the image and, when the *Crop Image* button is clicked, it will eliminate that white space around the image.

At this point, it is advisable to [Save](#) the edited image file. Since cropping has reduced the image width from 130 to 110 mm, we save it to a compressed image file called *Penguin110X130.png*.

## SEWART USER'S GUIDE



If you are using this help as a tutorial, click on the Home button (upper right) to return to the main page.

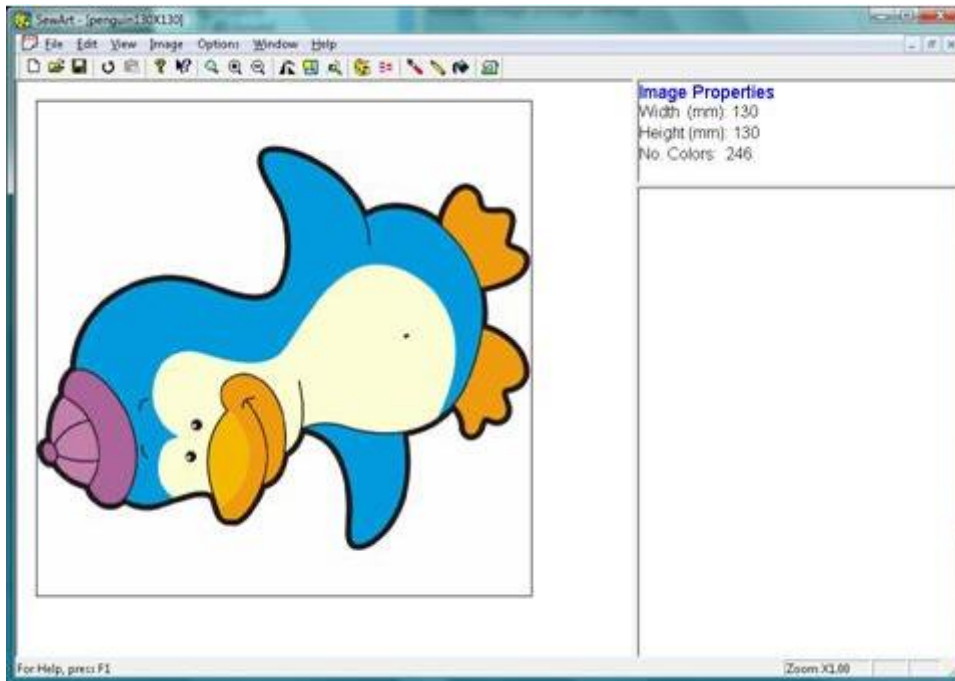
### Rotate



Use this toolbar command to rotate the image in 90-degree increments for easier viewing. For the tutorial example, the rotated image is shown in the figure below. Since this is *not* the preferred rotation, pressing *Ctrl-Z* (or click the Edit/Undo menu item) restores the original vertical orientation of the image.

If you are using this help as a tutorial, click on the Home button (upper right) to return to the main page.

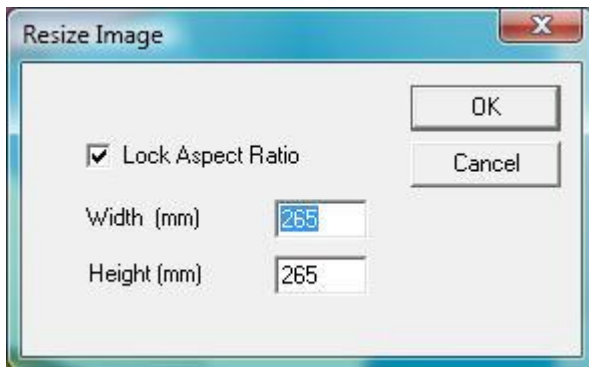
## SEWART USER'S GUIDE



## Resize



Use this toolbar command to open a dialog (shown below) for resizing the image. This is a useful option if you want to work in **SewArt** with an image of comparable size to the final stitched pattern.



The present size of the image will appear initially in the Width (265 mm for this example) and Height (265 mm) boxes. Edit these by entering the desired sizes for the image (in mm). If the *Lock Aspect Ratio* option is checked, then you only need to edit one or the other of these items and the other will be updated to keep the original height-to-width ratio (the aspect ratio of the image).

## SEWART USER'S GUIDE

If you wish to return to the previous size, press *Ctrl-Z* to *Undo* this operation.

If you are using this help as a tutorial, click on the Home button (upper right) to return to the main tutorial page.

## Wizard



Use this toolbar command to enter Wizard mode. This starts the image-processing wizard to guide you through the steps to convert the image into a form amenable for a high-quality stitch-out.

The basic principle of the Wizard is to choose various values (color numbers, despeckling or merge percentages) in a way that will both reduce the color number and preserve the image integrity. There are up to eight selections per page. To leave the image unchanged click the "Original Image" radio (selection) button and then proceed to the next Wizard page.

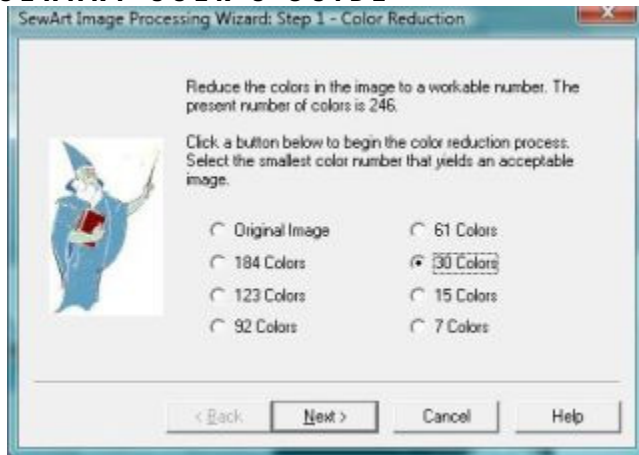
Each page of the Wizard (after the introduction) allows you to perform a different image-processing operation as noted in the caption title bar. The Wizard has *navigation* buttons at the bottom of each page to allow you to proceed to the next page (the *Next* button), to return to a previous page (the *Back* button), or to Cancel the Wizard and return to the main **SewArt** screen. Note that any operations performed in the Wizard mode may be *undone* when you have returned to normal mode.

There are 4 steps (distinct types of processing) performed by the Wizard and described below. At each step you may choose from one of up to 7 reduction values (including the option to keep the unprocessed image). The choice is guided by the basic principle stated above: try to choose the value closest to the end of each list (which produced the biggest image processing effect) which leaves the visual integrity of the image intact.

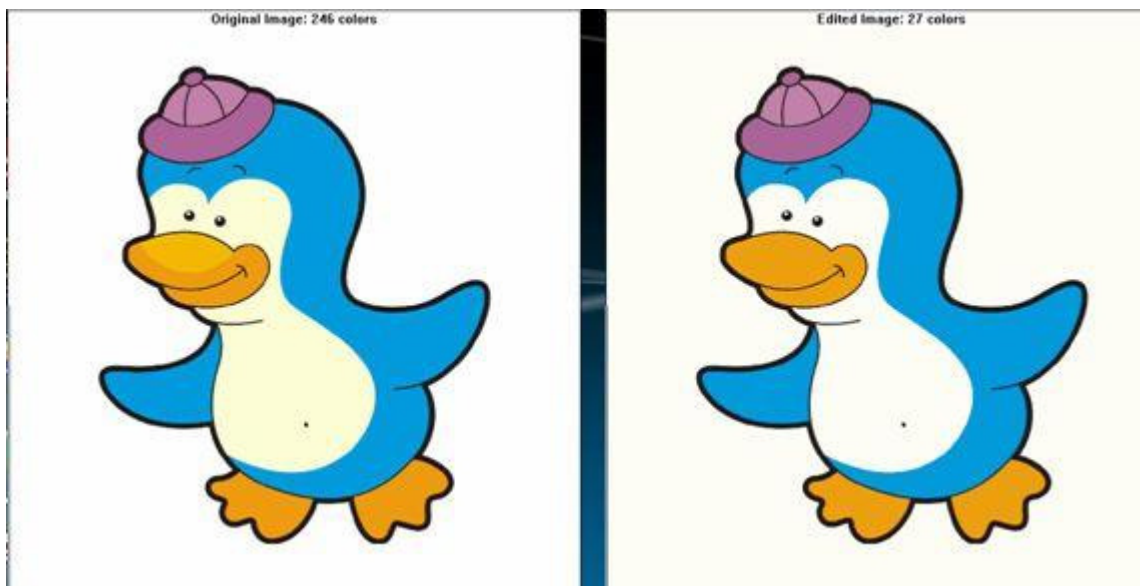
### Step 1: Color Reduction

The Wizard dialog for this case (we use the Penguin bitmap example, with 246 colors initially, throughout this discussion) is shown below:

## SEWART USER'S GUIDE



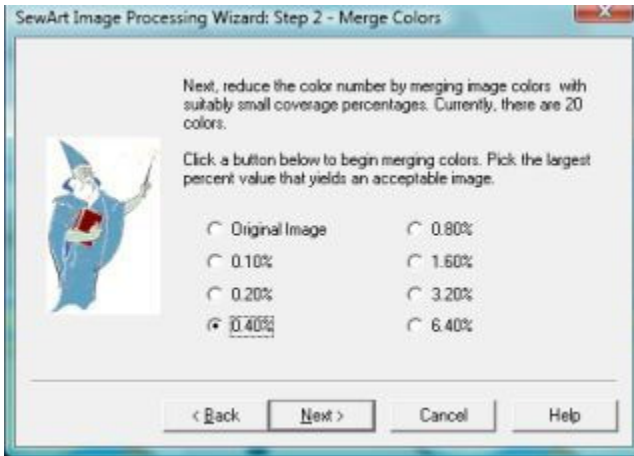
After reducing the color number a few times (to 30 colors), one arrives at an image which is no longer acceptable (see figures below).



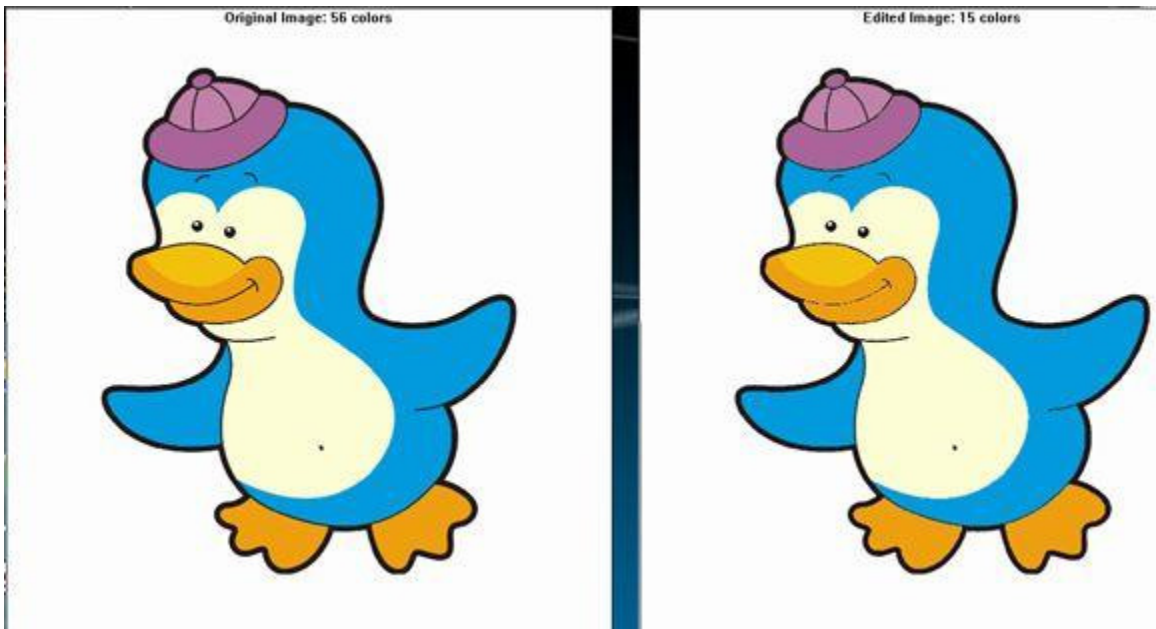
Note that the two-tone color of the penguin bill has disappeared. So the "61 colors" button was clicked, leading to an acceptable image. The *Next* button was then clicked to proceed to the next page of the Wizard. (NOTE: the color numbers shown on this dialog depend on the number of initial colors in the image. Also, the color numbers specified are only target values and the final reduction is only guaranteed to be equal to or less than the number clicked. In this case, the "61 colors" option was clicked to yield 56 colors in the processed image. If the *Back* button would be clicked from the next page, the color numbers would then be based on 56 colors and not the original 246.)

## Step 2: Merge Colors

The Wizard dialog for this case is shown below:



In this case, the list of percentages represent the fractional coverage in the image required before a color will be merged. The 0.40% button was clicked, indicating that colors that cover no more than 0.40% of the image area were merged. Even with this small percentage coverage, the image deteriorated so that it was unacceptable (see Figure below):

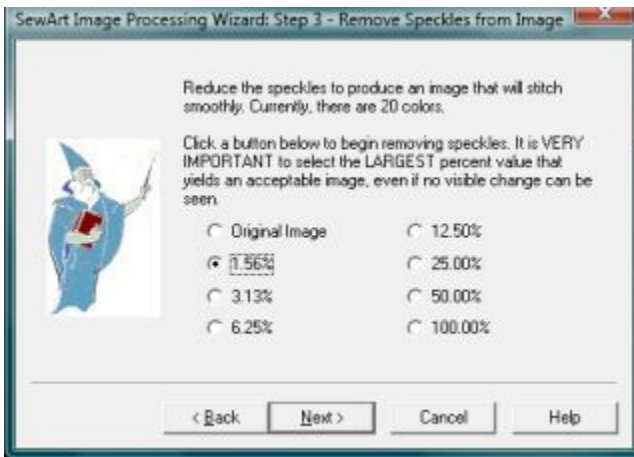


## SEWART USER'S GUIDE

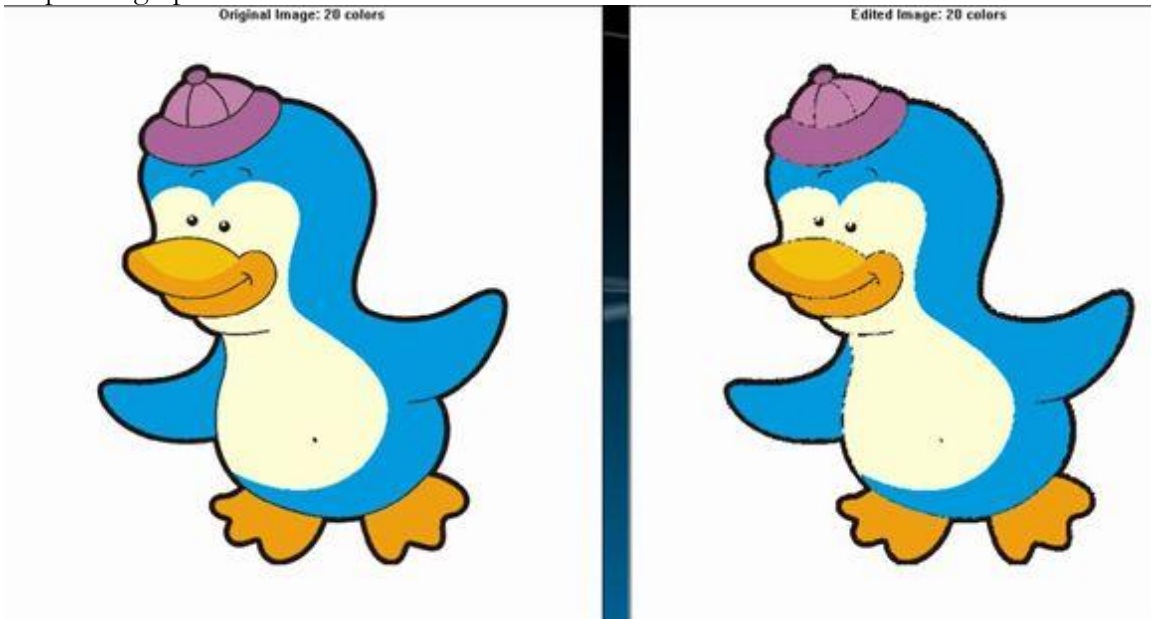
In particular the merge from 56 colors to 15 colors leaves *most* of the image intact but the outline of the bill began to disappear. (Note that the apparent discoloration of the cap is due to reducing the size of the figure and does not actually occur in the full-size image.) Thus, the 0.20% button was clicked to maintain the image integrity, while reducing the color number to 20.

### Step 3: Remove speckling

The Wizard dialog for this case is shown below:



In this case, pressing the lowest available color coverage fraction (1.56%) already produced an unacceptable image (see below), where the *thin* dark contours were broken up by the despeckling operation:

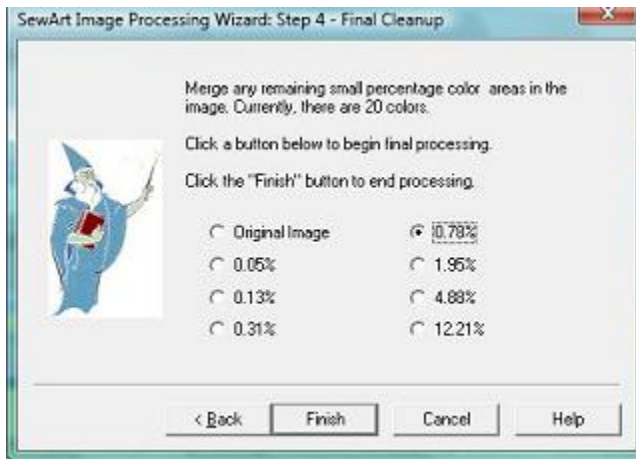


## SEWART USER'S GUIDE

This is unusual and due to the graininess of the thin, dark outline contours. A much more typical case would be for a substantial color fraction (50-100%) to be despeckled without any noticeable degradation of the image. For this case, the thin outline colors were *individually merged* once the image-processing Wizard completed. Therefore, It was necessary at this step to click the "Original Image" radio button on the present Wizard page and then move to the next and final Wizard page.

### Step 4: Final Image Processing

The Wizard dialog for this case is shown below:



This final step presents the opportunity to do a "clean-up" of any remaining small-coverage colors. In this case, clicking the 0.78% button gave an acceptable image with a further color reduction to 12 colors:



While *most* of the solid black outline is preserved by this final processing, some of the outlines in the cap seem to break up. We nevertheless chose to accept this reduction (by clicking the "Finish" button). Once the Wizard was finished, we were able to merge a thin layer of yellowish pixels from the merge dialog, thus recovering the black outlining in the cap. If this had not been possible, we would have *undone* (Ctrl-Z) this last processing step.

Once you have finished these Wizard steps, you may want to view the individual colors of the image in the [Merge](#) utility. In particular, make sure all the speckling has been removed, before trying to sew out the image.

## Reduce Colors



Use this toolbar command to reduce the number of distinct colors in the image. The color reduction is done through the same sophisticated *color quantization* process that **SewArt** uses to reduce the potentially 16 million image colors (in a 32-bit display) to only 256 when the image file is opened. This tool, in conjunction with color [merging](#), provides the capability to smooth small-scale color variations in the image which would be very difficult to sew-out well.

Why is color reduction important when converting an image to stitches? Below is a 10-fold magnification of the tutorial file *penguin130X130.png* (which originally had 246 distinct colors). Many of these colors are barely distinguishable shades of the seven or eight different solid colors that are clearly visible in the (unmagnified) image. For example, note the various shades of blue in what *appears* to be a solid blue region, particularly at the boundaries between the blue and the other colors. If each of these shades were stitched as a separate

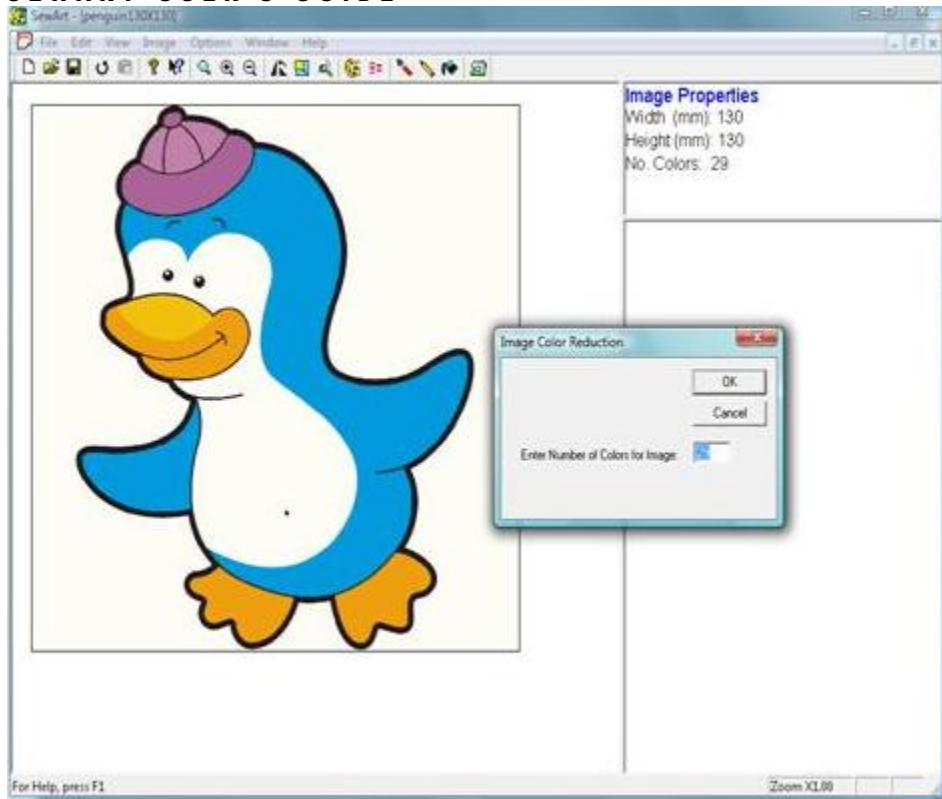
## SEWART USER'S GUIDE

color, there would be many small, disconnected regions. That will lead to a very low quality embroidery stitch-out. The goal of the color reduction tools in **SewArt** is to reduce these small variations and create a solid region that can be sewn in a single color shade without distorting the visual appearance of the image.



When the *Reduce Colors* toolbar button is clicked, the *Image Color Reduction* dialog box appears (see the figure below). Enter the desired number of colors for the image in the edit box. In this example, the initial 246 colors were changed in a series of steps. (In order to maintain the appearance of the image, it is best to reduce the colors in steps.) Typically, halving the number of colors is a good way to proceed. In this case, the image color number was reduced from 246 to 128 to 64 to 32, without any substantial change in the image appearance. Reducing the colors to 16 removed the variation of orange colors on the penguin's beak, so *Ctrl-Z (undo)* was entered to restore the color number to 29 (for this image, **SewArt** reduced the color number to 29 even though 32 were requested).

## SEWART USER'S GUIDE



It is interesting to ask: what happened to the other 217 colors? They have been color-merged ("quantized") with the remaining colors to form the remaining visible, approximately solid color regions. As noted above, this reduction is important for the eventual uniform sewing of the image.

If you are using this help as a tutorial, click on the Home button (upper right) to return to the main page.

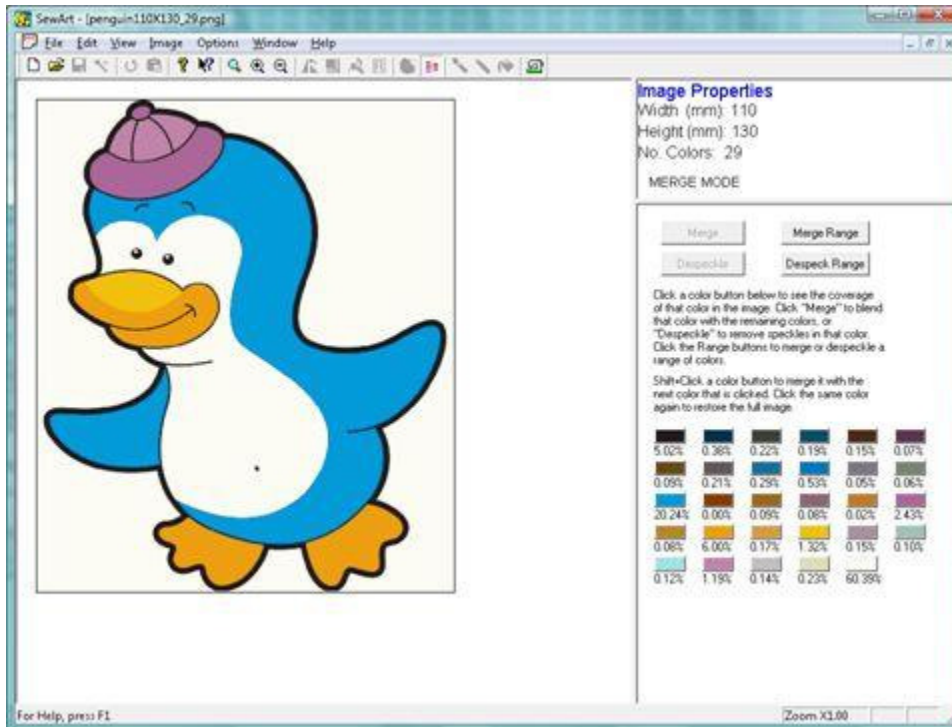
## Merge Colors



Use this toolbar command to further decrease (after applying the [reduce color](#) tool) the number of distinct colors in the image by merging colors that are very close to each other in appearance (i.e., close in *Red-Green-Blue* color space). This dialog also has a **despeckle** button which removes speckles (scattered, generally unconnected points). An example of image despeckling, and how it differs from color merging, is presented in the [speckle removal](#) topic.

## SEWART USER'S GUIDE

When the merge toolbar button is clicked, a list of all the colors appearing in the image will be presented in the *Merge Mode* pane (just below the information pane on the right of the **SewArt** workspace). Under each button is the percentage of the image area covered by each color. See the figure below.



The merge and despeckle buttons are disabled until you click one of the color buttons. When you click on a color button, the part of the image covered by that color is highlighted. (**Note:** this is a **toggle** operation - if you click the same color button twice in a row, the original complete image will reappear.) In the figure below, first the orange color was clicked (5.97% coverage, left side of figure), corresponding to the penguin's lower bill, mouth and feet, and then the yellow color (1.31% coverage, right side of figure), corresponding to the penguin's upper bill. Obviously these are solid color features which should be retained as part of the image to be sewn: that is, they should *not* be merged since they are distinctive features of the image.

The remaining orange and yellow color stops display very low coverage percentages. Clicking on the 0.08% (left) and 0.17% (right) orange buttons will show a barely discernable, diffuse pattern of scattered points that tend to follow the outline of the well-defined features in the figure. Such points arise because of the imperfect color quantization of a real JPG image and would generally be absent in vector forms of clipart. (They are not shown here because they would not be visible at this resolution). These *speckles*, or diffuse unconnected points, would clearly *not* contribute to an image that would sew *smoothly*: the needle would have to jump

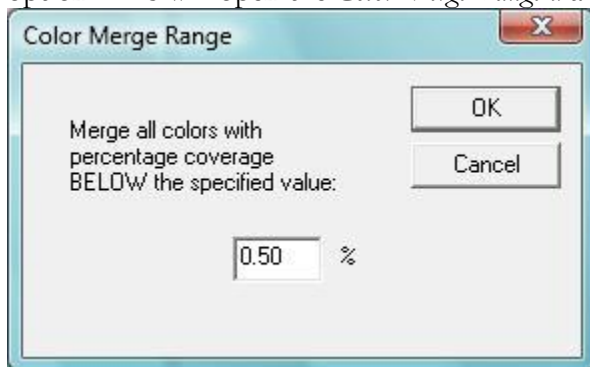
## SEWART USER'S GUIDE

from one unconnected point to another, which is clearly undesirable. They should therefore be **discarded** by *merging* them with the higher-percentage colors. The process of removing speckles is called *despeckling*. It can be accomplished by clicking the **Despeckle** button. When a particular color button has been previously clicked, then only the highlighted color will be despeckled. Otherwise, the despeckling operation can be applied to a range of colors in the image (by clicking the **Despeck(le) Range** button). If the result of despeckling is unsatisfactory, it can be "undone" by clicking the Undo toolbar button.

Many of these low coverage speckles may be eliminated by clicking on a color button that you want to merge. Once a color button has been clicked and the *Merge* button activated, clicking the *Merge* button will perform the merge operation and the number of colors will be reduced by 1. Also, the color button will become inactive (*dimmed*) corresponding to the elimination of that color from the pattern. If for some reason the effect of this merge is unacceptable, immediately enter the *Ctrl-Z* key combination to *Undo* the merge and return to the previous color state.

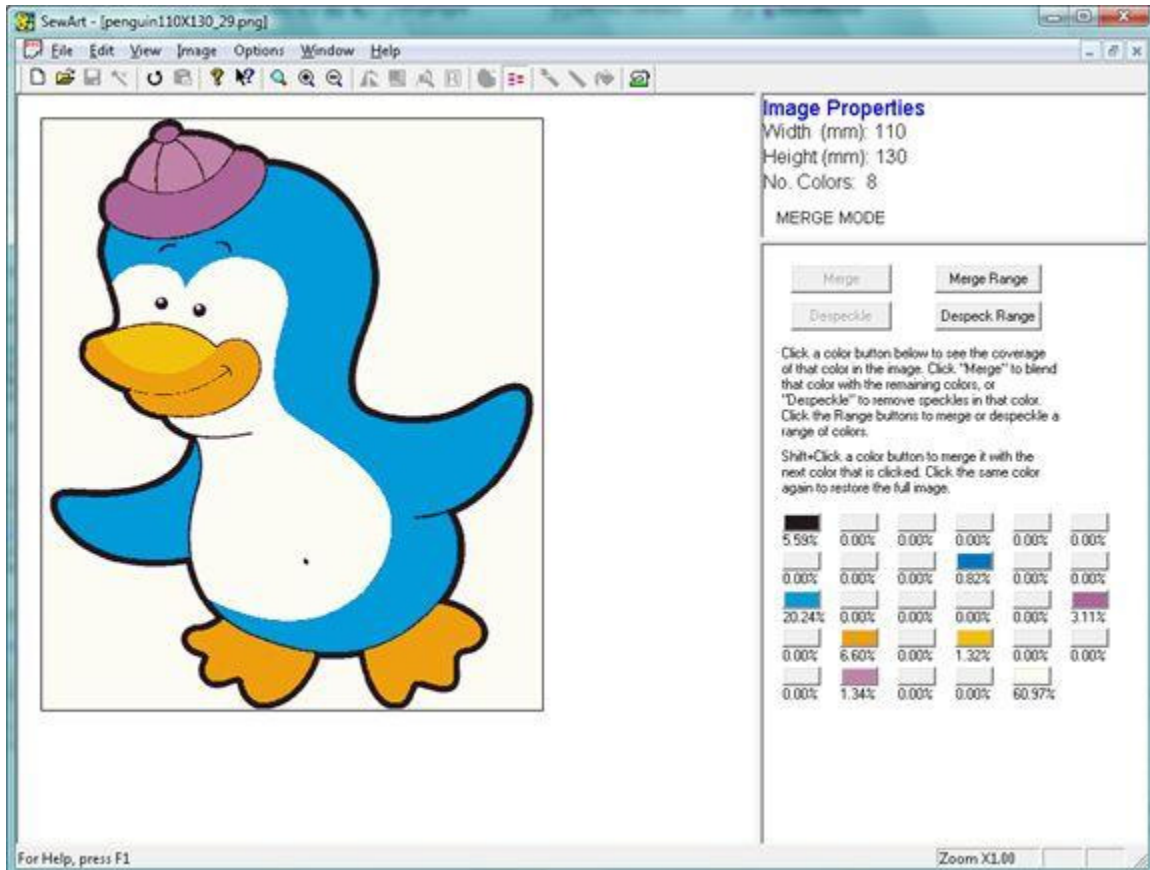
If you desire more control over *which* color the chosen one is merged with (*Merge* will automatically determine the nearest color in *RGB* space to the selected one), you can hold down the Shift (or Ctrl) key when you click the color button to be merged. Then, the *next* color button that is clicked will be the one that is used for the merge. This extra control might be useful in the following circumstance: suppose one of the colors consists largely - but not entirely - of a solid region, but has some speckles as well. This is fairly typical, with the speckles following a boundary between two colored regions of the figure. Then, you could use the [Bucket Fill](#) tool to fill the solid region with a *slightly* different color. When Merge Mode is entered, you will have two color buttons of nearly the same color, one with a relatively high percentage coverage (corresponding to the solid region that was just bucket-filled) and one with a low percentage coverage corresponding to the speckles that you wish to merge. Hold down the Shift key and select that speckle color button and then click on a color (usually black, but not always) corresponding to the solid boundary that you wish to merge the speckles with. Note that a simple *Merge* button click would **not** have worked in this case: it would have simply re-merged the speckles with the solid color region!

A powerful technique to eliminate an entire group of speckles is by choosing the *Merge Range* option. This will open the *Color Merge Range* dialog :



## SEWART USER'S GUIDE

All colors with an image coverage *below* the specified percentage will be merged when the *OK* button is clicked. The default value (shown here) is 0.5%. In the tutorial example, using this value causes parts of the black outline to disappear, which is unacceptable. Experimenting a bit (using *Undo* to restore colors), we found that 0.3% works well for this example. This leads to a color reduction from 29 colors to 8 colors, as shown in the figure below. Note that the buttons for *all* the colors that have been merged are now *disabled* (that is, you can no longer click on them) and are labeled with 0% coverage.



When you have completed the merge operations, click the *Merge* button again to exit from Merge mode. At this point in the image editing process, it is advisable to [Save](#) your changes, possibly renaming the file at the same time so you have a record of all the changes made.

Note that the background color (white in this case) takes up over 60% of the area of the figure, even though we have cropped the image to minimize the background. Part of that color covers the white vest of the penguin figure. It is good practice to use the [paint-bucket](#) tool to fill the true background (the part of the pattern that you do *not* want to sew, the so-called *transparency color*) with a distinct color, to distinguish it from the image colors that are to be eventually sewn as part of the embroidery pattern. This also allows you to use the *auto-stitch* feature (see [image conversion](#)) without stitching the background.

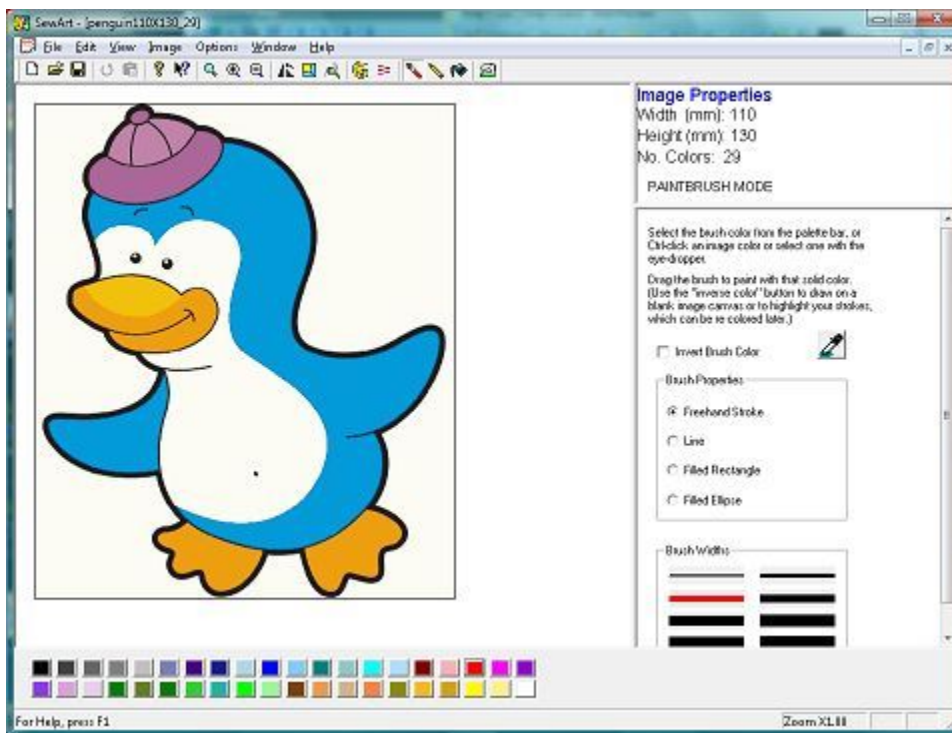
## SEWART USER'S GUIDE

If you are using this help as a tutorial, click on the Home button (upper right) to return to the main page.

### Paint Brush



Use this toolbar command to draw on the image with a colored brush. After pressing this button to activate *Painterbrush Mode*, the cursor will change to a paint brush whenever your mouse is over the image. The paint brush tool options will appear in the tool pane (see the figure below). To select the brush color, control-click on a region of the image, or on the color palette bar at the bottom of the **SewArt** workspace (see figure below). You may also click on the *eye-dropper* tool and drag over the image and click on the desired brush color.



Hold down the left mouse button while dragging the brush to blend that color into the region of the image. The tip of the brush is the *hot spot* where the drawing occurs. The width of the brush can be chosen by clicking on one of the line-width buttons. Note that the size displayed on the screen for the brush width will depend on the magnification ([zoom](#)) that is in effect during the blending procedure.

You may also select different properties for the brush operation, including free-hand strokes, constrained line brushing or filled rectangle or elliptical brushing. These latter brush operations are useful for filling larger areas in a single click, and for drawing figures on a [blank canvas](#). The usual application of this command is to fill in gaps or blend small regions with the dominant color of the chosen brush color. You may reverse a paint operation by pressing *Ctrl-Z* to *Undo* it.

To exit *Paintbrush Mode*, re-click on the paint brush toolbar button or any one of the other available toolbar buttons.

**Useful hint:**

It may be easier to see the region being drawn if you choose the "inverse" color option. The brush strokes will stand out against the blended color background. When you are finished drawing with the inverse color, exit from paint mode and open the bucket tool to fill the inverse color with the correct color.

If you are using this help as a tutorial, click on the Home button (upper right) to return to the main page.

## Pencil



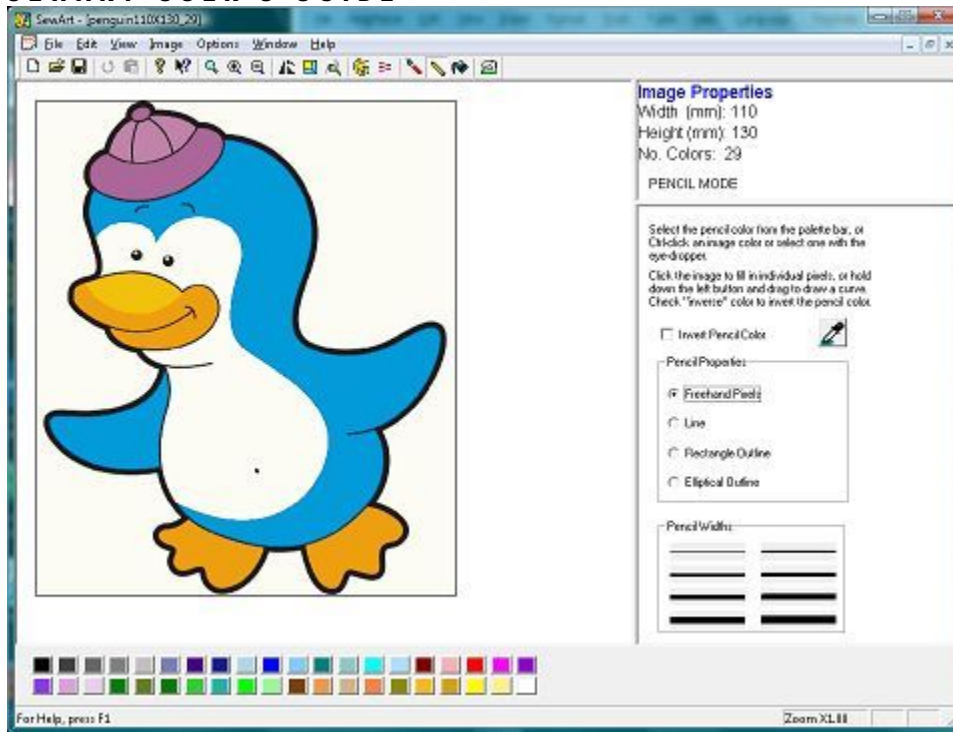
Use this toolbar command to draw individual points with a colored pencil. After clicking this button to activate the pencil drawing mode (see figure below), hold down the *Ctrl* key and click on a region of the image, or click on the color palette at the bottom of the **SewArt** workspace screen, to select the pencil color. You can also use the eye-dropper icon to select a color. Either click the left mouse button to draw individual points with this color, or drag the pencil to draw a line with the chosen color.

The default width of the pencil is one pixel. Its appearance on the screen depends on the chosen magnification [zoom](#) level. You may click one of the line width buttons to create a pencil up to 8 pixels wide. When using the pencil tool, it is convenient to magnify the region being edited until individual pixels can be viewed.

Drawing with the pencil can be done either in *free-hand* mode, or in one of the constrained modes used to create straight lines, rectangular or elliptical outlines.

The usual application of this command is to fill in individual points (isolated *outliers*) with the dominant color of the chosen region, or to straighten and/or thicken lines in the image. When drawing on the [blank canvas](#), the pencil is useful for free-hand sketching or drawing lines and outlines. The pencil complements the paint brush and can be used where very small (pixel-size) details of the image need to be adjusted. To erase lines entered with the pencil, press *Ctrl-Z* to *Undo* the last drawing operation.

## SEWART USER'S GUIDE



To exit *Pencil Mode*, either re-click the pencil toolbar button or click one of the other available buttons on the toolbar.

## Bucket Fill

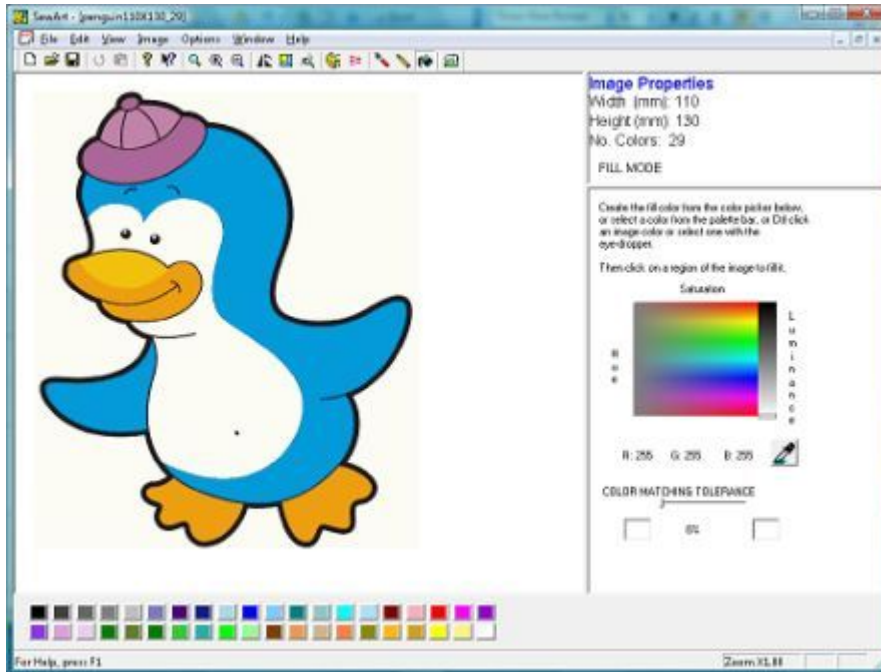


Use this toolbar command to uniformly fill a region with a solid color. After clicking this button to activate *Fill Mode*, you may choose the fill color in several ways (see the figure below):

1. Click the eye-dropper icon and drag the resulting cursor with your mouse onto the part of the image containing the desired color. Click that region with the eye-dropper cursor to select that color for the fill.
2. Hold down the Ctrl-key and click on the color in the image to use for the fill.
3. Click on one of the pre-defined palette colors appearing at the bottom of the workspace screen.
4. Create your own custom fill color using the hue-saturation-luminance (HSL) picker tool. Drag the little square to a part of the Hue-Saturation square and then adjust the luminance slider. The resulting RGB color value will appear below the square.

## SEWART USER'S GUIDE

In either case, the bucket fill color will appear below the *Color Matching Tolerance* slider (which will be described below). To reverse a recent fill, press *Ctrl-Z* to *Undo* it.

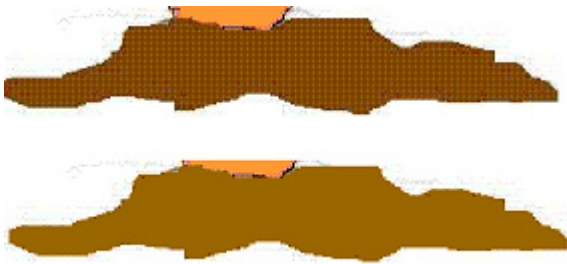


The simplest application of the bucket fill tool is shown in the figure above. After selecting the fill color using method #3, the bucket cursor (which automatically changes to a bucket when you move the mouse over the image but is not shown here) was moved over the background area of the image. Then the bucket was clicked to "pour" the tan fill color into the background. This is one way to distinguish the background area of the image which generally is **not** to be sewn from regions in the image (like the white vest of the penguin) that **should** be sewn. This same method may be used to change one or more of the image colors.

An advanced application of this command is to fill (blend) small color variations within a relatively large region of the image where [paint-brushing](#) may be too slow or prone to error (for example, at the boundaries of the region). Typically this would be done *after* [color reduction](#) and [color merging](#) were already applied to the image. This blending effect requires that you select a non-zero *blending tolerance*. Move the *color matching tolerance* slider from 0% upwards (gradually) towards 100%, then click the bucket tool in the desired region. Gradually increase the tolerance percent until the bucket fill yields the desired degree of blending. Increasing the tolerance too much will cause the bucket fill to *bleed* into adjacent areas. If this undesirable effect occurs, then press *Ctrl-Z* immediately to recover the previous unblended state.

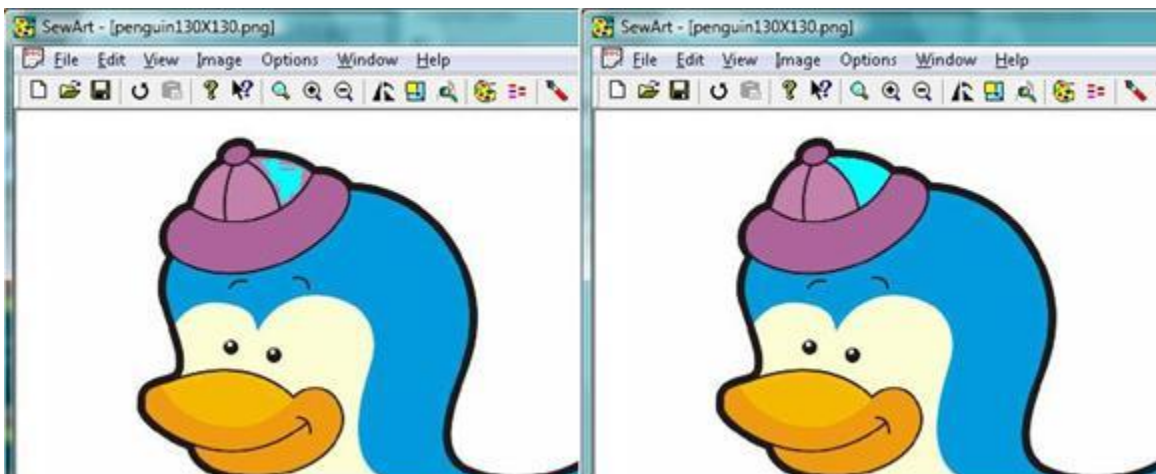
An example of how "tolerance-assisted" filling can perform color-smoothing is shown below (this is *not* taken from the tutorial example which has no regions demonstrating this effect):

## SEWART USER'S GUIDE



The top image is a blown-up region of a GIF file. Note the cross-hatching (*dithering*) in the brown region, which is undesirable for stitching since it would cause a tremendous amount of jumping from one thread location to the next. The bottom image was obtained using the bucket tool, using the following steps: 1) the eye-dropper was dragged over the top image and the desired brown color was selected; 2) the tolerance slider was incremented up to 40% (this was determined by trial and error - it may be a different value for different images); and 3) the bucket tool dragged over the same area and clicked. Note that now all the very small-scale color variations have been removed, and the brown region would now be considered suitable for stitching with **SewArt** since it is *uniformly* filled with a *single* solid (brown) color.

Bucket fill blending is sometimes a useful alternative to color reduction, at least for small regions of the image. The figure below shows the effect of bucket filling on the original 246 color tutorial image, without (left) and with (right) tolerance blending. On the left, the (default aqua) bucket fill tool was clicked on the right part of the penguin's beanie with the blending tolerance set to zero. (It has been recolored to aqua for purposes of this tutorial, but in practice the fill color would be the original wine-color.) Note that the fill is irregular since there are small-scale variations in color of the original image (before color reduction and merging were applied). This shows very clearly why some form of reduction or blending is required prior to sewing the image: otherwise the irregular (aqua) colored region would be stitched rather than the desired smooth full upper 1/3 of the beanie.



## SEWART USER'S GUIDE

On the right of the figure is shown the effect of bucket filling after setting the tolerance to 20%, and then clicked the bucket tool on the same region again. Now the entire 1/3 part of the beanie has been *uniformly* filled with the same solid color. As a result, this region is ready to be stitched.

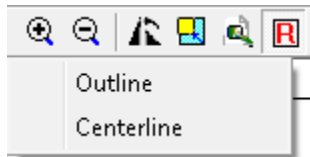
To exit *Fill Mode*, re-click the bucket toolbar button or click one of the other available toolbar buttons.

If you are using this help as a tutorial, click on the Home button (upper right) to return to the main page.

## Convert To Redwork



Use this toolbar command to convert the image to a redwork outline, that can be saved to an embroidery file by later clicking the [convert to stitches](#) button. When you click this button, the options menu shown below will pop-up:



You can choose *Outline* to convert a filled image into outline stitches. Choose the *Centerline* option if the image is already outlined. Note that this option will preserve (and thin down to a single pixel) existing outlines in the figure. For example, if you have created a stick-figure using the drawing tools in the Blank Canvas, you would want to use centerlining to convert the image to an outline.

After selecting the appropriate option, the image will be automatically converted to outlines *or* center-lines. The resulting "redwork" image can be edited with the pencil or paintbrush tools to either remove unwanted segments of the drawing, or to add to (or connect existing parts of) the image. When you are ready to save the redwork image to an embroidery file, click the [Convert to Stitches](#) toolbar button to open the [outline toolbar](#).

If you want to create your own redwork image from a blank canvas, then you should click this button *before* beginning to draw. This will avoid splitting single thin lines into parallel *pairs* of lines.

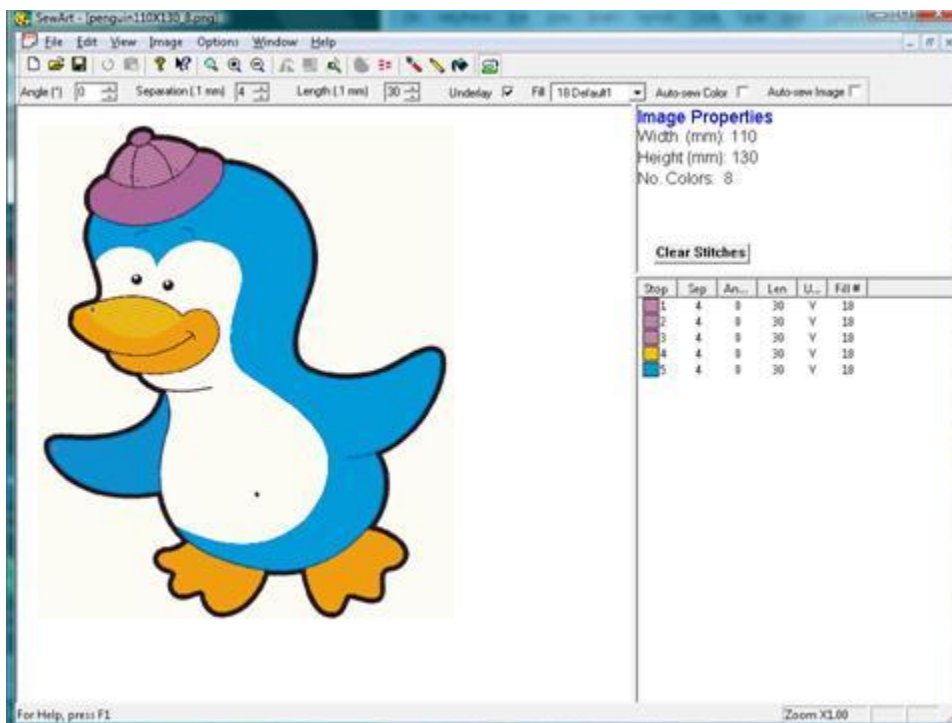
## Convert to Stitches



Use this toolbar command to convert the image to stitches which can be saved to an embroidery file in one of three popular file formats: Brother® (\*.pes), Janome® (\*.jef) or Singer® (\*.xxx).

When you click this button, the [Stitch Toolbar](#) will appear and become active, indicating that **SewArt** has entered *Stitch Mode*. With this toolbar you control properties of the stitches in any region of the image that you want to sew, including the stitch angle, presence or absence of underlay, fill pattern and stitch length. (If the image is a [redwork](#) image, then you can select the type of outline stitches to use. The remainder of this topic describes the steps needed to convert a filled image to stitches.) Presently **SewArt** supports only a satin stitch for filling the image. However, you can choose from a variety of *pattern fills* as described below. You may set these properties from the toolbar and/or edit them in the stitch list after the image has been sewn. Also, the cursor will change to a "sewing needle" when you are over the image. If you have previously sewn *and* saved this image and have reopened it, you will be asked if you want to import the existing stitch list. If you answer "yes," all the stitches from the previous session of **SewArt** for this file will be restored. You can clear the current stitch list by clicking the *Clear Stitches* button. **This operation cannot be undone.**

Follow the steps below to perform the actual conversion of the digital image to an embroidery pattern file. Refer to the figure below as needed. It shows **SewArt** in *Stitch Mode*, and the associated color stops entered into the stitch list (the right tool info pane).



## SEWART USER'S GUIDE

You may end a sewing session at any time by clicking the *End Sew Mode* button. If you have not saved the stitches to a file, you will be asked to do so at that time. Even if you decline, the stitches will be retained in memory *for the current session of SewArt*, so these stitches will be retrieved the next time you enter *Stitch Mode* but before closing this work session. However, the stitches will be *permanently* saved *only* if you decide to [save](#) them before closing **SewArt**.

There are just two steps involved in converting the image to into stitches that are saved in an embroidery file:

### 1. "Stitch" the Image (on screen)

The process of converting the image to stitches is very simple in **SewArt**. You can choose between completely manual stitching (which gives you the most control), auto-sewing an entire color, or auto-sewing the entire image. These options are described here:

1. **Manual stitching:** click on a region of the pattern that you want sewn. The point you click - the *seed point* - will show up as a colored rectangle on the screen. You will be prevented from later re-clicking on the same region (unless you have chosen the delete or re sew option, see below).
2. **Auto-sew Color:** click the *Auto-sew Color* check box on the toolbar. Then click a color and *all* disconnected regions of the image with that color will be sewn
3. **Auto-sew Image:** click the *Auto-sew Image* check box on the toolbar. A drop-down menu will appear with a choice to sew all colors (including the background) or to choose a *transparency* color that will *not* be sewn. Once you made this selection and chosen the transparency color if required, stitching of the image will begin automatically.

**Important Note:** use the *auto-sew* options with some care. Unless the image is *clean* (in the sense that it contains few outlier points), *auto-sew* could take considerably longer than manually clicking on the individual color regions. If there are numerous outlier points - which are barely visible and which make a negligible contribution to the image quality - the *auto-sew* option will nevertheless have to check each of those points.

You may want to edit certain features of the auto-sewn pattern before saving it - see the section below that describes how to edit the stitch list.

### 2. Save the Embroidery Pattern and Stitch List

Click the [Save](#) button on the [main toolbar](#) to write the contents of the stitch list to an embroidery file. This will open a [File Save As](#) dialog for you to enter the file name if the file was not previously saved in this session. There is an option to enter a scale factor in the *Design Scale Factor* box, which allows you to adjust the size of the pattern as a multiple of the image size. The default value (1.0) means the embroidery file size will be the same as the image size you are editing. The aspect ratio (width-to-height ratio) of the sewn pattern will be the same as that of the image regardless of the value of the scale factor. You can choose the minimum number of stitches to be sewn in any color block (the default is 10).

## SEWART USER'S GUIDE

After saving the stitches to the embroidery file, you may continue editing the image or adjusting the pattern parameters in the stitch list. If for any reason you decide to end your stitching session, click the **End Sew** button. If you have made any changes to the stitch list, you will be asked to save them at this time.

If you save the pattern and stitch list, the next time you open the image file in **SewArt** you will have the option to read in that information to continue further editing of the stitches, as described below.

**Congratulations!** You have now converted your image into an embroidery file!

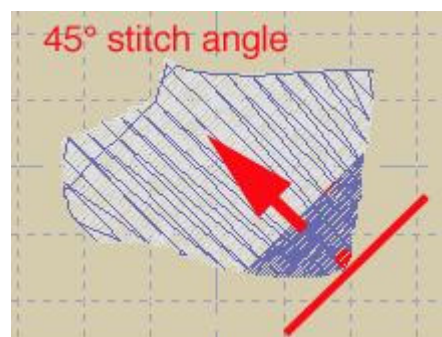
Once you have created the stitch list as described in step 1 above, and before proceeding to saving it as an embroidery file in step 2, you may want to edit the stitch list. Editing can also be done after the image conversion is complete and you have viewed the image in an embroidery editor. If for any reason you want to modify the embroidery file you created, just reload the stitch list into **SewArt** and apply some (or all) of the editing features described below.

### Choosing the starting point ("seed") for sewing

When you click the left mouse button, the tip of the "sewing needle" cursor defines the starting point (*seed*) from which **SewArt** will fill that region with stitches to match the image color. A judicious placement of the seed will minimize jumps in the final stitching.

For example, it is advisable to choose an extremity of the region - far left or right, top or bottom - so sewing can proceed in one direction only. You should **never** choose a seed in the middle of the region! To obtain the best sew outs, the thread should flow in one direction for each section (region) of the embroidery design. For a region, click the tip of the "needle" cursor at the farthest point perpendicular (at right angles) to the chosen **stitch angle**. Sewn regions (see the beanie-cap of the penguin figure above) are identified as showing shaded "threads" instead of a solid color fill.

The illustration below (taken from an embroidery editor, *not* from **SewArt**) shows the seed point as the red dot (where the tip of the needle cursor was clicked). The cursor was clicked at the farthest point *and* at 90 degrees to the angle chosen in **SewArt** (a 45 degree angle was used for this example.) The underlay stitches at 90 degrees to the chosen angle. Note that the embroidery stitches flow away from the red dot (seed point) in one continuous direction to the other side of the region.



Often the recommended angles to use are the diagonals (45 and 225, or 135 and 315 degrees) which avoid the weaker points at the top, bottom and sides of the hooped fabric where the fabric is more likely to *give* (pull away from the hoop). However, other angles may be more appropriate when trying to produce a textured appearance (for example, similar objects arranged on an arc).

Different sides of an odd-shaped region should be tested to find the best angle to use. Use the **resew** option (see below) to restitch as required.

After the clicked region has been sewn, continue to click on other regions of the image until all parts of the image you want in your final embroidery pattern are "sewn" in this manner.

### Pattern Fill

Click on the scroll arrow of the pattern fill combo box to select a fill pattern to use for the satin stitch. This will drop-down a list of available fill patterns to choose from. Use the up-down arrows to scroll through the patterns. An image of the selected pattern will appear next to the fill list. Click on one of these patterns to make it the active pattern that will be used the next time an area of the image is stitched.

### Edit the Stitch List

At any time during the stitching process, you may edit the values in the stitch list (such as the stitch angle, length, underlay and fill settings). Just click on the item in the list and type in the modified data. Tabs and arrow-keys can be used to easily navigate through the list to the item(s) to be edited. For example, suppose you stitched the pattern initially so that all stitches are at the same angle. Before the final pattern file is saved, you can change angles for different parts of the pattern. To do this, click on the appropriate angle entries in the stitch list and edit them by entering the desired values. Note that angles are measured from the *horizontal line* (which is the default, or 0 degrees). Thus, an angle of 90 degrees corresponds to stitches in the *vertical* direction.

### Helpful hint:

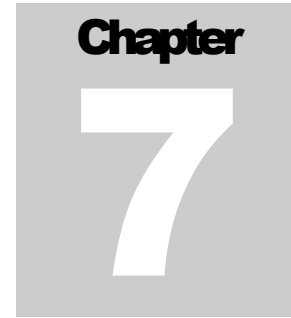
A contiguous range of stitch property values can be changed to the same value by clicking one of the header buttons at the top of the stitch list. For example, suppose the image was stitched with *Underlay* on (checked) for all parts of the pattern. But there are some thin outlines in the image that do not require (and indeed should not have) underlay. Click on the *U-L* (underlay) column header button and a dialog box will pop-up allowing you to enter the range of color stop numbers, and the value (either "Y" for underlay, or "N" for no underlay). Clicking *OK* will then automatically change all the underlay values in the entire range.

### Delete, Resew or Insert Color Stops

To see which sewn region of the image corresponds to one of the color stops in the stitch list, click that color stop button to highlight (in the inverse color) the associated part of the image. A pop-up menu will appear with options to **Delete** that color (from the stitch list, *not* from the image), or to **Resew** it, or to **Insert** another color stop **before** an existing one. **Resew** may be useful, for example, in the case when you have changed the stitch angle. To

#### **SEWART USER'S GUIDE**

see the effect of that change, click the **Resew** option for that color stop. This will clear the stitches from the associated region in the image. Re-click on the region to sew it out at the modified angle. If the **insert (before)** option is selected, a "blank" black color block will be inserted before the active color stop. The next image area that is clicked will be placed in that position in the stitch list. This may be useful if you want to add a particular part of the pattern somewhere other than at the end of the stitch list.. Ignore this pop-up (by clicking on the **Close menu** option) if you do not want to perform any of these operations.



## Options Menu

Use these menu items to apply set various viewing options in SewArt.

### Units

Use this menu item to choose between metric and Imperial (American) units of measure in SewArt.

### Parity

Use this menu item to choose between left-handed and right-handed tool cursors in SewArt.

## Windows Menu

Use these menu items to view open Windows in various configurations in SewArt.

### All Windows

**SewArt** displays a list of currently open document windows at the bottom of the Window menu. A check mark appears in front of the document name of the active window. Choose a document from this list to make its window active.

### New Window

Use this command to open a new window with the same contents as the active window. You can open multiple document windows to display different parts or views of a document at the same time. If you change the contents in one window, all other windows containing the same document reflect those changes. When you open a new window, it becomes the active window and is displayed on top of all other open windows.

### Cascade

Use this command to arrange multiple opened windows in an overlapped fashion.

### Tile

Use this command to arrange multiple opened windows in a non-overlapped fashion.

## Help Menu

Use these menu items to access help about SewArt.

### Help Topics

Use this command to display the opening screen of Help. From the opening screen, you can jump to step-by-step instructions for using **SewArt** and various types of reference information.

Once you open Help, you can click the Contents button whenever you want to return to the opening screen.

### About SewArt

Use this command to display the copyright notice and version number of your copy of **SewArt**.

### Order Information

This provides a link to the our website URL: <http://sandscomputing.com> for ordering **SewArt**, as well as other information about the application. In the commercial version, the batch conversion utility is fully enabled, allowing unlimited numbers of files to be converted and saved at once.

# Chapter 10

## Digitizing Topics

Use this to find specific information (How to's) about SewArt.

### Avoid Sewing Background

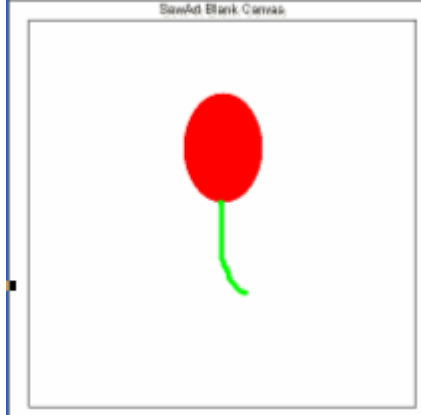
To avoid sewing the background, use the [bucket fill](#) tool to flood the background part of the image with a *transparency* color that will not be sewn. Use the interactive color mixing feature of the bucket fill to select a unique color not in the image pattern. Alternatively, if you have checked the *Auto-sew Image* box on the [Stitch Toolbar](#), then a drop down list will appear that allows you to chose either to sew all colors or to click on an image color that will be treated as transparent (not sewn).

Otherwise, simply avoid clicking on the background color and it will not sew-out. If you click it by mistake, you can delete it from the stitch list before the actual pattern file is written.

### Blank Canvas

When **SewArt** opens, the workspace contains a 100 X 100 mm image called a *blank canvas*. If you want to create your own artwork to sew, you can use the [paintbrush](#), [pencil](#) and [bucket](#) tools to draw and color images on the "canvas". You may [save](#) your artwork and [convert](#) it to stitches like any other image.

The balloon below was created (by someone with limited artistic ability!) using the paintbrush to create a solid red ellipse. Note that when "writing" on the blank canvas, all the colors are *inverted* by default, until you uncheck the *inverse color* button. This is done to allow you to write with a black pen or pencil on a white canvas. Next, the pencil tool was used to create a green free-hand string for the balloon.



## Change Fill Pattern

When in *Stitch Mode*, click the *Fill* scroll arrow on the [stitch toolbar](#) to open the pattern selection drop-down list. A bitmap of the presently selected pattern (the one showing in the edit box) will be displayed. Use the up and down arrow keys to scroll through the list of available pattern fills. Every time a new pattern is selected (highlighted in blue), its bitmap will be displayed next to the drop-down box. To select a pattern to use for filling, click on it. This will close the list and the name of the selected pattern will appear in the edit box.

If you decide at any time to change the pattern for a region (color stop) of the image, you may edit the *number* associated with a pattern file in the stitch list.

## Change Color of Paint (or Pencil) Tool

When one of the painting tools ([pencil](#), [paintbrush](#), or [paint bucket](#)) is active, its color may be changed in one of several ways:

1. hold down the Control key and click the tool cursor over the part of the image whose color you wish to use
2. click the normal (arrow) cursor on a color on the palette tool bar which appears at the bottom of the screen when one of the paint tools is active
3. click the "eye dropper" button. This will cause the cursor to change into an eye-dropper when you are over the image, and click the eye-dropper on the color you wish to use

For the paint bucket tool, you can mix a custom color with the color picker tool.

## Remove Speckles from an Image

Most raster images - represented by formats such as \*.bmp, \*.jpg, \*.gif, \*.png, \*.tif - will require some image *processing* before they are suitable for sewing a high-quality embroidery file pattern.

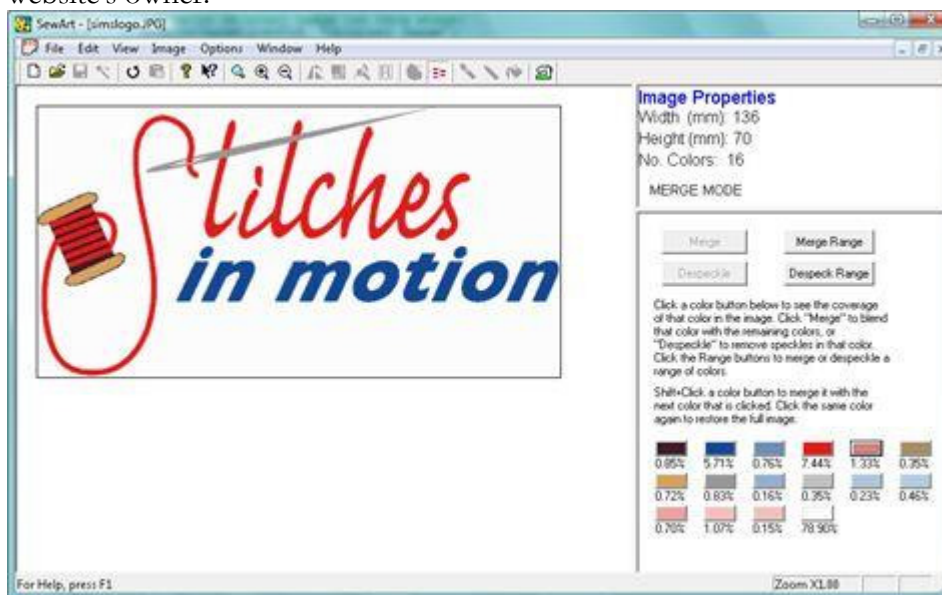
Most vector images - represented by formats such as \*.emf, \*.eps, \*.wmf - already have performed some type of image processing and may not require further processing before being sewn.

What determines when an image is suitable to be sewn? The simple answer is that all the visible (large-scale) colored regions are comprised of single colored pixels *and* there are very few (or no) *speckles* in the image.

### What are speckles?

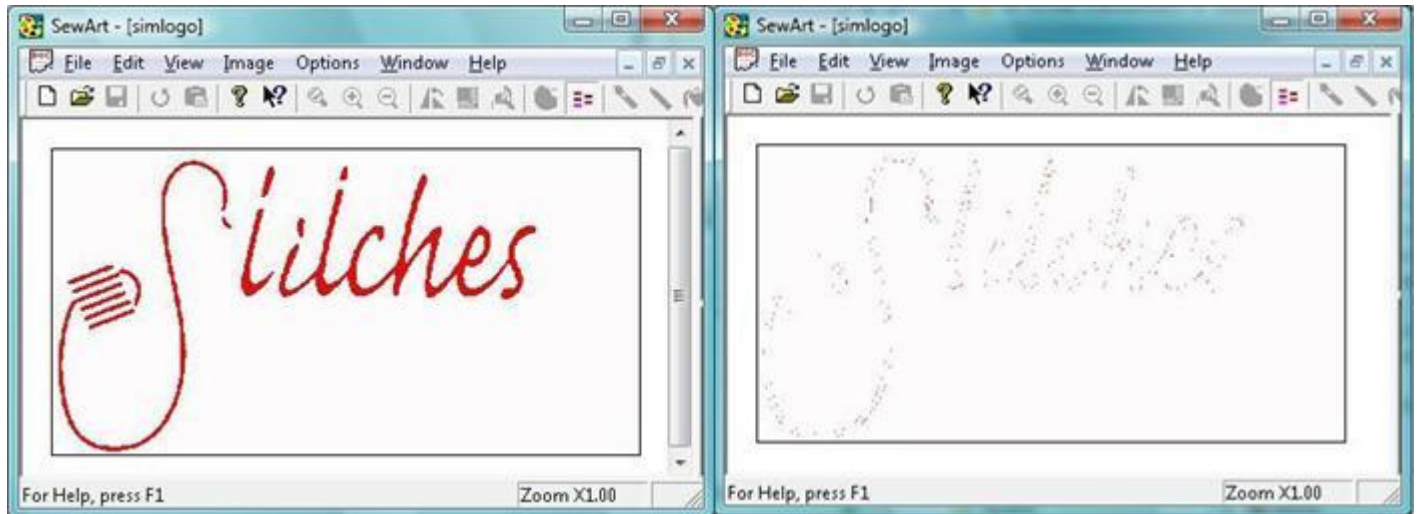
Digitized images very often display some color *aliasing* at boundaries between different colored regions. This aliasing effect introduces a mixture of differently colored pixels in a thin (usually only a few pixels wide) boundary region between the different solid colored regions. These pixels - referred to here as *speckles* - are generally disconnected from one another and would lead to a very unpleasant sew-out if they were each stitched separately. (The needle would skip around from speckle to speckle, rather than sew in a nice smooth solid fill!)

To view speckles with **SewArt**, open an image file and after [reducing](#) the color number if possible (without altering the image quality), click on the [merge colors](#) button. The example below is taken from a logo file that was downloaded with the permission of the embroidery website's owner:



## SEWART USER'S GUIDE

Note that while there are only five solid areas clearly visible in the logo file (not including the white background), after color reduction there are still 16 colors remaining. Consider the red-hue buttons in the second row. Clicking on the first two shows their contribution to the logo image below:

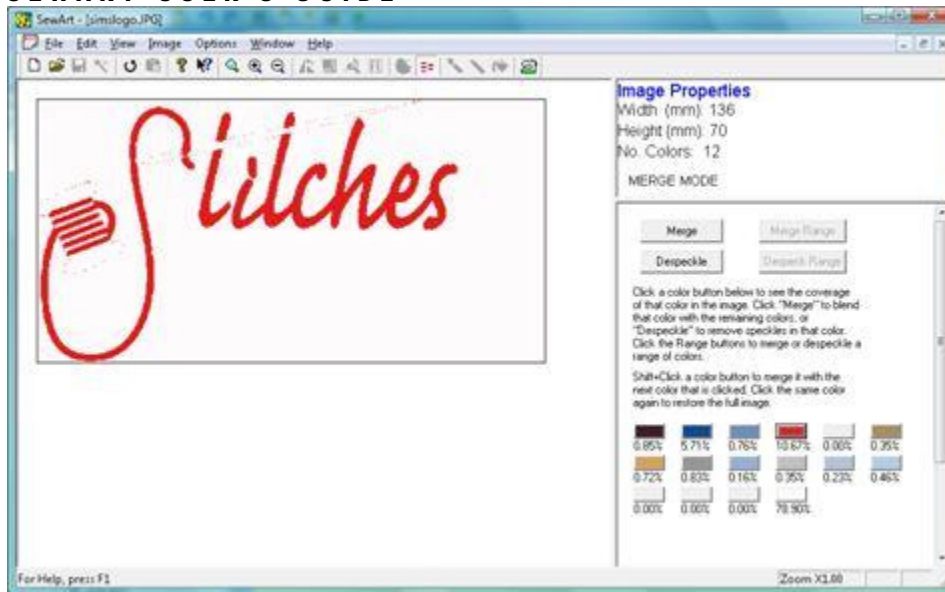


The figure on the left was generated by clicking the red color button (labeled 7.44% for the percent coverage that this color contributes to the image), and the figure on the right is the result of clicking the next (1.33% coverage) button. On the left are several solid areas of red. However, on the right are only *speckles* - occurring at the boundary between the red regions on the left and the background white region - which would lead to a disconnected, low-quality sew-out if they were sewn, due to the chaotic jumping of the needle from point to point.

### How to eliminate speckles

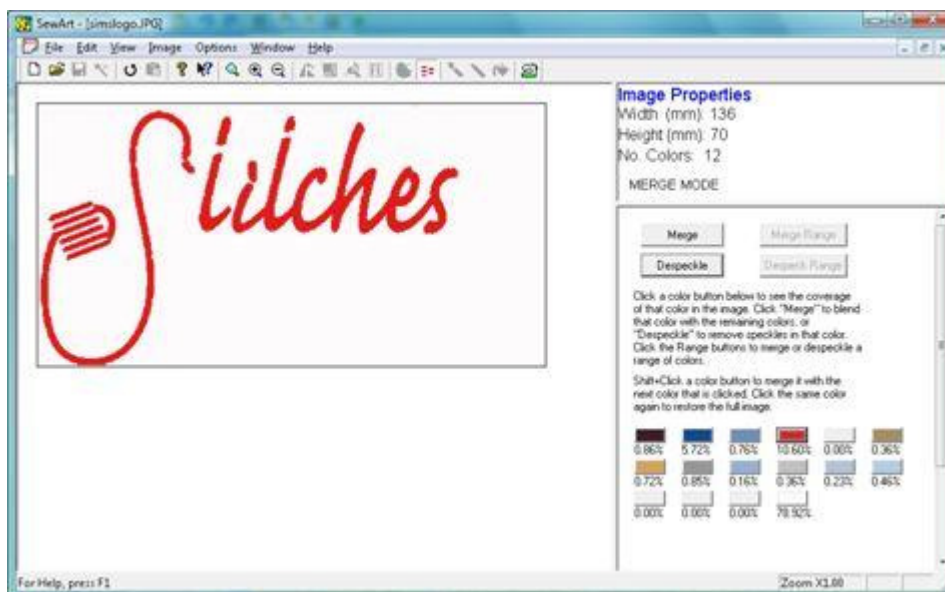
There are two types of speckles that require somewhat different handling. The first type is shown in the (right) figure above, where *all* the points are speckles. To improve the logo image quality, it is necessary to merge the speckles with the appropriate solid region color(s). In this case, by clicking consecutively **all** the red hue buttons, it is easily determined that they too are all boundary point speckles (except for the 7.44% case). To merge the speckles with the dominant solid red color, Shift-click each color button corresponding to red-hue speckles (one at a time), and then click on the 7.44% button to merge with it. Each time a merge is done, you will notice that the initial 7.44% coverage percentage will increase until it reaches 10.67%, as shown below:

## SEWART USER'S GUIDE



Note that the color number has now been reduced to 12 and that the single remaining red color is *almost* free of speckles.

This demonstrates the second type of speckle that occurs in practice, where *most* of the color is a solid region and now only a few speckles remain. In this case, one should *not* merge this color since that would also recolor the solid regions, which are desirable to retain in the final image. The remaining speckles can now be removed by clicking on the red color button (to highlight the red part of the image) and pressing the *despeckle* button. The figure below shows the result after of this despeckling operation. Notice the complete removal of the speckles around the needle and thread, while the solid red regions have been left intact. (Should a small number of speckles still remain, they could be efficiently removed with the pencil or paintbrush tools.)



## Resize or Change Density of an Embroidery Pattern

After you create an embroidery file with **SewArt**, it is possible to change the size, stitch density, fill pattern and/or angle.

**Important note:** If you want to preserve the stitch order of a previously-sewn pattern, **do not** resize the image file (or the stitch list will be cleared!) It is much easier to resize the pattern when you save it (as described below). Here is the simple procedure for editing the embroidery file:

Reopen the image file and click the "Convert" (sewing-machine) icon on the [main toolbar](#). This will get you into *Stitch mode*. You have the option at this time to reload the previously stitched embroidery file associated with the image. Then follow the directions for editing the stitch list, which are given in the [Conversion](#) section. In particular, to change the density, change the value of the *separation* settings. If you want to change the separation values for *all* the color stops, it might be easier to clear the stitch list, set the desired separation value on the sewing toolbar, and then resew the entire pattern. Finally, click the [File/Save As](#) menu item. Here is where you can choose to resize the pattern sewn, by entering a scale factor value (1.0 means no resizing, 2.0 means double the size, 0.5 means halve the size, compared to the nominal image size).

In addition, you may edit the embroidery file in a separate embroidery file editor.



## SEWART USER'S GUIDE



Save the active image and stitch file with its current name. If you have not named the image, **SewArt** displays the Save As dialog box. If you are in stitch-mode, then the embroidery file and stitch-list file will be saved instead.



Undo the previous operation.



Paste the image file stored in the Windows clipboard into the active window.



Magnifying glass to zoom-in on a particular region of the image.



Enlarges view on screen (**zoom-in**) without changing image dimensions.



Decreases screen size (**zoom-out**) without changing image dimensions.



Rotate image



Resize image



Crop Image (remove parts of the image not included in stitch pattern)



Start the image-processing wizard.



Reduce number of colors in image



Merge and despeckle colors in image



Paint brush to fill parts of an image with a solid color



Pencil to fill individual points or lines in the image



Paint bucket to fill large regions of the image uniformly



Convert image to redwork



Opens stitching mode to convert a graphics image to an embroidery file.



Context sensitive help.



Help for individual selected items.

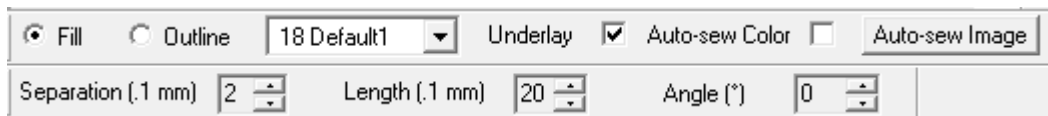
## Stitch Toolbar

The stitch toolbar is displayed across the top of the workspace when *Stitch Mode* has been activated by pressing the [Convert to Stitches](#) button on the main toolbar. There are two types of stitch toolbars described below which appear depending on whether the mode is for filling or outlining the image.

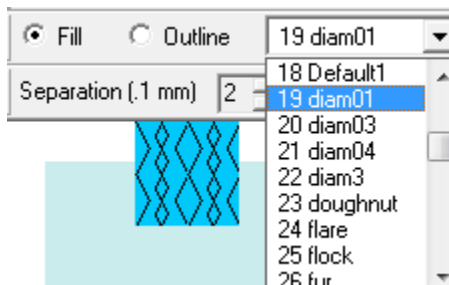
### Fill/Outline Stitch Mode Toolbar

This bar is split into two separate toolbars (see figure below). One of the bars displays tools for editing pattern properties (like underlay, fill or outline style), while the other has tools for setting thread properties (like thread separation). Both can be moved to other positions in the workspace by clicking and dragging the grab-bar at the left of the toolbar.

These toolbars provide quick mouse access to features used to sew out the pattern file corresponding to the current image in the **SewArt** workspace.



The content of the drop-down combo box shown above in the top toolbar changes depending on the fill **style** that is selected. When the *Fill* radio button is checked (as shown above), then the combo box contains the pattern fill styles that are available. Click on the down scroll arrow to open the combo box. Use the Up/Down *Arrow Keys* on your **keyboard** to scroll through the list of available patterns and to display an image of the pattern. This is the **ONLY** way you can scroll and view the pattern images (if you use the scroll bar on the combo box, you will **not** see the images appear!) In the example below, the #19 diam01 pattern is highlighted by pressing the Down arrow key, and the pattern appears to the right of the combo list. Once the desired pattern is found, click on it with your left mouse button to select it and close the combo list.



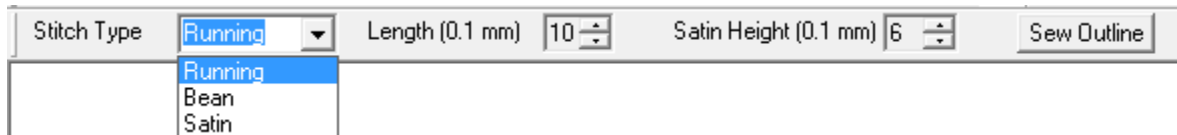
## SEWART USER'S GUIDE

When the *Outline* option is checked, the combo box will be filled with the three available outlining stitches (see the figure below). Again, scrolling with the arrow keys will give a depiction of the stitch layout. In Outline mode, the *Separation* control label (shown in the toolbar above since *Fill* is checked) changes to *Satin Height* and the *Angle* control becomes inactive.

Click	To
Fill/Outline Radio	Select stitch mode (either pattern fill or outline stitch)
Fill/Outline Combo Box	Open a drop-down combo box for selecting pattern fills or outline stitches
Underlay Check Box	Add (checked) underlay stitch to the pattern
Auto-sew Color	Automatically sew ALL the same colors (as the one clicked) in the image
Auto-sew Image	Automatically sew the entire image.
Separation/Satin Height	Set the density of the fill (in fill mode), with lower separation translates to higher density. In outline mode, set half-height of satin outline stitch
Length	Set the average stitch length for underlay.
Angle	Adjust the stitch angle of the fill (horizontal fill corresponds to 0 degrees)

### Redwork-Stitch Mode Toolbar

This toolbar appears automatically when the *Redwork* toolbar button has been clicked, indicating that the image has been previously converted to outlines or center-lines:



Click	To
Stitch Type Combo	Select either a running, bean, or stitch for the outline
Length	Set the average length for the stitch (default is 1.0 mm)
Satin Height	Set the height for the satin stitch
Sew Outline	Sew out the outline on the screen (preview) before saving the stitches