



# Advanced Lettering & Basic Digitizing

This section will focus on how to digitize basic embroidery designs using the Tajima DG16 software. The goal of this class is to introduce you to the features and concepts required to start producing quality digitizing immediately. Some features and settings will NOT be covered, as they are supplemental and can be learned through practice and experimentation.

*At this point, you should be comfortable in the Tajima DG16 Software environment and well-versed in all of the basic functions and processes. You should have already attended the Basic Embroidery Training Class which covered Lettering and Editing. If you have questions or are unsure of a process, please feel free to ask the Instructor.*

NOTE: The software is officially recognized as Tajima DG16 by Pulse Microsystems.

## Advanced Lettering

- Advanced Duplicate Tool
- Random Repeats
- Color It
- Import Emoji Tool
- Rainbow Lettering
- Word It

## Introduction to Digitizing

- What Is Digitizing
- The Digitizing Process
- Digitizing Tips

## Artwork Images

- Graphic File Formats
- Importing & Scanning
- Manipulation

## Stitch Types

- Runs
- Satins
- Fills

## Run Stitches

- Runs
- Two Ply
- Bean
- Half-Bean
- Settings

## Satin Stitches

- Satin Paths with and without holes
- Satin Settings

## Steil Tool

## **Brush Tool**

## **Fill Stitches**

- Complex Fill
- Complex Fill with Holes
- Fill Settings

## **Drawing Modes**

- Quick Draw Mode

## **Pathing**

- Laying Out a Roadmap

## **Applique tool**

## **Auto Trace With A Stitch Type**

## **Pen Tool**

- Create Boundary
- Drag Anchor Path
- Combine and Reflect
- One Click Conversion

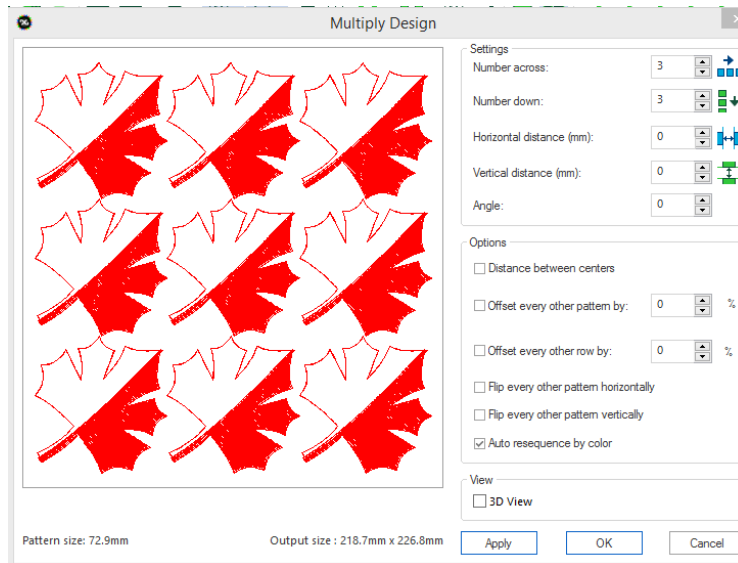
## **Vector Import**

## **Draw Fusion**

# Advanced Lettering Features

## Advanced Duplicate Tool Features

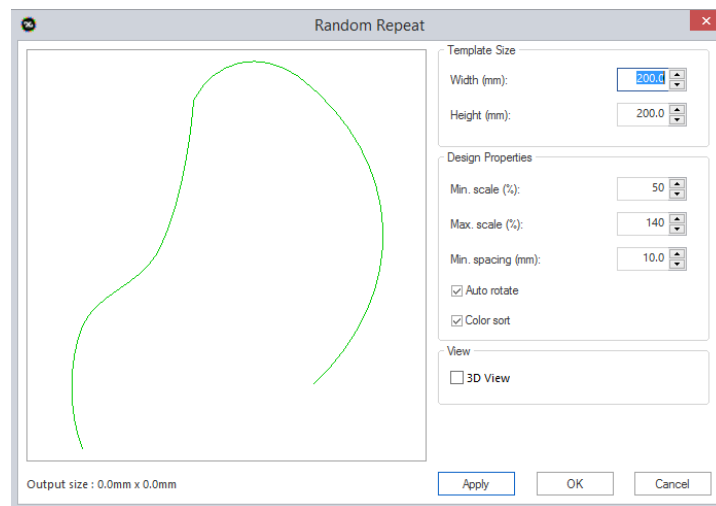
The Multiply Design dialog is an enhancement of the Duplicate tool. Use this feature to create an array of duplicates, arranged on a grid. You set the number of rows and/or columns of copies of the selected segment, and the horizontal and vertical spacing (displacement) between duplicates. There are also options that allow you to modify the final design; for example, you can include a percentage offset for alternate objects, add a percentage offset between every other row in the design, or flip the objects vertically or horizontally.



To use this feature, select a segment of any type and click the Duplicate tool on the Transform toolbar (Ctrl + D). Then, press Ctrl and left-click to open the Multiply Design dialog. Enter the parameters for how many rows and columns you want to include and adjust other settings as required. Press OK to add the duplicates to the design.

## Random Repeats

The new Random Repeat feature uses a selected design element and makes copies of it, which are randomly distributed in the design workspace. In the dialog, you are able to set the size of the template, the minimum and maximum scale of the copied design, whether the individual designs are rotated or not. You can also choose to color sort the overall Random Repeat design, to keep color changes to a minimum.



The Random Repeat can be applied to the whole design, or just one element of the design.

## ColorIt Tool

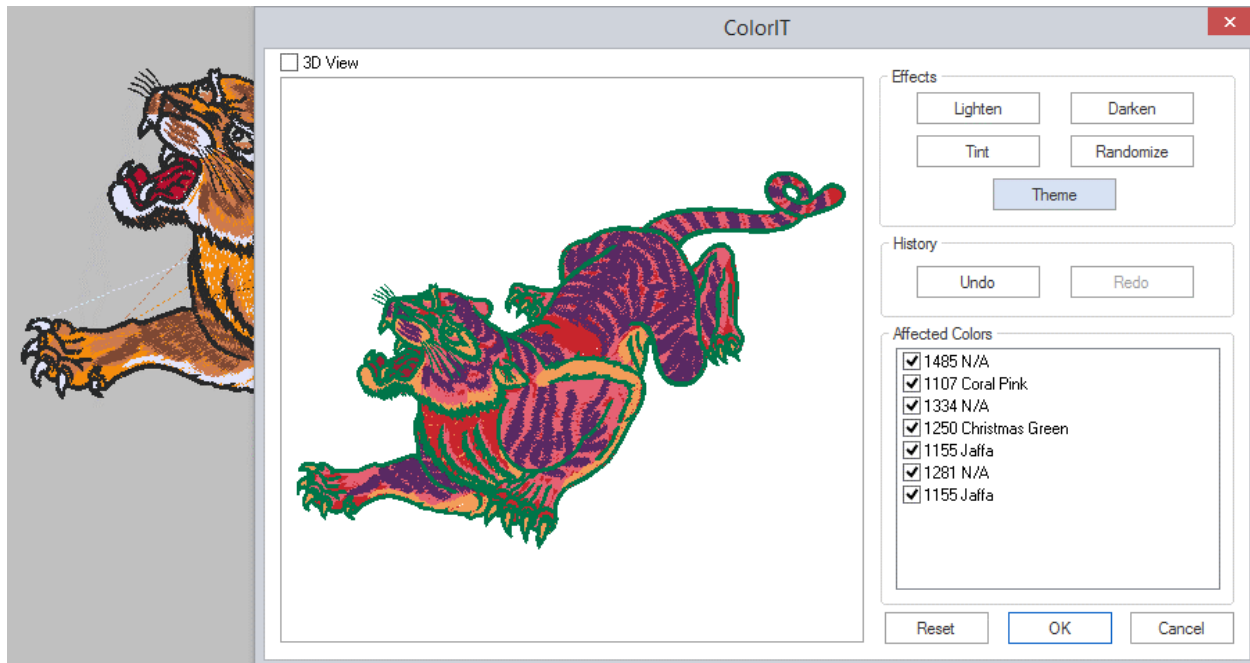
The ColorIt function adjusts the overall color scheme of the designs. There are a number of different ColorIt modes that can be applied:

**Lighten:** Lighter versions of the thread colors already in your design will be substituted in for the current thread colors.

**Darken:** Darker versions of the design's thread colors will be substituted in for the current thread colors.

**Tint:** You select a color from the color chooser dialog; when you press Apply, all the colors in the design will be tinted according to the color you choose.

**Randomize:** New thread colors are substituted randomly from the current palette.




Note that, by default, all colors in the design will be selected; however, you can choose which thread colors will be affected (or not) by checking or unchecking the boxes next to each thread in the "Affected Colors" area of the dialog.


To start using the ColorIT tool, select the ColorIt  icon from the Personalization toolbar, or select Tools—Personalization—ColorIT from the Menu bar.

## Import Emoji Tool

The Emoji tool is a new text tool which opens up a dialog for adding embroidery emojis to a design. When you click the Import Emoji button, it will open the a dialog of pre-digitized emoji designs; select and click in the workspace to instantly add the emoji to the current design.

To add Emojis, select the Add emoji  icon from the Personalization toolbar, or select Tools—Personalization—Import Emoji from the menu bar.

## Rainbow Text

The Rainbow Text  tool is a new text tool on the Text toolbar. When a text segment is selected, clicking the Rainbow text tool will change the individual letters to different colors. The colors will be chosen randomly from the colors available in the current palette; each time the Rainbow tool is clicked, a new set of colors is selected.

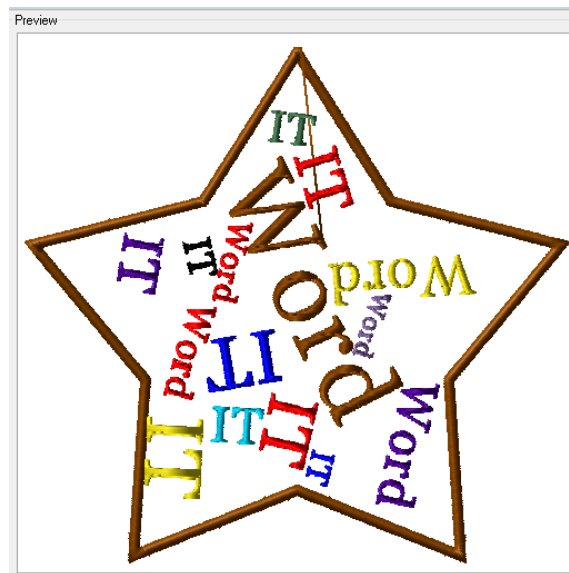
Somewhere over...

## WordIt Tool


The WordIt tool is a special type of text tool that generates a number of text paths, and puts them into the design. The text paths are scattered randomly around within the boundaries of an envelope shape, which you select from the dialog.

In the WordIt dialog, you can set other parameters of the WordIt design, such as the maximum number of text paths that will be included, the font used, the orientation of the text, and the shape of the outline that will be generated to contain all the text segments.

The WordIt dialog includes a preview window which allows you to get a picture of how the design will look before you actually place it in your design. This allows you to adjust settings, and re-generate the WordIt design as often as required to get the right result.



### *The WordIt preview window*

To open the WordIt dialog, select the WordIt  icon on the Personalization toolbar, or Tools—Personalization—WordIt in the menu bar.

# **Introduction to Digitizing**

## **What Is Digitizing?**

Digitizing is the process of converting non-electronic media (such as printed materials) into a digital electronic format. For the purposes of embroidery, digitizing is the process of converting artwork into an electronic stitch format that can be read by an embroidery machine.

Many people have a misconception that Embroidery Digitizing is as simple as scanning a design then sending it over to the machine. In reality, creating stitches is a fairly simple process. The challenge comes in making those stitches sew well on a given fabric.

The characteristics of the fabric will affect how the stitches look. Stretchy fabrics tend to distort the stitches, thick ones cause the stitches to sink in, while textured fabrics usually result in uneven stitches. Learning to compensate for different fabrics is perhaps the greatest challenge for a Digitizer. This will come with practice and experimentation.

## **The Digitizing Process**

Typically the process begins with acquiring artwork and displaying it on your computer screen. This artwork will serve as a background template over which you will trace stitches. These stitches, with one exception, are separate from the background image.

As a Digitizer, you will have to make many decisions about your design. You will begin by analyzing each piece of artwork in order to determine the best types of stitches to use as well as the proper settings. In addition, you will need to determine the sequence in which these stitches should sew.

Once you complete a basic analysis, you can begin creating the stitches by tracing the individual elements of the artwork on the computer screen using your software tools and a mouse.

## **Digitizing Tips**

### **Artwork**

- Analyze the artwork before you begin digitizing. Be realistic in your expectations.
- Determine the size of your finished design.
- Make a copy of your design at the actual size of the finished design. This helps to determine the proper stitch types.
- Make the artwork as crisp and clean as possible. Clean artwork saves a lot of time when digitizing. Camera ready artwork is ideal.
- The cleaner the lines are the easier it will be to zoom in and punch in fine detail.
- Make sure you can recognize all the shapes and lines in your artwork. For example, if you scan in a business card and then zoom in on it, the shapes may be too blurry to recognize.
- Determine sewing order of the design. Take into account color changes, trims, type of garment and the position of shapes in the design. For example, foreground, middle ground and background.
- Determine the proper stitch types by making a copy of your artwork the same size as the finished design.

### **Embroidery**

- Determine the fabric that the design will be sewn on. Fabrics such as crossgrain and corduroy need special consideration when digitizing. Caps also need special consideration.
- Try to place Run stitches between regions so that the Run is covered by stitches that come later. (Needle down)

- If a punching tool is enabled, you can press the Spacebar on your keyboard to toggle between the Run tool and the enabled punching tool. The user can digitize a run segment and press the Spacebar again to toggle back to the previously used punching tool.

## Other items to consider

- Are there special customer specifications?
- Does the artwork look finished?
- Does an outline need to be drawn around the Fill?
- Does the width of the columns need to be wider?
- Is the lettering minimum size or larger?

## A successful digitizer.

- Allows for a "learning curve". You may need to continue having difficult designs digitized by an outside source—this is normal.
- Spends time practicing.
- Has realistic expectations.
- Views designs as basic shapes.

## Artwork Images

To begin the digitizing process you must transfer your artwork onto the computer screen.

## Graphic File Formats

The most common graphical format is the bitmap file. Bitmaps come in a variety of file types including .bmp, .jpg, .tif, .gif. With a bitmap, the image is converted to a series of tiny pixels. Viewed in their original size, most bitmap files are very legible. However, when zooming in, these files become fuzzy and blurry.

## Training Exercise-Obtaining Artwork Images

1. *Start a New File. Remember that the styles have pre-set recipes based on the fabric type you choose.*
2. *Click on Image from the menu ribbon..*
3. *Left-click on Load which will activate the Open Image Dialog box. You will see several folder choices and can essentially search the entire computer for images if needed. In the lower section of the dialog box, click on the down arrow next to the box labeled Files of Type. This will open a drop-down box of all of the graphical file formats that the system can read. In most cases, you will stick with the All Image Files selection. (Choosing a specific file will limit the software to searching for only files of that type.)*
4. *Find the image called Shapes 1 and double-click on it. This will bring the image onto the workspace.*

## Manipulating Images

Once you have your artwork image open and displayed on the screen, you can manipulate it by resizing, rotating or flipping. Be aware that enlarging a bitmap file will usually decrease the clarity of the image.

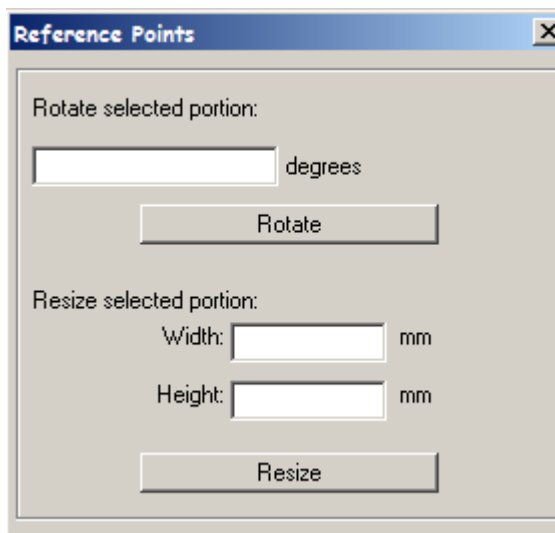
## Training Exercise-Manipulating Artwork Images Manually

1. *Go to Image on the menu ribbon and left click, choose the Backdrop Select tool. This will activate the Image Control Function and change the cursor into an arrow-head with + symbol. Place the cursor over the image and right click to activate the Image Control Commands.*
2. *Left click on **Rotate** and place the cursor in the top left corner of the image.*
3. *Left click and drag your mouse to the left or right to rotate the image. Experiment with this function until you are comfortable with it, and then return it to the normal vertical position. If you accidentally let go of the mouse button while dragging you will need to repeat steps 1 and 2.*
4. *Right click and select the **Flip Horizontal** command and observe the result. Repeat this step to return the image to its original position.*

5. Right click and select the **Resize** command.
6. Move the mouse and observe how the image is resized. Notice in the lower tool ribbon that the percentage and measurements of resizing is displayed.
7. **Resize to approximately 300%** and left click to lock in the new size. Notice how the image starts to appear jagged. This is typical of a bitmap file.

## Training Exercise-Manipulating Artwork Images Using the Reference Tool

1. While still in the Backdrop Select tool, place the the image and right click to activate the Image Commands.
2. Left Click on **Reference Tool**. The Reference Tool will be displayed.
3. In the Rotate Selected Portion Box, enter 10. Left Rotate. The image will rotate clockwise by 10 Change the value to -10 and left click on Rotate image will rotate counterclockwise by 10 degrees original position.)
4. Left click inside the Width box and change the value Left click on the Resize button. Notice that the changes in proportion to the new width value.
5. Tap the S on the keyboard to exit out of the tool & back in the Select Mode.



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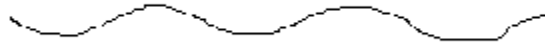
# **Stitch Types**

Once you have the artwork setup on the screen, you will choose the necessary stitch types required to recreate the graphical element in embroidery stitches. You have three basic types of stitches to choose from: Run, Satin and Complex Fill. Before you can apply them, you must understand them.

## **Run Stitches**

Runs are the most basic stitch type of all. A normal run stitch (or walk stitch) is usually a single row of stitches that “run” along while sewing. They are most commonly used for creating outlines and fine details of a design. They can be straight or curved.

Think of run stitches as drawing with a fine-tipped pencil or pen.



## **Satin Stitches**

Satin or column stitches are created by a series of single stitches that zig-zag back and forth, one stitch at a time. They are referred to as Satins due to their shiny appearance. The satin stitches have a raised appearance to them making them stand up on the fabric. They are most commonly used for creating lettering and for covering small areas. They are also used to create borders. The stitches contour and curve through out the segments. Think of Satin stitches as drawing with a narrow paint brush.



## **Complex Fill Stitches**

Complex Fill stitches are created by a series of multiple short stitches that sew back and forth in order to cover a large area. They are most commonly used for large pieces or complex shaped pieces. The stitches unlike the satin stitches lay flat on the garment and create a higher stitch count. The angle of the complex fill stitches all go the same direction per segment.

Think of the Complex Fill stitch as drawing with a can of spray paint.



# Run Stitches

In this section, you will learn how to create and manipulate run stitches. You will also learn about the different types of run stitches and the different settings that can be applied to the run stitches.

## Basic Run Stitches

Run stitches are created by selecting the Run Tool and then placing a series of anchor points that trace along the desired shape. These anchor points define the shape or path of the line. They do not represent where the needle will penetrate the garment that is determined by the length of the stitch.

**Quick Draw Mode:** QuickDraw mode gives you the flexibility and control you need to toggle between entering straight and curved points. To place a straight point, left-click the design workspace. To place a curved point, Right click your mouse.

To use QuickDraw mode press Q on your keyboard after you have clicked the punching tool you want to use.



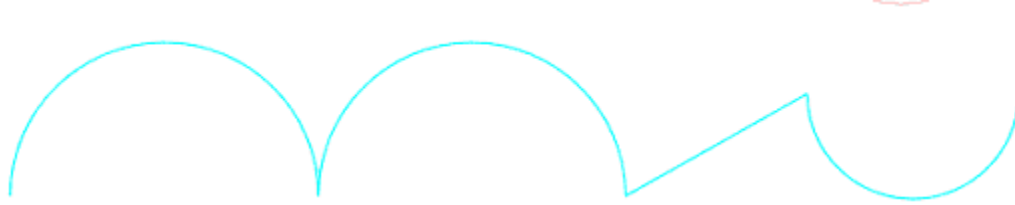
## Training Exercise – Generating Basic Run Stitches

1. Zoom into the first row of objects in the Shapes 1 artwork.
2. Select the Run Tool.
3. The cursor will change to crosshairs. Place the center of the crosshairs over the top left corner of the square and left-click to set an anchor point.
4. Move the cursor to the right until the crosshairs are over the top right corner of the square. Left-click to set the second anchor point. The 2 points are connected.
5. Notice that the line connecting the 2 points may not be straight. Tap the backspace key 1 time.
6. Hold the shift and plot the 2<sup>nd</sup> point in the upper right corner again. By holding the shift key this snaps the connection of the points to 15 degree increments.
7. Move the cursor down until the crosshairs are over the bottom right corner of the square graphic. Hold shift and left-click to set the third anchor point.
8. Move the cursor to the left until the crosshairs are over the bottom left corner of the square graphic. Hold shift, left click to set the fourth anchor point.
9. To complete the square, tap the O key on the keyboard. This will connect the last point to the first point plotted. The O key can be used to close in any shape. Depressing it will automatically close the shape.

*Note: If the last connection line is not straight use the Vertex Select tool to average the anchors as taught in Embroidery Essentials Day 2*

10. Press Enter on the key board complete the segment. It is important to press Enter on the keyboard when the segment is completed as this separates the segments from each other.
11. Choose a new thread color. On the bottom left of the screen is a series of colored blocks which represent the current needle/thread palette. Left click on the second block, which is red. This will make the new segment red in color.
12. Now digitize the diamond graphic by placing four anchor points starting at the top then use the H key to close the segment.
13. Press Enter on the key board to complete the segment.
14. After completion of the diamond graphic Digitize the oval and the circle. **For each graphic, be sure to change the color.** Remember to right click to get curved points while using Quick Draw.

15. Tap the I on the keyboard to hide the image. To bring back the image tap the I again. Then digitize this next shape as a regular running stitch.



## Two Ply Stitches

There are several styles of run stitches available. Each one is created the same as the standard run, but sews differently. The end result is a different thickness of stitches. Each type of run stitch can be likened to a drawing with various sizes of fine-tipped pens. When creating sophisticated designs, it's important to recreate the various details using appropriate styles of stitches.

The first type of run is the standard run which you just finished working with. The second type is the two-ply stitch. You digitize it the same as the standard run. However, when it sews, it automatically makes a double pass, ending where it began. Two-ply's are used where the digitizer desires a slightly heavier or thicker run stitch than the standard. It's also a time saver as you digitize it once, but it sews twice.

### Training Exercise – Two Ply Run Stitches

1. For this exercise, you will digitize the graphic in the third row of the same artwork that you have already been using.



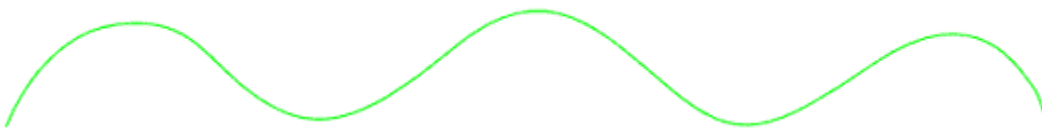
2. Select the Run Tool, change the color of thread.
3. In the top tool ribbon a box will appear that says Run Style. Click on the arrow to open the drop down box and view your choices of run styles. Select Two Ply.
4. Digitize the graphic using the same process as in the earlier exercises. When finished, Press Enter on the key board..

## Bean Stitches

The bean stitch is digitized the same way as a standard run stitch. The difference is in how it sews. It moves 2 steps forward, and one step back, creating a triple stitch. The sewing follows this sequence all the way to the end of the segment. The end result is a much thicker line than the standard run or the two ply. It also has a higher stitch count.

### Training Exercise – Bean Stitches

1. For this exercise, you will digitize the graphic in the forth row of the same artwork.



2. Select the Run Tool, change the thread color.
3. Click on the down arrow next to Run Style at the top of your screen and select the Bean.
4. Digitize the graphic using the same process as in the earlier exercises. When finished, Press Enter on the key board.

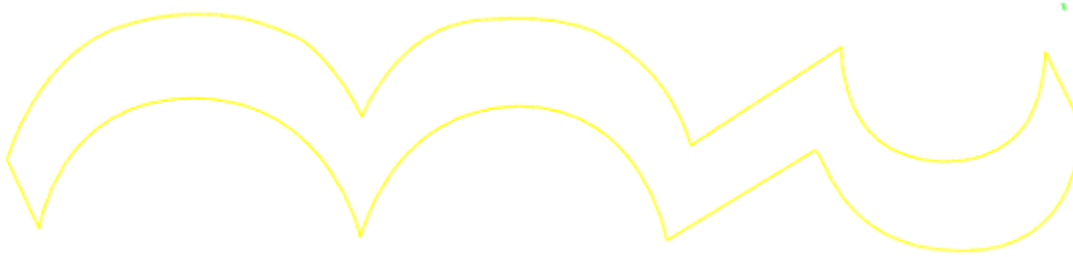
## Half Bean Stitches

The half bean stitch, also known as the back-stitch, is digitized the same way as a standard run stitch. Again, the difference is in how it sews. It moves 1 long step forward, then one short step back, 1 long step forward, and then one short step back. The sewing follows this sequence all the way to the end of the segment. The end result is a thicker line that the standard

run or the two ply, but thinner than the Bean. It has a higher stitch count than the standard run or two ply, but less than the Bean.

## **Training Exercise – Half Bean Stitches**

1. For this exercise, you will digitize the graphic in the fifth row.



2. Make sure that the Run Tool is still selected, change the thread color.

3. From the Run Style Box, select the half bean.

4. Digitize the graphic using the same process as in the earlier exercises. When finished, Press Enter on the key board.

## **Run Stitch Segment Settings**

All run styles have the same settings which can be changed as needed. While the default settings may work fine in many cases, there will be situations where you may need to make some changes.

To view the entire segment settings for the run stitches, select one of the pieces you have digitized, left-click on the black arrow at the top right side of the workspace. The first tab that will come up will be the Run Tab.

**Run Style:** – This allows you to select different styles of run stitches. It can also be found on the upper tool ribbon on the main screen or the Run Stitch Fly Out Window.

**Stitch Length** – This sets the specific length for each stitch within a run segment. Recommended minimum stitch length is 1.2 mm, while maximum stitch length is 10 mm.

**Drop Run Stitch** – This is used to ensure the proper placement of Run stitches. Choose from At Anchor, None, and Chord Gap.

This function controls where the needle penetrations for the run segment actually occur. When you digitize a run segment you place anchor points to create the proper line shape. These anchor points do not necessarily represent needle penetrations. The software will calculate the final needle penetrations and stitches based on the chosen segment settings.

When you designate a specific stitch length, it sometimes creates needle penetrations in undesirable location, which could affect the quality of the sewing. The Drop Run Stitch settings are used to allow the software to create the best stitch placement for the given situation.

**At Anchor** drops the Run stitches according to the specified stitch length as well as penetrates where ever there is an anchor point.

**None** forces the Run stitches to follow the Stitch Length setting. In the case of a 12mm long segment with a stitch length setting of 3mm, there would be four actual stitches, each one being 3mm in length.

**Chord Gap** places the stitches to fit curves smoothly by shortening the stitches at the top portion of a curve. It works in conjunction with the Maximum Chord Gap Distance setting and the Minimum Stitch Length setting.

**Now select the Commands Tab.**

**Start Command** – This allows you to assign a special function command to take place at the beginning of the segment. Usually embroidery machines with special devices such as sequin devices or boring devices need some type of command to turn on the device. The start command function turns the device on.

**Stop Command** – This allows you to assign a special function command to take place at the end of the segment. Normally this is where you will assign a trim command to a segment. Other commands are available again for special devices on embroidery machines such as sequin devices and the stop command turns the device off.

### **Now Select the Connections Tab.**

**Smart Connect** – This is a tool that automatically inserts stitches, jumps and runs between segments. Smart Connections simplifies the digitizing process by applying the proper connection method based on the distance between the segments.

**Trim at** - This setting will insert trims when the distance between segments is greater than the distance entered in the setting.

**Connection by run** – This setting will connect segments with run stitches, and will use the stitch length entered in the maximum length setting.

**Lock Stitches** – This setting will automatically insert lock stitches around trims, color changes and stops, depending on the selection of Never, Sometimes or Always.

**Lock Stitch-Start** – This places a lock stitch at the beginning of the segment. It is important to insert a lock stitch at the start of a segment any time the needle is penetrating the fabric for the first time. The purpose of the lock stitch start is to engage the top thread with the bobbin which helps prevent “no catches”.

**Lock Stitch-End** – This places a lock stitch at the end of the segment. Any time a segment is going to trim, change color or jump to another segment a lock stitch end should be added to the segment. The purpose of a lock stitch at the end of the segment prevents the thread from coming undone.

# Satin Stitches

In this section, you will learn how to create and manipulate satin stitches. You will also learn the different segment settings.

Satin stitches are very flexible and can be made to follow complex shapes. A satin segment is defined by two parallel sides. The sides are separated by one stitch length. During the process, the machine sews back and forth between the two sides of the defined segment. The stitches within the satin segment can be angled as desired to match the contours of the segment. The limitation of a satin segment is that it cannot be very wide, since the width of the segment is one stitch.

## Satin Paths

Creating a Satin Path is much like the process of creating a run segment. You begin by selecting the Satin Path Tool in the Digitizing draw of the tool cabinet and then create a series of anchor points which define the boundaries of the shape that you wish to make into a satin segment. The Quick Draw function exists, as well as the stop/start points. In addition, you must define the angle of the stitches that will make up the satin segment.

### **Training Exercise – Creating Satin Segments with the Satin Path Tool**

1. Open a New File
2. Go to Image, Load the **Shapes 2** Image.
3. From Image on the menu ribbon select the Backdrop Select tool.
4. Right click on the image and select Reference Tool. Change the width of the design to 4.0 inches and left click on the Resize button. Tap the S to go back to select.
5. Zoom in on the first shape of the image.



6. Select the Satin Path Tool from the Digitizing drawer of the Tool Cabinet. The cursor will become a set of crosshairs.
7. Start at the left side of the artwork and left-click to place the first anchor point.
8. Continue plotting anchors at each point of the shape. After the 4<sup>th</sup> anchor point, tap the O key to close in the segment.
9. Press Enter on the key board and the cursor turns into a green triangle. Left click on the segment to set the start point. The cursor change to a red triangle. Left click on the segment to set the stop point. Now the cursor changes into a small white triangle with a circle. This is the Add Angle Line function.
10. To create angle lines which will determine the stitch angles, place the cursor at any desired point on one side of the segment, then left click and drag the mouse to the other side of the segment. A line will be drawn across, indicating the angle of the stitches at that point.
11. You can continue adding as many angle lines as you wish. When finished, press G on the key board to generate stitches.

**NOTE: You can add more angle lines later by using the Angle Lines tool located in the Segment Edit draw of the Tool cabinet.**

12. Satin Stitches will now be generated within the created segment based on your angle line placement.
13. Continue digitizing the rest of the shapes. **Be sure to change colors for each segment.** Experiment with the Bezier function and different stitch angles.

### **Training Exercise – Creating a Satin Segments with Hole using the Satin Path Tool**

1. Load the **Shapes and Letters** Image.
2. Select the Satin Path Tool which is located in the Digitizing draw of the Tool cabinet. The cursor will become a set of crosshairs.
3. Begin by digitizing the outer boundary of the letter O. Tap H to close the segment. **Do not press enter at this point.**
4. Digitize the inner boundary of the letter O. Press O to close the segment, and then press enter on the key board.
5. Set the start and stop points, then add angle lines. Press G on the key board to generate the stitches.
6. You have now created a satin path with a hole.

## Satin Settings

The primary settings are displayed on the upper tool ribbon when a satin segment is selected. Additional settings can be found on the properties page, which can be accessed by clicking on the large black arrow point downward on the right side of the upper tool ribbon.

To fully understand these settings, it is suggested that you apply different ones to the selected satin path segment to show how the segment is affected.

## Satin Tab

**Fill Pattern Type** – Select the type of pattern for the filling. You can select Carved Tile or Standard.

**Pattern** – This allows you to change the pattern from a satin to any available fill pattern. You can use this if the columns of the lettering are too wide to be satin stitches. Be aware that when you select anything other than Satin, the segment will convert to a fill and no longer be a satin.

**Connection End** – You may set different types of connection ends for your stitches. The connection end is the shape of the stitch formed at the end of the stitch line in a given area.

- **Sharp** - default for Satin Stitches. Stitches straight across from side of column to next side of column then angles down while going back across to first side of column.
- **Square** - used for Complex Fill Stitches. Stitches conform more to edge of outline giving a cleaner appearance. Increases stitch count.
- **Chiseled** - default for Complex Fill Stitches. Chisels in before sewing across to opposite side of angle. Chisel Distance can be adjusted to gain a cleaner edge.
- **Zig Zag** - used for Satin Stitches. Stitches at an angle from side to side of column. Best used with thin columns of satin stitches. Allows better coverage for smaller columns and smaller lettering.

**Short Stitch Style** – Allows you to choose a different style of short stitches that turn around a curve.

- **None** - does not shorten stitches in corners. Can be used for larger segments.
- **smooth** - stitch starts out short, then a bit longer, another stitch a bit longer and a forth stitch longest. A four step process starting out short and progressively getting longer until corner is penetrated.
- **Aggressive** - stitch starts out penetrating corner, shortens a bit, shortens again, shortens a third time and then shortens a forth time before going back to the long stitch that penetrates the corner. This is a five step process which provides the least amount of penetration in the corner. Used best for small corners or small lettering.
- **Standard** - system default. Shortens stitch, drops next stitch shorter then back to long to penetrate the corner. A three step shortening process which provides the most coverage in the corner.
- **Regular** - A new algorithm designed to improve short stitches in corners.
- **Custom** - Settings defined by you.

**Override Stitch Length** – You can override the stitch length in a given fill pattern. This can be used to reduce the stitch count of a specific fill pattern.

**Density (+/-)** – Density is the distance between stitches. It is measured in stitches per inch (SPI). SPI is determined by the number of stitches per inch in a one inch column. Density is adjusted according to the fabric you are using, and the size of the design. Lighter fabrics and smaller designs require fewer stitches. Conversely, heavier fabrics and larger designs require more stitches.

Density can be adjusted to:

- Improve the sewing quality
- Change the look of the design
- Lower the stitch count

Density can also be adjusted to account for the varying length of stitches in a design. The density should be set tighter as stitches get wider (especially when using fill stitches). Density should be loosened as stitches get shorter.

There is a default setting of 63.5 spi density on the Pulse software. Therefore, when you change the density setting, you are in fact adjusting it up or down from the default setting. For example, entering a new density of 10 spi is really making the density 73.5spi. Conversely, entering a new density of -5 spi is making the density 58.5 spi.

Density can also be found in the value of Points or PT. The default setting of 63.5 spi is equal to 4.0 pt. When measuring in the point system you are not actually measuring the total number of stitches in the piece but instead the distance between the stitches. When using the point system negative numbers increase the density due to moving the stitches closer together and positive numbers decrease the density due to moving the stitches farther apart.

You can convert the points to stitches per inch by just typing a spi after the value that you would like to adjust your density to. Or change to points by changing the spi to pt after the new value. Note that the value is quite different in size so be careful when changing the point value.

**Auto Density Style** – This setting allows the software to adjust the density in a shape so that it visually has a consistent density.

- **None** - Maintains the same density through all segments
- **Style A** – System default, varies the density depending on the column width
- **Style B** - Loosens narrow columns such as stars or columns that come to a point.

**Stitch Length** – This setting is available if you click on Override Stitch Length. This is the stitch length you want to apply to your pattern. Increasing the stitch length will decrease your stitch count. This is not the width of the column, that can only be increased by adding pull compensation.

**Jagged** – This feature allows you to select a jagged edge for the first side of the segment, the second sides of the segment or both sides.

**Jag Randomness**-In the Jag Randomness box, enter the percentage of jaggedness you want. When you enter larger percentages of jag randomness, the segment edges become more jagged. When you enter smaller percentages of jag randomness, the segment edges become less jagged

**Min. Jagged Range** – This allows you to set a minimum value of how far in or out you want the column to range. This value is set in millimeters

A negative value places the jagged edge on the inside of the column.

A positive value places the jagged edge on the outside of the column.

**Max. Jagged Range** – This allows you to set a maximum value of how far in or out you want the column to range. This value is set in millimeters.

A negative value places the jagged edge on the inside of the column.

A positive value places the jagged edge on the outside of the column.

**Travel Route** – Hiding traveling run stitches for satin stitch types sets the position of the traveling run stitches placed underneath the design's stitches. You can choose between Along Middle and Along Edge. Use along Middle for stitches with a heavy density because the traveling run stitches will not be visible. Use Along Edge for stitches with a light density to hide the traveling run stitches.

### Quality Control Tab

**Quality Control Type** – Quality control can enhance and improve the stitches you generate. You can choose Absolute Split, Middle Split, None, Percentage Split and Random Split. This is normally used for areas sewn in satin stitches where the satin stitches are too long to sew as one stitch.

**Absolute** – Absolute Split places one stitch point on the outside edge and the other stitch point in the inside edge of a stitch column, if the stitch length is more than the default maximum stitch length. You also need to enter the maximum number of stitches that the split can consist of in the Abs. Split Distance box. For example, if the Abs. Split Distance is set at 3pt, and then each time a stitch is split, the split stitch cannot be more than 3pt long.

**Middle** – Middle Split places a stitch point in the middle of a stitch column, if the stitch length is more than the default maximum stitch length. It splits the stitches down the middle; ideal for wide Satin lettering.

**Percentage** – Percentage Split essentially works like Absolute Split except it does not place the split stitches evenly around a stitch column. If the stitch length is greater than the Max Split Distance setting, it takes a percentage of the stitch length.



You need to enter the percentage you want to use to split the stitch. Then, you need to enter the maximum number of stitches that the split can consist of. For example, if you set the Percentage split at 50% and the Maximum Split Distance at 5pt, then each time a stitch is split, the split stitch cannot be more than 5pt long.

**Random** – Random Split places stitches randomly across the column. This setting is excellent for wide Satin stitches. If the stitch length is greater than the maximum stitch length defined in the Max Stitch Length setting, Random Split generates as many random stitches as necessary to ensure that no stitches are apart longer than the maximum stitch length.

**Min Stitch Length** – The system filters any stitches shorter than the minimum stitch length you enter. The default is 3.0 pts; therefore, any stitches shorter than 3.0 pts are processed according to the quality control type.

**Max Stitch Length** – The system filters any stitches longer than the maximum stitch length you enter. The default is 20.0 points; therefore, any stitches longer than 20 pts are processed according to the quality control type.

**Abs Split Distance** – Absolute Split places one stitch point on the outside edge and the other stitch point in the inside edge of a stitch column, if the stitch length is more than the default maximum stitch length set by the software.

**Split Both Sides** – You can check this or leave it blank to only split one side.

**Percentage Split** – Percentage Split essentially works like Absolute Split except it does not place the split stitches evenly around a stitch column. If the stitch length is greater than the Max Split Distance setting, it takes a percentage of the stitch length.

**Max Split Distance** – This is the maximum length that will split.

**Overlap Lines** – You can also use Overlap lines to compensate and overlap stitches in a segment.

### **Connections Tab.**

**Smart Connect** – This is a tool that automatically inserts stitches, jumps and runs between segments. Smart Connections simplifies the digitizing process by applying the proper connection method based on the distance between the segments.

**Trim at** - This setting will insert trims when the distance between segments is greater than the distance entered in the setting.

**Connection by run** – This setting will connect segments with run stitches, and will use the stitch length entered in the maximum length setting.

**Lock Stitches** – This setting will automatically insert lock stitches around trims, color changes and stops, depending on the selection of Never, Sometimes or Always.

**Lock Stitch-Start** – This places a lock stitch at the beginning of the segment. It is important to insert a lock stitch at the start of a segment any time the needle is penetrating the fabric for the first time. The purpose of the lock stitch start is to engage the top thread with the bobbin which helps prevent “no catches”.

**Lock Stitch-End** – This places a lock stitch at the end of the segment. Any time a segment is going to trim, change color or jump to another segment a lock stitch end should be added to the segment. The purpose of a lock stitch at the end of the segment prevents the thread from coming undone

### **Commands Tab**

**Thread** – This is the color your segment will sew in. You can use this to change the color of a segment or select a segment and choose a color from the lower left-hand side of the screen.

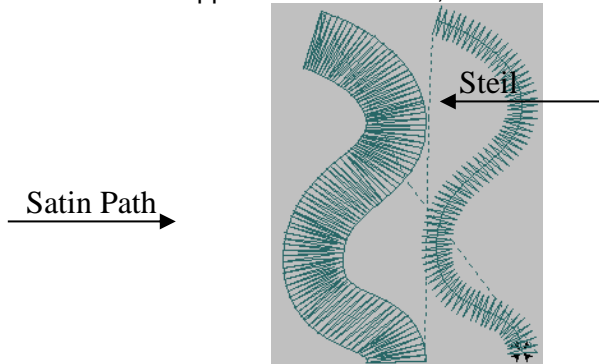
**Start Command** – This allows you to assign a special function command to take place at the beginning of the segment.

**Stop Command** – This allows you to assign a special function command to take place at the beginning of the segment.

# Steil Stitches

A Steil Stitch is a satin stitch. The difference between the two is in how they are created. A satin is created by defining two sides and inserting stitches between them. A steil stitch is created by defining the center line of the segment and assigning a specific stitch width. Thus, a steil will always have the exact same width throughout the segment. The most common use for a steil is to create a border.

The ability to create steil stitches is limited to Artist Plus and above. Illustrator Users can only create a steil stitch when using the Auto Border function to add a border to a complex fill. It is recommended that an Illustrator User use the Satin Path tool in a situation that calls for a steil application. However, an Illustrator user can edit a steil stitch



## Steil Segment Settings

The most commonly used properties can be found in the tool ribbon. The complete list of property settings is found in the Segment Settings.

To fully understand these settings, it is suggested that you apply different ones to the selected Steil segment, to see how the segment is affected.

## Steil Tab

**Steil Width** – A steil segment has a fixed width, which is changed using this setting. Recommended minimum width is 1.2 mm. Recommended maximum width is 10.0 mm.

**Scale Width** – By checking this box, when the size of the steil segment is increased or decreased, the width of the steil stitch will be increased or decreased as well.

**Steil Angle** –this allows you to change the angle of the stitches. Enter the degree of angle desired.

## *The next 2 settings will be covered in more detail in the Section Working with Steil Corners*

**Auto Corner Style** – Corners can create sewing problems. Four choices are available:

- None – No style is applied
- Standard – Finds all corner points and ensures that a stitch is placed exactly at that point.
- Auto – Functions like Standard, but also adjusts the angle lines for corner points if necessary.

- Custom – Generates corner stitches that look like they have been sewn by hand or sewing machine.

### Corner Ranges:

The range values, in the top left of the corner settings dialog, represent the angle in degrees that the corner has turned. An angle of zero would represent no turn or a straight line and 180 means the line has turned back onto itself. On the right you can choose which auto-cornering method to use for each range. The range settings for standard and auto cannot be changed. Custom settings can be modified.

### Corner Settings:

Three settings that were previously under the Custom Corner tab have been moved under the settings dialog mentioned above. These settings are Auto-turn distance, Capped overlap distance and Mitered overlap distance.

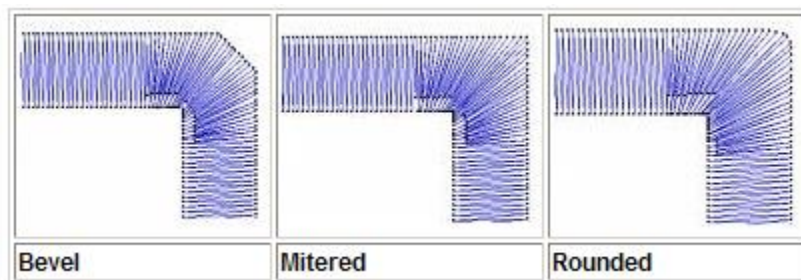
**Corner Shape** –Three shapes are available – Bevel, Mitered, Rounded.

**Inset Percentage** - You can shift Steil stitches using the Inset Percentage setting. For example, you can use Inset Percentage to move a Steil border closer or further from a fill segment. Moving the border closer allows you to compensate for any gaps that may appear between the border and the fill segment. Moving the border further out allows you to avoid any thick and "bunched up" stitches that may happen if the border is covering too much of the fill segment.





## Working with Steil Corners

When working with any form of satin stitch, cornering can be tricky. If the corner is too sharp it will not sew properly, resulting in thread breaks, bunching up of the fabric, holes in the fabric, poor registration and needle breaks. Special attention must be made to each corner that you create. The Steil stitch has several cornering options. Settings can be found on the Segment Settings Page under the Steil Tab – Auto Corner Style and the Custom Corner Tab.

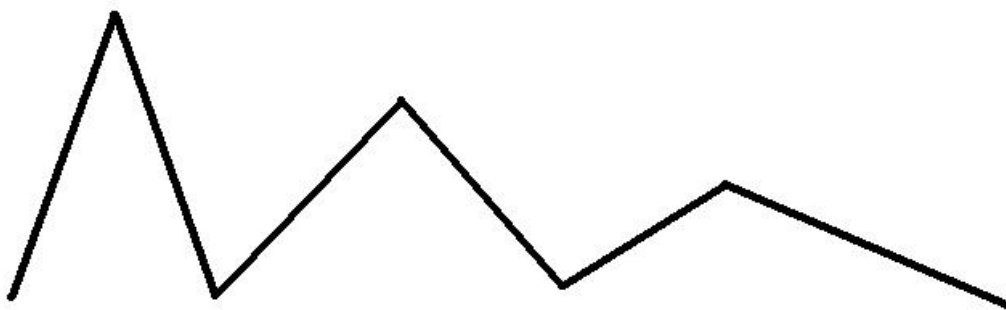
Corner Shape applies to appearance:



Corner Type sets the mechanics of how a corner is created.

Corner type	What it does	What it looks like
Standard	Generates and shortens Corner stitches according to the Short-Stitch Style.	
Mitered	Joins the corner stitches like a picture frame; ideal for corners that have a sharp angle. Use Mitered for corner angles from 60 to 130 degrees.	
Hand-Sewn	Generates corner stitches that look like they have been sewn by hand or sewing machine. Used mainly for appliqués.	
Capped	Overlaps stitches that are at a very sharp angle such as 30 degrees. Use Capped for corner angles from 0 to 60 degrees. Capped works well on spiky shapes. Avoid using Capped for average corners. Because Capped is designed for sharp corners, you may not get the desired result.	

After digitizing a steil segment that has a corner in it, you will need to decide what type of corner should be used. Begin the process by selecting the desired Auto Corner Style.



### Training Exercise – Working With Steil Corners

1. Start a new file.
2. Load in the **Steil Corners** image from the Training artwork folder.
3. Digitize the line using the Steil tool.
4. Change the Steil width to 4.0 mm, 0.16 inches.
5. Select the segment, and go into segment settings to the Steil Tab. Choose Auto Corner Style, Standard. You will see some changes in the stitches, though very little. (Hide the Image if necessary by depressing the I key.)
6. Go back into the Segment Settings to the Steil Tab, then apply the Round corner shape and notice the changes. Experiment with the other corner shapes.
7. Now apply Auto Corner Style, Auto, which will adjust the corner angle lines if necessary.
8. Apply Auto Corner Style Custom and notice the result. The first corner on the steil is capped, the second corner was automatically mitered and the third corner turned with the corner. This was based on the degrees of the corner. You can adjust how much the system overlaps using the settings under the Customer Corner Tab of the Steil Segment Settings. Experiment with the other corner shapes to see the difference between the mitered, rounded and beveled edges.

## Converting a Steil to a Satin Path

Though steil stitches are easy to create, they have a limitation. The column width is fixed for the entire length of a segment. There are many situations where the column width should vary within the segment.

### Training Exercise – Converting a Steil to a Satin

Select the steil segments on your screen. Right Click to open the right click shortcut menu. Select the Convert Segment To button which will open a secondary box. Select Steil to Satin Path.

## Brush Tool

The Brush tool is a new Advanced Digitizing tool. It is intended to create linear embroidery segments that simulate the appearance of hand-written calligraphy.

Much like steil segments, Brush segments consist of a single outline with stitches crossing it. As such, many of the parameters that apply to Brush are the same as those for Steil (Density, underlay, etc.). However, there are a number of settings that are unique to the Brush segment, and these are what give this segment type the appearance of calligraphy.

**Tapering End Type:** The Brush segment has the property of tapering; the stitch width can be reduced from the standard length to a point at the end of the line. Tapering can be applied to the starting end, the finishing end, or both ends.

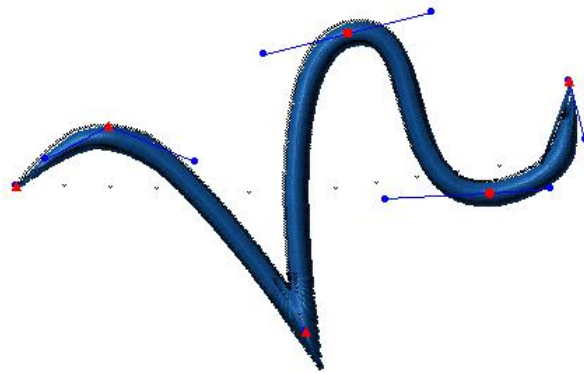
**Threshold:** Determines how far from the start and or end of the segment the brush width begins to taper off to a point. Expressed as a percentage of the total length of the segment, between 0 – 30%.

**Angle:** Selects the angle of the stitching compared to the path outline. There are two options:

- **Orthogonal:** Stitches always cross the outline at right angles.
- **Fixed:** The stitches are all parallel to each other, regardless of the direction taken by the outline path.

**Maximum Width and Minimum Width:** Determines the range of width variation of the Brush segment.

**Randomness:** This setting determines how much the width of the Brush path varies along its length. A randomness of 0% means no variation in width along the length of the path; the higher the percentage randomness, the more the stitch width will vary.



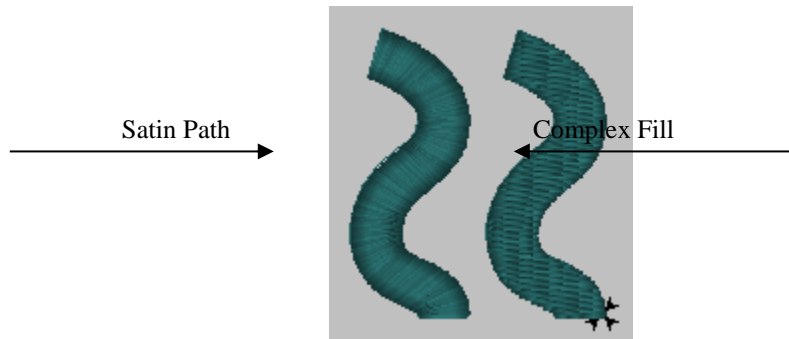
*Example of Brush Segment with Tapering set to “Both Ends”*

# Fill Stitches

In this section, you will learn how to create and manipulate fill stitches. You will also identify the different segment settings. Fill stitches are used to cover large or complex shaped areas. When sewing, the fill segment is a series of sequential short stitches that sew back and forth from one side of the shape to the other. The end result is a solid layer of stitches covering the shape.

## Complex Fill

The term complex fill is used to describe a shape that is actually made up of multiple fill segments that the computer automatically generates. The complex fill tool works much the same way as the satin path tool in that you create anchor points to define the desired shape. Then insert a start point, a stop point and then add an angle line. The major difference is that a complex fill only has **one** angle line. Whereas a satin path can have multiple angle lines. The end result is that all of the stitches in a complex fill sew in the same direction, because they all have the same angle assigned to them.



the default one created by the system, the stitches will convert to match your new setting. (With a fill you can only create one angle line).

## Training Exercise – Creating Fill Segments with the Complex Fill Tool

1. Start a New File
2. Load the image called Sun
3. Zoom in as necessary.
4. Select the complex fill tool from the digitizing draw of the tool cabinet.
5. Beginning at the top point of the yellow section, create the necessary anchor points required to outline the entire yellow section.
6. Use O to close off the segment.
7. Press Enter on the key board – Immediately stitches will fill the segment that you just created. Left click to place the start point, then left click again to place the stop point, left click and drag your mouse to place the angle line. If your angle line is different from

## Complex Fill with Holes

From time to time you may want to fill a shape with stitches, while leaving open areas within the shape. This is referred to as complex fill with holes.

## Training Exercise – Creating a Complex Fill With Holes

1. Start a New File
2. Load the image called Shapes and Letters
3. Zoom in as necessary.
4. Select the complex fill tool from the digitizing draw of the tool cabinet.
5. Plot the points around the outside of the letter A
6. Tap the O key to close the outside of the shape
7. Plot the hole in the letter A
8. Tap the O key to close the outside of the shape
9. Press Enter on the key board – Immediately stitches will fill the segment that you just created. Left click to place the start point, then left click again to place the stop point, left click and drag your mouse to place the angle line. If

*your angle line is different from the default one created by the system, the stitches will convert to match your new setting.*

## Fill Settings

The primary settings are displayed on the upper tool ribbon when a fill segment is selected. Additional settings can be found on the properties page, which can be accessed by clicking on the large black arrow point downward on the right side of the upper tool ribbon.

To fully understand these settings, it is suggested that you apply different ones to the selected complex fill segment to how they segment is affected.

## Complex Fills Tab

**Fill Pattern Type** - Choose between Carved, Programmed or Standard.

**Pattern** – This allows you to change the pattern to any available fill pattern.

**Connection End** – You may set different types of connection ends for your stitches. The connection end is the shape of the stitch formed at the end of the stitch line in a given area.

- **Chiseled** - default for Complex Fill Stitches. Chisels in before sewing across to opposite side of angle. Chisel Distance can be adjusted to gain a cleaner edge.
- **Square** - used for Complex Fill Stitches. Stitches conform more to edge of outline giving a cleaner appearance. Increases stitch count.
- **Sharp** – *This setting will force the connection ends of the complex fill segment to end in a single stitch. The lines of stitching will not be parallel like chiseled or square ends. This option is a better choice for small complex fill segments.*

**Override Stitch Length** – You can override the stitch length in a given fill pattern. This can be used to reduce the stitch count of a specific fill pattern.

**Density (+/-)** – This is an incremental setting for stitch density. Any value you place here will be added or subtracted from your default density. Satin stitch density is measured in stitches per inch (spi) and embroidery points (pts). For stitches per inch you are determining the number of stitches per linear inch. For embroidery points, you measure the distance between stitches. You adjust density according to the design's size and the fabric you are using. Lighter fabrics and smaller designs require less density.

**Random Range** – Makes the random fill pattern more or less random. This option is available when you chose Random as your pattern. A value of 0 will make the pattern not random at all. The highest value, 69%, will give you the most random effect.

**Chisel Distance** – Used with Chiseled connection end. It sets a specific minimum distance to move in to create a sharp edge effect.

**Stitch Angle**- This is where you can type in a degree for your angle line.

**Stitch Length** – This setting is available if you click on Override Stitch Length. Increasing the stitch length will decrease your stitch count.

**Density (+/-)** – You may change the density of the underlay in points by adding or subtracting a value. Remember this is in points thus a larger number will represent less density and a smaller number will decrease the density.

## Programmed Fill Settings

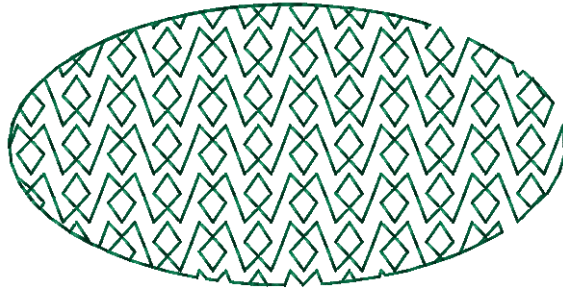
### Programmed Pattern Alignment

There is a new pair of settings in the Programmed Pattern settings that control how a programmed fill is aligned within the outline that it fills. There are both vertical (top, center, bottom) and Horizontal (left, center, right) alignment options.

**N.B.** These settings work best for Programmed fills in which the direction line is perfectly horizontal.

## Flipped Programmed Patterns

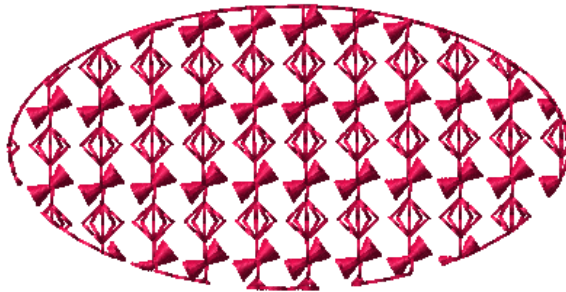
A new programmed pattern setting has been added to Tajima DG16 by Pulse, which flips alternate instances of the programmed pattern. When this is applied, each individual unit in the pattern will alternately have its orientation reversed.



This setting is found on the Programmed pattern tab of the Properties—Selection Settings panel.

## Mixed Programmed Patterns

There is an new option in the Programmed Fill Properties to add a second pattern, thus creating a mixed programmed pattern. When this option is applied, the two pattern types will appear alternately in the fill segment.



This setting is found on the Programmed pattern tab of the Properties—Selection Settings panel.



# **Pathing**

The Digitizing tools let you select different stitch types to use for punching. When you use any of the punching tools you have the choice of punching with or without loading a scanned image or clipart to use as artwork.

Even with all of the technological advances in machines and software in the embroidery industry, the puncher's skill is still the key to excellent embroidery. Good embroidery art is drawn to suit embroidery, not simply copied from printing or pictures. Therefore, when you punch a design, you can improve what did not look as good sketched or in print. IN addition, good designs not only have visual appeal, but also run well on the embroidery machine.

## **Laying Out a Roadmap**

The following worksheet is a sample of a digitizing worksheet that can be created to prepare for a digitizing job.

- Punch large areas first. In this example, you should begin with sun. Punch this in a complex fill. Make sure you leave holes for the sail and the mast.
- Punch the yellow rays next as a satin stitch, minimizing color changes. Be sure to keep the needle down by connecting each of the rays with a run stitch.
- Punch the orange rays of the sun as a satin stitch next, again be sure to keep the needle down by connecting each orange ray with a run stitch.
- After the rays are done, punch the orange band as a satin stitch around the sun.
- Now punch the pink inside the sails as a complex fill. There is no travel route between the sails so you will have to trim between the sail. Remember that the keyboard shortcut to add a trim is the F4 key.
- Punch the purple around the sails as a satin stitch next. Again add a trim between the sails.
- The green inside the boat is next, which will be a complex fill.
- Now punch the Brown around the boat as a satin stitch and then the brown mast also as the satin stitch.
- Punch the blue waves as satin stitches. Be sure to break up each satin path.
- Finally punch the clouds. This stitch type depends on the look that you want, the clouds can be puffy and full if you use a satin stitch or flat and with a pattern if you use a complex fill stitch.
- Remember to use lock stitches and underlay where appropriate.

# PATHING WORKSHEET



STEPS	
1. Yellow inside sun/Complex Fill	<b>FABRIC:</b>
2. Yellow Rays/Satin	Sweat Shirt
3. Orange Rays/Satin	
4. Orange Band/Satin	<b>FABRIC COLORS:</b>
5. Pink inside sails/Complex Fill	Black
6. Purple around sails/Satin	
7. Green inside boat/Complex Fill	
8. Tan outside boat & Mast/Satin	<b>THREAD COLORS:</b>
9. Blue Water/Satin	Yellow
10. Blue Clouds/Satin or Fill	Orange
11.	Pink
12.	Purple
13.	Green
14.	Tan
15.	Royal Blue
16.	Light Blue
17.	
18.	<b>PROBLEM SPOTS:</b>
19.	
20.	

# PATHING WORKSHEET



STEPS	
1	<b>FABRIC:</b>
2.	
3.	
4.	<b>FABRIC COLORS:</b>
5.	
6.	
7.	
8.	<b>THREAD COLORS:</b>
9.	
10.	
11.	
12.	
13.	
14.	
15.	
16.	
17.	
18.	<b>PROBLEM SPOTS:</b>
19.	
20.	

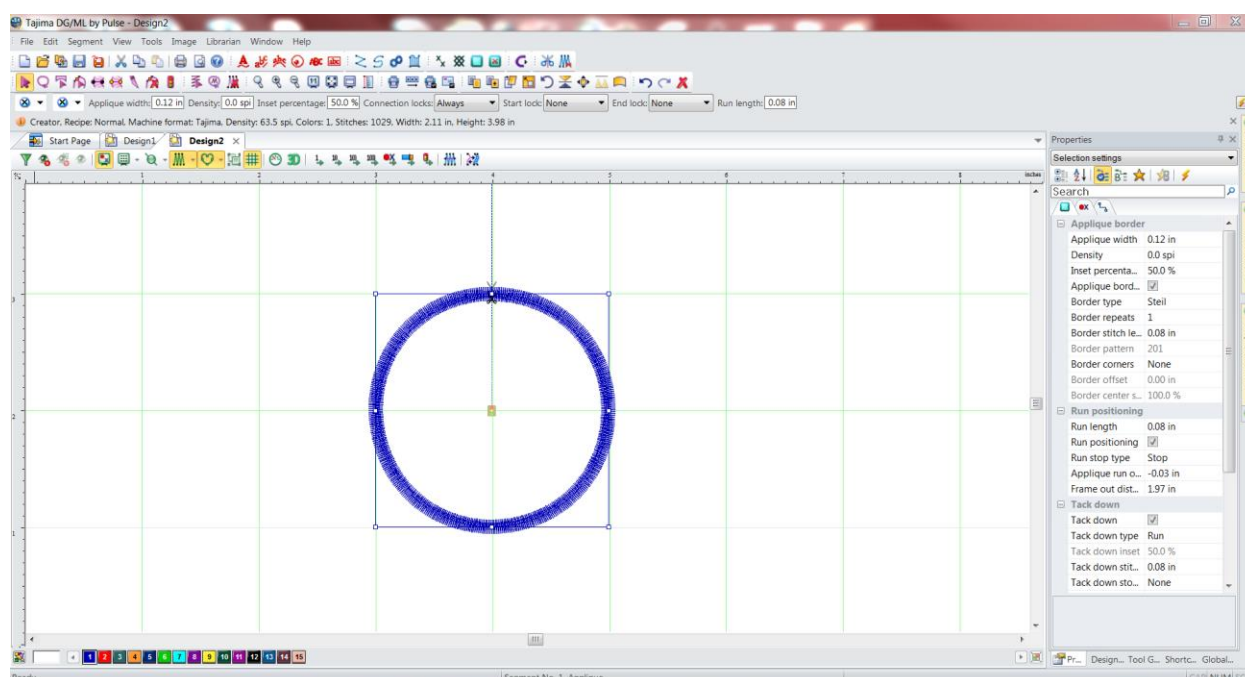
# Applique

The appliqué tool is an all-inclusive tool for creating appliqué segments. Traditionally an appliqué consists of three pieces.

1. A running stitch outline of the shape of the fabric to be sewn on.
2. A running stitch line slightly inside the original line which will tack down the fabric.
3. A zig zag finish stitch to hold the fabric securely in place. This can be sewn as a steil stitch or a full satin stitch.

## Exercise - Applique

Digitize an Circle shape, with the appliqué tool



## Applique Segment Settings

### Run Positioning

**Stitch Length:** This setting allows you to specify the length you wish this stitch to be. The default is 0.08 in.

**Offset:** This setting allows you to change the placement of this stitch from the actual digitized path. The default is -0.03in. This value can be changed so that this stitch is out or in from the digitized path. It can be either a negative or positive value: negative placed the stitch *inside* the path and positive places the stitch on the *outside* of the path.

**Stop:** This setting allows you to put a machine command after the last stitch. You have four options: Stop, Stop with color change, none, or stop with out frame out.

**Frame out distance:** This setting allows you to enter a value for how far above the design you wish the frame to move out. When you have chosen Stop or Stop with Color the machine stops to give the operator a chance to place the appliqué piece so the machine head is out of the way. The default value is 50.00mm, this means the frame will move out 50.00mm straight up vertically from the last stitch.

### Tack Down

**Type:** This setting allows you to select which type of stitch you wish to select for the tack down. You can also opt out of having a tack down by un-checking the box next to it. There are three options to choose from: E Stitch, Running, Zigzag.

**Offset:** This setting allows you to change the placement of this stitch from the actual digitized path. The default is -0.02 in; that means that this stitch will be -0.02 in inside the actual digitized path. This value can be either negative or positive: negative puts the tack down inside the path and positive places the tack down on the outside of the path.

**Width:** This setting is for the E Stitch and Zigzag only. It allows you to set the width value of the stitch. It defaults to 0.08in. That means that the stitch width on the digitized path is 0.08in.wide.

**# Repeats:** This setting allows you to repeat your tack down stitch.

**Center stitch length** This setting is for when you are using the E-stitch, the default is 100. % . In the center stitch length box, enter a percentage value. This setting determines the length of the center leg of the E-stitch as a percentage of the length of the outer legs of the E-stitch.

**Stitch Length:** This setting is for running. It allows you to set a specific stitch length for the run stitch.

**Inside:** This setting is the inset percentage for the E Stitch and Zigzag. It allows you to set a value of how far inside you want the stitch to sit on the path. Its default is 50. % . You can change this to a lower or higher number. A lower number will set it farther outside the digitized path, and a higher number will bring it farther inside the digitized path.

**Density:** This setting is for the E Stitch and Zigzag stitch only. It allows you to increase or decrease the density for these stitch types. Remember your default density is 63.5spi. The default for this value is -52.9spi this means that it is subtracting from your default value of 63.5spi to give you a total of 10.6spi.

**Stop:** This setting allows you to put a machine command after the last stitch. You have four options: Stop, Stop with color change, none, or stop with out frame out.

**Frame out distance:** This setting allows you to enter a value for how far above the design you wish the frame to move out. When you have chosen Stop or Stop with Color the machine stops to give the operator a chance to place the appliqué piece so the machine head is out of the way. The default value is 50.00mm, this means the frame will move out 50.00mm straight up vertically from the last stitch.

### **Applique border**

**Type:** This setting allows you to choose which type of stitch you wish for the final top stitch, you can choose between Steil, E Stitch, or programmed.

**Pattern:** This setting allows you to choose which programmed run you wish to apply to your appliqué piece.

**Offset:** This setting allows you to move your programmed run to the outside of your digitized path. The default is 0.00in this means that the programmed run is placed exactly on top of the digitized path. This value can be either negative or positive. Negative puts the stitch inside the path and positive places the stitch on the outside of the path.

**Width:** This setting is for the E-Stitch and the Steil only. It allows you to set the width value of the stitch. It defaults to 0.12in. That means that the stitch width on the digitized path is just 0.12in wide.

**#Repeats:** This setting allows you to repeat your appliqué stitch.

**Stitch Length:** This setting is for the programmed. It allows you to set a specific stitch length for the run stitch. (Because these run stitches are pre- programmed, they must be set at a specific stitch length. To find out that value: Go to help on the menu ribbon, Fills, Working with programmed Fill Patterns, Programmed Fill Patterns Settings.

Then select your Programmed Run Stitch from the list. The length value is going to be in (pts), erase everything in the stitch length box and type in the value plus pts, exactly how it appeared. The software will automatically convert it to imperial or metric depending on which setting you have selected.

**Inside:** This setting is the inset percentage for E-Stitch and Steil. It allows you to set a value of how far inside you want the stitch to sit on the path.

It defaults to 50% that means the stitch is 50%inside the digitized path and the other 50%is on the outside of the digitized path. You can change this to a lower or higher number. A lower number will set it farther outside the digitized path, and a higher number will bring it farther inside the digitized path.

**Density:** This setting is for the E-Stitch and the Steil only. It allows you to increase or decrease the density for these types of stitches. Remember your master density is 63.5spi. The default for the value is 0.0spi. So you will be either building on to the master density or building off the master density.

**Corners for the Steil :**

None – No style is applied

Style A – Finds all corner points and ensures that a stitch is placed exactly at that point.

Style B – Functions like style A, but also adjust the angle lines for corner points if necessary.

Style C – Generates corner stitches that look like they have been sewn by hand.

**Center stitch length:** This setting is for when you are using the E-stitch, the default is 100%. In the center stitch length box, enter a percentage value. This setting determines the length of the center leg of the E-stitch as a percentage of the length of the outer legs of the E-stitch.

## Auto Trace

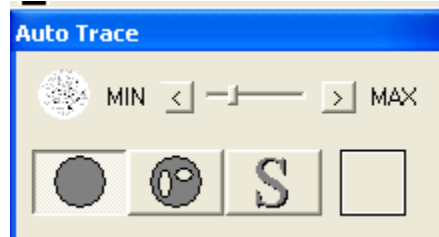
You can use Auto Trace mode to detect contours and trace an image to produce an artwork segment. Auto Trace mode supports Bezier curves; allows you to adjust the color tolerance of an image; recognizes holes; and allows you to ignore specific colors when tracing a shape.

With .bmp artwork, the software can “see” the different areas based on color. Auto Trace attempts to trace the boundaries of an area and create an art segment (vector file), based on color. You designate the area to be “traced” by moving your mouse over the desired region.



### Training Exercise – Using the Autotrace With Stitch Type Tool

1. Close out the file you were working with and start a New File.
2. Load the artwork entitled **Earth**
3. Select the Digitizing Tool You Wish To Use and Click T for Trace



4. A control box will open in the top left of the screen. In the control box, there are four small boxes along the bottom. The one on the left is for tracing a solid object without holes. The next one is for tracing an object with holes. The next one is for tracing lines. The next one is the Current Color box.
5. While watching the Current Color Box, move you cursor over different sections of the design. Notice that the color displayed in the box is the same as the color the cursor is over.

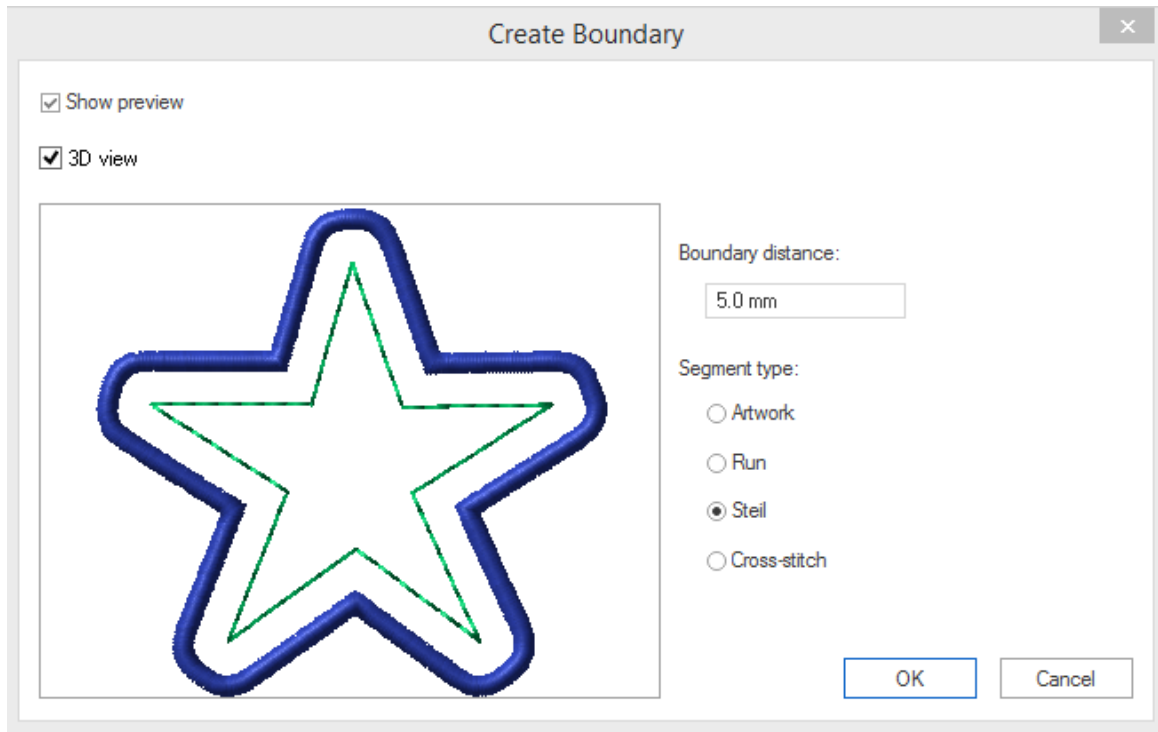
## Pen Tool

The Pen Tool is basically a free hand drawing tool. It works like the Run Stitch tool, except that it creates Vector art segments instead of run segments or other stitches.

## Create Boundary

The Create Boundary dialog allows you to add a boundary around a selected artwork or embroidery segment. The boundary that is created will exactly follow the outer outline of the selection, but will be slightly displaced outwards.

To create a Boundary segment, select an outline segment and right-click on it. From the context menu that appears, select Auto—Create Boundary.



Options available with the Create Boundary tool:

**Show preview:** Displays a preview of the original segment and the boundary in the Preview Pane of the dialog.

**3D:** Check to display the stitches in “realistic preview” mode.

**Boundary distance:** Sets the offset distance of the boundary from the original selection.

**Segment type:** The boundary can be generated as an artwork path or as embroidery. Select Artwork, Run, Steil, or Cross-stitch.

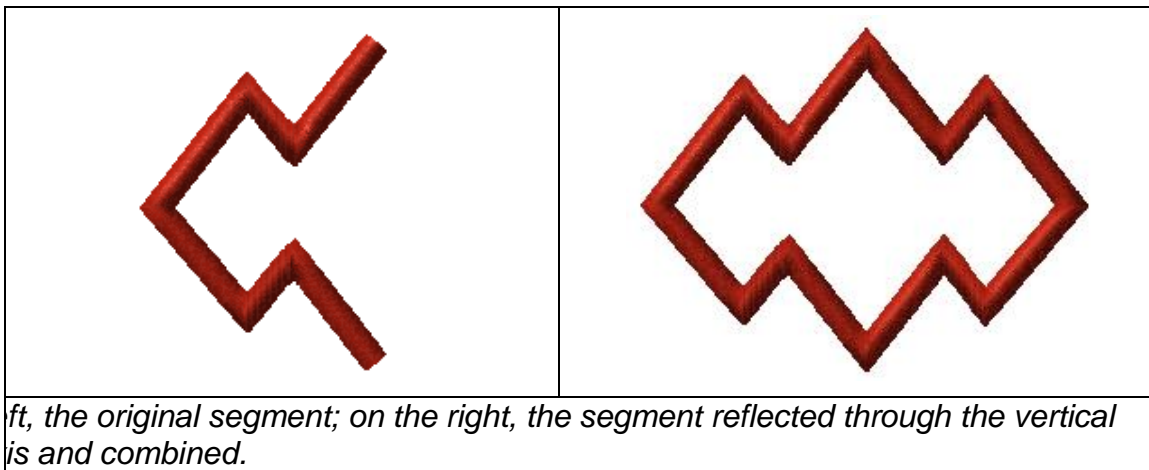
## Drag Anchor Path

The Drag Anchor Path tool is a new path edit tool that is very useful for editing outline shapes. It applies to both artwork paths and outline embroidery segments.

Using this tool, you can reshape paths by simply clicking and dragging paths between nodes (anchor points), rather than on the nodes themselves. The path will be reshaped when the mouse button is released, and, in the case of embroidery segments, the stitches will automatically be regenerated.

## Combine and Reflect

The Reflect Tool now includes an option that copies and combines the reflected segments. This means that the original reflected segment are created as a single, unified segment. This tool is useful for creating symmetrical segments. It can be applied to Artwork, Run, Steil, Complex Fill, and Satin segments.



### One Click Conversion

Right Click on Icons to Instantly convert segments to different stitch type



# Vector

Vector art is object based artwork that can be manipulated and changed. Working with vector art enables you to quickly create embroidery segments without having to trace or redraw the elements of a design. It is much cleaner than bitmap type of artwork because there are actual lines drawn to create the art rather than pixels.

## Vector File Import

This is an extremely useful feature that will allow you to import artwork that has been created in another drawing program, such as Adobe Illustrator or Corel Draw. The vector file must be imported and can't be just opened or merged. The software will allow you to assign stitches to the pre-existing outlines, therefore eliminating the need to retrace the design. You will still need to be aware of quality embroidery, such as overlapping, etc. You may also need to break an existing path into separate shapes in order to apply stitches correctly. This can be done using the Slice tool.

## Vector Formats Supported

When using the Import Vector file the following formats are supported:

CorelDraw (*.CDR type of file)	Supports CorelDraw Version 5 files.
Corel Presentation Exchange (*.CMX)	When exporting files in AI format from CorelDRAW, turn off "Simulate Complex Filled Curves" for the file to output correctly. Export files as AI Version 7.0.
Adobe Illustrator (*.AI)	File size is limited. Use files less than 2 MB in size.
Encapsulated PostScript (*.EPS)	<ul style="list-style-type: none"><li>•Text is interpreted as "Saved as Curves".</li><li>•No support for embedded clipart, gradient fillings, transparencies and compound path objects.</li><li>•Support Adobe Illustrator up to and including Version 8.0 files.</li></ul> However, some color information may be omitted in AI Version 8.0 files.
Enhanced Windows Metafile (*.EMF)	There is currently no text support. However, converting text to curves is supported.
Windows Metafile (*.WMF)	There is no support for wide and non-standard pens, embedded bitmaps, gradients, and new graphic commands and parameters in Windows 2000.
Hewlett-Packard Graphics Language (HPGL)	Currently supports basic drawing (Pen Up/Down, Plot Absolute/Relative), text (Label-LB, Symbol-SM) and configuration commands (DF,IN,IP,SC). Please see any HPGL Reference Manual for details.
AutoCAD (*.DXF)	Currently support the following DXF entities: point, line, polyline, circle, arc, trace, curves, and solid. Text entries are not supported.

## Importing Vector Files

Use the Import Artwork tool to load vector files as artwork segments. Importing is different from loading a bitmap type of file. You are able to work with the segments and don't have to punch on top of the image. You can use the Combine and Breakup tools to join or separate the parts of the vector segment as needed.

Before you import a vector file, you may want each artwork segment color to be assigned its own thread color. To do so, do the following:

Go to Tools, Configuration, and User Settings.

Left click on Import Artwork on the Left side of the Window.

In the Add to Palette when Importing Artwork area, select one of the following:

Never add to Palette – Imported artwork segment colors will never be assigned thread colors.

Always add to Palette – Imported artwork segment colors will always be assigned thread colors. The Ask if number of colors exceeds options are only available when this setting is selected.

Ask if number of colors exceeds -When selected, you can enter a specific number of colors in the box. If the number of colors in your imported artwork segments exceeds the number of colors specified, a dialog box will appear asking if you want to add these colors to the palette.

Click OK.

## Removing the Fill Color:

After you import, you can remove the fill color from the artwork segment, leaving only the outline of the vector artwork in place. To do so, do the following:

Select the segment or multiple segments that you want to remove the fill from.

Click the Remove Fill Color icon from the Artwork Tool Bar or the Artwork Drawer of the Tool Cabinet.

## Importing the Artwork:

In the Artwork toolbar or the Artwork drawer of the Tool Cabinet, click the Import Artwork tool. You will see the Load Artwork box.

In the Look in list, select the directory folder where your file is located.

If you are looking for a specific file format, you can change the Files of type to that specific format. *\*If DXF is selected you will be prompted to choose the units of measurement for the design. You can choose imperial or metric units.* Select your file and click Open.

Left-click to place the artwork on the design workspace. Each time you click you are placing another copy of the artwork.

Enter to stop importing.

## Training Exercise-Importing a vector file

1. Start a new file.
2. Select the Import Artwork Tool from the Artwork drawer of the Tool Cabinet or from the Artwork Toolbar.
3. select 84 Lumber
4. Point to the workspace, Left-click and then tap Enter on the keyboard. This will place the vector artwork.

## Copying Vector

You can now copy one or more vector objects from CorelDraw or Adobe Illustrator and paste these objects into DG16. Vector objects pasted into Pulse are automatically converted into artwork segments.

## To copy vector objects:

In CorelDRAW or Adobe Illustrator, select one or more vector objects you want to copy.

To copy the selected vector object(s), press Ctrl+C on your keyboard.

In Pulse, press Ctrl+V on your keyboard to paste the copied vector object(s). *The color and shape of objects will be preserved*


# Draw Fusion

This section will explain how integrating vector art and Corel Draw® a vector art program with the Tajima DG16 by Pulse software can be both quick and easy.

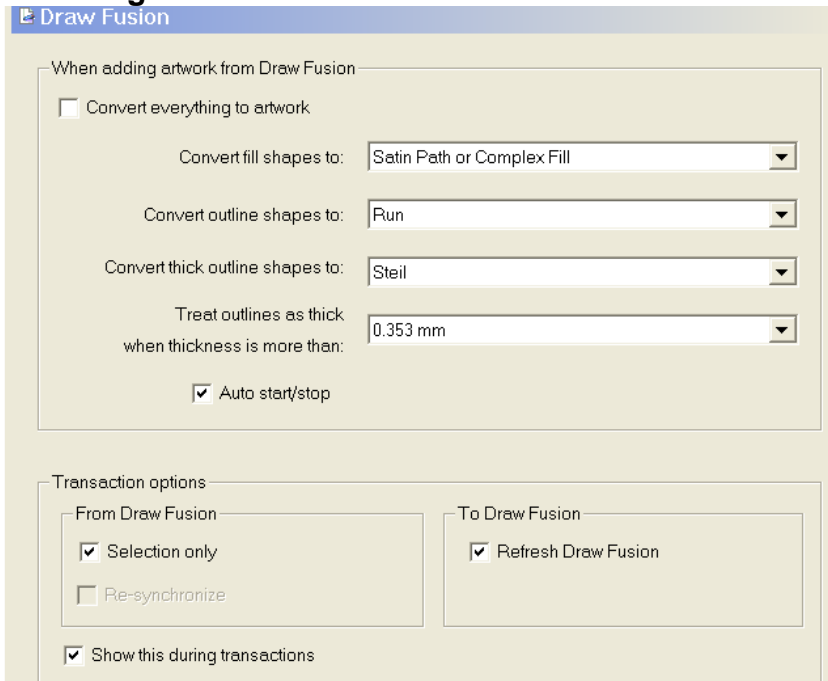
## What is Draw Fusion?

If you own CorelDRAW® X7 software, you can now combine the drawing capabilities of CorelDraw® with the stitch generation of Tajima DG16 by Pulse in the same window. The Draw Fusion feature converts partial or entire artwork designs to stitches in one step by assigning stitch types and stitch directions automatically. Draw Fusion tools allow you to edit artwork and embroidery segments within Tajima DG16 by Pulse. All changes made in Tajima DG16 by Pulse will appear in Draw Fusion and vice versa.

## Accessing Draw Fusion

Draw Fusion is accessed by activating the Draw Fusion Tool .

## When adding artwork from Draw Fusion:



**Convert everything to artwork:** When this is checked no stitches will be created, but instead everything will be converted to artwork segments.

**Convert fill shapes to:** With this selection you have a choice of the following:

- Artwork. Filled shapes automatically become Artwork segments.
- Complex Fill. Filled shapes automatically become Complex Fill segments.
- Satin Path. Auto-breakup is performed on filled shapes to improve the quality of segments during conversion. Filled shapes automatically become Satin Path segments.
- Satin Path or Complex Fill. Filled shapes automatically become Satin Path or Complex Fill segments. The software chooses the best option for segment type based on the vector shape.

**Convert outline shapes to:** With this selection you have a choice of the following: (*shapes with only an outline and no fill color*)

- Artwork. Outline shapes automatically become artwork segments.
- Run. Outline shapes x automatically become run segments.

Convert thick outline shapes to: With this selection you have a choice of the following: (You must now define the thick border)

- Artwork. Outline shapes with a thick border automatically become artwork segments.
- Steil. Outline shapes with a thick border become steil segments.
- Appliqué. Outline shapes with a thick border automatically become appliqué segments.

Treat outline as thick when thickness is more than: There is a list of thicknesses under this selection. Select a thickness value, this thickness value determines when the outline shapes are defined as “thick”.

## Transaction Options

### From Draw Fusion:

Selection Only: When selected this setting is activated. Only the changes made to the objects which are selected will be applied when switching back to the Tajima window from the Draw Fusion window. When this setting is unselected, changes will be made to the entire design.


Re-Synchronize: (Only available when “Selection Only” is not selected). All the segments in the Tajima window will be replaced with objects from the Draw Fusion window. Segment types will change according to the settings in the “When adding artwork from Draw Fusion”

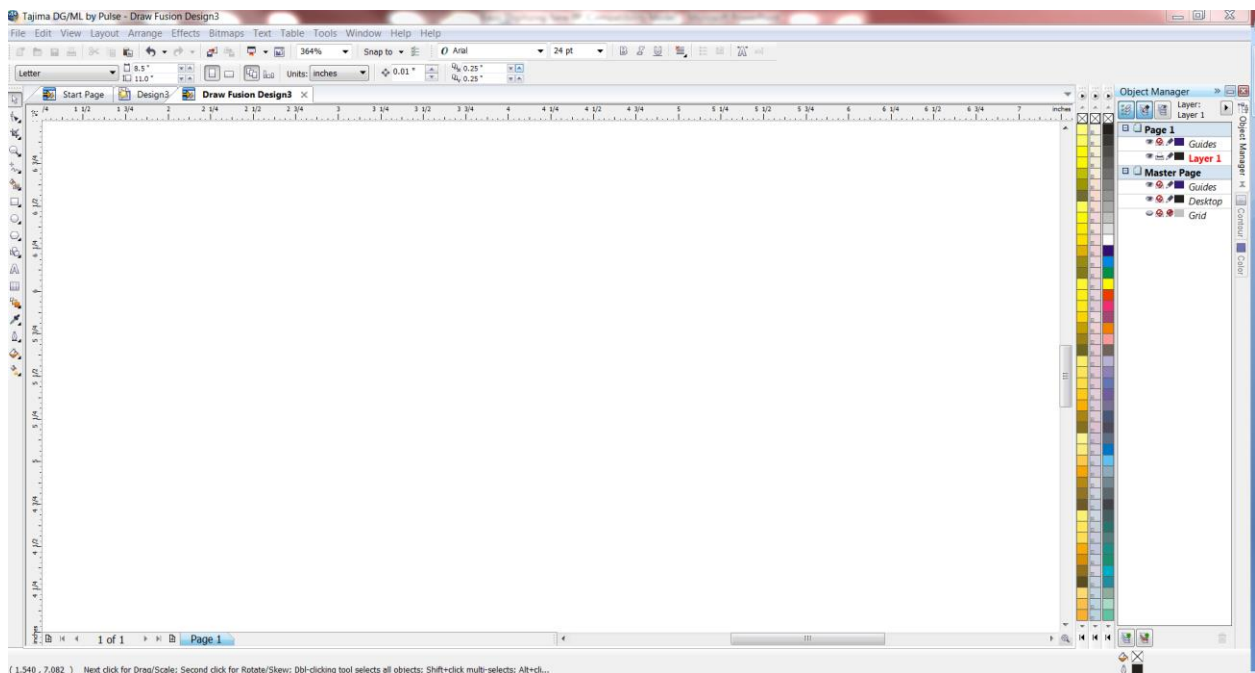
### To Draw Fusion:

Refresh Draw Fusion: All objects in the Draw Fusion window are removed and replaced with objects matching the segments in the Tajima window. When this is not selected, no changes will be made to the Draw Fusion window.

Show this during transactions: When this is selected, the settings window will appear each time a switch is performed.

## Training Exercise 1

1. Start a new file. Select a recipe if so desired. (**The computer system you are working on must have CorelDraw installed on it**)
2. Draw Fusion is accessed by activating the Draw Fusion Tool .



Notice that the design is behind the Corel Window. When you are highlighted on the Draw Fusion window you are working as though you were in CorelDRAW. When you are highlighted on the Tajima DG/ML by Pulse window you are working as Basic Digitizing © 2018 Hirsch Solutions

though you were in Pulse. It is most helpful if you are already versed in Corel as that is a separate product which is not covered in this training.

3. Left click on the Corel side of the windows.
4. Go to File and select Import., import the Sailboat.ai file.
5. Resize the design to 3.5 inches high.
6. Go to Arrange and select Ungroup.
7. The following should be fixed before switching:
  - a. Select the inside and outside border lines of the sun, Tap Ctrl+L to combine.
  - b. Select the inside and outside border lines of the small sail, tap Ctrl+L to combine.
  - c. Choose all lines that make up the outside border of the large sail, Ctrl+L to combine.
8. Select the entire design (Ctrl+A)
9. Go to File, Switch.
10. Fill objects should be Complex Fills or Satins.
11. On the Pulse side of the window, resequence and edit the pieces as needed. For example:
  - a. Insert run stitches between the yellow rays of the sun.
  - b. Insert run stitches between the orange rays and band around the sun.
  - c. Be sure to check all of the starting and stopping points and move them to the closest point if needed.

## Training Exercise 2 : Creating a Vector File From an Embroidery File

1. Start a new file. Merge in the Pizza Hut Design.
2. Activate Draw Fusion Tool. **(The computer system you are working on must have CorelDraw)**
- ❖ Notice that the Design Fusion Settings Box Comes Up

**Draw Fusion**

When adding artwork from Draw Fusion

☐ Convert everything to artwork

Convert fill shapes to:

Convert outline shapes to:

Convert thick outline shapes to:

Treat outlines as thick when thickness is more than:

☒ Auto start/stop

Transaction options

From Draw Fusion

☒ Selection only

☐ Re-synchronize

To Draw Fusion

☒ Refresh Draw Fusion

☒ Show this during transactions

- ❖ Make sure that Refresh Draw Fusion is Checked.
3. Click OK
4. You will now have a vector file on the Corel Side that matches your embroidery

