



Training:

Stitch & Sew 2.0

Learning Workbook for Studio and Studio Plus-Levels

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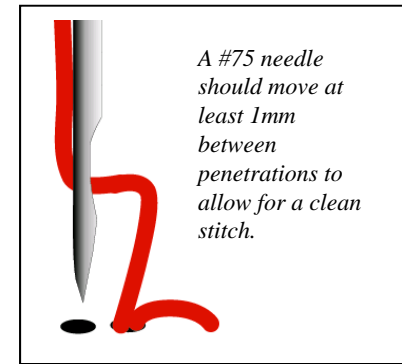
Current as of January 2014

Digitizing Basics

Important! Stitch Length Limits: All stitches in a design must be between:

Shortest: At least 1mm long (.04 inches) which is about the width of a needle. *The thread must be allowed to travel at least 1 needle's distance from 1 hole to another.*

Longest: No more than 10mm (.4 inches) long. Longer stitches (longer than 4-4mm) tend to be looser and more vulnerable to physical wear. Most embroidery machines and software cap this limit at about 10-12mm or about ½ an inch.



2 Types of Stitch File Formats in Embroidery

There are 2 types of stitch file (design) formats in embroidery, meaning that you'll often have 2 versions of the same design: (1) the **condensed** format called **CHE** that has special information that makes it easy for the digitizer to build on or edit, and (2) the **expanded** format that's simplified for an embroidery machine to read, the most common of which is **DST**.

How this works in Stitch & Sew

- **CHE file:** When a section of stitching is created in Stitch & Sew, the program generates more than just the stitching: it remembers the shape (or framework, or "mold") that was used to shape the stitches, whether the shape of a letter or part of a logo. It also remembers settings the digitizer used to create those stitches, like color, stitch density, type of stitch and any other special instructions needed to build that section of stitching. This information is kept with the stitch design to make it easy to make changes or edits. For example, changing the outline shape of part of a logo automatically re-builds stitches to conform to the new shape. Or choosing a different fabric setting causes Stitch & Sew to change settings like density, angle, and more to adjust the logo for that type of fabric. Stitch & Sew does this on-the-spot, meaning the digitizer doesn't have to re-build that part of the design from scratch. **All this extra info is kept when the digitizer saves the design in .CHE format.**
- **DST** is a universal design format that all commercial embroidery machines can read. It contains a simplified version of the design (compared to the CHE version above). It lacks all the special information added in with the stitches that make a CHE file so easy to edit. In the .dst version, only the stitch information remains – the pure, raw instructions required to tell an embroidery machine to sew the design.

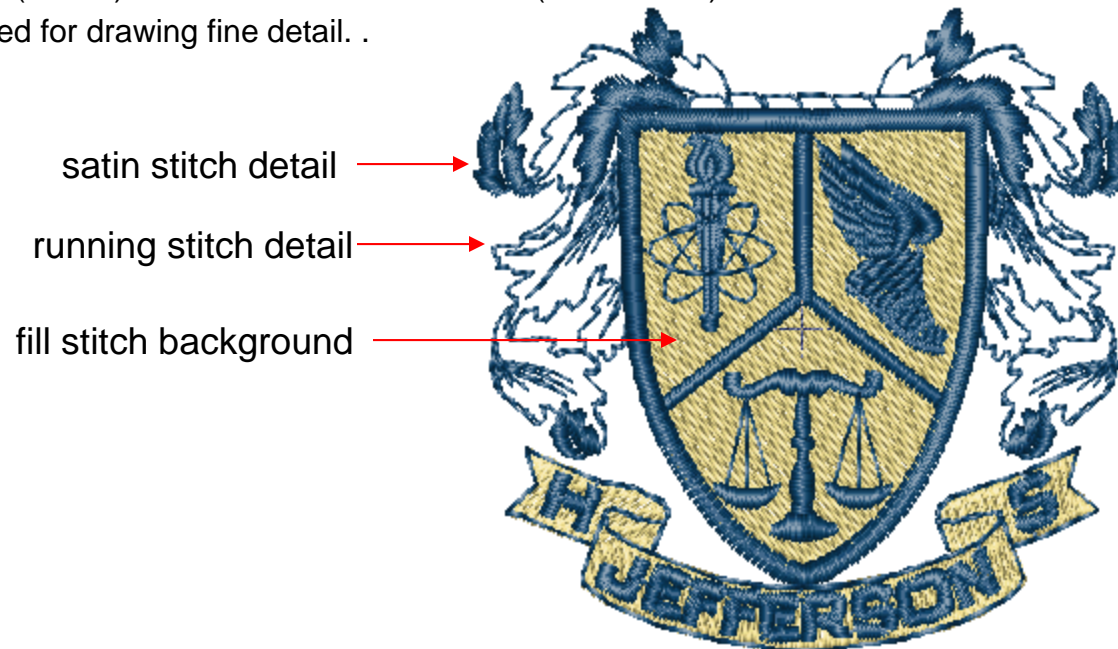
What to do with these 2 files in Stitch & Sew: Digitize the job and save it in CHE format on your PC (in Documents). **To embroider it, transfer a copy of the design in .dst format** to your machine (File...Save As) **For any fixes or adjustments needed after that, edit the CHE file**, then re-sew by making a fresh dst copy of the edited CHE file.

Digitizing Basics

Some Embroidery Basics: The 3 Basic Stitch Types

All designs are made up of small and large shapes. There are **3 basic types of stitches** that can be used to create these shapes:

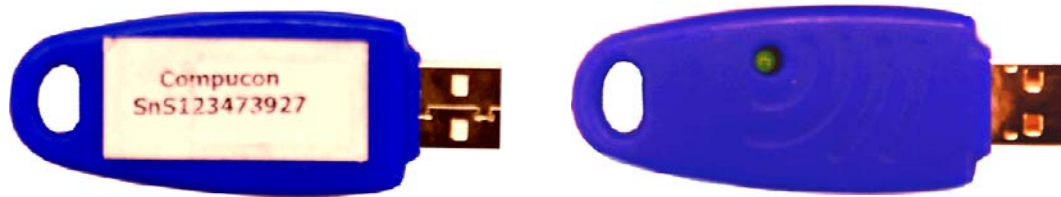
- **Fill Stitches** – Useful for filling in wide areas with color, wider than 10mm (.4 inches) – areas too wide to be filled in with satin stitches. Sit flatter and don't have the same sheen as satin stitches.
- **Satin Stitches** – Excellent for narrow detail like lettering stems, vine work, borders. But can be no wider than 0.4 inches (10mm) and no narrower than 1mm (0.04 inches).
- **Running Stitches** - used for drawing fine detail. .



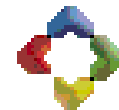
Starting Up Stitch & Sew

On this page, We've pointed out some useful tips to follow when getting started with Stitch & Sew 2.0

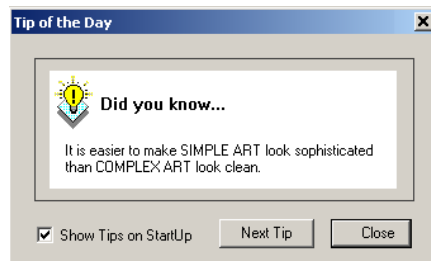
- 1. Software key (dongle).** Upon installing your Stitch & Sew 2.0 program, you'll need to have the software key (dongle) connected to a USB port in order to run. The key, shown actual size below, is plastic – take care not to damage it!



- 2. Launching the program.** Find the program icon shown here and launch **Stitch & Sew** by double-clicking on it.



- 3. Tip of the day.** Until you get to know **Stitch & Sew** well, this is a good way of learning things about the program that you might not otherwise pick up during your own study. Uncheck the box "Show Tips" when you wish to disable this feature.

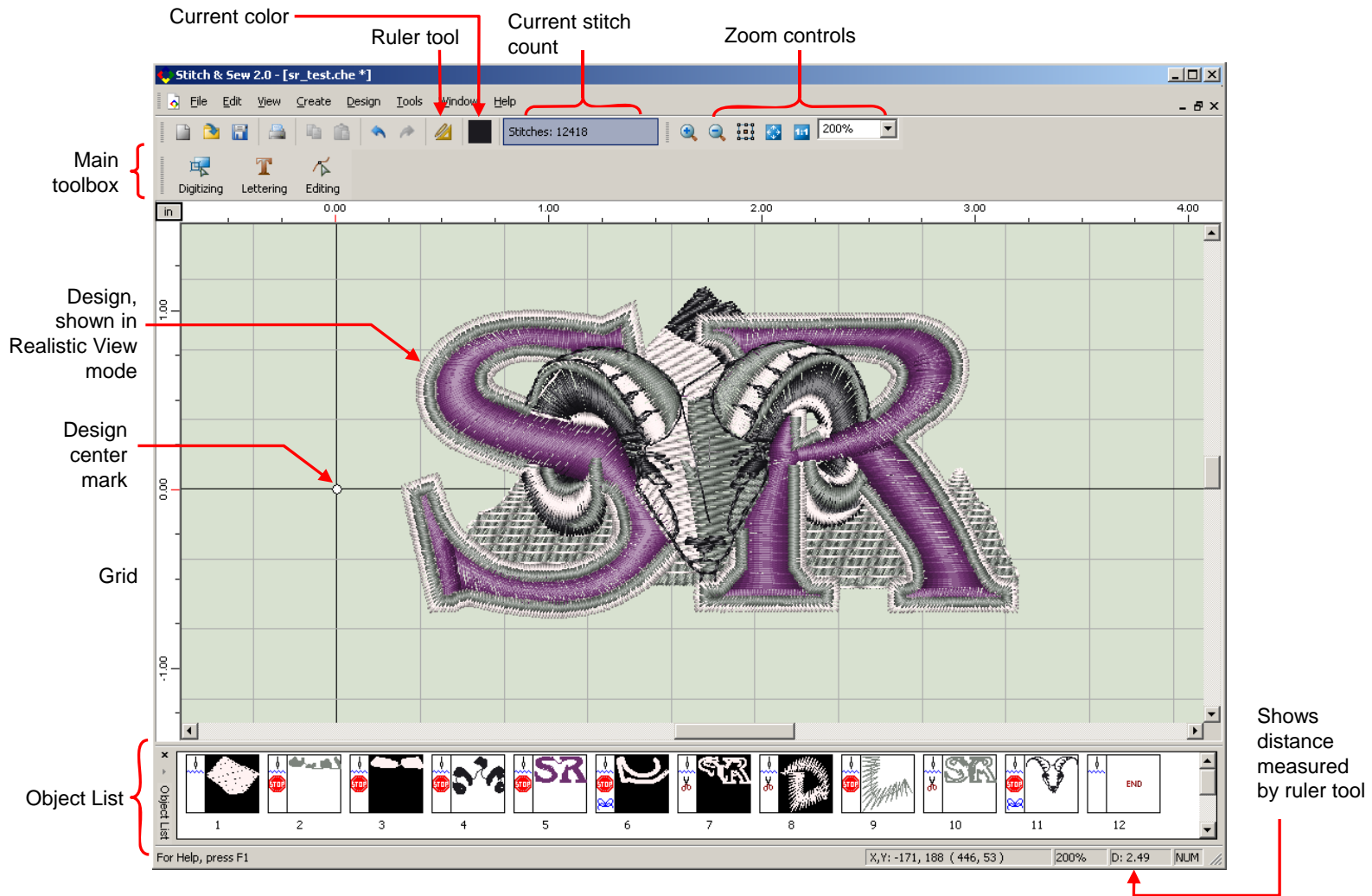


- 4. Choose an option based on what you want to do.** When the program starts, you can jump into a job from the menu that appears below, or you can close this by clicking on the **x** at the top right.



Program Window

Shown below is the Stitch & Sew 2.0 program window and important features to familiarize yourself with.



Program Window (continued)

Some notes about the parts of the program window shown on the previous page.



Ruler tool - Lets you measure parts of a design in “tape measure” fashion



Current color - any stitches generated will appear in this color

Stitches: 3844

Current stitch count - Updates continuously as you add onto your design. Important as an indicator of how long a design will take to sew.



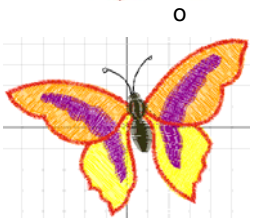
Zoom controls – Learn to zoom in/out. Digitizing is more accurate when zoomed in as much as practical (around 600% for example). Zoom out as necessary (100%) to make judgments about detail/overall size.



Main Toolbox - Puts the program into 1 of 4 modes: Digitizing, Lettering, Editing, or a “general operations” mode when neither of these 3 buttons are pressed. When Digitizing, Lettering, or Editing is selected, the related tools for that mode appear to the right.



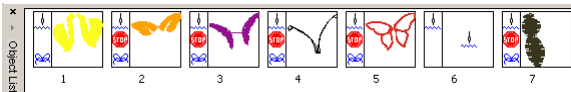
Realistic view mode - Toggle this mode on/off by pressing ALT+R – it simulates the appearance of the stitches as they would appear in 3-D. The alternate, normal view shows stitches as thin lines, which is easier to work with when viewing other detail like stitch angles or the tracing artwork underneath.



Center mark – shows where the center of the hoop will be when you sew the current design. To auto-center the design over this point, go to Design . . . Center Design.

Grid – When turned on, gives instant idea of the size of different elements of a design. The default 10mm (0.4 inch grid for example is a good measure of max satin stitch length. A 1mm (.04in) grid shows min. lengths.

Object List – Breaks down the design into thumbnail views of each part, in the order each will sew. You can change sewing order, color and connection types directly with this list.

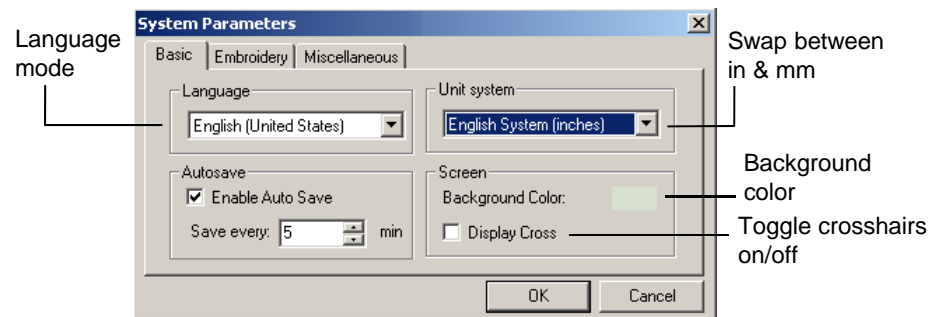


Customizing Stitch & Sew to your Preferences

You can customize your Stitch & Sew program to your preferences. Go to Tools, then System Parameters to show the settings you can adjust below.

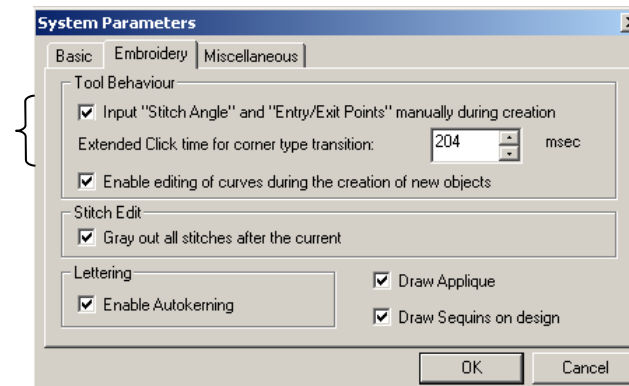
“BASIC” Tab

This is the first tab in the dialog box where you can set language, units, background color and toggle the cursor crosshairs.



“EMBROIDERY” Tab

This is the second tab in the dialog box. For greater control as you digitize, check both of these boxes. The first one lets you enter angle and entry and exit points for stitch blocks as you create them, rather than have the program set them automatically. This results in better-flowing stitches with fewer jumps, and more creative control (stitch angle) over blocks created by the Freeform tool.

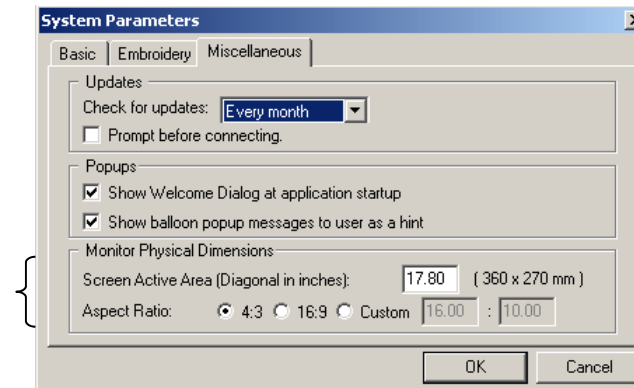


Customizing Stitch & Sew to your Preferences

Shown below is the third tab in the System Parameters dialog box.

“Miscellaneous” Tab

Adjust this based on your screen resolution if your images are distorted (i.e. circles appearing as squashed ovals, squares appear as rectangles). If your monitor is traditional 4:3 (not wide screen, i.e. 1024x768, 1280 x 1024, 1600x1200) set to 4:3. If you have a wide screen monitor, try wide screen mode 16:9. If neither of these work, you can enter custom resolution. Also, to show a design at its true size when viewed at 100% magnification, measure your diagonal screen dimensions and enter them in “Screen Active Area”.



How Stitch & Sew Handles the Embroidery Part

Stitch & Sew and other embroidery digitizing programs have some things in common with graphic drawing/design programs like CorelDraw or Photoshop or Illustrator: All are programs that use tools to create shapes in different colors to create or modify an image. However, there are some important additional characteristics about embroidery:

- 1. SEWING ORDER is important.** Embroidery designs sew 1 stitch at a time, 1 color at a time. As the digitizer, you can control the sewing order to affect how efficiently the design sews, create 3-D “layering” effects by choosing to sew some parts of a design on top of other parts.
- 2. TRANSITIONS BETWEEN SECTIONS are also important.** When one part of a design is finished sewing, the machine can move to the next part either by (1) trimming the thread, then moving, or (2) continuing to sew a running or pathing stitch to the next location, or (3) “jumping” to the next location (leaving a thread). All 3 have their advantages.

Viewing/Understanding the Sewing Order of a Design in Stitch & Sew

Variable-speed (slow) Redraw – (SHIFT-R) –By entering Redraw mode with SHIFT-R, you’ll be able to see the design “sew” stitch by stitch at any speed you wish sequence by manipulating the controls that appear (shown below). The re-draw will show not only the order of each block, but the sequence/direction of stitches as they fill each block with stitching.



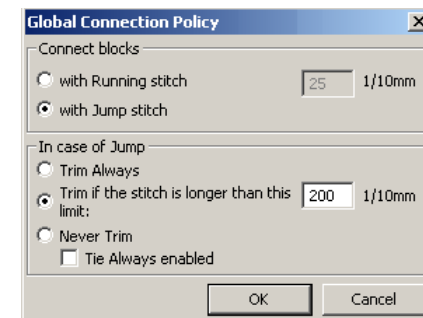
Connection Policy: How Stitch & Sew controls the connections between each section in a design

Transitioning between each stitch block is controlled by a “Connection Policy” in Stitch & Sew (Go to Design . . . Connection Policy to view the overall (Global) connection policy:

Trim Always – tells the machine to cut the thread between the section and the one before it.

Trim if the Stitch is longer than – Usually the best option, trims only if the the gap between sections exceeds a set length.

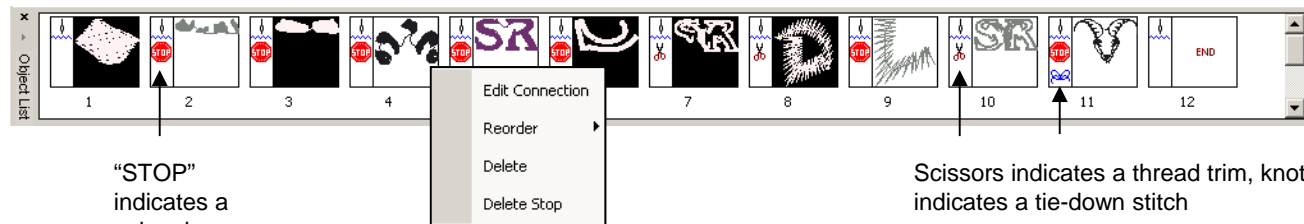
Never Trim - third option.



How Stitch & Sew Handles the Embroidery Part (continued)

Another important tool shown on this page is the Object List.

Object List – Shows **BOTH** the sewing order, block by block, of a design, and the connection (and also the color sequence)



“STOP”
indicates a
color change

Scissors indicates a thread trim, knot icon
indicates a tie-down stitch

Right-clicking on a frame gives options to:

- Change connection policy for the selected item
- Change the sewing order
- Delete the block
- Remove the color change (stop) or add one

Using the Grid to Measure Size & Detail

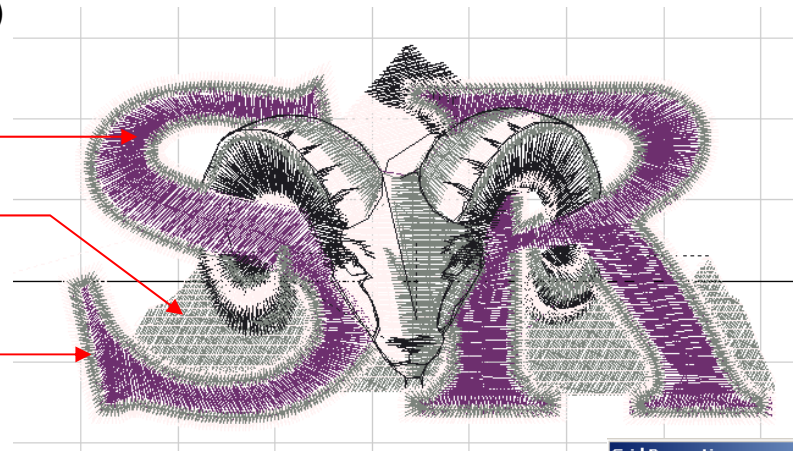
The Grid tool (press “W” to toggle it on and off) lets you see immediately how large each part of a design is. This is particularly important when deciding if parts of a design should be sewn as satin, fill (step satin) or running stitches. The default grid (0.39 inches, which we’ll call 0.4 inches) is a good way to check for areas too wide for satin stitches.

Viewing with the Grid at 0.4 inches (10mm)

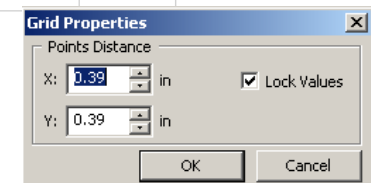
The areas of the “S” and “R” are wide but not too wide for satin stitches, according to the 0.4 inch grid blocks shown here.

The large background fill is wider than a grid block, showing that it should be rendered as fill (step satin) stitching.

View this design again with the grid set to 0.04 inches to see if this satin border is too narrow.



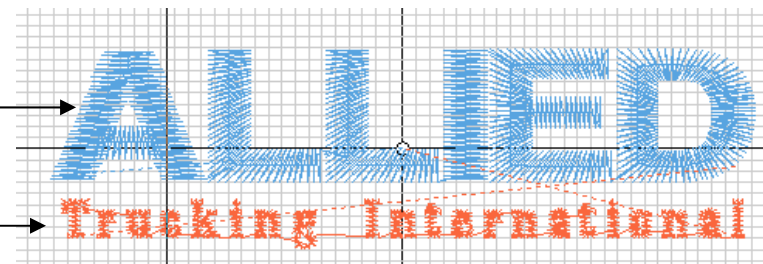
Change grid size from Tools . . . Set Grid Size.



Viewing with the Grid at 0.04 inches (1mm)

Good: With a .04 inch grid set, you can see that “ALLIED” is not too narrow and not too wide for satin stitching.

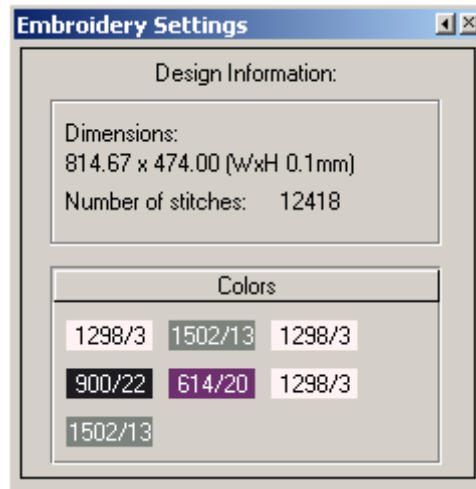
No Good: While the satin stems of “Trucking International” are too narrow to sew well.



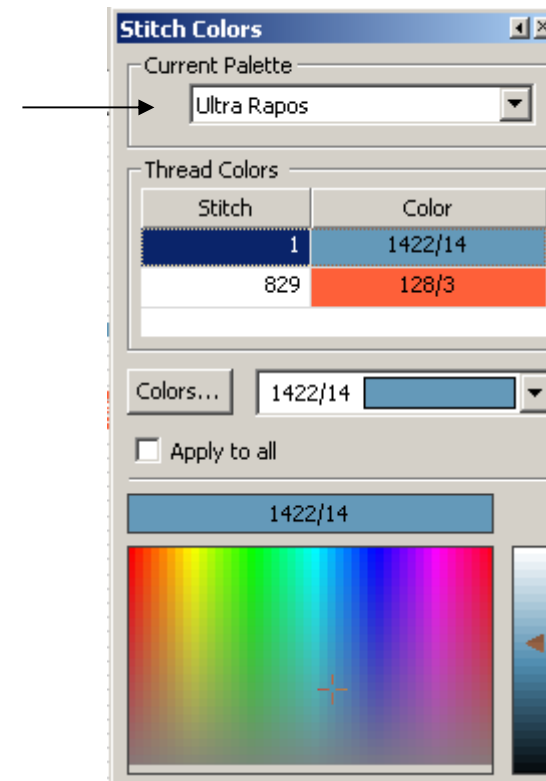
Color in Stitch & Sew

With Stitch & Sew 2, it's possible to select a thread library based on the brand of thread you use, from Tools . . . Stitch Colors. By changing to your preferred brand of thread, the Embroidery Settings box (with neither Digitizing/Editing on) shows the thread color numbers to make it easier to select thread to sew your design.

Current Thread Palette is visible in General Operations mode when you open the Embroidery Settings dialog box (press the letter "G" to toggle it on and off



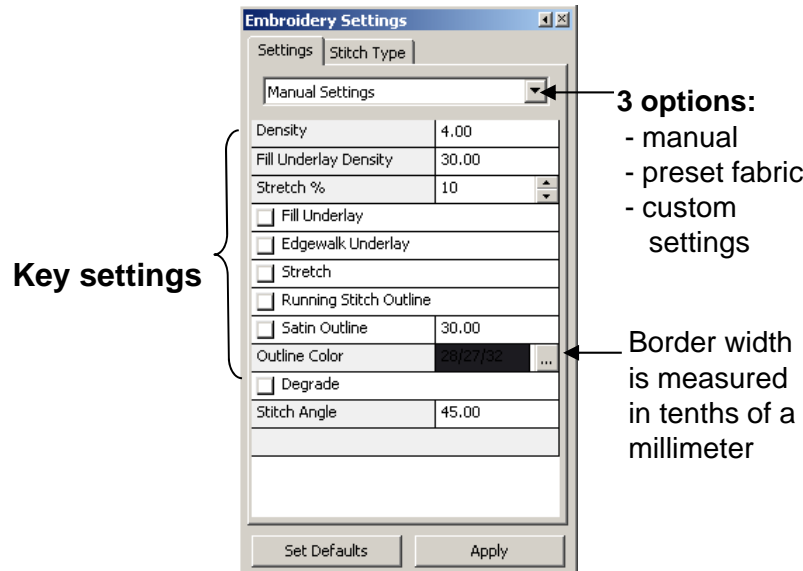
You can choose a thread library by opening the Stitch Colors dialog box (CTRL + K) and choosing your brand of thread from "Current Palette".



Embroidery Settings

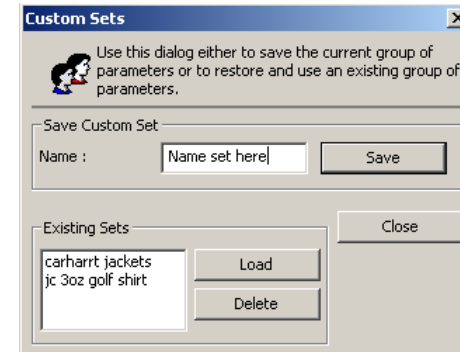
What Stitch Settings Are: As discussed back on page 2, Stitch & Sew fills in the shapes you create (using the Lettering or Freeform or Column tools) with stitches. Because of the wide variety of fabrics and differences in the way they behave when stitches are applied to them, it is important to be able to adjust **HOW** the stitches fill these shapes. The Embroidery Settings dialog box controls a lot of this, especially these 3 key settings:

- **Stitch density** (3.5 to 4.0 is normal, 2.0 is heavier density, 5.0 and up is lighter density)
- **Underlay** - how much and what type of supporting stitching (known as *underlay*)
- **Stretch** - The amount of overlap that an area of stitching needs to sew beyond the shape of the objects. Generically in the industry this is known as "Pull Compensation".



Customizing Your Own Stitch Recipes

As you become more experienced with Stitch & Sew, you can create your own library of fabric presets by choosing the 3rd option in the Embroidery Settings Dialog box, "Custom Settings".

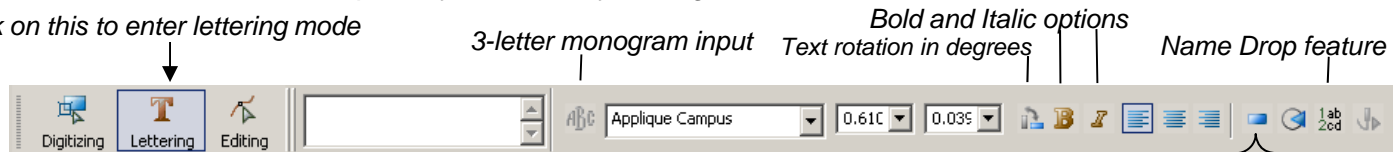


Viewing Embroidery Settings are in Stitch & Sew: When in Digitizing, Lettering or Editing mode, pressing the "G" key on your keyboard opens up the dialog box shown above.

Lettering in Stitch & Sew

What Stitch Settings Are: As discussed back on page 2, Stitch & Sew fills in the shapes you create (using the Lettering or Freeform or Column tools) with stitches. Because of the wide variety of fabrics and differences in the way they behave when stitches are applied to them, it is important to be able to adjust **HOW** the stitches fill these shapes. The Embroidery Settings dialog box controls a lot of this, especially these 3 key settings:

Click on this to enter lettering mode



Type text here.

Font list: 100 fonts for SNS Studio Plus, 72 for Studio.

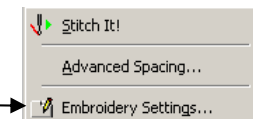
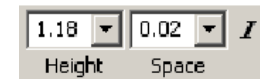


Frames options – 9 for Studio, 30 for Plus

NORMAL LETTERING

Lettering is straightforward: Once in lettering mode, follow the lettering control panel (shown above) from left to right as follows:

1. **Click on Lettering** causing the lettering controls to appear (shown above)
2. **Frames options Enter text** as shown above in the window. Letters appear over the center point
3. **Choose font** – You can choose from one of the built-in fonts in the programs. (To use TrueType fonts, exit Lettering mode and click on Design . . . Hyperfont Wizard).
4. **Set height and spacing, italic/bold** – The units for size can be in metric or inches, depending on what you’ve chosen in Tools...System Parameters
5. **Justification:** left, center, right – This is useful if you’re typing more than 1 line of text at the same time, or use “Center” to center multiple names in “Name Drop”.
6. **Frames** – allows you to place envelope around the text and force into different shapes including arcs, bridges, circles, rectangles. There are 9 frames available with Stitch & Sew Studio, 30 frames with Studio Plus.



Working with Imported Designs in Stitch & Sew

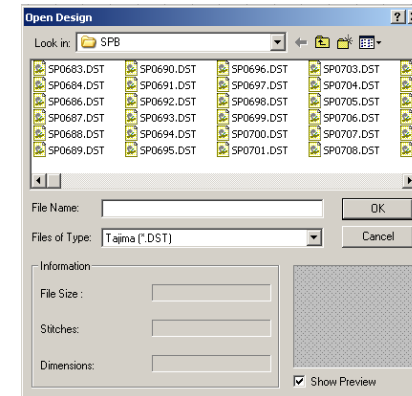
Importing pre-digitized stock designs is a great way to create custom logos without having to digitize.

Opening and Setting Up Stock Designs

Explained below are the steps for opening up a stock (pre-digitized) design before working on it.

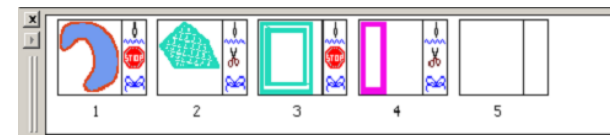
When ready to sew your design, always be sure to take the following steps, which all take just a few seconds:

1. Open the file. Click on File..Open. The dialog box at the right appears. As shown, choose the drive and directory where the design is (your CD ROM for example), the format that the design is in (such as .dst or .hus). Then, highlight the design and click OK.



Open Design

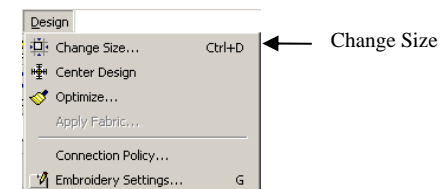
2. Set the Colors of the design. Designs in most common formats (.dst, .exp) do not have any information about what color each stitch block is. This should be provided by the seller of the design. You can do this from the Object List.



Setting up colors: Click on a frame to highlight it, then choose a color in the toolbar at the top of the program window.

3. Re-size the Design as necessary. You may want to re-size your stock design. To do so, follow these steps:

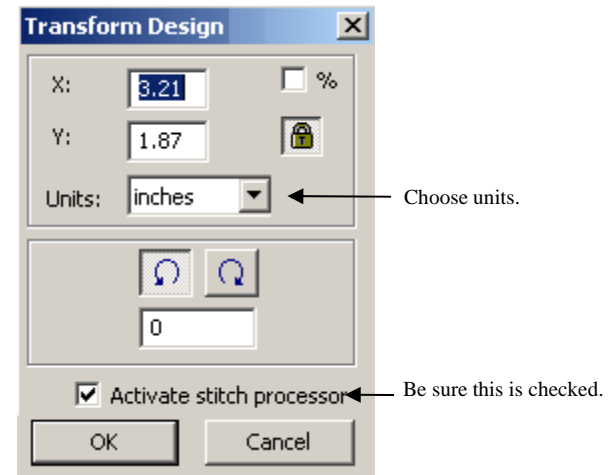
- a. **Select the stitches of the design** using the select tool. If they are the only stitches in the window, you can simply Select ALL (CTRL+A).
- b. **Click on Design...Change Size.** The dialog box shown on the right appears.
- c. **Choose Units** – inches or mm.
- d. **enter new dimensions.** In the dialog box, enter the new dimensions in inches, mm, or by percentage.
- e. **Press OK to resize.** Using this method, Stitch & Sew resizes the stitches AND adjusts the stitch count accordingly.



Working with Imported Designs in Stitch & Sew (continued)

CAUTION! Resizing a design too much can lead to problems relating to the limitations of that design with satin stitch detail becoming too large or too small. It's a good idea to check the width of any satin stitches using the grid tool after you've re-sized the design.

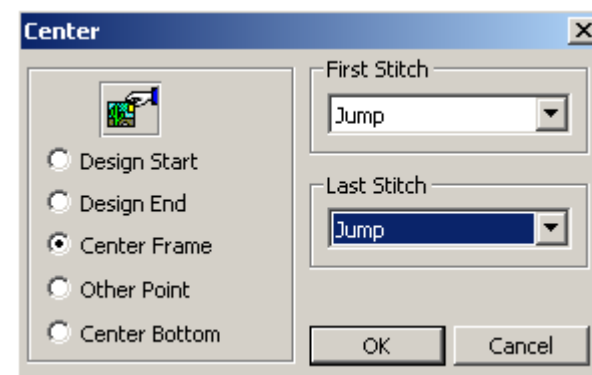
You Add text if you like to customize the design. Use the previous lesson on lettering to add text anywhere in the free space around the design.



Saving Your Design and Sewing It

When ready to sew your design, always be sure to take the following steps, which all take just a few seconds:

1. **Exit any editing/lettering/digitizing mode.**
2. **Compensate for fabric.** If you haven't paid any attention to Embroidery Settings, click on Design, then Apply Fabric and choose the fabric type of the garment on which you intend to sew. This helps better ensure good sewing quality.
3. **Center it in the hoop.** Click on Design . . . Center Design and click OK in the dialog box that appears. The default setting (Center Frame) automatically assures that the design will sew in the center of the hoop if the embroidery machine is set up normally.
4. **Minimize Thread Breaks** Click on Design . . . Optimize Design and click OK – this removes “trash” or “short” stitches that may cause thread breaks
5. **Save the design to .dst** format for sewing
6. **(Optional) Save a “master” copy in .CHE format** if you think you'll need o edit your design later. This is especially important for a logo you're digitizing yourself from the ground up.



Practical Exercises

Use what you've learned so far to try the exercises below. These have been set up like a lot of real-world embroidery jobs to give some useful practice.

Exercise 1: Basic Lettering Exercise.

Use the lettering tools to create a 2-line text logo in typical left-chest style with 2 different font styles. You can try the text arrangement on the right or use your own. Use the grid to make sure the lettering stays within sewable limits.



Try to set up this text for exercise 1.

1. Click on **Lettering** to show the lettering control panel.
2. Set up the first line of text which in this case is the company name. Set it up as shown below.



Enter text here

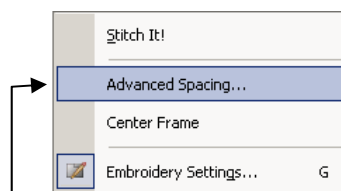
Choose font. If trying the example, choose Times Large in step 2.

Letter height: For step 2, set the 1st line of text t 0.6in. That should put the letters about 3.5" wide – perfect for left chest.

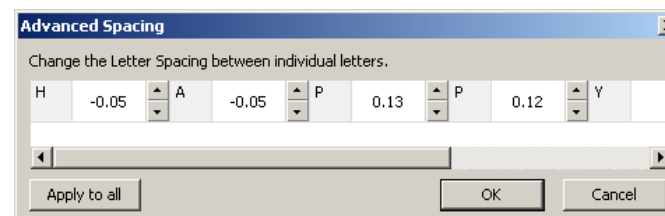


The text will appear in outline form as you type it, as shown above.

3. Try fine-tuning the spacing. – Sometimes the individual spaces between letters need to be adjusted (called Kerning) for aesthetic reasons or to avoid letters from bunching (sewing) together. Right-click on the text and select Advanced Spacing.



Right-click, select Advanced spacing



Opens this dialog box where you can set individual values between letters to fine-tune spacing. Click OK when finished.

4. Generate the stitches for the 1st line of text. Either press ENTER or click on the STITCH IT! button  at the top right. This will fill in the text outlines with actual stitches.

Practical Exercises – Lettering & Editing

Exercise 1: Basic Lettering Exercise *(continued)*

With the first line of text finished, now create the second line. Try to understand why this might be more challenging due to the text size.



Creating the 2nd line of text

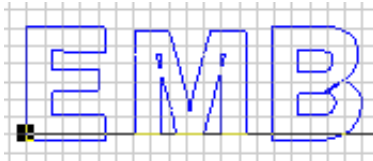
5. Click on **Lettering** if you're not still in Lettering mode.
6. **Set up the 2nd line of text.** Set it up as shown on the right. In this typical example, the 2nd line of text is a sub-title, description or slogan, which often means there's more text, forcing it to be smaller if the customer wants it to line up with the text above it.




If following the above exercise, choose Helvetica Small for the second line of text.

Letter height: Set to ¼ inch, or 0.25. Notice how the smaller letters now fit better under the large text.

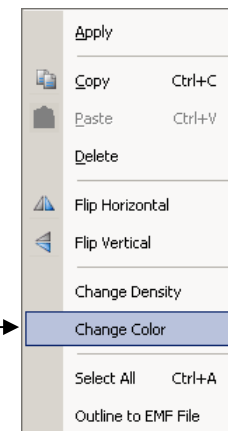
7. **Use the grid to see if the letters will be OK at the given sizes.** Referring to page 11 as need be, set up a 1mm grid and look at the text (both lines of text) and see if they will be OK to sew for satin stitching. Will they be OK? Why or why not?



Be sure to zoom in at least to 300% to have a good look at the lettering stems. Will these letters be OK at this size? (shown is a 1mm grid).

8. **Generate the stitches on the 2nd line of text.** Just like with the 1st line, press ENTER or STITCH IT! 

9. **Try changing colors:** Exit Lettering mode, and try selecting different parts of the text, right-clicking and changing colors.



10. **Center the design and pick a fabric.** (Page 17). Don't forget to do this before sewing!

Additional Thought: Try other fonts on the lower line of text. Which seem to work better?

Practical Exercises

Exercise 2: Other Common Text Arrangements

In this exercise, use some of the other lettering tools such as Frames to create these text effects.



The Frames options allow some of the text effects shown here. There are 30 for Plus, 9 for Studio.

Vertical arch

Text normally appears in a rectangular envelope (like in Exercise 1).

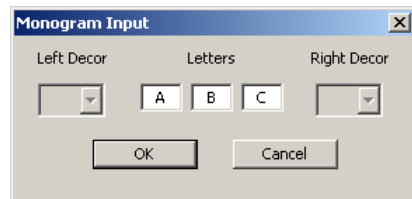


Try this arch tool, and drag the top center control point upwards to get this popular text effect:



3-Letter Monogram

Find this monogram tool  which opens this box:

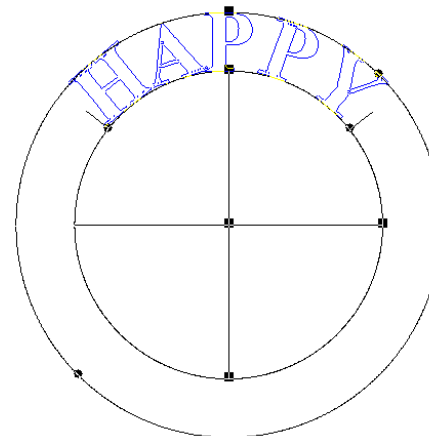


Which makes it easy to create effects like this:



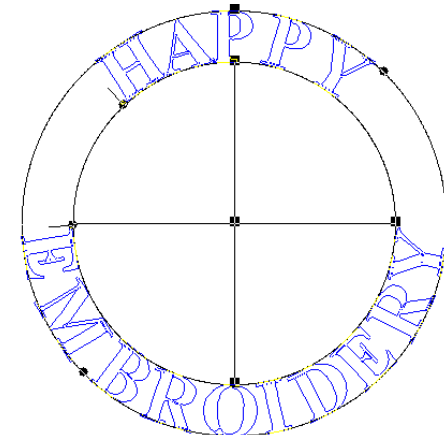
Top arc:

The Frame tool shown above places the text in a circular template, making it easy to set up arced text.



Upper and lower arc:

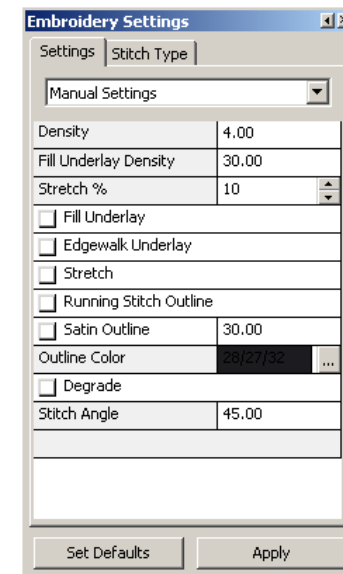
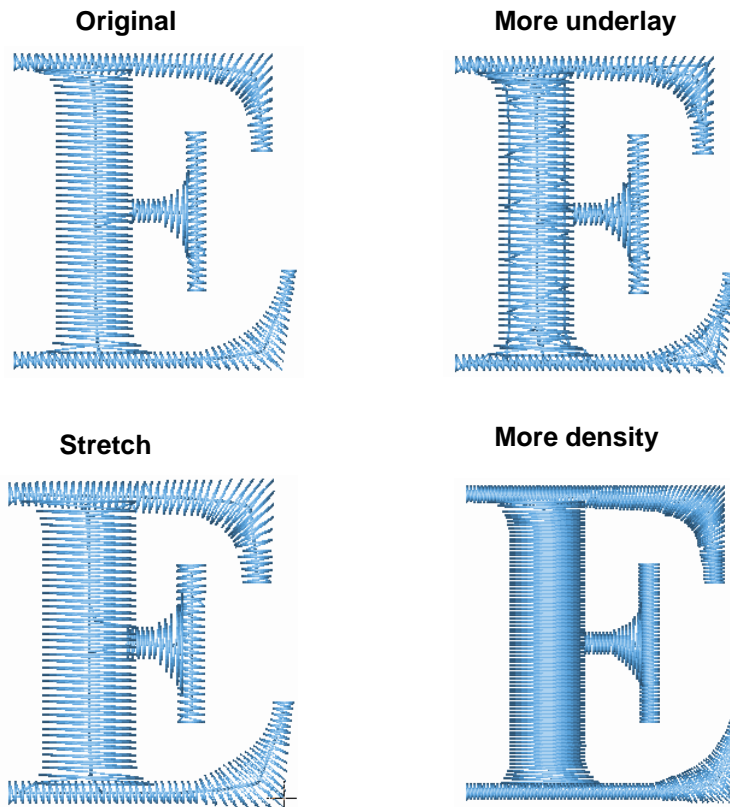
Using this tool, 2 lines of text separated by the ENTER key lets the program centers both lines as shown below:



Practical Exercises

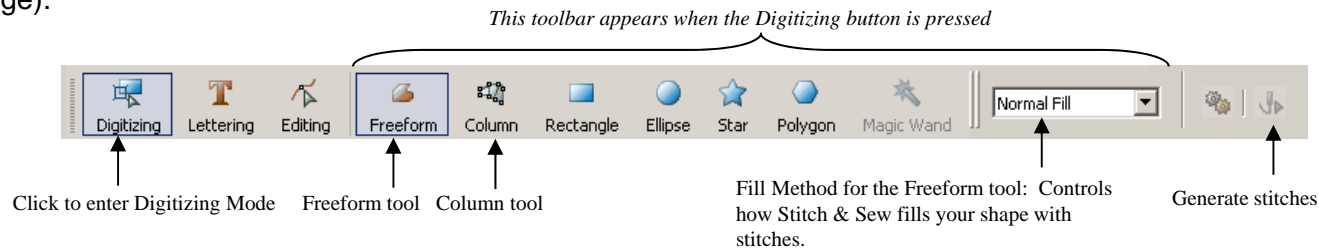
Exercise 3: Editing Embroidery Settings to Control Quality

In this exercise, learn to use Editing mode to modify any text you've created. How does each setting affect the sewability of the design/letter?



Digitizing Shapes (satin, fill & running stitches)

The first part of learning to digitize is learning to create your own shapes using the Freeform tool and the Column tool. You can draw these shapes either on the blank canvas free-handed, or import an image and trace the shape(s) on it (we'll get to that on the next page).



General Rules on using the Freeform tool

Use the Freeform tool to create fill stitches. You'll also find that you can use it to create running stitches and satin stitch (borders) but you'll primarily be using it to create fill stitches especially as you first start out.

1. **Draw by clicking along the edges of a shape.**
Start at almost any point and proceed clockwise or counter-clockwise, moving further along the edge of the shape and placing the next click. A black control-point will appear everywhere you click, and a curve or line will connect each new point to the previous point you set.
2. **You can set either corner points or curved points with the CTRL key.**
3. **You don't have to be perfect – you can fix your mistakes on-the-fly as you draw**
You can do 4 things to your drawing even before you finish the shape:
 - **Press Delete to un-do your last mouse-click.** You can go back as many clicks as you want. (pressing ESC erases the shape completely if you haven't finished it, and you can start all over)
 - **Move any control points you've already created** by clicking on them and moving them. This changes the shape in case you're not happy with where you've placed that click.
 - **Adjust the curves and lines** that connect each control point by clicking and dragging on those lines.
 - **CTRL-click the control points** to change the state of that point from curve to corner or vice-versa

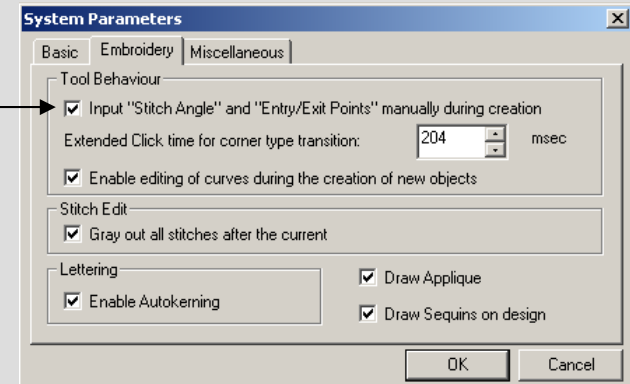
Digitizing Shapes (satin, fill & running stitches) (continued)

4. Finishing the shape:

- **Close the shape:** When you've set points all the way around the shape and you're 1 click away from the first control point you set, you can join your last point with the first point. To do so, right-click to show a menu of available options and un-check the option "Opened Curve".
- **Set the angle of the fill stitch using the blue line** by dragging either of its endpoints. The blue bar appears automatically as you start drawing a shape with the Freeform tool
- **Set the entry and exit points of the shape** with your mouseclicks
- **Fill in the shape by pressing "Stitch It!**

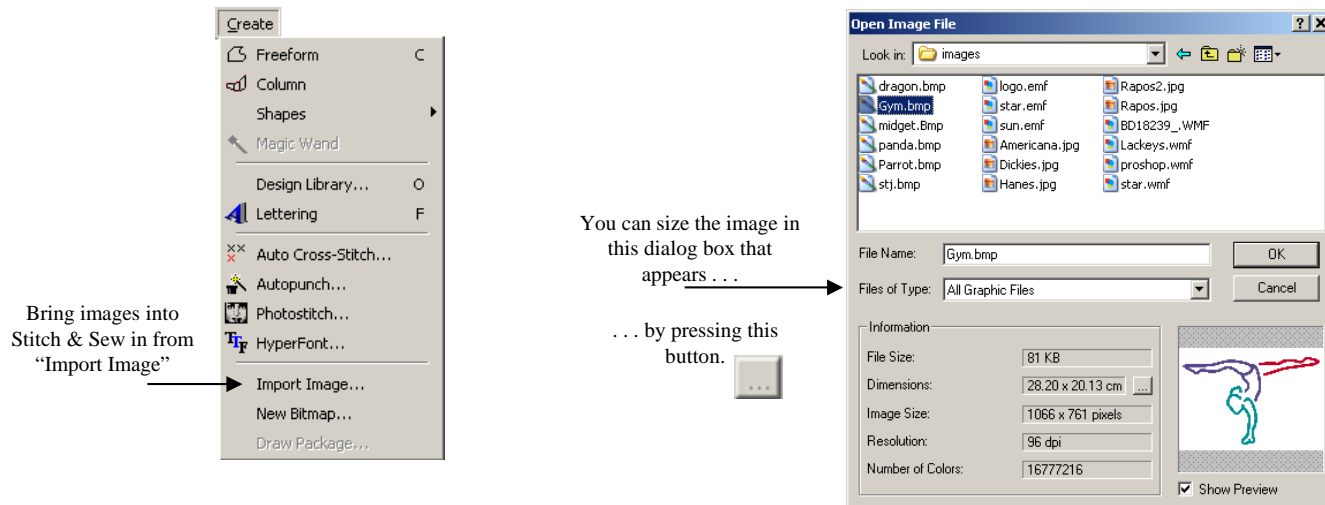
Setting Up Your Program for Manual Input

For better control of stitch direction and the ability to set the entry and exit points of a stitch block, go to Tools... System Parameters and check this box. After this, clicking on "Stitch It" will no longer automatically build the stitches – the program will instead prompt you to input first the stitch angle (or press ENTER to leave at previous setting) then the Entry and Exit points.



Importing Artwork to Digitize

You can bring artwork into Stitch & Sew from the Create menu by choosing Import Image as shown below.



TIP: get the size correct at this stage! Remember that you'll be making decisions on digitizing your design, such as deciding stitch type and detail level, based on the size of each part of the design.

TIP: Use the Grid tool to quickly evaluate the sizes of different elements of the design such as letter stems, areas of the design to decide which areas are too small for satins (i.e. tiny letters), which are too large for satins, which are better as fill (step satin) stitches and which are better as running stitches. The general rules for this are discussed on the next page. (tap the "W" key to toggle the grid on or off).

Digitizing Strategy

Once you know how to create fills and satin stitches using the drawing tools, you're ready to understand the entire digitizing process. We've described it in 2 stages on this and the next page – (1) Get all the relevant information first, then (2) plan the actual digitizing based on the steps gone over in this workbook, as outlined on the next page.

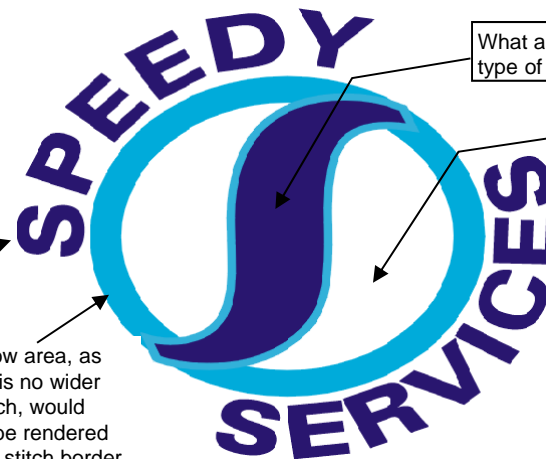
1. Getting Digitizing Jobs from Your Customer - It's important to get ALL the necessary information from your customer about a job before beginning the actual digitizing itself.

- a. **Artwork** – If possible get it electronically (as a CLEAN image, in jpg, bmp, tif, photoshop PSD) or get it on paper as large as possible. Be sure to get color information especially the number of colors i.e. specific thread colors.
- b. **Garment** – Type of garment will determine how you digitize the file. For example, hat designs need to be digitized completely differently. Other types of garments such as fleece or pique need different “recipes” of stitch settings.
- c. **Size of the design** – this will determine the type of stitches to use and the amount of detail.
- d. **Unusual/Special requests:** Before walking away from the initial conversation with the customer, take the time to examine the artwork or think of anything about the order that may be left open to interpretation. For example, are all areas of the design to be filled in with stitches? As an example, the logo below may or may not require that the interior white areas be sewn. There may be other “hidden” particulars. Be sure to present your customer with a color proof of your work before submitting the design – especially if you are embroidering it as well.

2. Digitizing Strategy: Breaking Down Artwork into Elements Ready for Digitizing. Logos and other artwork can be broken down mentally and planned out as shown on the right, based on the few simple rules shown on the next page.

Lettering, as long as the columns (stems) are > 1mm wide but no wider than ½ inch, is generally rendered in satin stitching.

This narrow area, as long as it is no wider than ½ inch, would normally be rendered as a satin stitch border.



What about this area? What type of stitch would you use?

Areas wider than ½ inch square, or areas that you want to stand out less, are done in fills.

Digitizing Strategy

(continued)

Key Rules in Planning Digitizing

Follow these general guidelines when digitizing a logo or artwork.

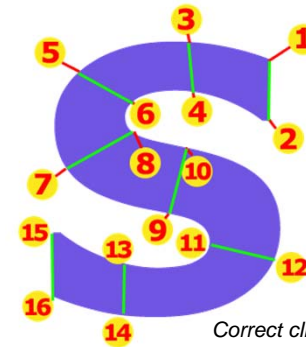
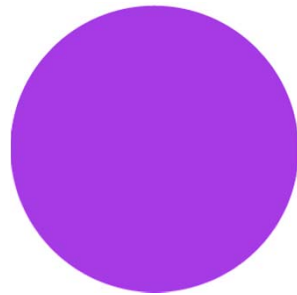
1. **Decide on the Stitch Types to be used based on the size of each element in the design.** Fine, narrow detail can be rendered as running or satin stitches. Wider parts of a design may need to be rendered as fill stitches.
2. **Group everything sequentially according to color, if possible.** Eliminating unwanted color changes in a design will make your machine run that much faster.
3. **Choose the sequence based on the layering order of the design.** The “S” in the Speedy Services logo on the previous page, for example, should appear on top – so it must be digitized to sew last.
4. **Transition smoothly between stitch groups** – A design sews more smoothly (fewer unnecessary jumps, trims & running stitches) when each stitch block starts closest to where the last one ended, and ends closest to where the next one will begin. Also choose carefully which way to connect between each stitch block: by stitch, by jumping, or by trimming. Use the Connection Policy to manage this.
5. **Anticipate and understand what happens where stitch blocks overlap or abut each other.**
 - a. **Stacking stitch groups** (i.e. a satin on a fill or a satin on a satin): The difference in angle between both stitch blocks is important. If the angle is different, the upper group stays separate from the one underneath. If the angle is the same, both stitch groups blend into each other.
 - b. **Adjacent Stitch Groups** – (i.e. stripes of satins as in the American Flag, or the edge of a fill stitch and its satin border) – often will pull away from each other and leave a gap. Be sure to add enough pull compensation (stretch).

Practical Digitizing Exercises

Use what you've learned so far to try the exercises below. These have been set up like a lot of real-world embroidery jobs to give some useful practice.

Exercise 1: Practice with the Freeform and Column tools

These 2 powerful tools by themselves let you build any shape, any logo or design, no matter how simple or complex. Master these to put high quality digitizing within your grasp. Try to draw the first row of shapes using first the Freeform, then the Column tool. Notice the correct click sequence for drawing the "S" shape with the column tool.



Correct click sequence for the column tool. Why?

Exercise 2: Now try these shapes with the Freeform and Column tool.

Understand the answers to the questions below each shape for a better understanding of how each tool works in digitizing..



Why does the "X" shape not work as a single shape with the column tool? How should the X be drawn with the column tool? (hint: multiple sections)



Why is the Freeform tool better than the Column tool for this shape? (hint: multi-segment fills)



The star works well drawn with the both tools. How would you create this with the column tool? (hint: similar to the "X" shape)