Training:

Stitch & Sew 2.0

Learning Workbook for Studio and Studio Plus-Levels

Updated Nov. 6, 2008: Digitizing section added

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. It's a lot easier to create stitches with a digitizing program that exceed these limits when building a design in any digitizing program, so it is important to keep these limits in mind and use tools like the Grid and Ruler in Stitch & Sew to prevent this. This will result in smoother-running, better looking designs overall

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:** Anything you create in Stitch & Sew is based on an outline or "framework" – the shape of a letter in an alphabet or a shape you in Stitch & Sew acts as a "mold" that is filled automatically by the program, along with general "settings" that tell Stitch & Sew how to fill in that shape (i.e. how dense the stitches should be, what angle, what type of underlay stitch, etc). In this way, if you need to change the shape you've drawn or any other aspect of that area of stitching (called a stitch block), you can do so by changing the shape or density – there is no need to edit individual stitches. If you save your design in the CHE, the outline shape is preserved as well as the stitch settings so you can edit this all any time you open the file.

- **The DST file** is created when you're finished with the CHE design and are ready to sew. It's easy – just File..Save As and save in DST format). The DST file is a copy of the CHE file, stripped of the shape and settings information. It contains the instructions needed for the machine to sew the design and nothing else.

Some Embroidery Basics: The 3 Basic Stitch Types and how Stitch & Sew objects creates them

All designs are made up of small and large shapes. Embroidery digitizing has 3 types of stitches that are each specialized for a specific purpose in designs.

- **Fill Stitches** – Useful for filling in wide areas with color. wider than 10mm (.4 inches). Fills in areas too wide for satin stitches, but do not have the same sheen as satin stitches.

- **Satin Stitches** – Excellent for narrow detail like lettering stems, vinework, 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. They 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.
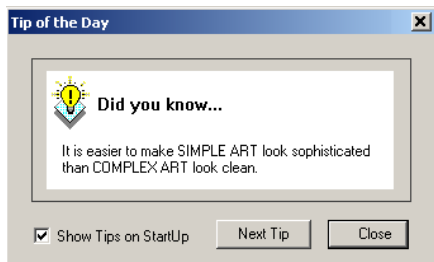
4. Choose an option based on what you want to do. When the program starts, you can jump into a job from the menu that appears below, or you can close this by clicking on the **x** at the top right.
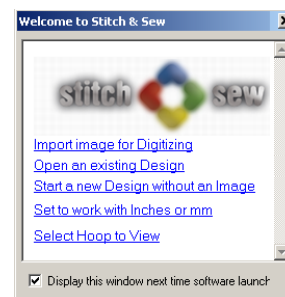
Program Window

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

Current color

Ruler tool

Current stitch count

Zoom controls

Main toolbox

Design, shown in Realistic View mode

Design center mark

Grid

Object List

Shows distance measured by ruler tool
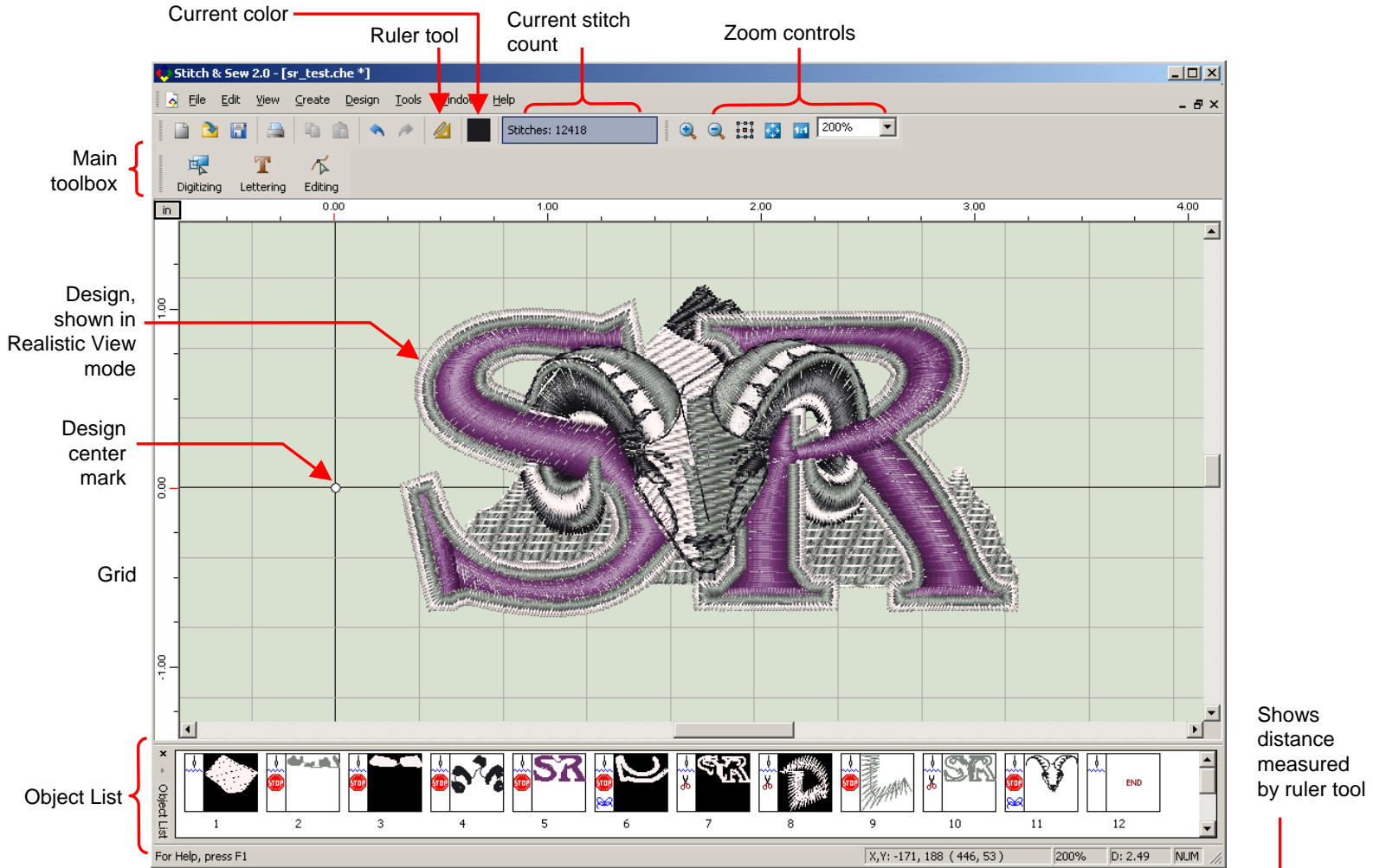
Program Window (continued)

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

- **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 - simulates the appearance of the stitches as they would appear in 3-D. You can toggle this on and off from the View menu. 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.

Language mode

Swap between in & mm

Background color

Toggle crosshairs on/off
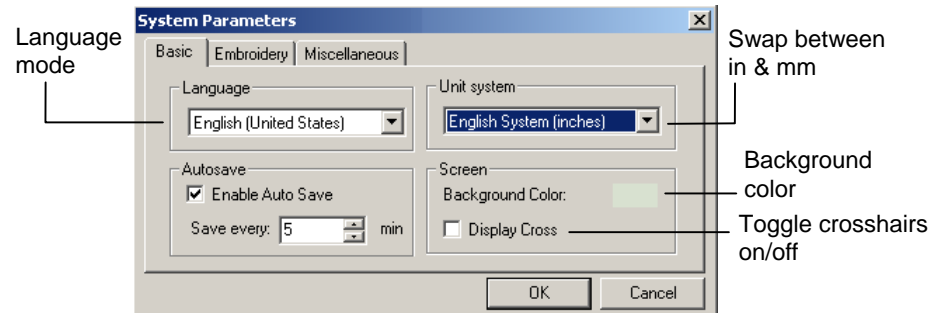
"EMBROIDERY" Tab
This is the second tab in the dialog box. For greater control as you digitize, check both of these boxes. The first one lets you enter angle and entry and exit points for stitch blocks as you create them, rather than have the program set them automatically. This results in better-flowing stitches with fewer jumps, and more creative control (stitch angle) over blocks created by the Freeform tool.
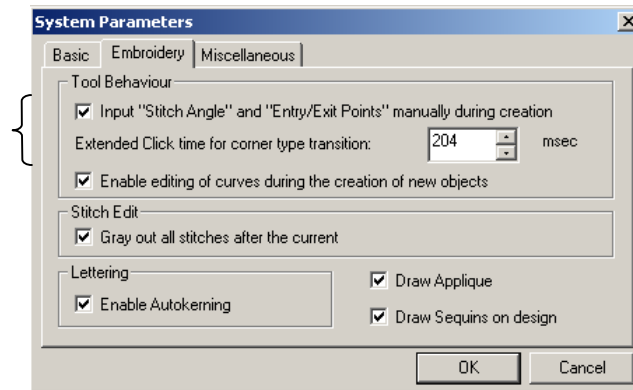
Customizing Stitch & Sew to your Preferences

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".
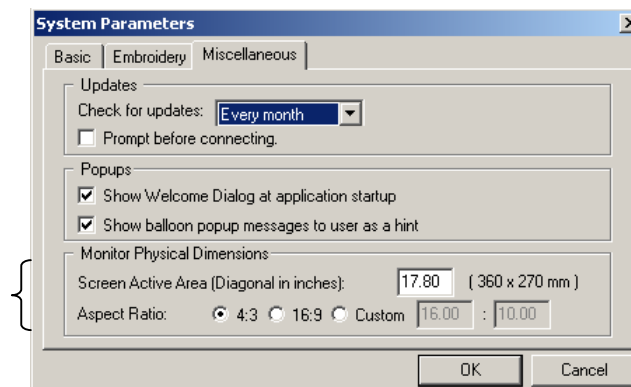
How Stitch & Sew Handles the Embroidery Part

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.
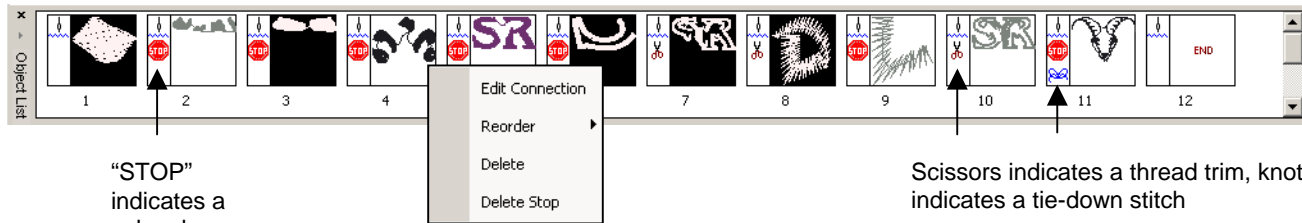
Never Trim - third option.
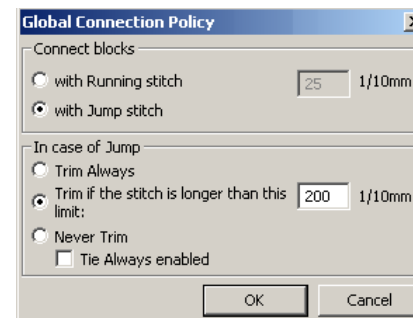
How Stitch & Sew Handles the Embroidery Part (continued)

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.
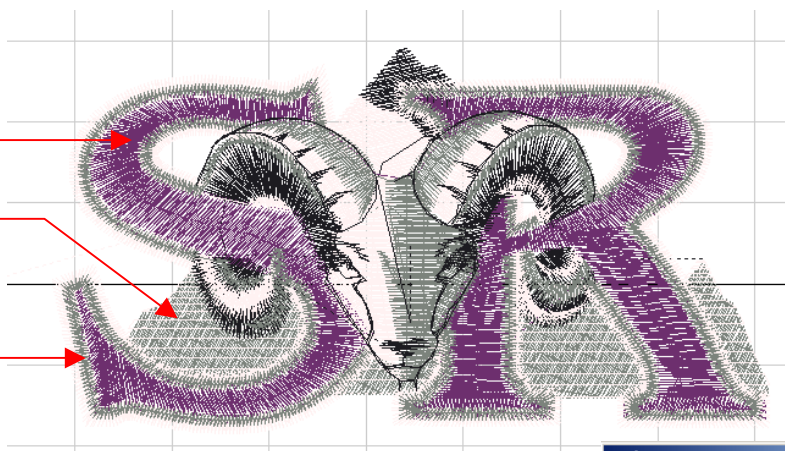
Change grid size from Tools . . Set Grid Size.
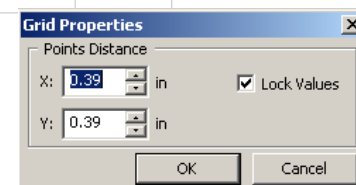
Viewing with the Grid at 0.04 inches (1mm)

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

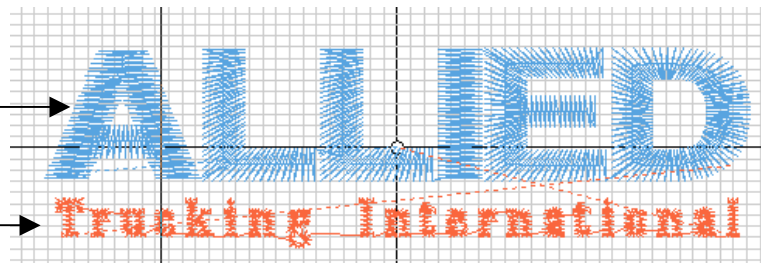With Stitch & Sew 2, it's possible to select a thread library based on the brand of thread you use, from Tools . . . Stitch Colors. By changing to your preferred brand of thread, the Embroidery Settings box (with neither Digitizing/Editing on) shows the thread color numbers to make it easier to select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

Current Thread Pallette is visible in General Operations mode when you open the Embroidery Settings dialog box (press the letter "G" to toggle it on and off
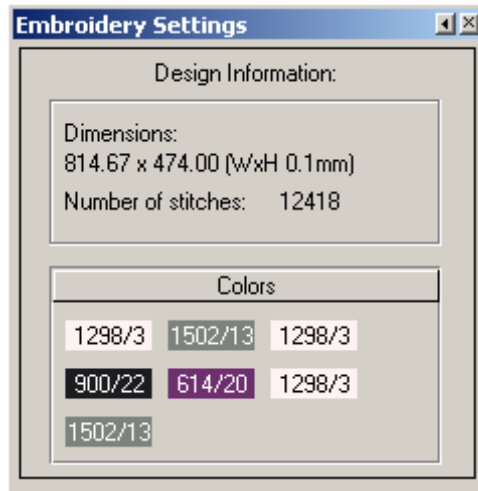
You can choose a thread library by opening the Stitch Colors dialog box (CTRL + K) and choosing your brand of thread from "Current Pallette".
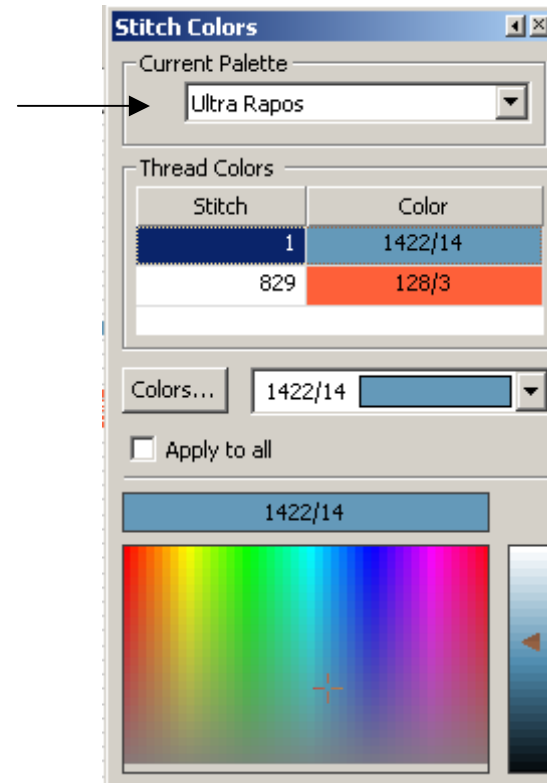
Embroidery Settings

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".

3 options:
- manual
- preset fabric
- custom
  settings

Key settings

Border width is measured in tenths of a millimeter

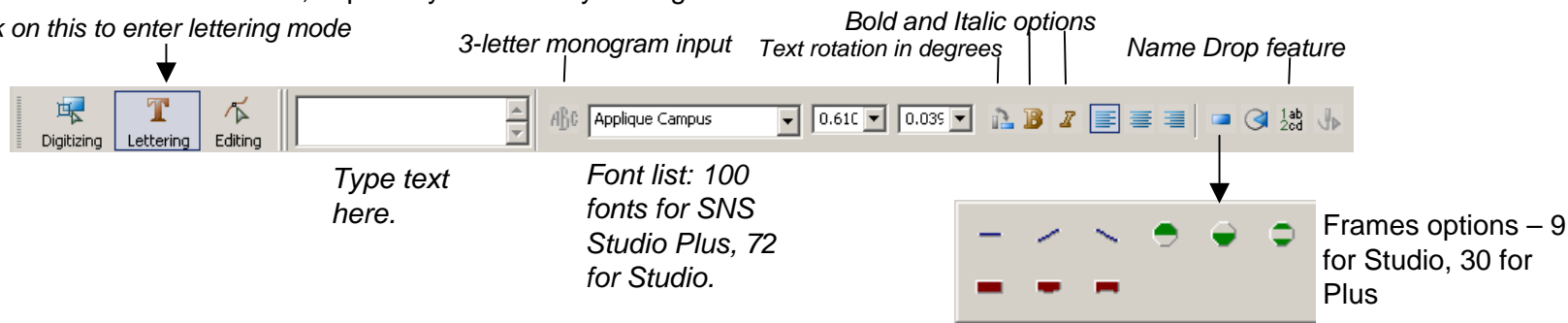**Customizing Your Own Stitch Recipes**
As you become more experienced with Stitch & Sew, you can create your own library of fabric presets by choosing the 3rd option in the Embroidery Settings Dialog box, "Custom Settings".

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

3-letter monogram input

Text rotation in degrees

Bold and Italic options

Name Drop feature

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.
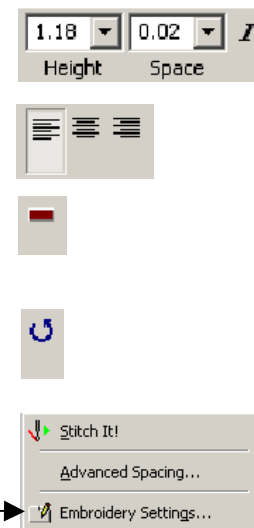
Saving Your Design and Sewing It

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

(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.
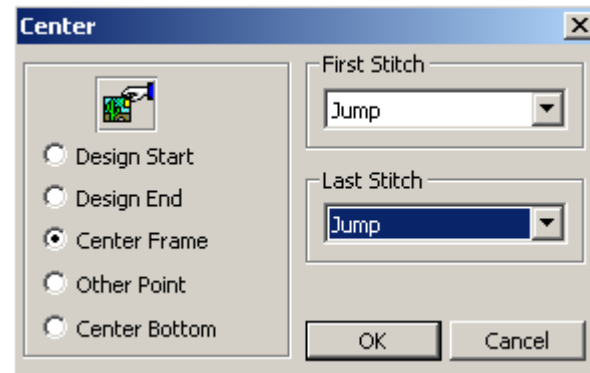
Working with Imported Designs in Stitch & Sew
Importing pre-digitized stock designs is a great way to create custom logos without having to digitize.

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.
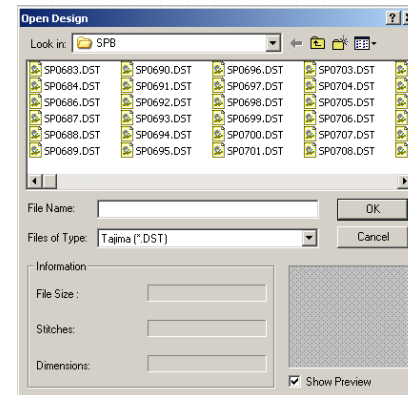
Open Design

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.

Change Size
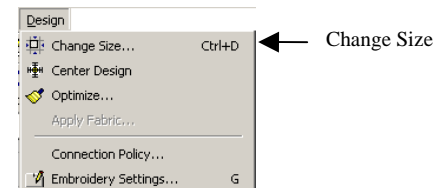
Working with Imported Designs in Stitch & Sew
(continued)

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.

Choose units.

Be sure this is checked.
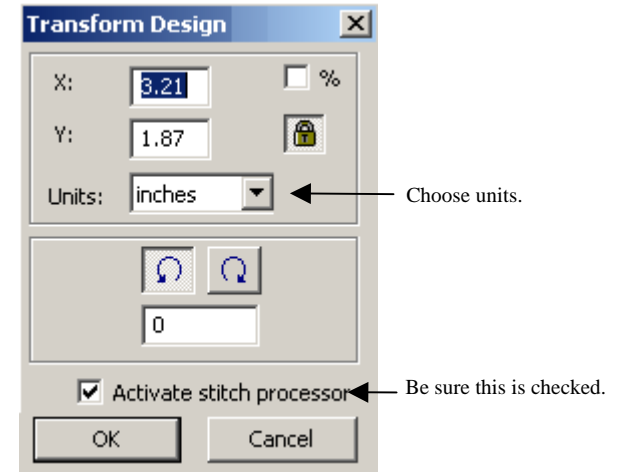
Digitizing Shapes (satin, fill & running stitches)

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).

This toolbar appears when the Digitizing button is pressed

Click to enter Digitizing Mode   Freeform tool   Column tool

Fill Method for the Freeform tool: Controls how Stitch & Sew fills your shape with stitches.
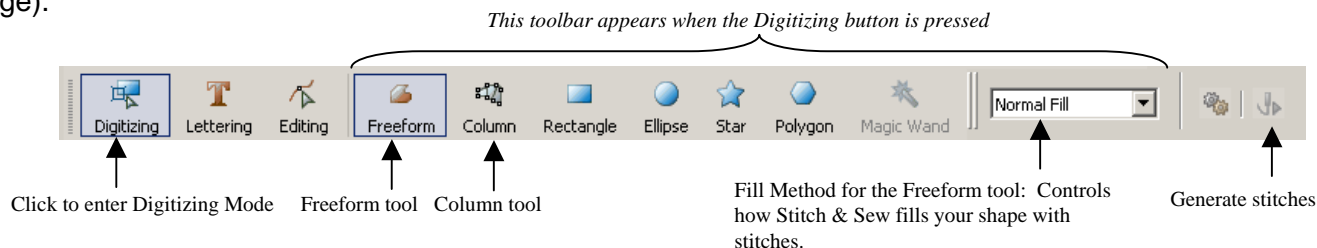
Generate stitches

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

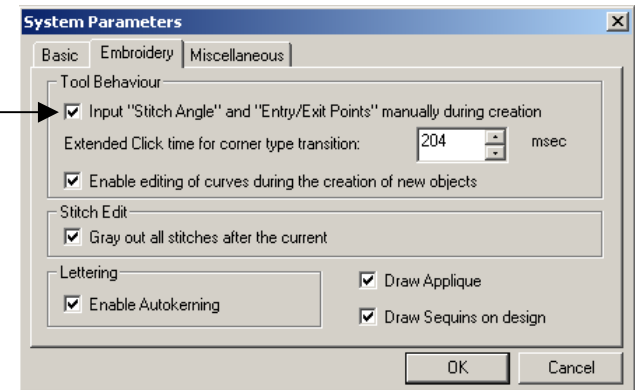# Digitizing Shapes (satin, fill & running stitches)
(continued)

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 poin 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 (this option appears if this is checked in Tools…System Parameters:

Fill in the shape by pressing "Stitch It!

System Parameters

Basic | Embroidery | Miscellaneous

Tool Behaviour
☑ Input "Stitch Angle" and "Entry/Exit Points" manually during creation

Extended Click time for corner type transition: 204 msec

☑ Enable editing of curves during the creation of new objects

Stitch Edit
☑ Gray out all stitches after the current

Lettering
☑ Enable Autokerning

☑ Draw Applique

☑ Draw Sequins on design

OK | Cancel

Importing Artwork to Digitize

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

Bring images into
Stitch & Sew in from
"Import Image"

You can size the image in
this dialog box that
appears . . .

. . . by pressing this
button.
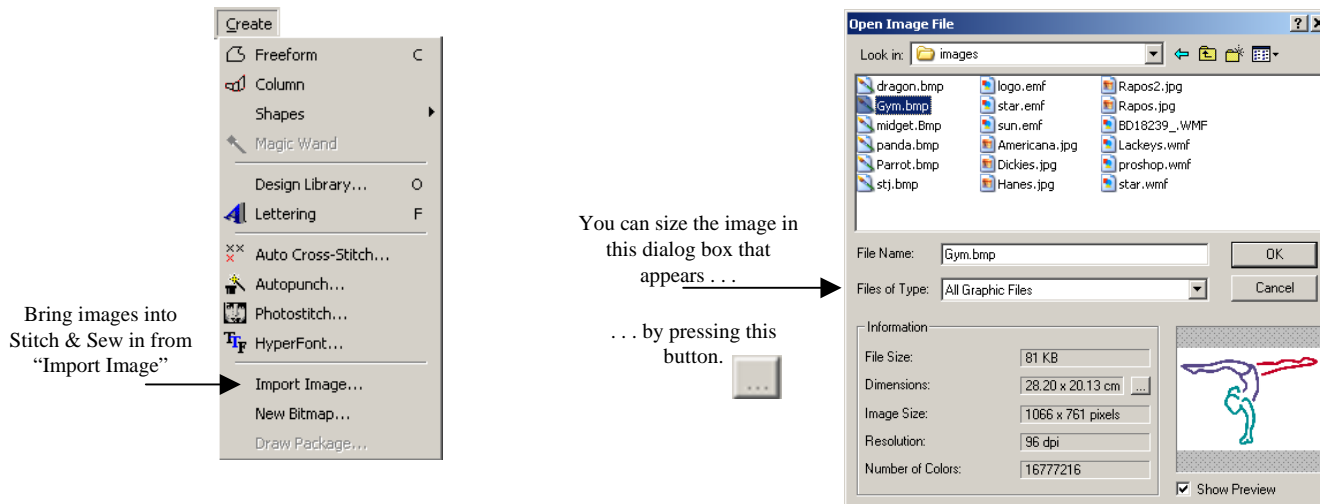
IMPORTANT: get the size correct at this stage! Remember that you'll be making decisions on digitizing your design based on the size of each part of the design.

IMPORTANT: 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.

1. Getting Digitizing Jobs from Your Customer

It's important to get ALL the necessary information from your customer about a job before digitizing it.

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. Sometimes this is not possible. Be sure to get color information especially the number of colors i.e. specific thread colors. PMS matching.

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.

c. Size of the design – this will determine the type of stitches to use and the amount of detail.

Unusual/Special requests: Take a good look at the design to check for anything unusual or open to interpretation. For example, are all areas of the design to be filled in with stitches? The logo below for example may or may not require that the interior white areas be sewn.

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.

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

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.
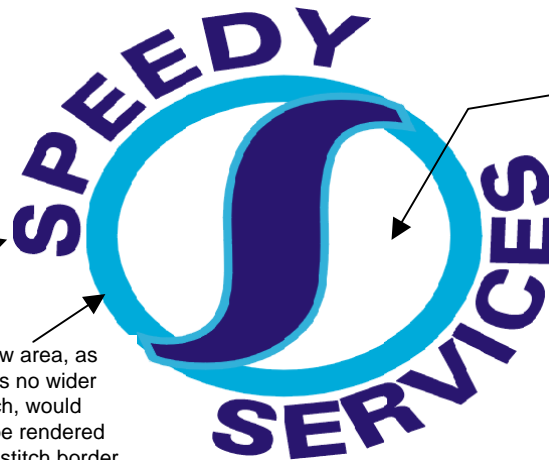
Digitizing Strategy
(continued)

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).