"Will I be able to resize your designs?"

Our designs are technically no different than any other stock design. Embroidery designs can be resized up or down with the appropriate resizing software. Resizing capability is available through stand-alone resizing programs, or as a built-in feature of many editing and digitizing software programs. Some newer embroidery machines also allow a limited amount of resizing to be done on the machine itself.

Resizing capability began years ago in the commercial embroidery industry with the introduction of the Melco Condensed (.cnd) format. The condensed format is basically a map of the outlines of the design details, saved as a vector file. When these designs are enlarged or reduced, the embroidery software program uses these vector points to reconstitute the stitch points in the design. Some commercial embroiderers still think that condensed format (.cnd) designs are the only resizable option. Embroidery technology has advanced significantly with respect to resizing, and we no longer consider Condensed format as the best available option. We do not offer designs in .cnd format.

The home embroidery industry began introducing resizing programs in the 1990s, and early versions did not include stitch processors to recalculate density. Older resizing programs did not change the density of the designs when the size changed - the stitches were simply moved closer together, or farther apart. The recommended change in design size was described as "plus or minus 20%" because thread breaks would not increase dramatically if the stitches were 20% closer together, and the design would not look too thinned out if the stitches were 20% farther apart. More recent resizing programs all include stitch processors, which recalculate the stitch count and the design density when the design is resized.

If you are unsure about which type of resizing software you have, try changing the size of the design, and pay particular attention to the number of stitches, before and after. If the number of stitches changes as the design size changes, then the density is being recalculated, and the program has a stitch processor.

Despite advances in resizing technology, many embroiderers still consider 20% to be the maximum resizing limit. The true limit for resizing with newer resizing programs is unknown. There are several important factors that come into play when resizing designs:

* Reducing Design Size

An embroidery design consists of a series of stitch points. A stitch point - where the needle penetrates the fabric - is a coordinate point, vertically and horizontally located in a specific place. These points tell the computerized embroidery machine where to locate the hoop under the needle for each stitch. When an embroidery software program resizes a design the program has to recalculate each stitch point to create its new location in the proper sequence.

Reducing the size of a design with a program that has a stitch processor involves repositioning, or in some cases eliminating stitches. Design density is a direct result of stitch count and stitch position.

A good example of the issues that can arise in drastically reduced designs can be found in reducing lettering. Properly digitized lettering consists of underlay - the first structure of a shape - followed by top stitching. When a letter that is properly digitized at 2" in height is reduced to 1/2" tall, the resizing program takes a mathematical approach, and reduces both components equally. Some resizing programs let you adjust the overall design density by a percentage factor when resizing, but most do not allow you to independently adjust underlay and top stitching. It may be possible to manually introduce a color change at the end of the underlay sequence, effectively separating it from the top stitching, then specify different densities for each portion when resizing. After resizing the color change could be eliminated. However, doing this requires considerable background with your resizing software, and is not as easy as it sounds. Our satin stitch elements, which represent the vast majority of embroidery elements in our product line and in our custom digitized monograms, are broken up into smaller elements to improve registration and sewout quality. An individual letter done in satin stitch might be broken up into a dozen or more separate parts. In order to break out underlay from top stitching each of these parts would need to be broken up individually - quite time consuming.

All of this is a long way of saying that significantly reduced designs may have too many stitches, and may not sew well. It is impossible to say what the limit of reduction is. Experimentation is essential, along with sewing samples.

* <u>Enlarging Design Size</u>

When the size of the design is enlarged, a different issue often comes into play.

Embroidery machines usually have a preset maximum stitch length - 12mm. A stitch longer than 12mm is part of a trim code on commercial embroidery machines with automatic thread trimmers. Home machines that don't have trimmers nevertheless still function within this limit, and resizing programs typically have this limit relationship also. Although many embroidery machines and resizing programs allow the embroiderer to adjust this limit, 12mm is a very long stitch, and already impractical for monograms that will be laundered.

Satin stitches represent the most common stitch type in a monogram design. A satin stitch is created as a single stitch from one edge of a column to the opposite edge, then back again, etc. etc.

With stitches of this type it's easy to see that when a design is enlarged, at some point the distance from one side of a shape to another is going to exceed 12mm. Since the column shapes in most of our designs vary in width, the 12mm distance may be exceeded in the widest part, but not exceeded in narrower areas. If you enlarge a satin stitch design with a resizing program and sections "disappear" from the screen, exposing the underlay, the satin stitch limit is causing this to happen.

This doesn't mean that these designs can't be enlarged, even significantly enlarged, but it does mean that the embroiderer needs to use the Options or Preferences features in the resizing software to make some adjustments. Many programs allow you to specify a shorter stitch length, which would have the effect of adding a stitch point, or several stitch points, between the two extremes of the edge of the shape. This may be a technically acceptable solution, but always sew a sample to insure that you are happy with how the design looks.

Another option involves specifying that the satin stitch design element be converted to a fill stitch once a specified stitch length is exceeded. Usually the stitch length within a converted fill pattern can also be

specified. Although this changes the look of the design from the rounded quality of satin stitch to the flatter look of a fill pattern, it does have practical advantages for wearability on pillows, chair backs, shower curtains, etc., and allows the original design to be used for these purposes without redigitizing. You should be aware that the number of stitches in the design will increase dramatically if this conversion is chosen. Again, sewing a sample is always advisable.

Although satin stitch is our most common digitizing element, some of our design elements also include running stitch details, or manually digitized stitch-for-stitch sections intended to simulate the look of hand-embroidered seeding stitch. Significantly resizing designs that include these elements may produce unexpected results - running stitches may be longer than desired, or seeding stitch areas may appear too thin to completely cover.

* <u>Special Stitch Features</u>

Many embroiderers have heard that some details of special fill patterns may be lost in resizing, or may be familiar with resizing software programs that specifically preserve these features.

A good example of what this issue is about involves what are sometimes referred to as "carved fills." Some digitizing programs allow the digitizer to introduce special textures or visual details within the outline of a digitized shape. These special details are usually chosen during digitizing from a menu of fill types, and are created when the digitizing program places stitch points in a particular pattern - basket weave, wave patterns, or spiral shapes are some examples of carved fills. Many resizing programs will only calculate the outline of a shape, not the specific stitch points within that shape, so these details can be lost.

This is not an issue for our designs, since we don't employ these fill types. Our designs are created from basic embroidery features - running stitches, satin stitches, and occasionally a very basic fill pattern that is easily retained when designs are resized.

* <u>The size of your hoop</u>

This may seem obvious, but designs cannot be usefully enlarged beyond the limit of your hoop size.

From our own experience, and from experiences shared with us by our customers, we can offer several additional "tips":

* Many of our stock Monogram Sets contain two letter heights, to facilitate creating three-letter monograms following the conventional design direction - a larger central initial flanked by two smaller initials. If you are creating such a monogram by "merging" or combining individual letters together, start by creating the monogram using the sizes provided, then save this combination under a new filename. If you then wish to resize this new monogram you can resize the whole combination more easily.

* If the Monogram Set has two included sizes, but you are only making single letter monograms, you will find that you have a more extensive resizing range if you use the smaller scaled sizes for reduction, and the large scaled sizes for enlargement.

* Resizing software can often be "tricked" into a larger range of successful size changes by reducing or enlarging partially, saving the resized design, then resizing the saved design again, rather than trying to do major resizing all at once.