

School of Hard Knots

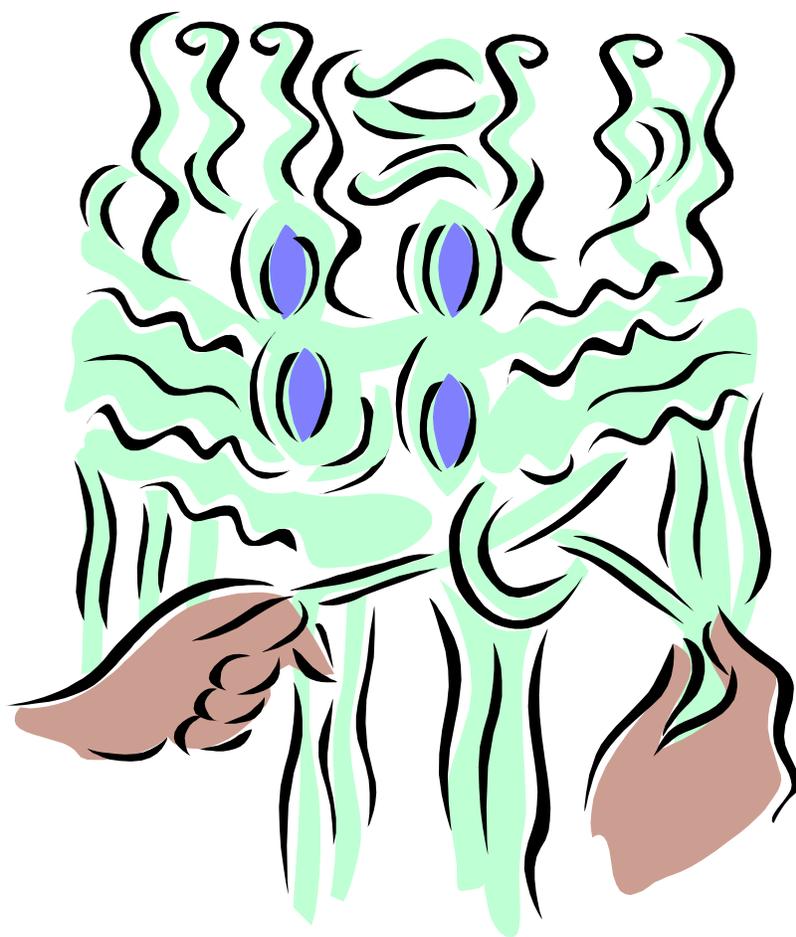


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Wel come to the Data Stitch Famil y

And the wonderful world of embroidery and “self employment”! (Yes, I say those words with excitement.) By now you have managed to research the commercial embroidery & monogramming business and taken the first step: The recent purchase of a Toyota embroidery machine. I am “assuming” (using this word with caution) that you are new to the embroidery & monogramming industry. You are probably feeling a mixture of emotions; everything from excitement – to what have I got myself into! I know exactly what you are feeling because I myself “have been there done that”.

side bar: I was forced into an early retirement from a totally unrelated field. I had never threaded a bobbin or sewn on regular sewing machine. When my first machine, software, computer, hoops, backing, thread, designs etc... was delivered I was overwhelmed beyond belief! However, the years have past & I can say I have made it. If I can conquer this so can you!!

Now I have joined the team of trainers and after the first few installs I realized the need for general information. I learn something new in our industry on a regular basis so I emphasize this informational guide is just that: “general information guide”. The sole purpose of this guide is simply to pass on terminology, resources, how to’s, standards, etc... (The school of hard knots)

We will start off with terminology that is commonly used in the industry and through out this guide.

Bare Bone Terminology

Appliqué: Decoration or trimming cut from one piece of fabric and stitched to another to add dimension and texture. Designs with appliqué can be more economical than embroidery alone, if the appliqué occupies a significant amount of the design, thereby lowering stitch count. (This is commonly used with Greek lettering styles on college sweatshirts.)

Arc Column stitch: Formed by closely placed zigzag stitches (a column stitch) that includes an arc.

Backing: Material used underneath the item or fabric being embroidered to provide support and stability. Can be hooped with the item or placed between the machine throat plate and the hooped garment. Available in various weights and in two basic types – cuta-way and tear-away.

Bean Stitch: Three stitches placed back and forth between two points. Often used for outlining, because it eliminates the need for repeatedly digitizing a single-ply running stitch outline.

Birdnesting: Collection of thread between goods and the needle plate, resembling a bird's nest. Formation of a birdnest prevents free movement of goods and may be caused by inadequate tensioning of the top thread, top thread not through take-up lever, top thread not following thread path correctly, needle burred, bobbin not in correctly or flagging goods.

Bobbin: Spool or reel that holds the bobbin thread, which helps form stitches on the underside of the fabric.

Buckram: Coarse, woven fabric, stiffened with glue, used to stabilize fabric for stitching. Commonly used in caps to hold the front panel erect.

Column stitch: Formed by closely placed zigzag stitches. Often used to form borders. Also referred to as a satin stitch.

Complex fill: Refers to a digitized capability that allows areas to be designated as voids at the same time the design's edges, or perimeter points, are defined. The design can thus be digitized as one fill area, instead of being broken down into multiple sections.

Condensed format: Method of digitizing in which a proportionate number of stitches are placed between defined points after a scale has been designated. With software that can read condensed format, the scale, density and stitch lengths in a design may be changed with sizing. The file extension is designated with .cnd. The data-stitch native extension .sti is a condensed format.

Cross Stitch: Two stitches that cross at the center to form an X.

Digitizer: Modern term for punching, reflecting the computerized method of converting artwork into a series of commands to be read by an embroidery machine. (see punching)

Emblem: Embroidered design with a finished edge. Also known as a crest or patch.

Expanded format: A design program in which individual stitches in a design have been specifically digitized for a certain size. Designs punched in this format cannot generally be enlarged or reduced more than 10% - 20% without distortion, because stitch count remains constant. The file extension is designated with .exp. The data-stitch native extension .stx is an expanded format.

Facing: Material hooped or placed on top of fabrics that have definable nap or surface texture, such as corduroy and terry cloth, prior to embroidery. The facing compacts the wale or nap and holds the stitches above it. It includes a variety of substances such as plastic wrap, water-soluble plastic (solvi) and open-weave fabric that has been chemically treated to disintegrate with the application of heat. Also known as *topping*.

Fill stitch: Series of running stitches commonly used to cover large areas. Different fill patterns can be created by altering the angle, length and repeat sequence of the stitches. Also known as *gefect* stitch.

Flagging: Up and down motion of goods under action of the needle, so named because of its resemblance to a waving flag. Often caused by improper framing of goods. Flagging may result in poor registration, unsatisfactory stitch formation and birdnesting.

Fox test: Method of testing thread tension and soundness of timing. Sew the word FOX in one-inch satin stitch block letters with each needle bar then examine the reverse side for skipped stitches and correctly balanced ratio of top thread to bobbin thread. The correct balance is generally considered to be a one-third ratio of bobbin thread to two-thirds top thread. These letters are used because they require the movement of the pantograph in all directions, increasing the likelihood that the beginnings of timing irregularities will be discovered.

Framer: Holding device for insertion of goods under an embroidery head for the application of embroidery.

H test: Method of testing thread tension. Stitch a one-inch letter H with each needle bar. The reverse side of the completed embroidery should show a ratio of two-thirds top thread to one-third bobbin thread.

Hook: Holds the bobbin case in the machine and plays a vital role in stitch formation. Making two complete rotations for each stitch, its point meets a loop of top thread at a precisely timed moment and distance (gap) to form a stitch.

Hoop: Device made from wood, plastic or steel with which fabric is gripped tightly between an inner ring and outer ring and attached to the machine's pantograph. Machine hoops are designed to push the fabric to the bottom of the inner ring and hold it against the machine bed for embroidering.

Interlock stitch: Two or more rows of overlapping satin stitches. The intersection, or point of overlapping, can be straight, curved or angled. Also known as thread blending or random stitch.

Jump stitch: Movement of the pantograph without needle penetration, commonly used to get from one point in a design to another.

Lock stitch: Commonly referred to as a lock-down or tack-down stitch, a lock stitch is formed by three or four consecutive stitches of at least a 10-point movement. It should be used at the end of all columns, fills and any element where jump stitches will follow, such as color changes or the end of a design. May be stitched in a triangle or in a straight line.

Metallic thread: Thread with a high luster and a composition of a synthetic core wrapped in metal foil.

Monogram: Embroidered design composed of one or more letters usually the initials in a name.

Needle: Small, slender piece of steel with a hole for thread and a point for stitching fabric. A machine needle differs from a handwork needle; the machine needle's eye is found at its pointed end. Machine embroidery needles come with *sharp points* for piercing heavy, tightly woven fabrics; *ball points* which glide between the fibers of knits; and a variety of specialty points, such as wedge points, which are used for leathers.

Needle bar: Bar which holds the needle and regulates the distance to which the needle is driven into the bobbin assembly.

Pantograph: In this industry, a rack to which frames or fixtures are attached that moves goods under the sewing head to create a design. The movement of the pantograph rack is determined by numerically controlled codes contained on specifically programmed disks or paper tapes.

Paper tape: One punching format. Continuous reel of paper or Mylar tape containing X-Y coordinate information in Binary, Fortran or other numeric code to control pantograph movement. Paper tapes have been replaced by computer media.

Pitch: Degree of slope or angle of stitches in relation to a base line.

Polyester thread: A strong and colorfast synthetic thread.

Puckering: Result of the fabric being gathered by the stitches. Many possible causes include loose hopping, lack of backing, incorrect tension or dull needle.

Push and pull compensation: Digitizing technique that takes into account the distortion of the design that will occur because of the interaction of the thread with the goods. "Push and pull" will cause a circle digitized perfectly round to sew with the sides pushed out, resulting in an egg shape. Employ this technique where elements require an outline to achieve registration. Generally, it is necessary to extend horizontal elements and reduce vertical elements.

Rayon thread: Thread with a high sheen made from cotton.

Registration: Correct registration is achieved when all stitches and design elements line up correctly. Example: The outline around a filled circle follows the circle without allowing the fabric to show between.

Running stitch: Consists of one stitch between two points. Used for outlining and fine detail. Also known as walk stitch.

SPM: Stitches per minute; system for measuring the running speed of an embroidery machine.

Satin stitch: Formed by closely arranged zigzag stitches. Can be laid down at any angle and with varying stitch lengths. Also known or referred to as a column stitch.

Scaling: Ability to enlarge or reduce a design. In expanded format, most scaling is limited to 10 % - 20%, because the stitch count remains constant despite final design size. In condensed formats, on the other hand, scale changes may be more dramatic, because stitch count and density may be varied.

Short stitch: A digitizing technique that places shorter stitches in curves and corners to avoid an unnecessarily bulky build-up of stitches.

Specialty fill: Borne of recent technology, a fill stitch capability that produces a fill with a "relief" or motif design within.

Stitch editing: Digitizing feature that allows one or more stitches in a pattern to be deleted or altered.

Stitch processing: 1) The calculation of stitch information by means of specialized software, allowing scaling or expanded format designs with density compensation. 2) A trademarked software feature developed by Wilcom Pty. of Australia.

Stock designs: Digitizing generic embroidery designs that are readily available at a cost below that of custom-digitized designs.

T test: Method of testing thread tension. Stitch a one-inch letter T with each needle bar. The reverse side of the completed embroidery should show a ratio of two-thirds top thread to one-third bobbin thread.

Tackle twill: Letters or numbers cut from polyester or rayon twill fabric, commonly used for athletic teams and organizations. Tackle twill appliqués attached to a garment have an adhesive backing that tacks them in place; the edges of the appliqués are then zigzag stitches.

Tension: Tautness of thread when forming stitches. Top thread tension, as well as bobbin tension, needs to be set. Proper thread tension is achieved when about one-third of the thread showing on the underside of the fabric, on a column stitch, is bobbin thread.

Thread: Fine cord of natural or synthetic material made from two or more filaments twisted together and used for stitching. Machine embroidery threads come in rayon, polyester, metallic and acrylic.

Underlay stitch: Stitches laid down before other design elements to help stabilize stretchy fabrics and to tack down high wales or naps on fabrics so the design's details don't get lost. May also be used to create such effects as crowned, flat or raised in the embroidery, depending on how they are laid down.

Walk stitch: Consists of one stitch between two points. Used for outlining and fine detail. Also known as a running stitch.

What makes a design

All designs are created with four basic types of stitches; column or satin stitch, arc column, fill stitch and running stitches. (Some would argue that an arc column stitch is a type of column stitch and thus there are only three basic stitch types.)

Column stitch or Satin stitch: Formed by closely placed zigzag stitches. Often used to form borders. Can be laid down at any angle and with varying stitch lengths.

Arc Column stitch: Formed by closely placed zigzag stitches (a column stitch) that includes an arc.

Running stitch: Consists of one stitch between two points. Used for outlining and fine detail. Also known as walk stitch. A bean stitch is a type of running stitch: Three stitches placed back and forth between two points. Often used for outlining, because it eliminates the need for repeatedly digitizing a single-ply running stitch outline.

Fill stitch: Series of running stitches commonly used to cover large areas. Different fill patterns can be created by altering the angle, length and repeat sequence of the stitches. **Complex fill:** Refers to a digitized capability that allows areas to be designated as voids at the same time the design's edges, or perimeter points, are defined. The design can thus be digitized as one fill area, instead of being broken down into multiple sections.

Design Information

Every embroidery file type has a file designation in computer language referred to as an extension. There are numerous file extensions in the embroidery world, a couple of dozen actually. There are different extensions for home users than on the commercial side. These worlds do cross over on occasion, therefore, common ground is important.

The .cnd and .exp are file extensions that specifically refer to a Melco originated design although common throughout the commercial industry. The .cnd (also known as a wireframe or condensed) is preferred when purchasing designs because of its sizeable & editing capabilities. The .exp extension is an expanded file and has limitations when sizing and is not easily edited.

The .dst extension is also common throughout the commercial industry and refers to a Tajima origination. The .dst extension is at times used by the home embroidery users and is common ground, although limited. It is also an expanded file and is not recommended because of its limitations. Your Toyota embroidery machine however reads the .dst files when using the disk reader. These files are transferred using a numerical base such as G001.dst, G002.dst, G003.dst and etc...

The .sti extension is the wireframe file native to data-stitch. It is the recommended extension for saving files when using data-stitch software. You may number or name these files using the .sti extension such as apple.sti, baseball.sti, etc... The .stx file extension is also native to data-stitch. It is an expanded file and has limitations.

Another common extension is .emb and is native to the Wilcom software. Data-stitch software can not open nor manipulate these files. However, Oesd (Oklahoma Embroidery Supply) has a software program, "true sizer" that is available at no charge. This program allows you to open and size .emb files and save them to .dst files, therefore, allowing you the means of transferring to your Toyota embroidery machine for sewing.

STOCK DESIGNS

Pre-digitized or stock designs are available from a wide selection of companies. These companies have books, books on CD and web sites to allow you to browse their designs prior to purchasing. With the introduction of the internet you now have access to thousands of designs almost instantly (no more waiting 3-5 business days for the disk to arrive). There are several ways to purchase from these companies.

Mostly users will pre-purchase the hard copy book (the CD book is usually free) which allows customers to browse for a design then you simply purchase it individually on an as needed basis, average cost is \$25.00 - \$50.00 per design. Another popular method is to purchase specialty packs or partial sections of collections, costs ranging from \$100.00 - \$2,500.00. You can also purchase the entire collections from the stock design companies, average cost per collection is \$5,000.00. Once you have purchased a companies entire selection you will have the option to up-grade annually at a discounted rate, \$750.00 - \$1,000.00.

Many of the following companies will gladly send you their book on CD at or charge. You may order their hard copy book, \$25.00 - \$45.00 plus shipping. The following is just a few of the stock design companies. Each company has their own style. You may actually find the same design within each company because it was produced from a non-registered / trade-mark clip art.

Largest selection of stock designs on the web:www.embroiderydesigns.com
Designs range from \$2.00 and up

Custom digitizing from \$5 per 1000 at www.internetstitch.com

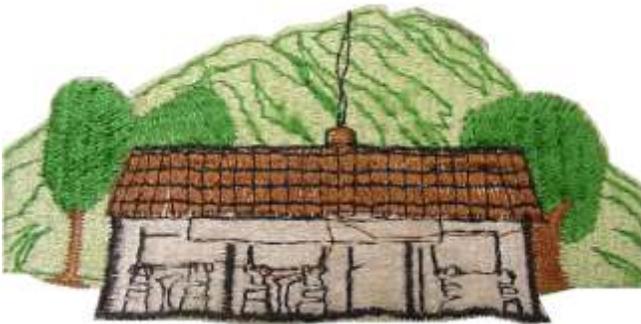
Catalogs

Balboa Threadworks	(800)	www.Balboathreadworks.com
Dakota Collectables	(800)	www.dakotacollectibles.com
OESD	(800)	www.oesd.com
Cactus Punch		

CUSTOM DESIGNS – DIGITIZING

You always want to begin the digitizing process with the cleanest and sharpest artwork available to you. We have a saying in the industry, “crap in....crap out” (well something like that). When a embroidery design is digitized it is usually a combination of the aforementioned stitch types. The design is built from the background forward, thus providing some depth. As in any industry there is a wide range of quality. However, there are general design considerations that every digitizer should use when punching a design. There should be minimum number of trims within the color / block, travel stitches should not be visible, depth of the design by use of direction & stitch length of thread, fill patterns, good registration, and etc... The days of “flat” plain designs are gone with the introduction of the computerization into our industry.

The intention of this general information guide is not to instruct you on the art of digitizing. There are several excellent digitizing “how to” books available. But, you do need to know good from not so good. Below is a sample I use often at our shop. I believe that if you show your customers what good is and what they should be able to expect then our industry standards can only continue to improve.



Poor digitizing



Good digitizing

THREAD BASICS

There are several thread manufactures & distributors within the textile industry. The distributors will sell directly to you at a considerable savings compared to your local fabric store. There are basically two sizes available; mini cones (1,000 yards) and king cones (5,000 yards). Among the numerous types of threads three primary ones are the basics; polyester, rayon and metallic. Threads are purchased according to color denoted by the perspective manufacture. Not all colors from a company will be available in both polyester and rayon. There are differences because of the dying properties between synthetic and cotton fibers.

Thread manufactures can be contacted for a thread samples and color charts specific to their company. You will find that the stock design company will actually provide you the exact color for their designs according to a specific thread manufacturer. For example: Oklahoma Embroidery Supply & Design (OESD) uses Ackerman thread and provide their color code. Balboa threadworks provides Maderia thread colors.

Your customer may also provide you a “pantone” color when requesting a color. This is a universal color coding that is used in the printing industry and among screen printers. If this is a concern the thread manufacturers can cross match a pantone color to their thread.

TENSION

Tension: Tautness of thread when forming stitches. Top thread tension, as well as bobbin tension, needs to be set.

There are two areas of thread tension to be considered on all lock-stitch embroidery machines: bobbin and upper thread. The bobbin is usually the easiest to set and usually requires little or no change when embroidering different goods or using different types and sizes of upper thread. Because the bobbin thread flows in one direction only it has a simple, single-tension spring. To set this tension, first clean out the bobbin case and insert a fresh bobbin. Next, slip the thread under the tension spring, pull on the end of

the thread and make sure the bobbin is rotating clockwise as viewed from the open end of the bobbin case. Before feeding the thread through the pigtail guide, hold the loose end of the bobbin thread between thumb and index finger and slightly “bob” the case like a yo-yo. The case should drop vertically about $\frac{1}{2}$ inch to $\frac{3}{4}$ inch and stop with each stroke. Adjust the tension screw accordingly.

The upper thread tension is more complex and requires an understanding of how a stitch is formed. Each time a needle enters the fabric the rotary hook pulls approximately 3 inches of thread through the eye of the needle and around the bobbin case. As the needle is withdrawn from the goods, the loop has passed around the bobbin case and the take-up arm now has to remove this loop from behind the goods. As the loop is withdrawn, it passes back through the eye of the needle a second time, less the length of the stitch previously formed. This means that a $\frac{1}{8}$ inch long stitch passes through the needle’s eye approximately 48 times before being planted on the goods. This process occurs at a rate of 10 times per second.

In general, the upper thread tension must be at least greater than the sum of the drag in the thread path plus the resistance of the material so as to release the loop that was formed around the hook. If this isn’t the case, a series of loops will be left in the hole of the throat plate at a rate of 10 per second and the garment will appear to be eaten by the machine. This phenomenon (bird nesting) requires cutting the garment loose, removing a ball of thread from beneath the machine, and quite often damaging the garment.

Proper upper thread tension should just be enough to cause fills to lay flat against the materials sewn. Different fabrics require different tension settings. Polyester thread requires slightly more tension than rayon, and size 30 thread requires more tension than 40 weight. Caps have a tendency to flag and additional tension will be required. Be careful, however, not to over-tension polyester because it has a better yarn memory than rayon, and a design may develop a latent puckering.

Proper thread tension is achieved when about one-third of the thread showing on the underside of the fabric, on a column stitch, is bobbin thread. Several test can be of assistance when checking your tension:

Fox test: Method of testing thread tension and soundness of timing. Sew the word FOX in one-inch satin stitch block letters with each needle bar then examine the reverse side for skipped stitches and correctly balanced ratio of top thread to bobbin thread. The correct balance is generally considered to be a one-third ratio of bobbin thread to two-thirds top thread. These letters are used because they require the movement of the pantograph in all directions, increasing the likelihood that the beginnings of timing irregularities will be discovered.

H or T test: Method of testing thread tension. Stitch a one-inch letter H with each needle bar. The reverse side of the completed embroidery should show a ratio of two-thirds top thread to one-third bobbin thread.

Generally, the rule of thumb is if the bobbin is showing, “pulling bobbin”, then your top tension is too tight or bobbin is too loose. If little or no bobbin is showing (on the backside) then the top tension is too loose or bobbin is too tight.

There are also a couple of “trouble shooters” that is tensions related:

1. Excessive thread breakage: one or both tensions are too tight
2. Puckering: both tensions are too tight
3. Top thread forming knots on the underside: tighten top thread and or loosen bobbin thread

POLYESTER vs. RAYON

Polyester thread is made of synthetic material making it stronger than rayon and it is colorfast (will not bleed or accept bleeding). Polyester thread normally does not have the initial sheen that rayon does, however, over time (a few washings) polyester retains its' sheen. A downside to polyester is that because of its' durability it is harder on your machine. Polyester wears parts (specifically thread paths) faster and requires a little additional maintenance. Polyester thread will also maintain its' color through a dyeing process. We use embroidered denim shirts for our display. We dye the shirts often to refresh the denim shirt without affecting the embroidery.

Rayon thread is made of twisted cotton. Manufacturers can provide their individual specifications. Most will advise you that their thread will not bleed under normal washing conditions. Rayon has high sheen properties, however, the sheen will dissipate slightly after normal washing.

sidebar: Our shop produced several local Sheriff's Departments dive team red shirts. We used a very nice bronze rayon thread (wanting the sheen of the rayon) for their badge. After their first washing the dive team had a nice pink badge. The white polyester thread (the lettering) was still nice and white. The thread did not bleed, however, the rayon thread accepted the bleeding of the red shirts. The Sheriff's dive team did find their pink badges humorous, but not acceptable and we re-placed the order.

Metallic thread & specialty thread (glow in the dark, sunshine activated, film or translucent, etc...) is a another subject all their own. These threads can be a little difficult to run, but be patient they are worth the effort. You will need to check your tension (usually run metallic a little tighter than normal) and slow the running speed down. Metallic thread is even harsher on the thread paths than polyester merely because of its' metal sheathing

THREAD WEIGHT

Thread is available in different weights; 40 weight is the industry standard, however, there are exceptions. Although the majority of your embroidery will take place using 40 weight thread there may be occasions you may use 30,50 or 60 weight. For example: If you have an expanded file and you are embroidery a knitted fabric and you are not satisfied with the fill density coverage you could correct it by using the 30 weight thread because it is thicker. On the contrary, if you are embroidering small letters on a delicate fabric you may want to decrease the thread weight for a cleaner letter, 50 or 60 weight. It is recommended when selecting a thread weight you need to consider the needle size and as well. If using a 60 weight thread a slender needle would be appropriate, 65/9. When running 30 weight thread you may consider using a 80/12 needle. However, also remember to take the fabric properties into consideration.

BOBBINS

Bobbins are available in a variety of different materials: polyester, cotton and blends. Although you can wind your own bobbins many shops find the pre-wound bobbins expense to be minimal. The thread manufactures usually sell bobbins by the box, 144 count.

sidebar: I personally prefer the cotton or blend bobbin simply because if the bobbin is pulled to the top one can "color" the bobbin with a fabric indelible pen (available in assorted colors). Do not use sharpie markers because they bleed when washed. These fabric pens are available in assorted color packs from the thread & supply companies. Although these fabric pens are allegedly indelible do not use prior to using "fray check" because the fray check can cause the pen to bleed.

Bobbin tension is adjusted by tightening (clockwise turn) or loosening (counter clockwise) on the small screw located on the side of the bobbin case. The bobbin case does need some minor maintenance. Occasionally you may want to spray the bobbin case out with canned air (you should refrain from blowing on your bobbin case because of the moisture in your breath). You will also occasionally need to clean the bobbin case tension spring area. Just above the tension screw you will see a slot that a small piece of paper (I use a sticky note) can slide under the tension spring and the case. This should push any excess bobbin fuzz out. This fuzz can build up until the tension is affected and will cause unexplainable bobbin being pulled.

NEEDLE BASICS

VERNACULAR

It helps to familiarize yourself with the anatomy of an embroidery needle:

Tip: The pointed end of the needle

Shaft: The portion of the needle between the tip and the shank that will penetrate the fabric

Scarf: The notch above the eye on the back of the needle that is notched out and allows the hook to swing in and gather the thread and form the lock-stitch.

Groove: This is the area down the length of the front of the needle that the thread falls into so it is protected when the needle penetrates the fabric.

Eye: The polished hole at the tip end of the groove that the thread goes through.

Shank: The larger end of the needle that fits into the needle bar.

Needles are made in many sizes and shapes. Just because two needles are the same size does not mean that they are identical from manufacturer to manufacturer. For instance, there often will be a difference in the position of the eye of the needle. The eye may also differ in size. These and other variations will affect your timing. Therefore, when you select a brand of needles, keep using it for consistency.

Basically (very basic) there are 2 primary types of needles: sharp and ball. Both types are available in different materials (titanium, nylon, chromium, etc...) and sizes.

BALL vs. SHARP

Ball point needles are designed to alleviate making holes in knit or loosely woven materials. The cross fibers which constitute the knit or loosely woven materials are relatively far apart as compared to those in tightly woven materials. When a sharp needle encounters one of those fibers during penetration of the fabric it cuts right through the fiber, thus creating a hole. The ball point needle pushes aside the fiber it encounters in penetration and thereby avoids making a damaging hole in the fabric.

SIZES

Both U.S. and European needle sizes are printed on the packaging 100/16, 90/14, 80/12, 75/11, 65/9 and 60/8. The smaller the number, the smaller the diameter of the needle. Starting with the smaller sizes and moving up one size per number, we would go 8, 9, 10, 11, 12, 13, 14, 15, etc on the US scale and 60, 65, 70, 75, 80, 85, 90, 95 on the European scale. You will hear the industry refer to the size or gauge of the needle by the printed package sizes, 75/11 (seventy five eleven), 80/12 (eighty twelve), etc...

Your Toyota is timed with the 75/11 needle as your primary or regular size. You may vary slightly up to an 80/12 (probably when running hats or heavy fabrics) or down to 65/9 (for delicate fabrics) without having a timing issue. If you change the needle size, or brand of needle and you immediately notice skipping of stitches, excessive thread breakage, etc... it is probably a timing issue. The change in needle size or specification differences between manufactures is just enough to throw the timing off. Unless this need that caused you to vary your needle size is going to be your primary source or income it is simpler to return to the 75/11 or brand than to attempt to re-time your machine.

NEEDLE COMPOSITION

Each manufacturer will have their specific properties regarding composition and will provide you with their literature. Basically, the standard needle is a chromium-finished. Other specialty needles include: Teflon, nylon, titanium, etc... The Teflon needle helps with high speed embroidery or sticking issues. The titanium needle is stronger and runs cooler on heavier fabrics, such as hats and canvas.

The best advise is that there is no firm, fast rule to solving problems associated with needles. Experimentation to solve problems is the best advise. Keep a variety of needle types, sizes, and finishes on hand so you will have some tools needed to solve related questions. Manufactures will send you samples at no charge.

STABILIZERS – BACKINGS & TOPPINGS

There are two basic categories of materials – woven goods, which have little to no stretch: and knit goods, which have varying amounts of stretch. When embroidery on these goods, it is usually necessary to support the material with some kind of backing. There are basically three types of backings and toppings (although several weights or material properties within these) on the market: tear-away, which can simply be torn away around the edges of the stitched design; cut-away, which must be manually cut; and the heat-disintegrating or water-soluble type (generally confined to toppings). Both tear-away and cut-away is available in roll stock, die cut pre-packaged and in black and white (white being primarily used in the industry). Toppings are available in roll stock in a variety of lengths and widths. All is available direct from manufacturers &/or distributors at a discounted price compared to your local fabric store. Sample packs are available from most distributors for the asking.

The basic rule is that if the fabric stretches (such as knit fabrics) you need to stabilize with a cut-away backing. If the fabric does not stretch (such as denim or canvas) you may use a tear-away. If the fabric has a nap, such as a towels, it is recommended that you add a topping to hold the nap down while stitching. It is also recommended that when embroidery smaller or thinner designs on knit type shirts a topping will assist in lifting the thread and produce an overall nicer product. There are a few occasions where you do not want a backing to show, but the fabric has a stretch property; you can use a

tear-away backing with the addition of a topping for extra stabilization should be adequate. After considering the fabric type you also need to consider the stitch count and underlay in the design. Higher stitch count designs need extra support as well as good underlay. The use of a temporary adhesive spray can also be used for extra support, especially when embroidery on slick fabrics (hosiery, silk, lingerie, etc...).

When embroidery caps you will need to use backing (typically a tear-away) on caps that do not have buckram. If registration issues occur you can use a cut-away backing to correct the problem, this is especially helpful when the cap is extremely light weight or has slippery properties. Although it is not necessary to use backing on caps that have buckram you may choose to in attempt to control: flagging, registration issues and excessive thread breakage.

HOOPS FOR YOUR TOYOTA

Hoops can be purchased in a variety of materials. The majority of hoops are made of synthetic (plastic) available in many sizes and shapes. Wooden hoops are also available in most shapes and sizes.

Your Toyota embroidery machine comes with a tubular hoops and 180 cap driver (adult) hoops. Tubular hoops are available in several sizes and shapes (round, square and rectangular). Some prefer round hoops because the goods have a uniform surface tension; compared to the square or rectangle hoops that have a tendency to pull tighter in the corners.

Also available for flat embroidery is a magnetic adapter and hoops. The magnetic hoops are slightly quicker to change on and off the machine, however, it is not as secure as the tubular method. The magnetic adapter has only one point of attachment (opposite magnetic attraction), compared to the tubular that has two points that actually lock in. Caps are available in three sizes; adult, youth and infant. Your Toyota comes standard with the adult framer and hoops, however, a smaller (infant) framer is available. There is two sleeve hoops available for the embroidering of sleeves, socks, golf club covers, etc... A border sash or frame is available for the embroidery of large flat items, such as flags or banners.

HOOPING TECHNIQUES

When embroidering the design must be hooped straight and have the correct backing and topping to obtain top-quality. No matter how well digitized the design is the entire job can be lost to improper hooping techniques. Too much tension leads to distortion and hoop burns (visible marks left on the fabric from the hoop), however, too little tension causes poor registration and puckering. It is always recommended to use the smallest hoop possible as this gives stability to the fabric and will help to eliminate puckering.

Hoop marks can occur when the hoop is too tight upon hooping. Hoop burning can be minimized if the garment is hooped loosely and then tighten for adequate tension. Equally important is to loosen the hoop prior to removing the garment. If hoop marks occur you can remove them with a little steam from an iron or hand held steamer.

When problems occur arise, stop and think about what you're trying to achieve. Sometimes adding an extra piece of backing or adding topping is all it takes to get a design to work on a difficult substrate. Also, remember to smooth out the garment. If it has a lining, be sure it is smooth against the outer fabric. Don't over-stretch knits and be sure to keep the knit straight.

HOOPING STATIONS

There are several hooping stations or hooping aids available on the market. Data-stitch has a hooping station that is fairly priced and is versatile in usage. Using a hooping station can be most beneficial, as it is a device which helps in consistent hooping and accurate placement of a design on a garment. Once the device is set up, every finished piece should be fairly close in appearance.

MONOGRAM PLACEMENT

The correct placement of monograms is subject to many variables. Surprisingly, tradition is not a big factor. The size of the article, the size of the monogram the ease of hooping, and the customer's preference are the most important factors to be considered. After some experience, you will become familiar with where monograms look best and what sizes and thread density you prefer for various materials. The following are general guidelines; feel free to change them to suit your needs and taste.

BATH TOWELS: Place 4 inches above hem or 2 inches above border

BATH SHEETS: Place 4 inches above hem or 3 inches above border

HAND TOWELS: Place 2 inches above hem or 1-1/2 inches above border

LADIES ROBES & BLOUSES: Place 4 to 6 inches down from the left shoulder seam and 3 to 5 inches over from the center. Typically over the heart; use consideration for petite sizes as to not to have the embroidery too low.

SWEATSHIRT CENTERS: Place 3 ½ to 4 ½ down from the collar and centered on the front.

MENS SHIRTS: Place 7 ½ to 9 inches down from the left shoulder seam and 4 to 6 inches over from the center. Typically over the heart; use consideration for tall men as to ensure not to have the embroidery too high.

PILLOW CASES: The monogram should be centered between the edges of the open end and the stitching on the hem or the border design.

SHEETS: The bottom of the monogram should be centered about 2 inches above the wide hem line on the top of the sheets.

SHIRT CUFFS: To place the monogram in the top center of the wrist, start 1 inch from the center of the cuff toward the bottom hole and ¼ to ½ inch above cuff edge. The bottom of the letters should fall at the bottom of the cuff.

SHIRT POCKET: Place ¼ to ½ inch down from the pocket edge and centered between the seams.

TIES: Place 1 ½ to 2 inches up from the bottom tip; or 9 to 11 inches up from the bottom tip when worn with a vest.

JACKETS: Names on the left or right chest is typically across from the 2nd snap or button approximately 3 ½ to 4 inches from the center edge. For the back of the jacket, the placement depends on the size of the design and the size of the jacket. A design or lettering can be centered anywhere from 6 to 9 inches down from the seam on the collar.

PRICING GUIDE

No two shops have the same cost of doing business, so pricing of embroidery varies widely by geographic region and business type, among other factors. Pricing is usually based on stitch count with a direct relationship to number of sewing heads.

Single head operation: \$1.25 - \$2.00 per 1,000 stitch count

2 – head: \$.75 - \$1.25 per 1,000 stitch count

4 – head: \$.60 - \$.75 per 1,000 stitch count

6 – head: \$.50 - \$.60 per 1,000 stitch count

12 – head: \$.35 - \$.50 per 1,000 stitch count

Most shops have minimum piece price for embroidery; such as name drops at \$7.50 - \$10.00. Many shops have a minimum piece per order, too. Your geographic region and demographics greatly affect your pricing guide. Typically, shops either do not allow a customer to provide their own garments or have a higher minimum for those who pre-purchase garments elsewhere. Consider the extra time in excessive color changes within designs when pricing; the design may only have 35,000 stitches, however, it has 27 colors. When pricing bags or difficult items to hoop it is acceptable to up-charge because of the added time considerations.