

Chapter 2

Preparation of the Garment

This section deals with all of the elements of preparing a garment for sewing, which includes, hooping, backing, topping, needle selection, and thread selection.

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Special Class Note

There are two different machine models that may be covered in this class, the NEO and the HX1501. Both machines are very similar in design, with the major difference being in the control panel. Chapter 2 is not machine-specific and applies to all models. The only exception is the Final Exercise at the end of the Chapter which has a specific version for each type of machine.

Section 2.1 – Introduction to Hooping

Hooping is the mechanical process for attaching a garment to the embroidery machine for sewing purposes. This is accomplished by mounting the area to be sewn in a special frame or hoop and then attaching this to the pantograph of the machine. The pantograph moves the garment as needed for proper needle penetration location. Its movement is controlled by the software commands embedded in an embroidery design file.

But hooping is not just about getting the garment on the machine. The garment must also be supported and held as rigidly as possible during the sewing process. If the garment were to move while sewing, this could lead to poor quality stitching. There are many sizes and shapes of hoops, so it's imperative that the right hoop be selected for each job.

Improper hooping can cause a number of problems with stitching. If an item is hooped too tightly, embroidery would likely pucker. If the item is hooped too loosely, the design elements might not line up properly. The most obvious element of poor hooping is that the design would simply be crooked. The design would not appear level, as one side would start out higher or lower than it would finish at the other end of the design.

2.1.1 Hoop Shapes

Round or oval hoops provide the most even tensioning on fabric, but don't accommodate elongated or square designs very well.

Rectangular hoops may be needed for dealing with square or rectangular shapes, though the fabric tension is not equal at all parts of the hoop.

2.1.2 Hoop Materials

Plastic is the most common hoop material. Virtually all styles of hoops are available in plastic.

Wooden hoops are favored by many Embroiderers over the plastic variety. They are sturdier and have better tensioning qualities. However they are more expensive than plastics. Wooden hoops are available in single and double height styles, with the double height being preferred due to its added strength qualities.

Metal hoops are available in a limited number of styles. They are most common in the very small sizes as they have high strength in a small area. But for the most part, metal hoops are rarely used.

2.1.3 Hoop Selection

In general, always choose the smallest hoop for the job, as it will provide the most support for the garment.

Be sure to account for the presser foot when choosing your hoop. You will need at least one inch between the edge of the design and the edge of the hoop to accommodate the presser foot.

Stiff garments do better with wooden hoops, as the plastic ones tend to lose their shape somewhat when attempting to hoop such items. This reduces their holding power and also affects design registration.

2.1.4 Hoop Inventory

Because logos come in many shapes and sizes, it's imperative that you have a wide selection of hoops to choose from. The most frequently used sizes are 12cm round, 15cm round, 18cm round, 21cm round and 30X30cm rectangular. (These are not the only sizes available.)

You must always have at least two hoops of each size per sewing head. This allows you to hoop a garment while one is sewing.

2.1.5 Hooping Tips

The fabric must be taut, but not stretched. If the fabric is stretched during the sewing process, it will return to normal when released from the hoop, which will distort the embroidery and possibly cause puckering in the fabric. If the fabric is too loose, then it will pucker while sewing.

Do not over-tighten the hoop, as this will cause "hoop burn" in the fabric. Hoop burn is different from hoop marks. It's normal to see an image of the hoop left behind on the fabric after it's been unhooped. Magic Sizing spray or steam will easily remove all traces. Hoop burn, on the other hand, may be permanent. If the hoop is too tight it crushes the fibers in the garment, possibly causing permanent damage that cannot be fixed.

Do not adjust the hoop tension while it is applied to the garment. Always remove it first. Adjusting the tension screw while a garment is hooped only affects the hoop tension immediately adjacent to the tension screw, not all around the hoop. This leads to inconsistent hoop tension, which can cause poor quality stitching.

The framed piece should rest completely flat against the machine sewing surface. If not, the hooped item will bounce (flag) during sewing which will lead to thread breaks and even needle breaks.

Hooping is one of the most critical elements of the embroidery process. Different types of fabric affect how easy or hard it is to hoop properly. In addition, larger hoops are more difficult to work with than smaller ones. It takes practice to become proficient with the process.

Section 2.2 – Hooping Flat/Tubular Items

The Tajima Tubular system is used for sewing most flat and tubular items. Tubular refers to the construction of such things as t-shirts, polo shirts, sweatshirts, sleeves, pants legs, etc. All of these items are essentially large tubes. Even a jacket or dress shirt can fall into this category, as they form a tube shape when fastened. The advantage for a jacket or button-up shirt is that it can be unfastened for easier hooping, while true tubular items such as polo shirts, t-shirts and sweatshirts cannot. Regardless of the item, the Tajima Tubular system can easily handle most flat and tubular applications, due the variety of hoops that are available for the system.

2.2.1 Choosing the Correct Hoop Size

Tubular hoops come in a wide variety of sizes. Always try to select the smallest frame that will comfortably accommodate the size of the embroidery design. Using the correct hoop size creates an even tension on the area being sewn. This leads to better design appearance. You need to leave approximately one inch of space on each side between the design and the hoop. If it looks like a design will barely fit a particular hoop size, go to the next larger size.

It is recommended that you print out a Design Information Sheet (in the actual dimensions) for the design that will be sewn and use this to choose the correct size of hoop.

2.2.2 - Design Placement

Before applying the hoop to the garment, you must first determine where the design will be placed, then make a reference mark as to where the center of the design should be located. Embroidery designs are created so that they start and end in the center of the design, thus it's important to mark where the center of the design should be located.

Refer to the attached Placement Chart at the end of this chapter for recommended locations on a variety of common garments.

It is suggested that you use a tape measure or ruler to help ensure that each design receives proper positioning. It only takes a few moments to verify that you have followed the recommended guidelines.

Place a piece of masking tape in the vicinity of where your center point will be. After you have measured out the exact placement of the center point, draw an X on the masking tape. Make sure that you fold one side of the masking tape under. This will make it easier to remove the tape from the item, before you begin sewing.

2.2.3 - Applying the Hoop to the Garment

The outer hoop with the side brackets should always have the beveled side facing up. This is the top of the hoop, and will facilitate its proper placement onto the embroidery machine bed. The round hoop pieces should always have the number facing up.

The most important factor when hopping is to have the fabric taut but not stretched!

**Exception – Lycra is normally worn in the stretched mode, so it should be stretched slightly before sewing.

Training Exercise - Setting Up a Knit Polo Shirt for a Left Chest Design

Choose the Proper Hoop

1. *Select a Polo Shirt and the Design Information sheet for the TEAM USA (TEAM) logo, found at the back of this chapter.*
2. *Referencing the Design Information Sheet, choose the appropriate size hoop. (15cm)*
3. *Lay the hoop over the design and verify that the design fits within the boundaries.*

Determine Logo Placement

4. *Choose a flat, dry clean surface for the process, preferably a hooping device.*
5. *Reference the Placement Chart at the back of this chapter to determine where the center of the design should be located for a Left Chest application.*
6. *Verify that the hoop will fit within the area of the shirt that has been marked for sewing. Make sure there are no seams, buttons, pockets, etc in the way.*
7. *Using a ruler, locate this position and place a 3- 4” strip of masking tape, with one edge folded under on itself.*
8. *Mark an X on the tape where the exact center of the design should be located.*
9. *Using the ruler as a guide, also mark a straight horizontal line on the masking tape from one side to the other. This line should represent the horizontal plane of the shirt, not the tape.*

Hoop the Garment

10. Lay the backing on the outer hoop.
11. Pull the fabric of the shirt away so that just the portion that you wish to sew on is exposed, and carefully lay it over the backing covered outer hoop.
12. Check that the item is approximately centered in relationship to the hoop. Also be sure it is straight, using the horizontal reference marks as a guide. Verify that no unwanted fabric is caught beneath the intended sewing surface, such as the tip of a sleeve.
13. Carefully push the inner hoop into place. There should always be a light surface tension to the hooped piece. If the hoop is properly adjusted before it is applied, then the tension is created automatically. If it's too tight, STOP and loosen the adjustment screw. Hooping too tightly may cause "hoop burn" which cannot be removed. If it's too loose, STOP and tighten the adjustment screw. Ideally the hoop will go into place with just a gentle pushing motion. If you have to put your weight behind it, the hoop is too tight. Do not allow the hooping process to stretch the fabric!
14. Verify that the garment is hooped such that it is centered in the hoop and is still straight. Also, verify that no wrinkles exist, and that the fabric is not stretched. Check again to ensure no other portion of the garment is trapped underneath such that it could be accidentally sewn on.

Finish the Garment Preparation

15. Have the Training Instructor verify that the shirt is hooped correctly.
16. Gently remove the piece of masking tape from the shirt. Pulling too hard may stretch the material. In a production situation, you would now be ready to sew.
17. Unhoop the shirt.

Training Exercise – Setting Up a Denim Shirt for a Left Chest Design

Choose the Proper Hoop

1. Select a denim shirt and the Design Information sheet for the AMERICAN TEAM (AMERI) logo.
2. Referencing the design information sheet, choose the appropriate sized hoop. (15cm)
3. Lay the hoop over the design and verify that the design fits within the boundaries.

Determine Logo Placement

4. Choose a flat, dry clean surface for the process, preferably a hooping device.
5. Reference the Placement Chart at the back of this chapter to determine where the center of the design should be located for a Left Chest application.
6. Verify that the hoop will fit within the area of the shirt that has been marked for sewing. Make sure there are no seams, buttons, pockets, etc in the way.
7. Using a ruler, locate this position and place a 3- 4" strip of masking tape, with one edge folded under on itself.
8. Mark an X on the tape where the exact center of the design should be located.
9. Using the ruler as a guide, also mark a straight horizontal line on the masking tape from one side to the other. This line should represent the horizontal plane of the shirt, not the tape.

Hoop the Garment

10. Lay the backing on the outer hoop.
11. Unbutton the shirt. This will make it easier to hoop and mount on the machine. However as you become more proficient with hooping, you may choose not to unbutton this style of shirt.
12. Pull the fabric of the shirt away so that just the portion that you wish to sew on is exposed, and carefully lay it over the backing covered outer hoop.
13. Check that the item is approximately centered in relationship to the hoop. Also be sure it is straight, using the horizontal reference marks as a guide. Verify that no unwanted fabric is caught beneath the intended sewing surface, such as the tip of a sleeve.
14. Carefully push the inner hoop into place. There should always be a light surface tension to the hooped piece. If the hoop is properly adjusted before it is applied, then the tension is created automatically. If it's too tight, STOP and loosen the adjustment screw. Hooping too tightly may cause "hoop burn" which cannot be removed. If it's too loose, STOP and tighten the adjustment screw. Ideally the hoop will go into place with just a gentle pushing motion. If you have to put your weight behind it, the hoop is too tight. Do not allow the hooping process to stretch the fabric!
15. Verify that the garment is hooped such that it is centered in the hoop and is still straight. Also, verify that no wrinkles exist, and that the fabric is not stretched. Check again to ensure no other portion of the garment is trapped underneath such that it could be accidentally sewn on.

Finish the Garment Preparation

16. Have the Training Instructor verify that the shirt is hooped correctly.
17. Gently remove the piece of masking tape from the shirt. Pulling too hard may stretch the material. In a production situation, you would now be ready to sew.
18. Unhoop the shirt.

Training Exercise – Setting Up a Knit T- Shirt for a Full Front Design

Choose the Proper Hoop

1. Select a t-shirt and the Design Information sheet for the HIKE SILVER MOUNTAIN (HIKE) design,
2. Referencing the Design Information Sheet, choose the appropriate sized hoop for this job. Notice that the printed dimensions indicate that this design is 10.85 inches X 5.54 inches. This is obviously wider than the paper, so the design printout is not at full scale. Thus, it will be necessary to use a measuring tape/ruler to determine the appropriate hoop size for this design. (30cm X 30cm)

Determine Logo Placement

3. Notice that the bottom opening of the shirt is much larger than the neck opening. It is customary to hoop t-shirts and sweatshirts that are receiving large designs, upside down. This reduces pressure on the neck area of the shirt caused by the sewing arm of the machine. Thus, it will be necessary to rotate the design 180 degrees before sewing.
4. Choose a flat, dry clean surface for the process, preferably a hooping device.
5. Reference the Placement Chart at the back of this chapter to determine where the center of the design should be located for a Full Front application.
6. Verify that the hoop will fit within the area of the shirt that has been marked for sewing. Make sure there are no seams, buttons, pockets, etc in the way.
7. Using a ruler, locate this position and place a 3- 4" strip of masking tape, with one edge folded under on itself.
8. Mark an X on the tape where the exact center of the design should be located.
9. Using the ruler as a guide, also mark a straight horizontal line on the masking tape from one side to the other. This line should represent the horizontal plane of the shirt, not the tape.

Hoop the Garment

10. Lay the backing on the outer hoop.
11. Pull the fabric of the shirt away so that just the portion that you wish to sew on is exposed, and carefully lay it over the backing covered outer hoop.
12. Check that the item is approximately centered in relationship to the hoop. Also be sure it is straight, using the horizontal reference marks as a guide. Verify that no unwanted fabric is caught beneath the intended sewing surface, such as the tip of a sleeve.
13. Carefully push the inner hoop into place. There should always be a light surface tension to the hooped piece. If the hoop is properly adjusted before it is applied, then the tension is created automatically. If it's too tight, STOP and loosen the adjustment screw. Hooping too tightly may cause "hoop burn" which cannot be removed. If it's too loose, STOP and tighten the adjustment screw. Ideally the hoop will go into place with just a gentle pushing motion. If you have to put your weight behind it, the hoop is too tight. Do not allow the hooping process to stretch the fabric!
14. Verify that the garment is hooped such that it is centered in the hoop and is still straight. Also, verify that no wrinkles exist, and that the fabric is not stretched. Check again to ensure no other portion of the garment is trapped underneath such that it could be accidentally sewn on.

Finish the Garment Preparation

15. Have the Training Instructor verify that the shirt is hooped correctly.
16. Gently remove the piece of masking tape from the shirt. Pulling too hard may stretch the material. In a production situation, you would now be ready to sew.
17. Unhoop the shirt.

Training Exercise – Setting Up a Nylon Jacket for a Full Back Design

Choose the Proper Hoop

1. Select a nylon jacket – windbreaker and the Design Information sheet for the PATRIOTIC STAR (STAR) design
2. Referencing the Design Information sheet, choose the appropriate size hoop for this job. Notice that the printed dimensions indicate that this design is 10.20 inches X 10.13 inches. This is obviously wider than the paper, so the design printout is not at full scale. Thus, it will be necessary to use a measuring tape/ruler to determine the appropriate hoop size for this design. (30cm X 30cm)

Determine Logo Placement.

3. Choose a flat, dry clean surface for the process, preferably a hooping device.
4. Reference the Placement Chart at the back of this chapter to determine where the center of the design should be located for a Full Front application.
5. Verify that the hoop will fit within the area of the shirt that has been marked for sewing. Make sure there are no seams, buttons, pockets, etc in the way.
6. Using a ruler, locate this position and place a 3- 4” strip of masking tape, with one edge folded under on itself.
7. Mark an X on the tape where the exact center of the design should be located.
8. Using the ruler as a guide, also mark a straight horizontal line on the masking tape from one side to the other. This line should represent the horizontal plane of the shirt, not the tape.

Hoop the Garment

9. Lay the backing on the outer hoop.
10. Unbutton the jacket. This will make it easier to hoop and mount on the machine. However as you become more proficient with hooping, you may choose not to unbutton this style of garment.
11. Pull the fabric of the jacket away so that just the portion that you wish to sew on is exposed, and carefully lay it over the backing covered outer hoop.
12. Check that the item is approximately centered in relationship to the hoop. Also be sure it is straight, using the horizontal reference marks as a guide. Verify that no unwanted fabric is caught beneath the intended sewing surface, such as the tip of a sleeve.
13. Carefully push the inner hoop into place. There should always be a light surface tension to the hooped piece. If the hoop is properly adjusted before it is applied, then the tension is created automatically. If it's too tight, STOP and loosen the adjustment screw. Hooping too tightly may cause “hoop burn” which cannot be removed. If it's too loose, STOP and tighten the adjustment screw. Ideally the hoop will go into place with just a gentle pushing motion. If you have to put your weight behind it, the hoop is too tight. Do not allow the hooping process to stretch the fabric!
14. Verify that the garment is hooped such that it is centered in the hoop and is still straight. Also, verify that no wrinkles exist, and that the fabric is not stretched. Check again to ensure no other portion of the garment is trapped underneath such that it could be accidentally sewn on.

Finish the Garment Preparation

- 15. Have the Training Instructor verify that the shirt is hooped correctly.*
- 16. Gently remove the piece of masking tape from the jacket. Pulling too hard may stretch the material. In a production situation, you would now be ready to sew.*
- 17. Unhoop the jacket.*

Section 2.3 – Hooping Caps

There are several styles of cap frames, but since the 270 degree frame is the only one discussed here, since it is the standard cap frame provided with Tajima machines. The 270 frame allows a horizontal sewing field that covers 270 degrees of arc. That corresponds to “ear to ear” coverage. Though few designs are this wide, the real advantage is that three locations can be sewn using one hooping.

2.3.1 Cap Challenges

Caps tend to be the most difficult garment to hoop. The key aspect is that the curvature of the cap must match the curvature of the cap frame. If not, then distortion will occur and the result will be poor quality sewing, excessive thread breaks and possible needle breaks.

You Are Putting a Flat Logo on a Curved Surface

Embroidered logos are designed to be flat, while caps are designed to be curved. As a result, the sewing process tries to flatten out the curvature, so you end up forcing the cap to be flat in the sewing area, which can distort the logo.

Horizontal Curve Of The Crown Doesn't Mate To Curve Of Frame.

This is a significant problem. The cap frame is designed to hold and support the cap in its natural shape during the sewing process. If the two don't match up, it's a recipe for disaster.

The Crown Has Vertical Curvature While The Frame Does Not. Don't confuse this with the horizontal curvature. Most popular cap crowns today, curve back and away from the bill. Yet, most cap frames don't accommodate this characteristic, which leads to cap distortion from the minute it's hooped. (270 degree cap frames are an exception)

Center Seams Cause Abrupt Fabric Depth Change.

It isn't necessarily the thickness of the seam that causes problems; rather it's the abrupt change in thickness. If you watch closely, you will see that most thread and/or needle breaks occur at the edge of the seam rather than the middle.

Low Profile Caps May Be Distorted By The Machine Arm.

Due to the reduced crown height on low profile caps, there is less room to accommodate the protrusion of the machine arm (where the bobbin resides). As a result, the end of the arm “pushes” on the top inside area of the cap, which distorts the cap and leads to quality problems.

2.3.2 Cap Solutions

There are two basic rules for cap embroidery that if applied correctly, will eliminate about 90% of all cap problems.

The Design Must Fit the Cap

The single leading cause of cap problems is trying to sew a design that is too large for the given cap. Caps are not created equally and some can handle larger designs than others. In general, limit your design size to 2.0" H X 4.5"W, and you should be able to sew on just about any style of cap. In actuality, you can go larger for some caps, but if you make it a standard practice to work with tighter parameters, you will be better off in the long run. Also, having the customer focus on the smaller size helps get an order started on the right foot. It's much easier to increase the size for a larger cap, than to decrease it for a smaller cap.

TIP – Use a standard business card as a reference for maximum (cap) logo dimensions.

The Cap Must Fit the Frame

The second most common mistake made by Embroiderer's in regards to sewing caps, is trying to use a cap that doesn't match up to their machine's cap frame. Each frame has a built-in curvature that needs to mate with the horizontal curve of the cap to be sewn. If these two surfaces don't match-up, then the cap will have to be forced to fit onto the frame, which will lead to distortion of the sewing surface. And of course, the final result is poor sewing. One trick to test how well a cap lines up, is to remove the bill and place the curved portion (that used to attach to the crown) over the curved portion of the cap frame, then visually inspect the match-up. Of course, this destroys the cap, but better one than a dozen. Unfortunately, there is no great master list of which brands and styles work best for each machine brand. It comes through trial and error. And because the cap manufacturers, change cap specifications frequently, what works best this year may not do so next year.

2.3.3 - Design Placement

Before hooping the cap, you must first determine where the design will be placed, then make a reference mark as to where the center of the design should be located. Embroidery designs are created so that they start and end in the center of the design, thus it's important to mark where the center of the design should be located.

To determine the vertical center-point, divide the height of the design by 2 and add 1/2".

It is suggested that you use a tape measure or ruler to help ensure that each design receives proper positioning. It only takes a few moments to verify that you have followed the recommended guidelines.

Place a piece of masking tape in the vicinity of where your center point will be. After you have measured out the exact placement of the center point, draw an X on the masking tape. Make sure that you fold one side of the masking tape under. This will make it easier to remove the tape from the item, before you begin sewing.

2.3.4 - Applying the Frame to the Cap

Hooping caps is quite different from hooping flats. It's imperative that the cap mate to the cap frame correctly to ensure proper sewing without problems. A special device called the Cap Gauge is used to support the Cap Frame during hooping.

Training Exercise – Setting Up A 6 Panel Unconstructed Cap

Verify the Design Fits the Cap

- 1. Select a 6 panel unconstructed style of cap and the Design Information Sheet for the ARGAST RACING TEAM (ARGAS) logo.*
- 2. Referencing the Design Information sheet, verify that it fits within the allotted space on the front of the cap. This style of cap can support very wide logos, but is limited in height to about 2.25". Notice that the printed dimensions indicate that this design is 4.28 inches X 1.78 inches. This should fit the cap without any difficulty.*

Determine Logo Placement

- 3. Using a ruler, locate front center point of the cap and place a 3- 4" strip of masking tape, with one edge folded under on itself.*
- 4. Mark an X on the tape where the exact center of the design should be located. To determine the vertical center-point, divide the height of the design by 2 and add ½".*

Hoop the Cap

- 5. Install the cap frame on the cap gauge.*
- 6. Line up the center slot on the top of the cap frame with the block on the top of the cap sash.*
- 7. Push the cap frame onto the cap sash until it snaps into the two top lock pins and the bottom base frame presser roller.*
- 8. Gently tug the cap frame outward to ensure that it is securely locked in place.*
- 9. Unclip the cap band and mount the cap frame on the cap gauge.*
- 10. Place the correct amount of backing on the cap frame (enough to easily overlap the design on each side). Recommended size for backing is 4 X 6 pieces - precut to minimize waste.*
- 11. Select the 6 Panel Unconstructed Cap, open the adjustment band on the back of the cap and pull out the sweatband.*
- 12. Slide the cap onto the cap frame over the backing with the sweatband folded out.*
- 13. Ensure that the cap is centered on the cap frame.*
- 14. Pull the lid of the cap frame across the cap, making sure that the pin on the cap frame engages the slot in the cap band.*
- 15. Make sure the teeth of the lid, line up with the bottom of the visor seam.*
- 16. Be sure the center of the hat is in the center of the cap frame*
- 17. Clamp the pinch lock on the cap band tight.*
- 18. Ensure that the cap band is lined up evenly with the bottom edge of the crown of the cap, especially when sewing on the sides of the cap.*
- 19. Install the cap clips. Add 2 clips to each side*

Finish the Garment Preparation

20. Have the Training Instructor verify that the cap is framed properly.
21. Gently remove the piece of masking tape from the cap. Pulling too hard may stretch the material. In a production situation, you would now be ready to sew.
22. Unlatch the cap band and remove the cap.

Training Exercise – Setting Up a 6 Panel Baseball Cap

Verify the Design Fits the Cap

1. Select a 6 panel baseball style of cap and the Design Information Sheet for the BOB'S TOWING SERVICE (BOBS) logo.
2. Referencing the Design Information sheet, verify that it fits within the allotted space on the front of the cap. This style of cap can support very wide logos, but is limited in height to about 2.25 inches. Notice that the printed dimensions indicate that this design is 4.46 inches X 2.29 inches. This design is a tight fit for this style of cap but should be possible.

Determine Logo Placement

3. Using a ruler, locate front center point of the cap and place a 3- 4" strip of masking tape, with one edge folded under itself. To determine the vertical center-point, divide the height of the design by 2 and add ½".
4. Mark an X on the tape where the exact center of the design should be located.

Hoop the Cap

5. Install the cap frame on the cap gauge.
6. Line up the center slot on the top of the cap frame with the block on the top of the cap sash.
7. Push the cap frame onto the cap sash until it snaps into the two top lock pins and the bottom base frame presser roller.
8. Gently tug the cap frame outward to ensure that it is securely locked in place.
9. Unclip the cap band and mount the cap frame on the cap gauge.
10. Place the correct amount of backing on the cap frame (enough to easily overlap the design on each side). Recommended size for backing is 4 X 6 pieces - precut to minimize waste.
11. Select the 6 Panel Unconstructed Cap, open the adjustment band on the back of the cap and pull out the sweatband.
12. Slide the cap onto the cap frame over the backing with the sweatband folded out.
13. Ensure that the cap is centered on the cap frame.
14. Pull the lid of the cap frame across the cap, making sure that the pin on the cap frame engages the slot in the cap band.
15. Make sure the teeth of the lid, line up with the bottom of the visor seam.
16. Be sure the center of the hat is in the center of the cap frame
17. Clamp the pinch lock on the cap band tight.
18. Ensure that the cap band is lined up evenly with the bottom edge of the crown of the cap, especially when sewing on the sides of the cap.
19. Install the cap clips. Add 2 clips to each side

Finish the Garment Preparation

20. Have the Training Instructor verify that the cap is framed correctly.

21. Gently remove the piece of masking tape from the cap. Pulling too hard may stretch the material. In a production situation, you would now be ready to sew.

22. Unlatch the cap band and remove the cap.

Section 2.4 – Hooping Cylindrical Items

Many garments have small tubular areas which cannot be sewn using any of the standard tubular hoops, including pants legs, sleeves, golf club head-covers, wine bags, etc. These items are classified as narrow tube or narrow cylinder. In most situations they cannot be embroidered without special equipment. To facilitate this, Tajima offers the optional Cylindrical Frame kit.

2.4.1 - Design Placement

Before applying the hoop to the garment, you must first determine where the design will be placed, then make a reference mark as to where the center of the design should be located. Embroidery designs are created so that they start and end in the center of the design, thus it's important to mark where the center of the design should be located.

It is suggested that you use a tape measure or ruler to help ensure that each design receives proper positioning. It only takes a few moments to verify that you have followed the recommended guidelines.

Place a piece of masking tape in the vicinity of where your center point will be. After you have measured out the exact placement of the center point, draw an X on the masking tape. Make sure that you fold one side of the masking tape under. This will make it easier to remove the tape from the item, before you begin sewing.

2.4.2 - Applying the Frame to the Garment

There are two types of cylindrical frames – clip frames & clamp frames. With the clip frame the garment is held in place by clips at the bottom. This type of frame offers more embroidery space in the “X” axis (side-to-side) than the clamp frame. The clamp frame has two clamps, one for securing the backing, the other for securing the garment. This type of frame offers more embroidery space in the “Y” axis (front-to-back) than the clip frame.

Training Exercise – Wine Bag

Verify the Design Fits the Frame

- 1. Select a wine bag and the Design Information Sheet for the FLORAL (FLORA) logo.*
- 2. Referencing the Design Information sheet, verify that it fits within the allotted space of the cylindrical frame. This style of frame can support logos that are 2 inches wide X 5 inches high. Notice that the printed dimensions indicate that this design is 1.55 inches X 4.88 inches. This design should fit without a problem.*

Determine Logo Placement

- 3. Using a ruler, locate front center point of the cap and place a 3- 4” strip of masking tape, with one edge folded under on itself.*
- 4. Mark an X on the tape where the exact center of the design should be located.*

Frame the Garment

5. *Install the cylindrical clamp frame on the cylindrical gauge.*
6. *Line up the center slot on the top of the cylindrical frame with the block on the top of the cylindrical gauge.*
7. *Push the cylindrical frame onto the cylindrical gauge until it snaps into the two top lock pins and the bottom base frame presser roller.*
8. *Gently tug the cylindrical frame outward to ensure that it is securely locked in place.*
9. *Lift both clamps.*
10. *Cut a piece of cut-away backing so that it is larger than the opening.*
11. *Lay the piece of backing over the cylindrical frame opening and pull down the first clamp to secure it.*
12. *Place the sock onto the cylindrical frame and verify it's centered.*
13. *Pull down and latch the second clamp.*

Finish the Garment Preparation

14. *Have the Training Instructor verify that the wine bag is framed properly.*
15. *Gently remove the piece of masking tape from the wine bag. Pulling too hard may stretch the material. In a production situation, you would now be ready to sew.*
16. *Unhoop the wine bag.*

Section 2.5 – Bringing It All Together

You have now had the opportunity to learn the basic machine functions and the hooping process. This final section will bring it all together so that you can see the complete Garment Preparation Process.

The following exercise will illustrate the complete Garment Setup process including design placement, hooping, loading a design into the machine, setting the color sequence, mounting the hooped item onto the machine and design tracing. Essentially all of the steps needed to get a garment ready to sew with the exception of pushing the START key.

Because of the differences in the Control Panels, there are two versions of this exercise, one for the HX Model and one for the NEO model. Refer to the one that applies to your machine.

Special Training Exercise – Bringing All Together HX Version

Setting up a Knit Polo Shirt for a Left Chest Design

Choose the Proper Hoop

- 1. Select a Polo Shirt and the Design Information sheet for the TEAM USA (TEAM) logo.*
- 2. Referencing the Design Information Sheet, choose the appropriate size hoop for this job. (15cm)*
- 3. Lay the hoop over the design and verify that the design fits within the boundaries.*

Determine Logo Placement

- 4. Choose a flat, dry clean surface for the process, preferably a hooping device.*
- 5. Reference the Placement Chart at the back of this chapter to determine where the center of the design should be located for a Left Chest application.*
- 6. Verify that the hoop will fit within the area of the shirt that has been marked for sewing. Make sure there are no seams, buttons, pockets, etc in the way.*
- 7. Using a ruler, locate this position and place a 3- 4” strip of masking tape, with one edge folded under on itself.*
- 8. Mark an X on the tape where the exact center of the design should be located.*
- 9. Using the ruler as a guide, also mark a straight horizontal line on the masking tape from one side to the other. This line should represent the horizontal plane of the shirt, not the tape.*

Hoop the Garment

10. Lay the backing on the outer hoop.
11. Pull the fabric of the shirt away so that just the portion that you wish to sew on is exposed, and carefully lay it over the backing covered outer hoop.
12. Check that the item is approximately centered in relationship to the hoop. Also be sure it is straight, using the horizontal reference marks as a guide. Verify that no unwanted fabric is caught beneath the intended sewing surface, such as the tip of a sleeve.
13. Carefully push the inner hoop into place. There should always be a light surface tension to the hooped piece. If the hoop is properly adjusted before it is applied, then the tension is created automatically. If it's too tight, STOP and loosen the adjustment screw. Hooping too tightly may cause "hoop burn" which cannot be removed. If it's too loose, STOP and tighten the adjustment screw. Ideally the hoop will go into place with just a gentle pushing motion. If you have to put your weight behind it, the hoop is too tight. While applying pressure to the hoop, be sure that the fabric stays in a natural, somewhat tight position. Do not allow the hooping process to stretch the fabric!
14. Verify that the garment is hooped such that it is centered in the hoop and is still straight. Also, verify that no wrinkles exist, and that the fabric is not stretched. Check again to ensure no other portion of the garment is trapped underneath such that it could be accidentally sewn on.

Setup the Machine for the Job

(If the machine is already setup for tubular sewing, proceed to step 23)

15. Verify the power is turned off.
16. Slide the right tubular arm into place on the pantograph and hand-tighten the two hex (allen) screws.
17. Install the left tubular arm into place using the 15cm hoop as a reference and hand-tighten the two hex screws.
18. Make sure both arms are pushed completely back against the pantograph.
19. Push the 15cm hoop into place, making sure that the rectangular spring on each tubular arm securely engages the rectangular slot in the bottom corners of the hoop.
20. Once the hoop is in place, push inward on the tubular arms to make sure they are properly aligned and square.
21. Tighten the tubular arm mounting screws using the hex key (allen) wrench.
22. Turn on the power to the machine.

Load The Design Into The Machine

23. Insert the Disk Labeled HIC Training Disk #1 into the Floppy Disk Drive.
24. Press A twice (you will see 2F : on the screen).
25. Press SET once - Wait until you see 2F: Design Name.
26. Rotate inner jog control dial until you see TEAM.
27. Press SET once (you will see 2F>M: The design # and name).
28. Press SET again and wait until the beep. This will indicate that the design has been transferred into the machines memory..

Set The Needle Bar/Thread Color Sequence

29. The **Team USA (TEAM)** design has the following thread color sequence (the color names in parenthesis refer to the specific Madeira thread name):
- (1) **Royal** (Indigo)
 - (2) **Yellow** (Straw)
 - (3) **Kelly** (St. Patrick's Green))
 - (4) **Black**
 - (5) **White**
 - (6) **Silver** (Nickel)
 - (7) **Red** (Strawberry)
30. Find the needle bars that are associated with these colors and write them down next to the colors listed above.
31. Press **B** twice (you will see 2 S (01): and a series of numbers and letters).
32. Rotate the inner jog control to select the desired needle bar # associated with the **Royal** thread and press **SET**.
33. Rotate the inner jog control to select the desired needle bar # associated with the **Yellow** thread and press **SET**.
34. Rotate the inner jog control to select the desired needle bar # associated with the **Kelly** thread and press **SET**.
35. Rotate the inner jog control to select the desired needle bar # associated with the **Black** thread and press **SET**.
36. Rotate the inner jog control to select the desired needle bar # associated with the **White** thread and press **SET**.
37. Rotate the inner jog control to select the desired needle bar # associated with the **Silver** thread and press **SET**.
38. Rotate the inner jog control to select the desired needle bar # associated with the **Red** thread and press **SET**.
39. Rotate the inner jog control to the dash sign (-) and press **SET**.

Install The Hoop On The Machine

40. Carefully slide the hoop onto the machine, ensuring that the sewing arm is inside of the polo shirt, not underneath it.
41. Push the hoop into place, making sure that the rectangular spring on each tubular arm securely engages the rectangular slot in the bottom corners of the hoop.
42. Give the hoop a gentle tug to ensure that it is locked securely into place.
43. Using the four frame position arrow keys, move the frame such that the number one needle is lined up with the desired start point (center) of the design.

Manually Select Needle #1

1. Press **D** once (you will see 1 M_NDL: and a number).
2. Rotate inner jog control to #15.
3. Press **SET**. The machine will move to the #15 needle.
4. Press **D** once (you will see 1 M_NDL: and 15).
5. Rotate the Inner Jog control to #1
6. Press **SET** – The machine will move to the #1 needle.

Perform A Design Trace

44. Press D until you see 5M _ TRC:
45. Rotate the inner jog control to change the (-) to (0)
46. Press SET once and watch the trace.
47. The hoop/frame will move such that the outline of the design is traced in relationship to the Selected Needle (Needle #1 in this case). Verify that the design fits within the parameters of the hoop.
48. If necessary, change the position of the hoop using the four frame position arrow keys.

Finish The Garment Preparation

49. Gently remove the piece of masking tape from the shirt. Pulling too hard may stretch the material. In a production situation, you would now be ready to sew.
50. Remove the hooped polo shirt by pulling the frame firmly outward.
51. Unhoop the shirt.

Special Training Exercise – Bringing All Together NEO Version

Setting Up A Knit Polo Shirt For A Left Chest Design

Choose The Proper Hoop

1. Select a Polo Shirt and the Design Information sheet for the TEAM USA (TEAM) logo.
2. Referencing the Design Information Sheet, choose the appropriate size hoop for this job. (15cm)
3. Lay the hoop over the design and verify that the design fits within the boundaries.

Determine Logo Placement

4. Choose a flat, dry clean surface for the process, preferably a hooping device.
5. Reference the Placement Chart at the back of this chapter to determine where the center of the design should be located for a Left Chest application.
6. Verify that the hoop will fit within the area of the shirt that has been marked for sewing. Make sure there are no seams, buttons, pockets, etc in the way.
7. Using a ruler, locate this position and place a 3- 4” strip of masking tape, with one edge folded under on itself.
8. Mark an X on the tape where the exact center of the design should be located.
9. Using the ruler as a guide, also mark a straight horizontal line on the masking tape from one side to the other. This line should represent the horizontal plane of the shirt, not the tape.

Hoop The Garment

10. Lay the backing on the outer hoop.
11. Pull the fabric of the shirt away so that just the portion that you wish to sew on is exposed, and carefully lay it over the backing covered outer hoop.
12. Check that the item is approximately centered in relationship to the hoop. Also be sure it is straight, using the horizontal reference marks as a guide. Verify that no unwanted fabric is caught beneath the intended sewing surface, such as the tip of a sleeve.
13. Carefully push the inner hoop into place. There should always be a light surface tension to the hooped piece. If the hoop is properly adjusted before it is applied, then the tension is created automatically. If it's too tight, STOP and loosen the adjustment screw. Hooping too tightly may cause "hoop burn" which cannot be removed. If it's too loose, STOP and tighten the adjustment screw. Ideally the hoop will go into place with just a gentle pushing motion. If you have to put your weight behind it, the hoop is too tight. While applying pressure to the hoop, be sure that the fabric stays in a natural, somewhat tight position. Do not allow the hooping process to stretch the fabric!
14. Verify that the garment is hooped such that it is centered in the hoop and is still straight. Also, verify that no wrinkles exist, and that the fabric is not stretched. Check again to ensure no other portion of the garment is trapped underneath such that it could be accidentally sewn on.

Setup The Machine For The Job

15. First setup the machine for tubular sewing.
16. Verify the power is turned off.
17. Slide the right tubular arm into place on the pantograph and hand-tighten the two hex (allen) screws.
18. Install the left tubular arm into place using the 15cm hoop as a reference and hand-tighten the two hex screws.
19. Make sure both arms are pushed completely back against the pantograph.
20. Push the 15cm hoop into place, making sure that the rectangular spring on each tubular arm securely engages the rectangular slot in the bottom corners of the hoop.
21. Once the hoop is in place, push inward on the tubular arms to make sure they are properly aligned and square.
22. Tighten the tubular arm mounting screws using the hex key (allen) wrench.
23. Turn on the power to the machine.
24. Select the proper frame attachment by using the RIGHT and LEFT ARROW keys to toggle between "Flat", "Cap" and "Cylindrical" and "Border".
25. When FLAT is selected, press the SET key.
26. Press SET key again.

Load The Design Into The Machine

27. Insert the Disk Labeled HIC Training Disk #1 into the Floppy Disk Drive.
28. Press the DATA key.
29. Then use the RIGHT ARROW key to select FD (Floppy Disk)
30. Press the SET key
31. At this point the design on the floppy disk will be available for use.
32. Use the UP and DOWN ARROW keys to find the design named TEAM on the floppy disk.

33. Press the SET key
34. This will transfer the design into the machine memory.

Set The Needle Bar/Thread Color Sequence

35. The **Team USA** (TEAM) design has the following thread color sequence:

- (1) Indigo (Royal)
- (2) Straw (Yellow)
- (3) St. Patrick's Green (Kelly)
- (4) Black
- (5) White
- (6) Nickel (Silver)
- (7) Strawberry (Red)

36. Find the needle bars that are associated with these colors and write them down next to the colors listed above.
37. Press the NEEDLE BAR SELECTION key.
38. Enter the needle bar number associated with the royal thread using the number pad. (To enter any number over 9, press the +10 key, followed by the number necessary to add up to the number of the desired needle bar. SEE CHART ABOVE)
39. Enter the needle bar number for the **Royal** thread using the number pad.
40. Enter the needle bar number for the **Yellow** thread using the number pad.
41. Enter the needle bar number for the **Kelly** thread using the number pad.
42. Enter the needle bar number for the **Black** thread using the number pad.
43. Enter the needle bar number for the **White** thread using the number pad.
44. Enter the needle bar number for the **Silver** thread using the number pad.
45. Enter the needle bar number for the **Red** thread using the number pad.
46. Press the SET key after the complete color sequence has been setup.

Install The Hoop On The Machine

47. Carefully slide the hoop onto the machine, ensuring that the sewing arm is inside of the polo shirt, not underneath it.
48. Push the hoop into place, making sure that the rectangular spring on each tubular arm securely engages the rectangular slot in the bottom corners of the hoop.
49. Give the hoop a gentle tug to ensure that it is locked securely into place.
50. Using the four frame position arrow keys, move the frame such that the number one needle is lined up with the desired start point (center) of the design.

Manually Select Needle #1

51. Put the machine into the Manual Mode by pressing the AUTO/MANUAL key. When the light below the key is Lit, the machine is in the Manual Mode.
52. Use the RIGHT COLOR CHANGE arrow key to manually select Needle 1, by pressing the key as many times as necessary to slide the needle case to the correct position.
53. Press the SET key.
54. Press the AUTO/MANUAL key to return the machine to the Auto Mode. The light below the key should turn off.

Perform A Design Trace

55. Press the TRACE key.

56. The hoop/frame will move such that the outline of the design is traced in relationship to the Selected Needle (Needle #1 in this case). Verify that the design fits within the parameters of the hoop.

57. If necessary, change the position of the hoop using the four frame position arrow keys.

Finish The Garment Preparation

58. Gently remove the piece of masking tape from the shirt. Pulling too hard may stretch the material. In a production situation, you would now be ready to sew.

59. Remove the hooped polo shirt by pulling the frame firmly outward.

Unhoop the shirt.

Section 2.6 – Introduction To Fabric Characteristics

Each and every garment that you sew will need to be carefully evaluated in order to determine how to prepare it for sewing.

2.6.1 – Stretch and Give

In general, knit garments such as t-shirts, fleece and sweaters, are very stretchy, while woven ones such as twill and denim are not. Stretchy/elastic materials tend to stretch and even distort when being embroidered, due to their unstable nature. In addition, garments are generally placed in a special hoop for support, which is then attached to the machine. The process of “hooping” the garment has a tendency to stretch it beyond its normal state. If this happens, then the sewing will be done with the garment in a stretched state. When it is removed from the hoop after sewing, the garment will snap back to its original shape, which will in turn cause the embroidery to “wrinkle up”. This of course, yields unacceptable quality.

Most fabrics fall into either the woven or knit category. However, there is another grouping referred to as non-woven. These fabrics are neither knit nor woven, but tend to be very stable in nature. They include felt and terrycloth.

Training Exercise

The Training Instructor will pass out two garments for your inspection, a t-shirt and a denim shirt.

- 1. Pick up the t-shirt in both hands and gently tug the fabric, by pulling your hands apart. Notice how easy it is to stretch.*
- 2. Pick up the denim shirt in both hands and gently tug the fabric, by pulling your hands apart. Notice how hard it is to stretch.*

This is a very simple, yet very important lesson in fabric characteristics.

2.6.2 – Bulk and Thickness

Some fabrics are thin, some are quite thick. Thicker fabrics, which are soft tend to allow the stitches to sink down into material. The result can affect the appearance of the design. In addition, bulky garments are harder to place securely in the embroidery hoop and may have a tendency to slip out of the hoop while sewing.

2.6.3 – Surface Texture

A smooth, unbroken surface texture provides a stable platform for embroidery stitches to lie on. By contrast, a fabric that has a rough uneven surface will cause the embroidery stitches to lay somewhat haphazardly. This may cause the embroidery to look uneven, jagged and even distorted.

Training Exercise

The Training Instructor will pass out two garments for your inspection, a pique mesh polo shirt and a jersey knit t-shirt.

- 1. Pickup the pique mesh polo shirt and hold it close to your eyes for a detailed inspection of the surface. Notice how the material appears to have lots of tiny indentions. This textured pattern will cause some distortion when sewn on.*
- 2. Pickup the jersey knit t-shirt and hold it close to your eyes for a detailed inspection of the surface. Notice how the material appears to smooth and even. This fabric surface will not cause any distortion of the embroidery threads.*

Section 2.7 – Compensating For Fabric Characteristics

There are a number of tools and techniques for dealing with the different fabric characteristics. Each individual garment will have to be first analyzed, so that you can determine which tools to use, based on the fabric characteristics.

Section 2.7.1 – Backings

Backing or stabilizer, is a fabric material which is placed behind the garment being sewn, but in the hoop with it. Backing material is very stable and does not shift or stretch during the hooping or sewing process. Once the sewing process begins, the backing becomes attached to the garment by virtue of the embroidery process – they are sewn together. Because of this, the stable characteristics of the backing are transferred to the garment, essentially causing the fabric to be anchored in place.

Backings are also used to improve detail stitching on some items. Fabrics with coarse weaves, and knits, do not offer enough material to hold the stitching in place, especially when the embroiderer tries to produce high quality detail work.

Backings come in two basic styles: cut-away and tear-away. As the names imply, one can be easily removed at the end of the sewing process, by simply “tearing-off” the excess, while the other has to have the excess removed by cutting it with scissors.

Cut-away Backing – This type of backing material tends to be quite stable and is the most common choice by most Embroiderer’s. It comes in various weights (thicknesses) and can be purchase in rolls or precut pieces. When hooping a garment, the backing material must always be larger in area than the hoop. As a result, when the sewing is completed, the excess backing must be trimmed away from the edges of the design. Extreme care should be used in this process to avoid damaging the fabric. Fabric applications for cutaway include:

- Loose knit fabrics
- Fine knit fabrics
- Golf jerseys
- Knit golf shirts
- Lightweight woven silks
- Wool / acrylic sweaters
- Bathing suits / lycra / spandex

Always trim the excess by holding the backing, and letting the weight of the item hang down. The item being trimmed should always be facing you. By following this rule, you are never trimming blindly. You can see where you are cutting in relation to the fabric at all times. Don’t try to trim right up to the embroidery. Leave a border of approximately 1/4” to 1/2” of backing around the embroidery. Trimming any closer may create a damaging hole in the garment.

Tear-away Backing – This type of backing is not as stable as the cut-away, but it provides stability to the garment being sewn. The simplicity of being able to tear off rather than cut off the excess backing material makes this the choice of many embroiderers. However, the very nature of the material reduces its stabilizing characteristics. Tear-away backings can be used on a wide variety of garments, but are perhaps best regulated to situations, where the “back” of the embroidery can be seen, such as on towels, since it leaves a sharp clean edge to the embroidery, whereas, the cut-away leaves a certain amount of exposed backing in place. Fabric applications for tear-away include:

- Towels
- Hats
- Cotton / polyester
- Corduroy
- Sheets
- Nylon satin jackets
- Leather or vinyl

There are some specialty backings available for special situations. Two of those are adhesive backing and no-show backing.

Adhesive Backing – This is a special version of tear-away backing. One side is coated with an adhesive. There are peel-n-stick versions and wet versions available. Peel-n-stick, has a protective paper covering that is removed to expose the adhesive. The wet version requires that the adhesive coating be moistened for activation. Either way, adhesive backing is special applications where normal hooping techniques are not possible. Such applications will be discussed later.

No Show Backing – One of the negative attributes of cutaway backing, is that the remaining edges of the material after trimming, can sometimes be seen through a white or light-colored shirt. Most backing is solid white, whereas No Show Backing is semi-transparent. The end result is that the finished appearance of the embroidery looks neater.

Proper backing use is directly linked to consistent, high quality embroidery production. However, there is no single correct option, because each situation is different, resulting in production tradeoffs that can affect the end product. The solution is to experiment with different weights and combinations of backings, until you become comfortable with their use.

For example, a stiff tear-away backing tends to produce crisp stitches in designs with low stitch count and fine details. However, it may not be stable enough to use with a knit fabric. One possible solution is to use a layer of cutaway hooped with the garment. Then slip a layer of stiff tear-away between the hooped garment and the machine sewing surface. Since this is the layer upon which the under-stitches rest, it will have the most effect on the quality of the top stitches. Meanwhile, the cut-away layer will stabilize the garment.

Take the time to experiment and learn about proper backing use and how it affects the quality of sewing.

Training Exercise

The Training Instructor will pass out three samples of backing for examination.

- 1. Take the tear-away sample and pull it apart. Note how easy it tears.*
- 2. Take the cut-away sample and try to pull it apart. Note how difficult this is to perform.*
- 3. Take the no-show backing and compare it to the cutaway. Note the difference in transparency.*

Section 2.7.2 - Toppings

Topping material is used when dealing with textured surfaces. Typically, topping looks like plastic kitchen wrap, but it's quite different in the fact that it can be dissolved with water. By laying a piece of topping material on a rough surface, you are creating a smooth stable platform for the stitches to lay on. Once the sewing is complete, the excess topping can be torn off and any remaining pieces can be dissolved with water or steam.

Corduroy, pique mesh knit, sculptured knit, large twill and terrycloth are typical fabrics that require a topping to be used.

In most cases, the topping is just laid on top of the hooped item. However, with towels and terrycloth, it is usually necessary to hoop the topping with the garment.

Section 2.7.3 - Needles

There are several variables to consider when selecting a needle including: application, current size in use, needle eye size and thread type. Specific needle characteristics are as follows: needle size, needle points, and system number.

Needle Size

Needle Size denotes the diameter of the blade or shaft. The size that you would select for a job is dependent upon the thread size as well as the thickness or stiffness of the fabric. In general, the larger the needle, the larger the eye. Thus thicker threads require a larger needle so that the thread can pass easily through the eye. To test the proper needle/thread combination, thread a loose needle with about 2 feet of the chosen thread. Alternately raise and lower each end of the thread, allowing the needle to slide back and forth. If the needle slides easily by its own weight, it is suitable for that thread size.

As needles get larger in size, the diameter of the blade or shaft increases. The result is a stronger needle. For heavy, stiff fabrics, a larger size needle should be selected. For lightweight fabrics, a smaller needle can be used.

There are systems used for indicating the needle size: the metric (European) system and the Singer (United States) system. The metric system size is determined by multiplying the diameter of the blade by 100. For example, a needle with a metric system size of 80 has a blade diameter of 0.8mm (0.8 X 100). The United States system arbitrarily applies a number to these measurements. The Metric Size System increases in increments of five, while the other system increases in increments of one. Usually both systems are reflected on the needle package. (70/10, 75/11, 80/12, etc.)

Needle Points

Needles are also characterized by the type of point used. Needles generally fall into one of three categories: Sharp, Ball and Wedge.

The sharp-point needle is preferred for tightly woven fabrics, such as denim, twill, towels, corduroy, etc. As the needle passes through the garment it may actually cut some of the fibers. However, since these types of fabrics are tightly woven, this is not generally a problem.

The ball-point needle is preferred for knit goods, fleece and delicate fabrics. The cross fibers which constitute these materials are relatively far apart as compared to those in tightly woven fabrics. When a sharp-point needle encounters one of those fibers while penetrating the fabric, it cuts right through the fiber. This can create a damaging hole in the fabric. The ball-point needle pushes aside the fiber it encounters in penetration and thereby avoids making a permanent hole in the fabric.

Sharp-point and ball-point needles are available in different size points: light, medium, etc.

The wedge-point needle is used primarily on leather or tough non-woven fabrics. It cuts as it penetrates and reduces friction while piercing the fabric.

The System Number

The System Number is an additional descriptive term for needles. It is actually a combination of numbers and/or letters referring to the total length of the needle and variations in the needle eye. Each machine is setup to use a specific Needle System Number. Changing to a needle with a different System Number may require changing the timing of the machine.

Here are some examples of commonly used Needles for Tajima embroidery machines.

DBxK5 – This is considered the standard needle for many of the popular brands of commercial embroidery machines. It works well with most threads.

DBx7ST – This needle is similar to the DBxK5, except that it has a larger eye that is elongated and rectangular in shape. It's designed to be used with metallic threads.

DBx9ST – This needle is designed for use with heavy embroidery threads and has an eye size twice as large as a basic needle such as the DBxK5.

Coated Needles

Needles may be available with a special non-stick coating that will reduce heat buildup and allow the needle eye to remain clear of thread or garment fibers. These needles are referred to as Teflon coated or Cool Sew, depending upon the manufacturer. Their ability to reduce friction makes them ideal for synthetics like cordura and nylon.

Needle Orientation

There are two sides to a needle: front and back. To properly insert the needle, first locate the straight side with the long groove. This is the front. It should be facing you when it's inserted into the machine. The purpose of this groove is to guide the thread to the eye during the sewing process. It runs almost the entire length of the needle and its width is 40% of the needle width. This limits the maximum diameter of the sewing thread that can be used. The back of the needle contains the "scarf", which is a short indentation above the eye. Its purpose is to enable the bobbin hook to pass close to the centerline of the needle. (The bobbin hook contains the bobbin case and rotates around it while sewing.)

Needle Recommendation Chart		
FABRIC/GARMENT	NEEDLE SIZE	NEEDLE POINT
Canvas	80/12	Sharp point
Coated or Waterproof Fabrics	80/12	Sharp or light ball point
Corduroy	75/11	Sharp or ball point
Cotton Sheeting	70/10 to 80/12	Sharp point
Denim	75/11	Sharp point
Dress Shirt (woven)	70/10 to 80/12	Ball point
Golf Shirt (Knit)	70/10 to 80/12	Ball point
Lace	75/11	Sharp point
Leather	80/12	Sharp or wedge point
Lingerie and Silk	60/8 to 75/11	Sharp or light ball point
Lycra or Spandex	70/10 to 80/12	Medium ball point
Nylon Windbreaker	70/10 to 80/12	Light ball point
Organza	65/9	Ball point
Rayon	75/11	Ball point
Satin Jacket	75/11	Sharp point
Sweater	75/11	Sharp point
Sweatshirt	70/10 to 80/12	Light ball point
Taffeta	65/9	Ball point
Terry Cloth Towels	75/11	Sharp or ball point
Velvet	65/9	Ball point
Vinyl	75/11	Sharp point

Section 2.8 Embroidery Threads

Most new Embroiderers purchase a startup kit with their equipment that contains one type of thread. They start with and continue to use this same thread as if it's the only style available, without ever considering if there is a better alternative. As it turns out, there are several types and styles of thread and the professional Embroiderer needs to be aware of their characteristics and applications.

Commercial embroidery threads are most commonly grouped by fiber content as follows: rayon, polyester, metallic and cotton. Within each fiber group, threads are available in different thicknesses or weights.

Weight is an important consideration, as it can affect the visual quality of a design. 40 weight is considered the standard for the industry. A higher number is thinner, while a lower number is thicker. Most designs are digitized with a 40 weight thread in mind. For example, a large area designed to be filled with stitches created using 40 weight thread, would appear nice and solid upon completion. If the Embroiderer switched to 60 weight thread, which is not as thick, then the "filled" area would have many gaps. One trick for reducing thread counts is to use a heavier thread such as 35 weight. Because it is thicker, fewer stitches are needed to cover the same area than if a 40 weight thread were being used.

NOTE: This discussion is focused on the "top" threads. Bobbin threads will be addressed later.

2.8.1 Rayon

Rayon thread has been the mainstay of the commercial embroidery industry for many years. It is soft, brilliant and durable. Rayon is available in a wider range of colors, than any other thread. It can withstand dry cleaning and multiple washings. However, some colors do not resist bleach very well.

40 weight is considered the standard for rayon. Several manufacturers offer it in other weights such as 60, 35, 30 and 12. 60 weight rayon is ideal for creating smaller detail work. To be successful, it should only be used with a smaller needle such as a 60 or 65. When using a heavier weight thread such as 30 or 35, a larger needle will be required.

2.8.2 Polyester

Polyester thread has gained popularity in the last few years and is fast overtaking rayon as the thread of choice amongst commercial Embroiderers. Though not available in as many colors as rayon, there are still a wide range of choices, with more being added every year by the manufacturers. Polyester thread is considered more durable than rayon and can withstand the harsh effects of bleaching. This makes it the ideal choice for garments that will undergo frequent washings, such as service uniforms that are worn in "dirty" environments.

Like rayon, the standard weight for polyester is 40. Some manufacturers offer it in 30 weight as well. Because polyester is slightly stiffer than rayon, fine design details may need to be digitized differently when using it.

Another characteristic of polyester thread is that it is more elastic than rayon. Thus, some stretching followed by rebounding can occur while sewing. The result is tiny loops forming on top of the embroidery design. Therefore, the thread tensions should be increased (on the machine) to control this problem.

2.8.3 Metallic

Metallic thread is a specialty thread that is used to create unique textures and special effects. Their construction is very unique and they come in three different variations: core-wrapped, twisted and flat-foil. All of them have some sort of foil used in their construction. These foils are generally metalized polyester. Core-wrapped is the most common and gives the smoothest, most even shine. It's created by wrapping the foil around a core yarn of rayon, polyester or nylon, resulting in a round thread with a metallic covering.

Metallic threads can be difficult to use. They are less flexible than rayon or polyester and do not flow easily. In fact, there is a tendency for them to "kink" while sewing which leads to thread breaks and "birdnests". Thus, when sewing with metallic thread, slower machine speeds are required along with the undivided attention of the machine operator.

Once again, 40 weight is the most common size. However, even though it's approximately the same thickness as a 40 weight rayon, the density of an area sewn with metallic should be programmed 5 to 10 percent less than if rayon were being used.

2.8.4 Cotton

Rayon and polyester threads are known for their high luster finishes. Cotton on the other-hand has a low luster, almost dull finish. This can be quite useful for creating different looks. It is available in many weights, with 40 being the standard, but a limited number of colors. It withstands repeated washings very well, but not bleaching. Cotton is an excellent choice for sewing designs with high detail. It's also very useful for creating designs where the desire is for a low key, understated appearance.

2.8.5 Thread Care

Thread should be stored in a cool, dark location. Manufacturers suggest a humidity level of 40% to 60% and a temperature ranging between 50 and 70 degrees Fahrenheit. Direct sunlight is also not good for thread, as it can cause discoloration over time. Threads should also be kept covered to prevent dust and lint buildup, which will cause the thread to soften, which leads to thread breaks. Thread tends to be somewhat tender. Dropping it will cause "bruising" where the thread contacts the floor. This is actually a weak spot that will cause thread breaks during sewing.

Section 2.9 – Embroidery Bobbins

The sewing process requires two different threads to make a stitch – the top thread and the bobbin thread. In fact a stitch is formed when the two are joined together. Since the bobbin thread is not seen, little attention is paid to it. But in actuality it's a very important part of the embroidery process.

Many Embroiderers don't realize that there are many types of bobbins available today. Most machines are designed such that you can wind your own bobbins, but this is not recommended due to the low cost of purchasing pre-wound ones. Typically, pre-wound bobbins are available in the following fiber types: continuous-filament polyester, spun polyester, cotton and nylon

- **Continuous-Filament Polyester** – This is the most popular type of bobbin among U.S. Embroiderers. It is strong, thin and consistent and does not leave behind any lint. On the other hand it has the potential to leave a waxy deposit on bobbin cases. In addition, its thinness sometimes makes it hard to adjust the tension properly.
- **Spun Polyester** – A growing number of Embroiderers are turning to this bobbin type as it has a texture similar to cotton, but without the lint problems associated with cotton.
- **Cotton** – This bobbin thread is not as strong as the synthetics, but Embroiderers usually choose it because of its texture, which allows for a wide range of bobbin tension adjustments. The main drawback for cotton thread is the amount of lint that it gives off, which causes undesirable buildups in the bobbin case.
- **Nylon** – Nylon bobbin thread is perhaps the strongest of all bobbin thread types. However, its small diameter and slick texture make it difficult to maintain consistent tension, which can lead to sewing quality problems.

There are two bobbin sizes, designated as L or M. Your machine supplier will designate which one fits your machine. L is the most common for commercial embroidery machines. It holds between 130 and 154 yards of bobbin thread. The M bobbin can hold up to 235 yards of bobbin thread.

2.9.1 Bobbin Tips

- Use care when oiling the bobbin hook area, so as not to allow oil to get into the actual bobbin. This will lead to thread breaks, poor sewing, and oil stains on the garment.
- The first last 10% of a bobbin should be considered unusable. Avoid running bobbins all the way to the end, as the tension tends to fluctuate greatly with the last 10% of the thread.
- When running a multi-head machine, when one bobbin runs out, change all of them. Otherwise, you will be stopping the machine over and over as the others run out. Bobbins are cheap, so don't be afraid to discard them with thread remaining on them.

Section 2.10 - Review And Testing

1. Cut-Away Backing would be a good choice for which garment?
 - A. Denim Shirt
 - B. T-Shirt
 - C. Twill Dress Shirt
 - D. Satin Jacket

2. Which thread should be used for Uniforms that will be laundered frequently?
 - A. Rayon
 - B. Polyester
 - C. Metallic
 - D. Cotton

3. When sewing on thin, white golf shirts, what would be the best backing choice?
 - A. Tear-Away
 - B. Adhesive
 - C. No-Show
 - D. Water soluble topping

4. A sharp point needle is the best choice for which fabric?
 - A. silk
 - B. cashmere
 - C. denim
 - D. fleece

5. Over-tightening a hoop may cause?
 - A. hoop burn
 - B. wrinkles
 - C. a hole in the garment
 - D. a broken needle

6. When sewing on caps the design must be?
 - A. a single color
 - B. wide
 - C. rotated 90 degrees
 - D. sewn backwards

7. The most common cause of cap embroidery problems is?
 - A. Wrong type of thread
 - B. A design that is too large
 - C. Machine speed is too slow
 - D. Failure to use a topping.

8. Which garment would require the use of a topping?
- A. bath towel
 - B. denim cap
 - C. nylon jacket
 - D. oxford shirt
9. When hooping, the fabric should be taut but not:
- A. thick
 - B. bunched up
 - C. wrinkled
 - D. stretched
10. Consider using the hoopless embroidery method (involving adhesive backing) when the garment:
- A. Can't be hooped easily
 - B. Is textured
 - C. Is stained
 - D. Is wrinkled

Design: TEAM

Dimension: 2.55" x 2.34"

Stitches: 5797

Thread changes: 7













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1	Indigo 1166 Madeira 40 52.40 " 218 stc. (218)	2	Straw 1083 Madeira 40 39.80 " 207 stc. (425)	3	St. Patrick's... 1051 Madeira 40 598.39 " 2599 stc. (30...	4	Jet Black 1000 Madeira 40 208.43 " 1217 stc. (42...
5	White 1001 Madeira 40 32.48 " 159 stc. (4400)	6	Nickel 1011 Madeira 40 46.61 " 306 stc. (4706)	7	Strawberry 1147 Madeira 40 200.28 " 1091 stc. (57...		



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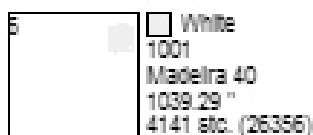
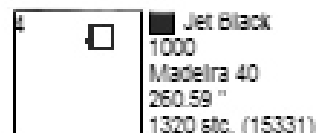
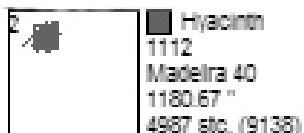
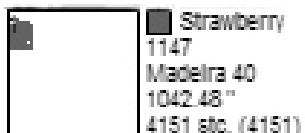
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5		Nickel 1011 Madeira 40 16.57 " 99 stc. (2958)	6		Indigo 1166 Madeira 40 126.26 " 699 stc. (3657)	7		St. Patrick's... 1051 Madeira 40 315.00 " 1667 stc. (53...	8		White 1001 Madeira 40 43.46 " 218 stc. (5542)
9		Jet Black 1000 Madeira 40 30.12 " 223 stc. (5765)	10		Indigo 1166 Madeira 40 302.36 " 1569 stc. (73...						

Design: HIKE

Dimension: 10.85" x 5.55"

Stitches: 33443

Thread changes: 7










Design: STARS
Thread changes: 7

Dimension: 10.21" x 10.12"

Stitches: 83739



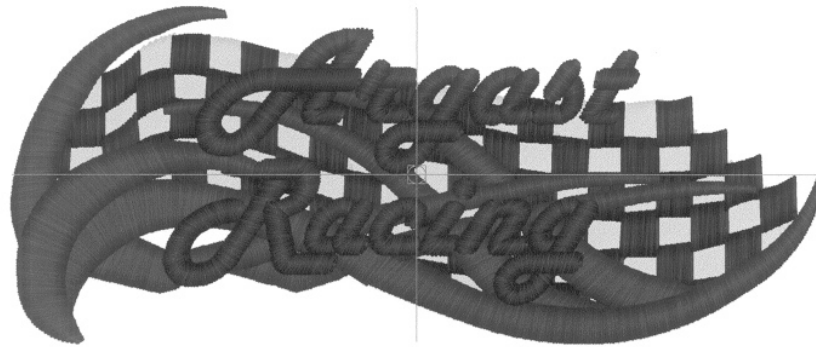
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5	 Straw 1083 Madeira 40 768.31 " 2316 stc. (67...	6	 Indigo 1166 Madeira 40 2137.72 " 12901 stc. (8...	7	 Straw 1083 Madeira 40 847.68 " 3297 stc. (83...		



Design: ARGAS
Thread changes: 5

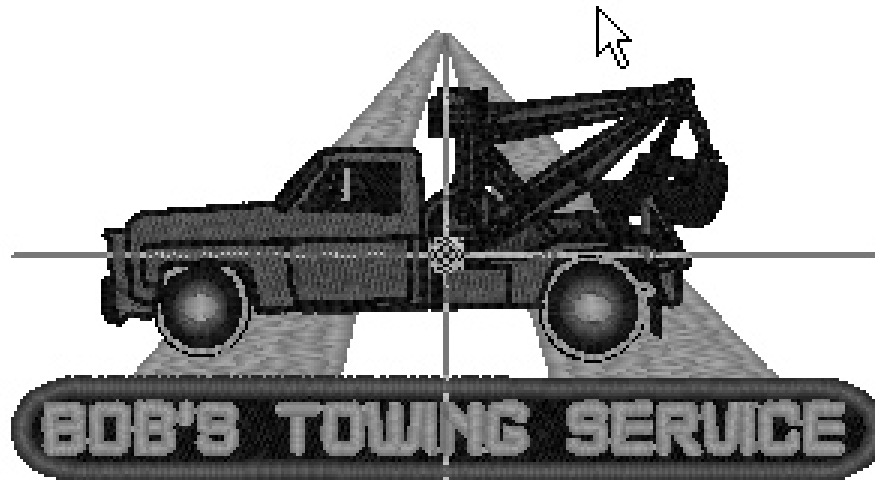
Dimension: 4.28" x 1.78"

Stitches: 11040



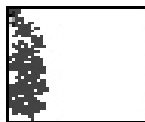
Page 1 of 1

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5	 Indigo 1166 Madeira 40 568.43 " 2944 stc. (11...						

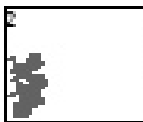


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	<p>5 Rust 1181 Madelra 40 304.25 " 1710 stc. (10537)</p>		<p>6 Jet Black 1000 Madelra 40 488.35 " 2739 stc. (13276)</p>		<p>7 Strawberry 1147 Madelra 40 545.12 " 2857 stc. (16133)</p>		<p>8 Nickel 1011 Madelra 40 37.68 " 253 stc. (16386)</p>
	<p>9 Jet Black 1000 Madelra 40 84.80 " 569 stc. (16955)</p>						



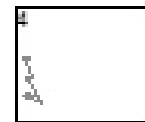
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Madelra 40
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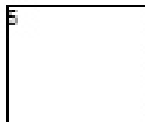
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2997 stc. (4851)



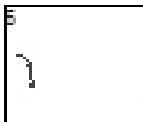
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1112
Madelra 40
246.77 "
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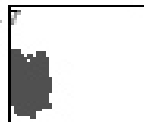
4 Paprika
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Madelra 40
30.98 "
188 stc. (6354)



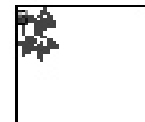
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Madelra 40
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2 stc. (6356)



6 St. Patrick's Gr...
1051
Madelra 40
5.79 "
30 stc. (6386)



7 Indigo
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Madelra 40
563.54 "
4803 stc. (11189)



8 St. Patrick's Gr...
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Madelra 40
150.28 "
872 stc. (12061)



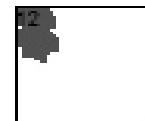
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Madelra 40
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2078 stc. (14139)



10 Strawberry
1147
Madelra 40
177.56 "
870 stc. (15009)



11 Indigo
1166
Madelra 40
24.72 "
147 stc. (15156)



12 Indigo
1166
Madelra 40
405.67 "
3476 stc. (18632)



13 Willow Green
1246
Madelra 40
25.87 "
155 stc. (18787)

Monogram And Embroidery Placement Chart

Garment Description	Typical Location	Garment Size	Max Design Size	Suggested Placement	Backing*	Topping**	Needle***
Polo/Golf/Placket Shirt	Left or Right Chest	Mens - S	2.25" H X 4.50" W	6" down from shoulder seam and 4" over from center	cutaway	optional	75/11 BP
Polo/Golf/Placket Shirt	Left or Right Chest	Mens - M	2.25" H X 4.50" W	6" down from shoulder seam and 4" over from center	cutaway	optional	75/11 BP
Polo/Golf/Placket Shirt	Left or Right Chest	Mens - L	2.25" H X 4.50" W	6 1/2" down from shoulder seam and 4 1/2" over from center	cutaway	optional	75/11 BP
Polo/Golf/Placket Shirt	Left or Right Chest	Mens - XL	2.25" H X 4.50" W	7" down from shoulder seam and 5" over from center	cutaway	optional	75/11 BP
Polo/Golf/Placket Shirt	Left or Right Chest	Mens - XXL	2.25" H X 4.50" W	7" down from shoulder seam and 5" over from center	cutaway	optional	75/11 BP
Polo/Golf/Placket Shirt	Left or Right Chest	Ladies - S	2.25" H X 4.50" W	5" down from shoulder seam and 4" over from center	cutaway	optional	75/11 BP
Polo/Golf/Placket Shirt	Left or Right Chest	Ladies - M	2.25" H X 4.50" W	5" down from shoulder seam and 4" over from center	cutaway	optional	75/11 BP
Polo/Golf/Placket Shirt	Left or Right Chest	Ladies - L	2.25" H X 4.50" W	5 1/2" down from shoulder seam and 4 1/2" over from center	cutaway	optional	75/11 BP
Polo/Golf/Placket Shirt	Left or Right Chest	Ladies - XL	2.25" H X 4.50" W	6" down from shoulder seam and 5" over from center	cutaway	optional	75/11 BP
Polo/Golf/Placket Shirt	Left or Right Chest	Ladies - XXL	2.25" H X 4.50" W	6" down from shoulder seam and 5" over from center	cutaway	optional	75/11 BP
Polo/Golf/Placket Shirt	Left or Right Sleeve (SS Only)	All Sizes	2.00" H X 3.00" W	Bottom of design 2" above edge of sleeve	cutaway	optional	75/11 BP
Polo/Golf/Placket Shirt	Top Center Back	All Sizes	2.25" H X 4.50" W	Top of design 2" below bottom edge of collar	cutaway	optional	75/11 BP
T-Shirt & Sweatshirt	Left or Right Chest	Mens - S	2.25" H X 4.50" W	6" down from shoulder seam and 4" over from center	cutaway	optional	75/11 BP
T-Shirt & Sweatshirt	Left or Right Chest	Mens - M	2.25" H X 4.50" W	6" down from shoulder seam and 4" over from center	cutaway	optional	75/11 BP
T-Shirt & Sweatshirt	Left or Right Chest	Mens - L	2.25" H X 4.50" W	6 1/2" down from shoulder seam and 4 1/2" over from center	cutaway	optional	75/11 BP
T-Shirt & Sweatshirt	Left or Right Chest	Mens - XL	2.25" H X 4.50" W	7" down from shoulder seam and 5" over from center	cutaway	optional	75/11 BP
T-Shirt & Sweatshirt	Left or Right Chest	Mens - XXL	2.25" H X 4.50" W	7" down from shoulder seam and 5" over from center	cutaway	optional	75/11 BP
T-Shirt & Sweatshirt	Left or Right Chest	Ladies - S	2.25" H X 4.50" W	5" down from shoulder seam and 4" over from center	cutaway	optional	75/11 BP
T-Shirt & Sweatshirt	Left or Right Chest	Ladies - M	2.25" H X 4.50" W	5" down from shoulder seam and 4" over from center	cutaway	optional	75/11 BP
T-Shirt & Sweatshirt	Left or Right Chest	Ladies - L	2.25" H X 4.50" W	5 1/2" down from shoulder seam and 4 1/2" over from center	cutaway	optional	75/11 BP
T-Shirt & Sweatshirt	Left or Right Chest	Ladies - XL	2.25" H X 4.50" W	6" down from shoulder seam and 5" over from center	cutaway	optional	75/11 BP
T-Shirt & Sweatshirt	Left or Right Chest	Ladies - XXL	2.25" H X 4.50" W	6" down from shoulder seam and 5" over from center	cutaway	optional	75/11 BP
T-Shirt & Sweatshirt	Left or Right Sleeve (SS Only)	All Sizes	2.00" H X 3.00" W	Bottom of design 2" above edge of sleeve	cutaway	optional	75/11 BP
T-Shirt & Sweatshirt	Top Center Back	All Sizes	2.25" H X 4.50" W	Top of design 2" below bottom edge of collar	cutaway	optional	75/11 BP
T-Shirt & Sweatshirt	Full Back-Designs < 6" high	All Sizes	6.00" H X 10.00"W	Top of design 4" below base of neck	cutaway	optional	75/11 BP
T-Shirt & Sweatshirt	Full Back-Designs > 6" high	All Sizes	10.00" H X 10.00"W	Top of design 3" below base of neck	cutaway	optional	75/11 BP
T-Shirt & Sweatshirt	Full Front-Designs < 6" high	All Sizes	6.00" H X 10.00"W	Top of design 4" below base of neck	cutaway	optional	75/11 BP
T-Shirt & Sweatshirt	Full Front-Designs > 6" high	All Sizes	10.00" H X 10.00"W	Top of design 3" below base of neck	cutaway	optional	75/11 BP
Sweater	Left or Right Chest	Mens - S	2.25" H X 4.50" W	6" down from shoulder seam and 4" over from center	cutaway	optional	75/11 BP
Sweater	Left or Right Chest	Mens - M	2.25" H X 4.50" W	6" down from shoulder seam and 4" over from center	cutaway	optional	75/11 BP
Sweater	Left or Right Chest	Mens - L	2.25" H X 4.50" W	6 1/2" down from shoulder seam and 4 1/2" over from center	cutaway	optional	75/11 BP
Sweater	Left or Right Chest	Mens - XL	2.25" H X 4.50" W	7" down from shoulder seam and 5" over from center	cutaway	optional	75/11 BP
Sweater	Left or Right Chest	Mens - XXL	2.25" H X 4.50" W	7" down from shoulder seam and 5" over from center	cutaway	optional	75/11 BP
Sweater	Left or Right Chest	Ladies - S	2.25" H X 4.50" W	5" down from shoulder seam and 4" over from center	cutaway	optional	75/11 BP
Sweater	Left or Right Chest	Ladies - M	2.25" H X 4.50" W	5" down from shoulder seam and 4" over from center	cutaway	optional	75/11 BP
Sweater	Left or Right Chest	Ladies - L	2.25" H X 4.50" W	5 1/2" down from shoulder seam and 4 1/2" over from center	cutaway	optional	75/11 BP
Sweater	Left or Right Chest	Ladies - XL	2.25" H X 4.50" W	6" down from shoulder seam and 5" over from center	cutaway	optional	75/11 BP
Sweater	Left or Right Chest	Ladies - XXL	2.25" H X 4.50" W	6" down from shoulder seam and 5" over from center	cutaway	optional	75/11 BP

Jacket	Left or Right Chest	S	2.25" H X 4.50" W	7" down from shoulder seam and 4" over from center	cutaway	optional	75/11 SP
Jacket	Left or Right Chest	M	2.25" H X 4.50" W	7" down from shoulder seam and 4" over from center	cutaway	optional	75/11 SP
Jacket	Left or Right Chest	L	2.25" H X 4.50" W	7 1/2" down from shoulder seam and 4 1/2" over from center	cutaway	optional	75/11 SP
Jacket	Left or Right Chest	XL	2.25" H X 4.50" W	8" down from shoulder seam and 5" over from center	cutaway	optional	75/11 SP
Jacket	Left or Right Chest	XXL	2.25" H X 4.50" W	8" down from shoulder seam and 5" over from center	cutaway	optional	75/11 SP
Jacket	Full Back-Designs < 6" high	All Sizes	6.00" H X 10.00"W	Top of design 4" below base of neck	cutaway	optional	75/11 SP
Jacket	Full Back-Designs > 6" high	All Sizes	10.00" H X 10.00"W	Top of design 3" below base of neck	cutaway	optional	75/11 SP
Turtleneck	Left or Right Chest	Mens S	2.25" H X 4.50" W	6" down from shoulder seam and 4" over from center	cutaway	optional	75/11 BP
Turtleneck	Left or Right Chest	Mens - M	2.25" H X 4.50" W	6" down from shoulder seam and 4" over from center	cutaway	optional	75/11 BP
Turtleneck	Left or Right Chest	Mens - L	2.25" H X 4.50" W	6 1/2" down from shoulder seam and 4 1/2" over from center	cutaway	optional	75/11 BP
Turtleneck	Left or Right Chest	Mens - XL	2.25" H X 4.50" W	7" down from shoulder seam and 5" over from center	cutaway	optional	75/11 BP
Turtleneck	Left or Right Chest	Mens - XXL	2.25" H X 4.50" W	7" down from shoulder seam and 5" over from center	cutaway	optional	75/11 BP
Turtleneck	Left or Right Chest	Ladies - S	2.25" H X 4.50" W	5" down from shoulder seam and 4" over from center	cutaway	optional	75/11 BP
Turtleneck	Left or Right Chest	Ladies - M	2.25" H X 4.50" W	5" down from shoulder seam and 4" over from center	cutaway	optional	75/11 BP
Turtleneck	Left or Right Chest	Ladies - L	2.25" H X 4.50" W	5 1/2" down from shoulder seam and 4 1/2" over from center	cutaway	optional	75/11 BP
Turtleneck	Left or Right Chest	Ladies - XL	2.25" H X 4.50" W	6" down from shoulder seam and 5" over from center	cutaway	optional	75/11 BP
Turtleneck	Left or Right Chest	Ladies - XXL	2.25" H X 4.50" W	6" down from shoulder seam and 5" over from center	cutaway	optional	75/11 BP
Turtleneck	Collar-front center or front left	All Sizes	1.00" H X 2.00" W	Left neck area centered between front and left shoulder seam	cutaway	optional	75/11 BP
Collared Shirt	Left or Right Chest	Mens S	2.25" H X 4.50" W	6" down from shoulder seam and 4" over from center	cutaway	optional	75/11 SP
Collared Shirt	Left or Right Chest	Mens - M	2.25" H X 4.50" W	6" down from shoulder seam and 4" over from center	cutaway	optional	75/11 SP
Collared Shirt	Left or Right Chest	Mens - L	2.25" H X 4.50" W	6 1/2" down from shoulder seam and 4 1/2" over from center	cutaway	optional	75/11 SP
Collared Shirt	Left or Right Chest	Mens - XL	2.25" H X 4.50" W	7" down from shoulder seam and 5" over from center	cutaway	optional	75/11 SP
Collared Shirt	Left or Right Chest	Mens - XXL	2.25" H X 4.50" W	7" down from shoulder seam and 5" over from center	cutaway	optional	75/11 SP
Collared Shirt	Left or Right Chest	Ladies - S	2.25" H X 4.50" W	5" down from shoulder seam and 4" over from center	cutaway	optional	75/11 SP
Collared Shirt	Left or Right Chest	Ladies - M	2.25" H X 4.50" W	5" down from shoulder seam and 4" over from center	cutaway	optional	75/11 SP
Collared Shirt	Left or Right Chest	Ladies - L	2.25" H X 4.50" W	5 1/2" down from shoulder seam and 4 1/2" over from center	cutaway	optional	75/11 SP
Collared Shirt	Left or Right Chest	Ladies - XL	2.25" H X 4.50" W	6" down from shoulder seam and 5" over from center	cutaway	optional	75/11 SP
Collared Shirt	Left or Right Chest	Ladies - XXL	2.25" H X 4.50" W	6" down from shoulder seam and 5" over from center	cutaway	optional	75/11 SP
Collared Shirt	Top Center Back	All Sizes	2.25" H X 4.50" W	Top of design 2" below bottom edge of collar	cutaway	optional	75/11 SP
Collared Shirt	Monogram - left cuff	All Sizes	0.50" H X 1.00" W	1" from cuff center toward button hole, 1/4" to 1/2" above cuff edge	tearaway	optional	75/11 SP
Collared Shirt	Monogram - left collar	All Sizes	0.50" H X 1.00" W	1/4" above button hole, centered between collar edges	tearaway	optional	75/11 SP

Wash Cloth (3 letter mono)	Bottom Center or Right corner	All Sizes	1.00" H X 2.00" W	1 1/2" above hem or 1" above border OR angled in bottom right corner	tearaway	required	75/11 SP
Wash Cloth (1 letter mono)	Bottom Center or Right corner	All Sizes	1.00" H X 1.50" W	1 1/2" above hem or 1" above border OR angled in bottom right corner	tearaway	required	75/11 SP
Golf Towel (3 letter mono)	Bottom Center	All Sizes	2.00" H X 3.00" W	2" above hem or 1 1/2" above border	tearaway	required	75/11 SP
Golf Towel (1 letter mono)	Bottom Center	All Sizes	2.00" H X 2.00" W	2" above hem or 1 1/2" above border	tearaway	required	75/11 SP
Hand Towel (3 letter mono)	Bottom Center	All Sizes	3.00" H X 4.00" W	2" above hem or 1 1/2" above border	tearaway	required	75/11 SP
Hand Towel (1 letter mono)	Bottom Center	All Sizes	3.00" H X 3.00" W	2" above hem or 1 1/2" above border	tearaway	required	75/11 SP
Bath Towel (3 letter mono)	Bottom Center	All Sizes	4.00" H X 5.00" W	4" above hem or 2" above border	tearaway	required	75/11 SP
Bath Towel (1 letter mono)	Bottom Center	All Sizes	4.00" H X 4.00" W	4" above hem or 2" above border	tearaway	required	75/11 SP
Beach Towel (Name)	Bottom Center	All Sizes	3.00" H X 10.00" W	4" above hem or 2" above border	tearaway	required	75/11 SP
Napkins (3 Letter mono)	Bottom Center or Right corner	All Sizes	1.00" H X 2.00" W	1/2" to 1" from the edge. Bottom Center or angled in bottom right corner	tearaway	optional	75/11 SP
Napkins (1 Letter mono)	Bottom Center or Right corner	All Sizes	1.00" H X 1.50" W	1/2" to 1" from the edge. Bottom Center or angled in bottom right corner	tearaway	optional	75/11 SP
Pillowcase (3 letter mono)	Open end, center	All Sizes	2.00" H X 3.00" W	Centered between edge of open end and stitching on the hem or border	tearaway	optional	75/11 SP
Pillowcase (1 letter mono)	Open end, center	All Sizes	2.00" H X 2.00" W	Centered between edge of open end and stitching on the hem or border	tearaway	optional	75/11 SP
Sheets (3 letter mono)	Top Center	All Sizes	2.00" H X 3.00" W	Bottom of monogram centered 2" above wide hem line on top of sheet	tearaway	optional	75/11 SP
Sheets (1 letter mono)	Top Center	All Sizes	2.00" H X 2.00" W	Bottom of monogram centered 2" above wide hem line on top of sheet	tearaway	optional	75/11 SP
Neckties	Bottom Center	All Sizes	0.50" H X 1.00" W	2" to 2 1/2" above bottom edge	tearaway	optional	75/11 SP