Training:

HAPPY HCS-1201 Voyager Operations & Maintenance

(for Standard non-color monitor version)

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HAPPY HCS-1201 Voyager Operations & Maintenance

Chapter 1: Introduction & Embroidery Theory

- **Overview of your machine**
  - Diagram of major parts
- **Overview of major mechanical systems**
  - Color change system, sewing system, X-Y pantograph
- **Control Panel Introduction & Orientation**
  - Adjustment / emergency stop
  - Power-on & navigating to the main sewing screen
  - Shutting down
- **Other Important Screens: A brief introduction**
  - Function menu
  - Main menu, pages 1 and 2
- **Embroidery basics & theory**
  - About stitches, sewing quality, stitch file formats, the embroidery needle

Overview: A Quick Tour of the Machine

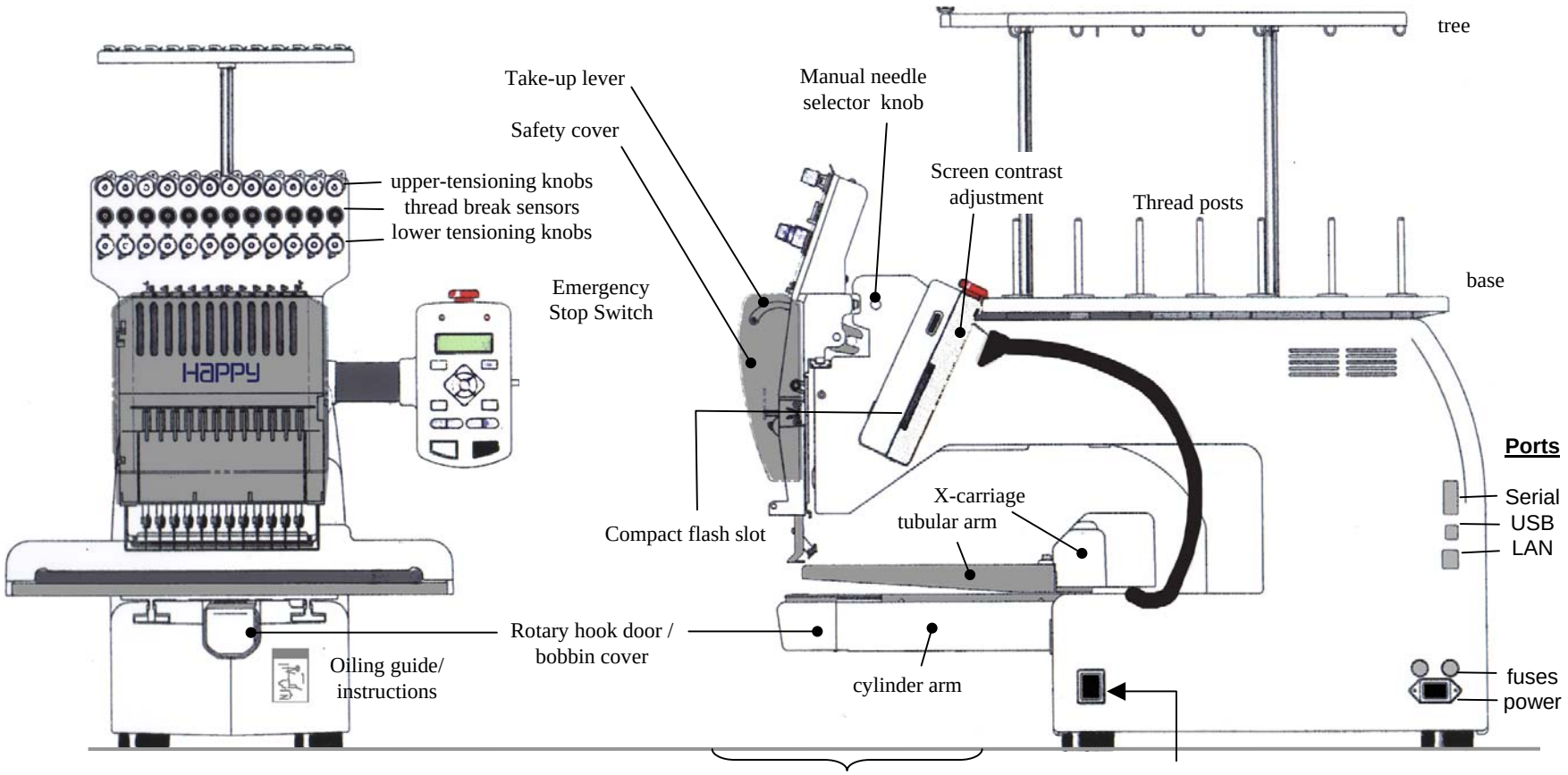


Table area beneath cylinder arm:: for tubular goods, table or other object under cylinder arm can provide support. For garment. However, cap driver requires that surface be at least 4" below level of feet.

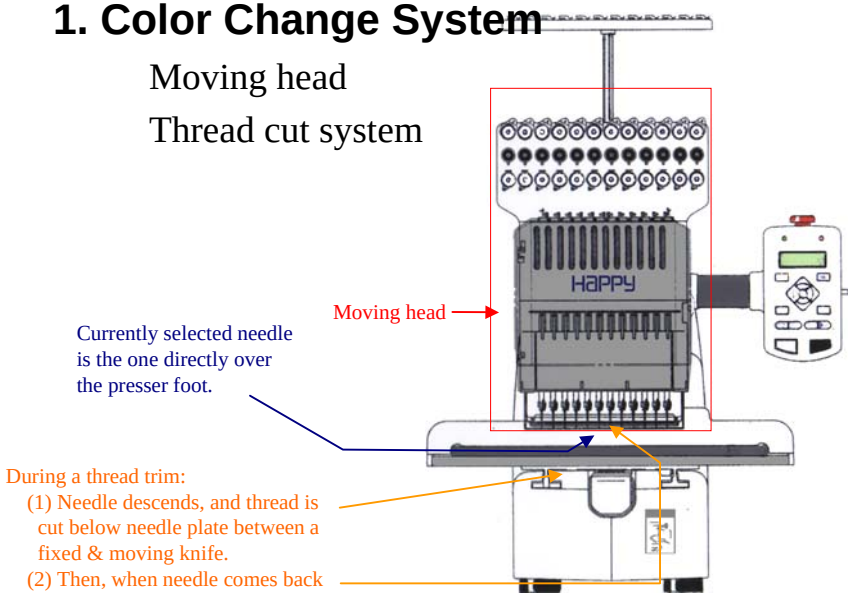
Main power switch: Press and hold continuously for 1-2 sec. to power on

Overview: 3 key mechanical systems

1. Color Change System

Moving head

Thread cut system

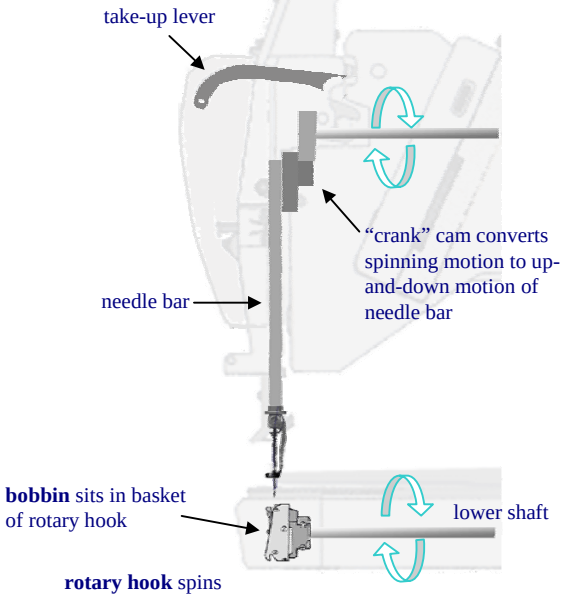


2. Sewing System

Take-Up Lever

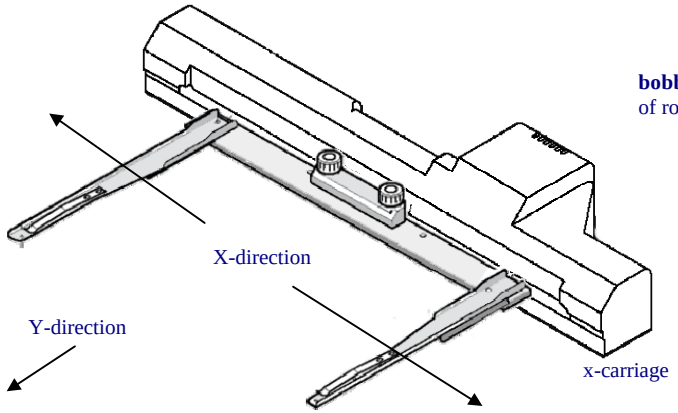
Needle bar

Rotary hook / bobbin



Side view of machine: head and sewing arm

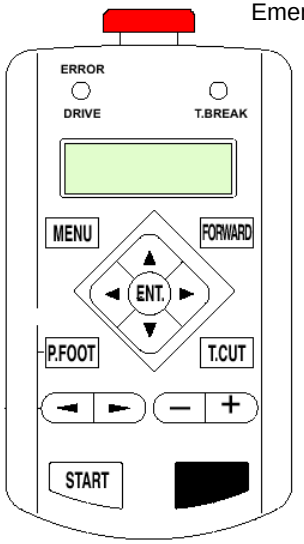
3. X-Y Pantograph



Control Panel Intro: Quick Orientation

Emergency Stop

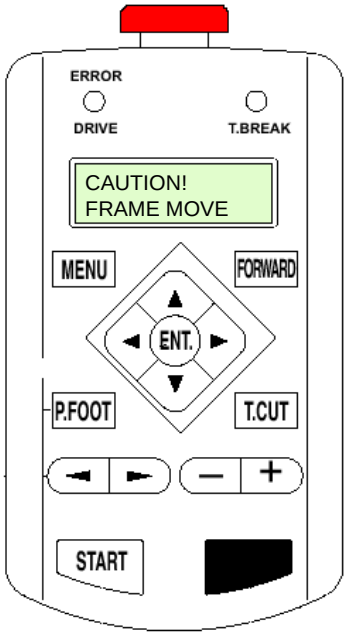
This button is used to shut the machine off in case of emergency. The machine will remember the last sewn stitch but may be slightly off alignment when re-started. To recover from emergency stop, clear any problem, un-twist the button to re-set it and power on normally. The machine will not power on unless the button is re-set to the "on" position.



Emergency Stop

Initial Power-On

Power on your machine with the black switch located on the side of the machine. The message below appears.



Press ENT to continue.

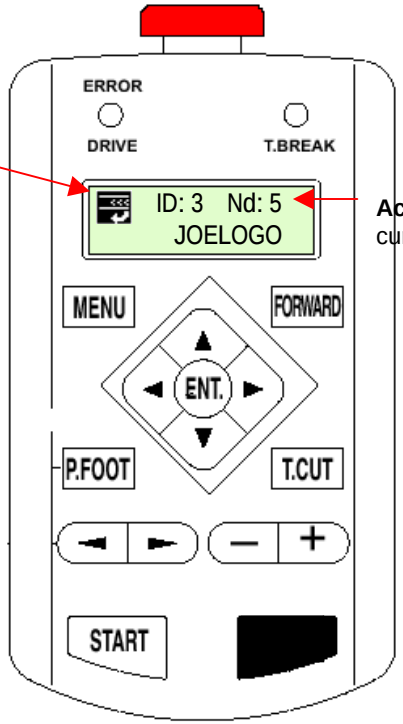
Control Panel Intro: Power On to the Main (Drive) Screen

Getting to the Main Screen

This is the main “drive” screen. The machine will not sew or accept design transfers via cable unless it is in this mode. Learn how to get to this screen either from power-on or by pressing MENU.

Origin Symbol: shows that the current design is at the origin and ready to begin.

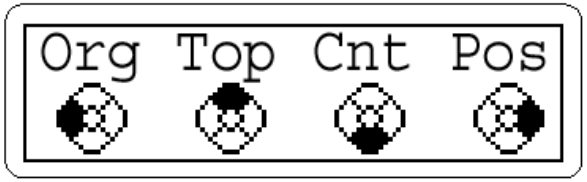
This is the main “drive” screen.



Active needle: current needle

The FUNCTION menu

In addition to the main Drive screen, there are 2 other important menus to know: The Main Menu (shown on the next page) and the Function menu, shown below, which is accessed by pressing AND holding the MENU button.



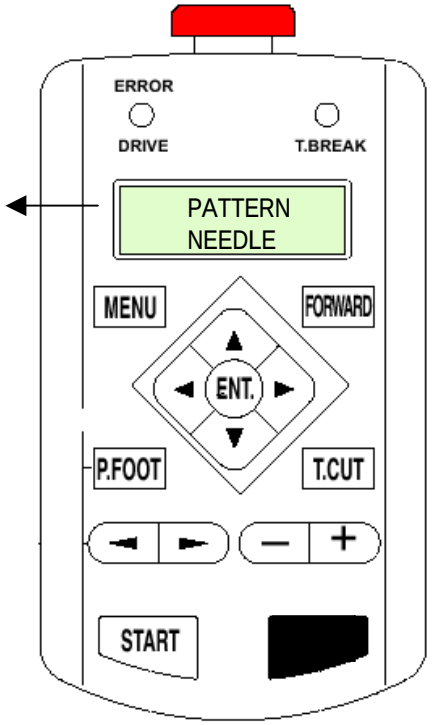
Control Panel Intro: Other Important Screens

The Main Menu

The other - and most important - menu is the Main Menu, accessed from the main Drive screen by pressing MENU as shown below.

The machine can only display 2 items of the main menu at a time. Use the up and down arrows to navigate to adjacent items.

Pattern
Needle
Card
Convert
F Position
Create
Letter
Other

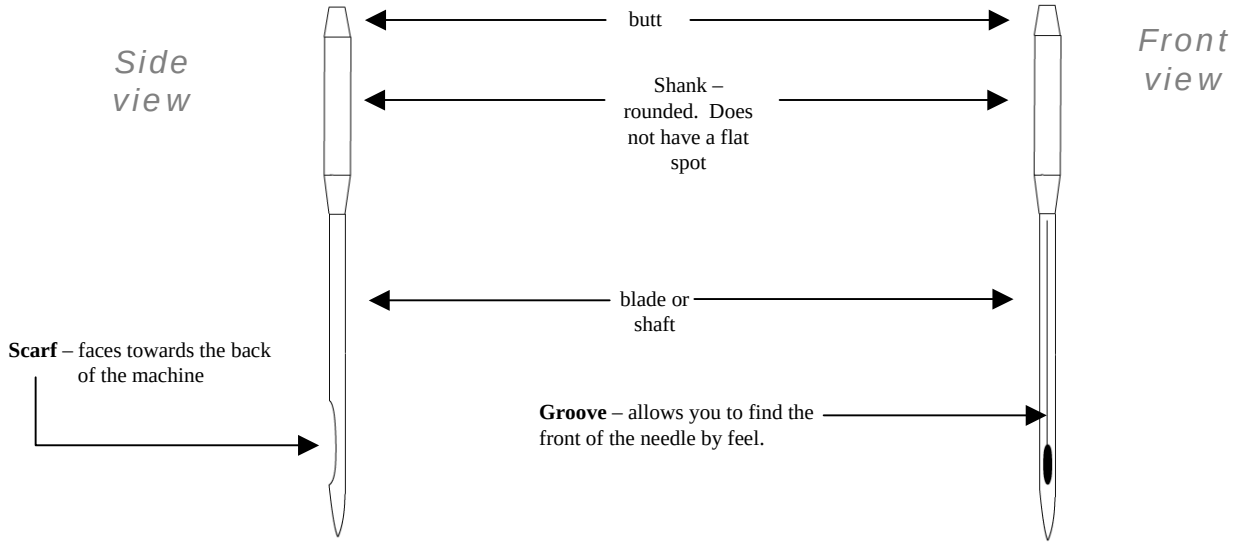


Key Embroidery Basics / Theory

- **About Stitches :**
  - **All stitches are formed** by a ½ loop of colored thread looped with ½ loop of bobbin thread.
  - **Max and minimum length**: Must be between 1mm (.04 inch) and 12.7mm (1/2 inch). Too short causes thread breaks. Too long, stitches are too loose.
- **3 Major Factors Affecting Sewing Quality that you can control:**
  - **Tension** – once properly set, should rarely require re-adjustment. We will cover this in class.
  - **Hooping** – proper hooping is a must. Not too tight, not too loose. We will cover this in class.
  - **Digitizing** – hire a digitizing service and/or learn how to digitize in digitizing classes.
- **Sewing file format used in embroidery: DST**
  - All commercial machines read this format
  - Does not have color information – must load the design into the machine AND tell it which colors to sew.
  - Limited in editability – the design must be sewn at the size it was digitized.
- **About Embroidery Thread**
  - Upper (colored) thread
    - **Can be polyester or rayon, usually polyester. Standard is 40 weight**
    - **Comes in several sizes: 5,000 meter cones to 1,000 meter cones.**
    - **Handle carefully: physical contact, oil/dirt, moisture can prevent it from unspooling smoothly and catch**
  - Bobbin thread
    - **L-type, approximately 350 yards per spool. Bobbin thread will have to be changed more frequently than upper thread**
    - **Lasts approximately 25,000 to 60,000 stitches**

Key Embroidery Basics (continued)

- **Embroidery Needles:**
  - **Type DB-K5, standard size is 75/11 ballpoint for most applications.** Alternate needle for sewing caps and other tightly-woven goods (heavy canvas) is 80/12 sharp point for better penetration
  - **The width of the shaft of an embroidery needle** limits the the finest possible detail (the smallest possible stitch). Standard size (75/11) needles are .75 mm across, so stitches must be at least a little wider than the hole that the needle punches in the fabric (minimum distance 1mm)
  - **Needles are subject to wear!** Over time, burred surfaces and other wear can cause problems. Be prepared to change needles frequently especially with heavy use.



Chapter 2: Machine Setup, Control Panel Operation

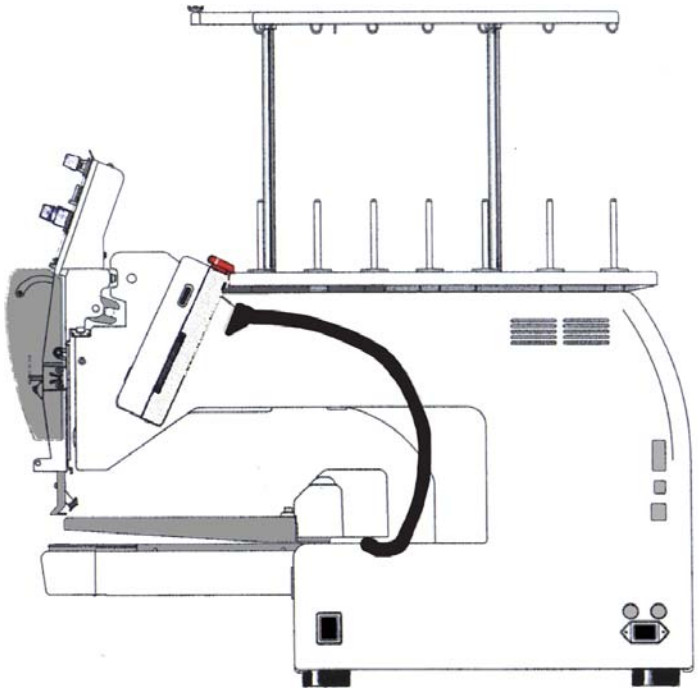
- **Proper Machine Setup**
  - Machine environment
  - Upper threading
  - Bobbin threading & Tensioning
- **Control Panel 2**
  - Sewing controls, what your machine is telling you on the main screen
  - Important Main Menu functions in detail: Pattern, Setting, Needle, Read, Frame, Position
- **Transferring Designs into the machine, detailed steps**
  - Via Compact Flash
  - Via USB

Proper Machine Setup: Environment

Temperature and Humidity-Controlled Environment
Thread must pass up from cones through guide holes in thread tree and through every specific point along the face of the sewing head. Thread must be “docked” at the thread holder spring.

Clean, protected electrical power
Thread must pass up from cones through guide holes in thread tree and through every specific point along the face of the sewing head. Thread must be “docked” at the thread holder spring.

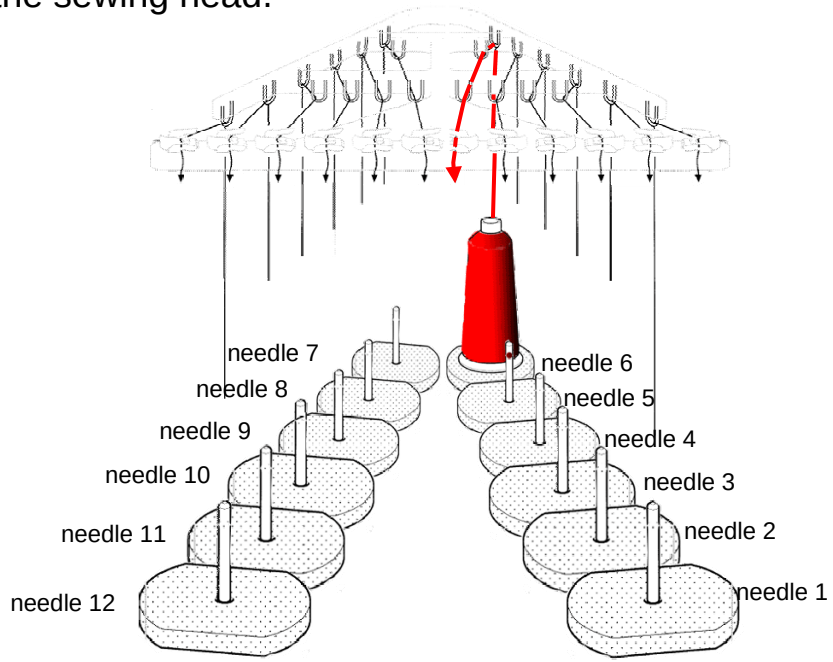
Steady table/mounting surface
Thread must pass up from cones through guide holes in thread tree and through every specific point along the face of the sewing head. Thread must be “docked” at the thread holder spring.



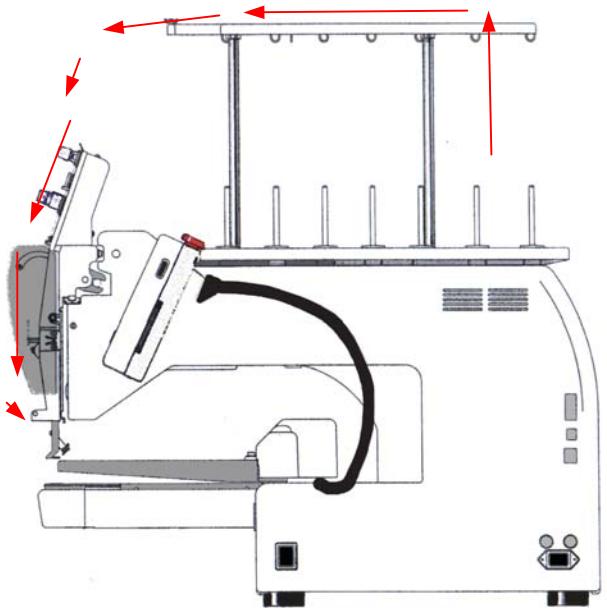
Proper Machine Setup: Upper Thread

UPPER THREAD

-**Proper Thread Routing:** All threads **must** be routed correctly at all points along the path through the sewing head.



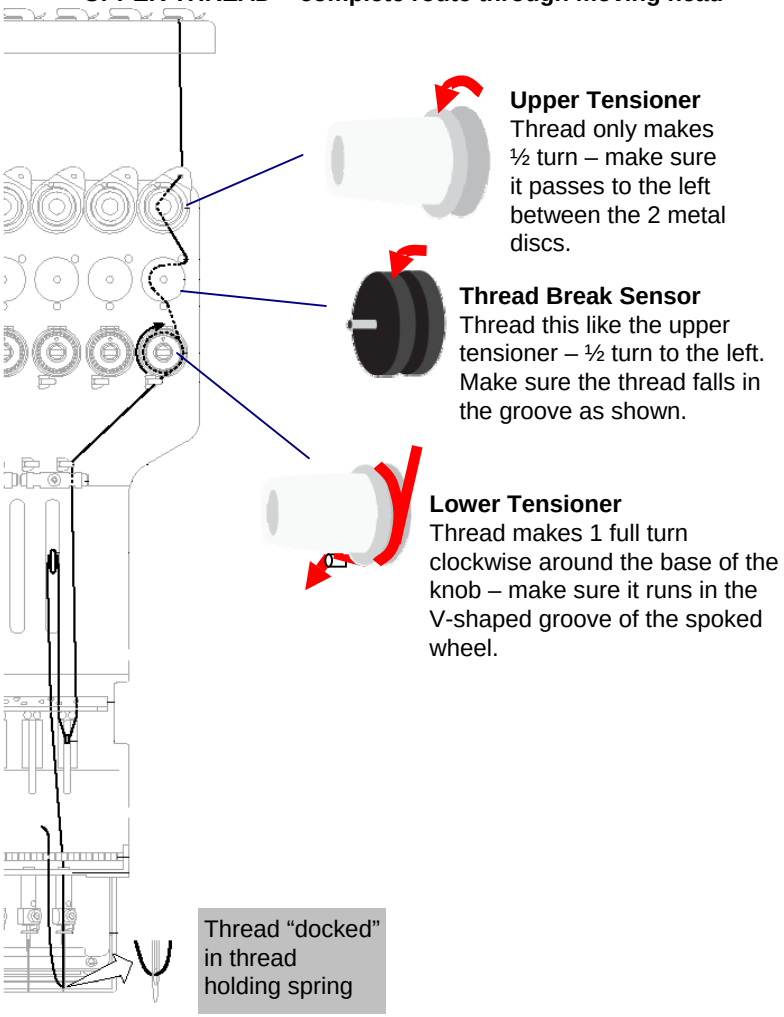
Layout of Cone/Needle Sequence
Needle numbers are arranged right to left, lowest number to highest.



General Thread Route
Thread must pass up from cones through guide holes in thread tree and through every specific point along the face of the sewing head. Thread must be “docked” at the thread holder spring.

Proper Machine Setup: Upper Thread

UPPER THREAD – complete route through moving head



-**Proper Thread Routing:** All threads **must** be routed correctly at all points along the path through the sewing head.

-**Practice good thread "Discipline":** After threading all needles, ensure there is no slack anywhere along the thread path. Make sure to:

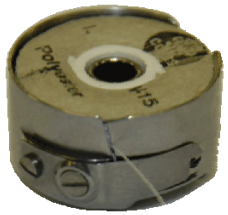
-***Pull all threads*** – to ensure thread feeds smoothly and turns the break sensor, and all slack is removed from around thread cones

-***"Dock" all thread ends*** from each needle onto the thread-holding spring. Prevents thread from coming loose and catching where not desired.

Proper Machine Setup: Re-loading/ Checking Bobbin

RE-LOADING THE BOBBIN CORRECTLY

The bobbin will need to be replaced frequently, allowing only 30,000 to 60,000 stitches per spool. This has to be done correctly every time.



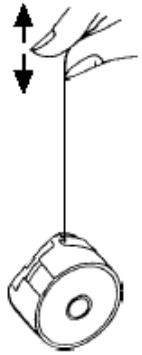
1. **Ensure bobbin turns clockwise. Pull thread through this slit.**

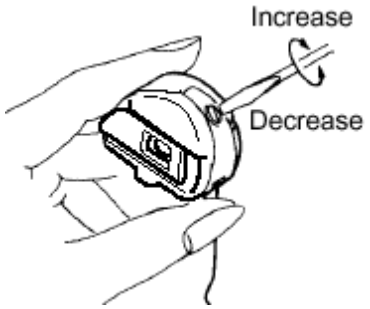
2. **Feed thread through eye at the end of the tension flap.**

3. **Pass thread under wire loop** at the top front of the bobbin case.

CHECKING TENSION

- ***The "yo-yo" test*** is very exact in checking tension. Perform this quick check each time you re-load the bobbin. Practice until you are comfortable doing this.
- ***Check bobbin tension frequently*** when changing bobbins.





Make small adjustments – no more than a ¼ or ½ turn in either direction before re-checking tension.

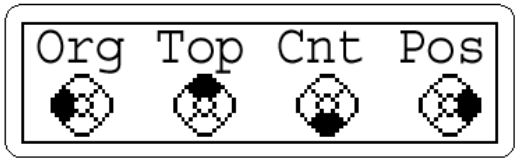
TAKE CARE TO RE-INSERT THE RELOADED BOBBIN CASE FULLY!

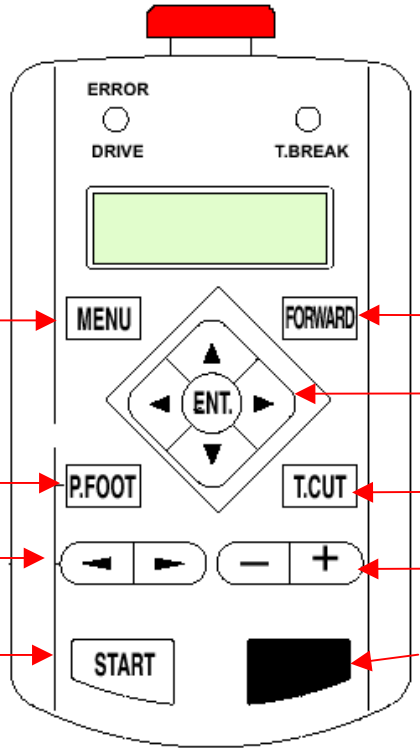
Your machine will not sew any stitches unless this is done. At worst, the needle & needle bar may strike the side of a poorly-inserted bobbin case, breaking the needle and possibly putting needle depth out of adjustment for that needle.

Sewing Controls

Basic Sewing Controls

On this page, learn the function of the important sewing controls.





MENU accesses the main menu or the Sewing Position sub-menu

P.FOOT lowers the presser foot on command

Needle Select Keys change the currently-selected needle while machine is stopped.

START starts sewing or starts the trace. Sews in "creep" mode when held down.

FORWARD advances sewing position forward while machine is stopped.

Sewing arm movement move pantograph arm with the 4 arrow keys, hold ENT at same time for quick movement

T. CUT cuts current thread and tucks end into thread holder.

Speed control – adjusts max sewing speed.

STOP stops sewing. Also when stopped moves sewing position backwards. Useful after thread breaks.

Menu Screens

Important Main Menu Features

The options of the main menu have the most important, useful functions.

ACCESSING THE MAIN MENU

Press MENU →

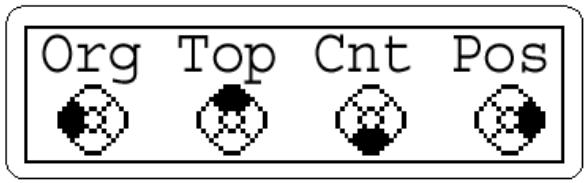
Main Menu

- **Pattern** → Select or delete from list of patterns
- **Needle** → List of color changes in selected design
- **Card** → Load from list of designs in Flash card
- **Convert** → Normal / Mirror reverse
- **F Position** → Jump to stitch or color change
- **Create** → Machine default settings menu
- **Letter** → Lettering functions (do not use !)
- **Other** → Setup, Clock, Thread detect setting

ACCESSING DESIGN POSITIONING MENU

These are important for adjusting the sewing position in the hoop and getting to the last-sewn position

Press and hold MENU →



Important Menu Items

Pattern - The control panel can store a maximum of 250,000 stitches of designs, or 99 designs total. From Pattern, you can choose one of the designs other than the current one, or delete any designs in memory.

Needle - Designs sew in a sequence of ***color blocks***. In order that your machine sews each color block with the correct color in the correct order, you can set that color sequence in the Needle screen, shown here.

Card – Go to this menu item to read designs from a compact flash card.

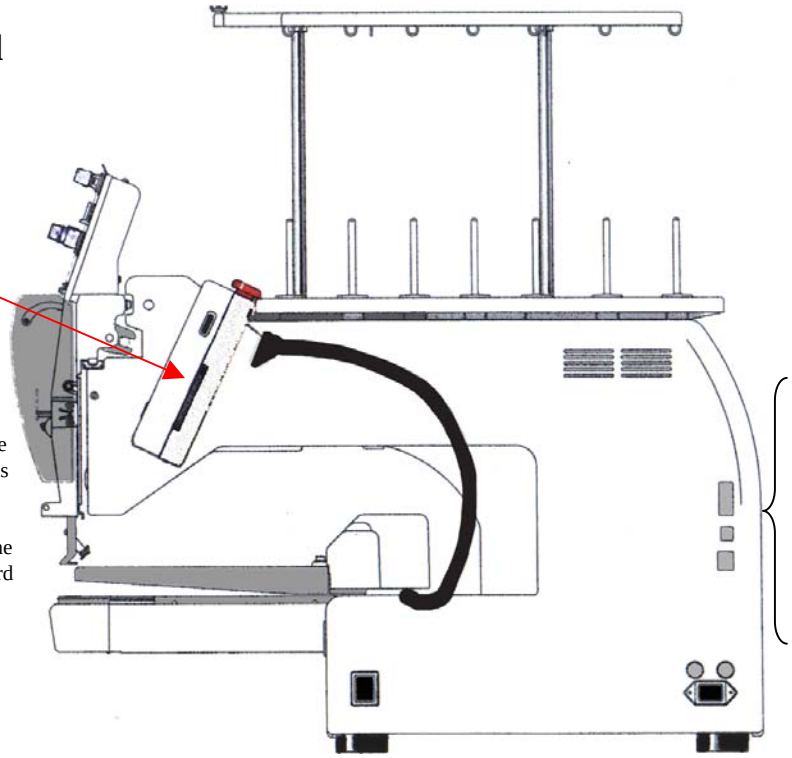
F. Pos – Use this option to move the sewing position to any point in the design – you can do this by stitch # or color block #.

Transferring Designs into Your Machine

In this section, we provide detailed steps about the 2 most common ways to transfer a design into your machine to be sewn:

- **USB connection** or
- **Compact flash card**

Compact Flash Card – (shown inserted into PCMCIA adapter sleeve) inserts into this slot on the side of the control panel. It works like a floppy disk or a USB jump drive: connect the Flash card to a computer, save the design onto the flash card, and insert the flash card into the machine.



USB port is found on side wall of machine with other ports. You can connect a Windows PC to the machine with a USB cable so you can transfer designs and perform other functions.

On the following pages, we'll go over the steps for both methods in detail. Next: USB connection

Transfer via USB Connection

One-Time Set-up of the USB Connection (continued from last page)

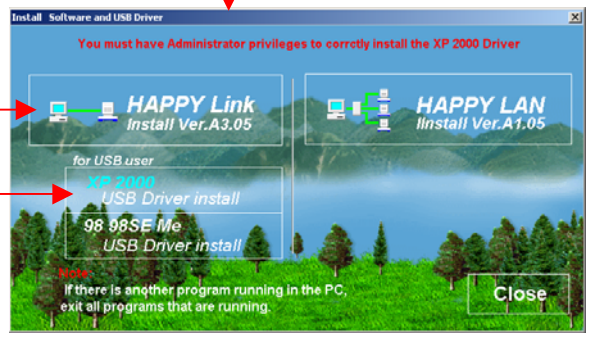
Follow the 11 steps on these pages to set up your PC for a USB connection. You'll only need to do this once.

1. Run the CD that came with your machine before connecting your HAPPY machine to your computer.

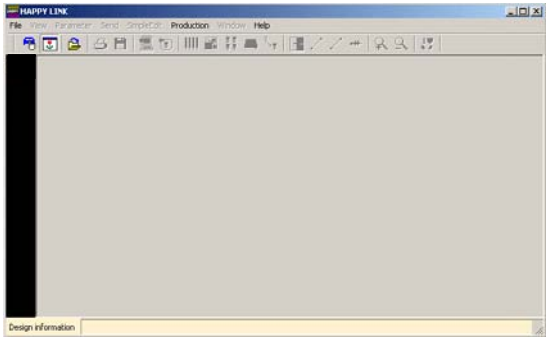
2. Wait for this screen to appear.

3. Click here to install the HAPPYLINK transfer program.

4. Click here to install the USB driver if your PC has Windows 2000, XP or Vista.

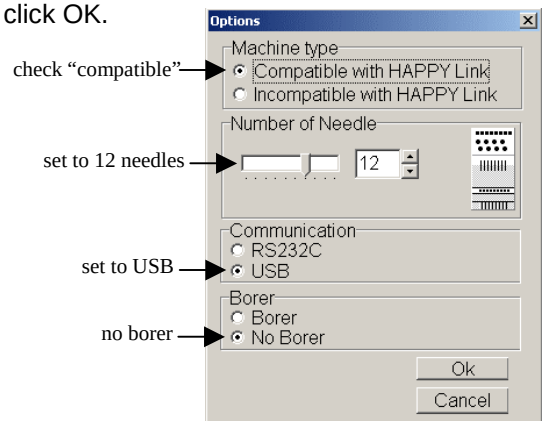


5. Launch the HAPPYLINK program you installed in Step 3.



HAPPYLINK program window

6. Click on File…Options until the dialog box shown below appears. Ensure that the dialog box is set as shown below, then click OK.

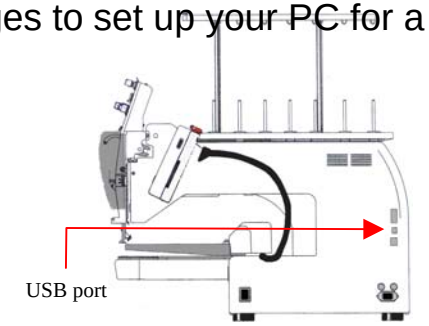


Transfer via USB Connection

One-Time Set-up of the USB Connection (continued from last page)

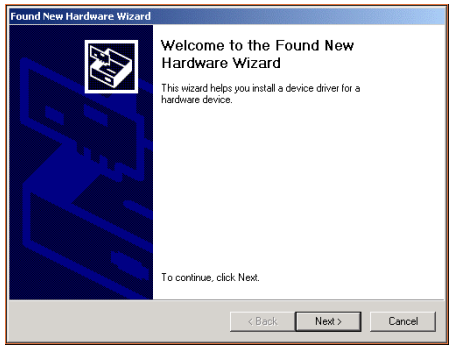
Follow the 11 steps on these pages to set up your PC for a USB connection.

5. **Ensure that your HAPPY machine is turned off, and connect a USB cable between your PC and the machine.** You may use the cable that came with your machine or purchase a longer one at any computer supply store. Ensure that any USB cable you purchase is high-quality and under 16 feet.

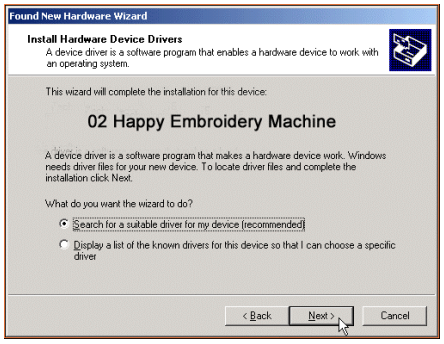


Connect USB cable to any USB port on your PC.

6. **Power on your HAPPY machine and watch your PC screen.** Windows should detect the machine, starting the Hardware Installation Wizard, similar to what is shown below.



7. **Continue through the prompts,** ensuring that at some point, Windows identifies the new hardware as “02 Happy Embroidery Machine” as shown below:



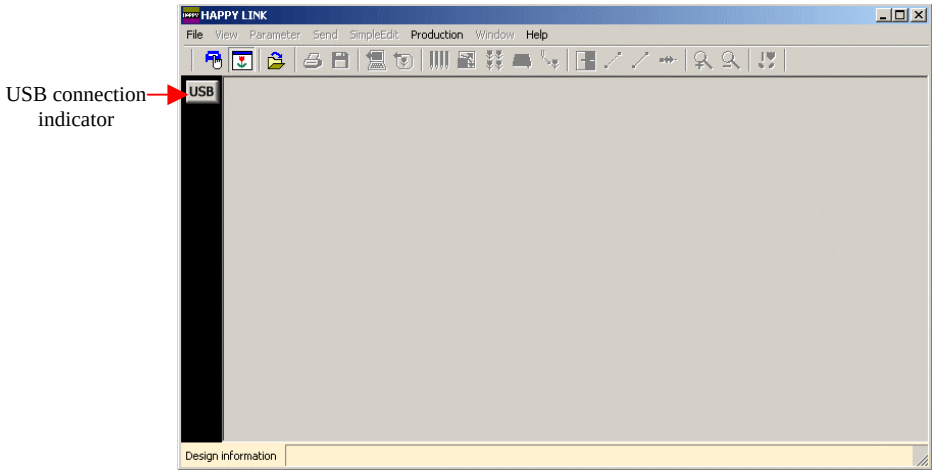
8. **Click “no not at this time”** if the prompt ‘do you want Windows to search the Internet for drivers’
9. **Check “continue anyway”** if you receive a message saying that “the software for this hardware has not passed Windows Driver Signing Testing”
10. **Continue until the message “**Your new hardware is installed and ready to use” or a similar message appears.

Transfer via USB Connection

One-Time Set-up of the USB Connection (continued from last page)

Follow the 11 steps on these pages and the next to set up your PC for a USB connection.

11. Launch the HAPPYLINK program again. If you've done everything correctly, the USB connection indicator should appear as a solid grey icon in the top-left corner of the program bar as shown below.



NEXT: Actual Steps to Transfer a Design by USB Cable

Transfer via USB Connection

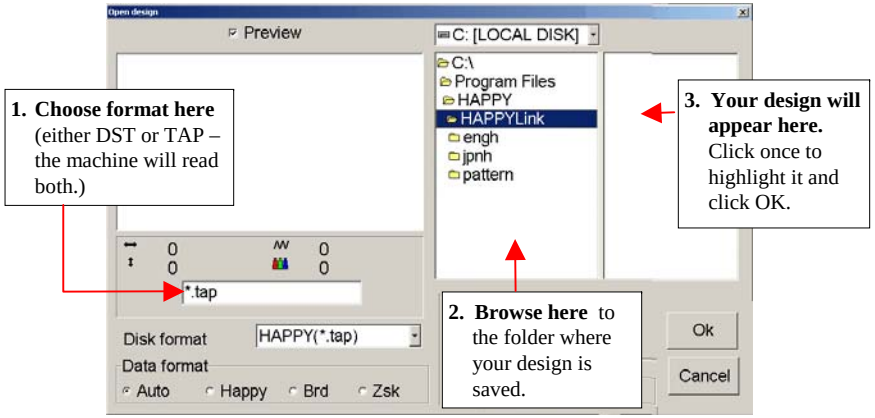
Actual Steps to Transfer a Design by USB

Once you've properly set up HAPPYLINK and the USB drivers on your PC, you'll only need to follow the 5 steps on this page to actually transfer designs.

1. Ensure that the machine is powered on and at the main (drive) screen. Your PC will only be able to transfer designs from this screen.

This is the main (drive) screen.

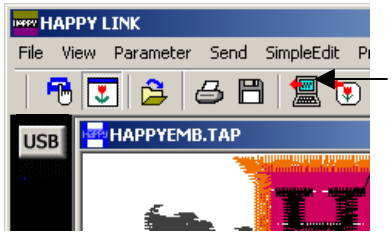
2. Connect the USB cable between machine and PC if you haven't already done so.



3. Launch the HAPPYLINK program and check to ensure the USB icon is lit.

4. Open your design by clicking on File…Pattern Open. The above dialog box appears. Follow the directions indicated above, and your design should open (in grey tones) into HAPPYLINK.

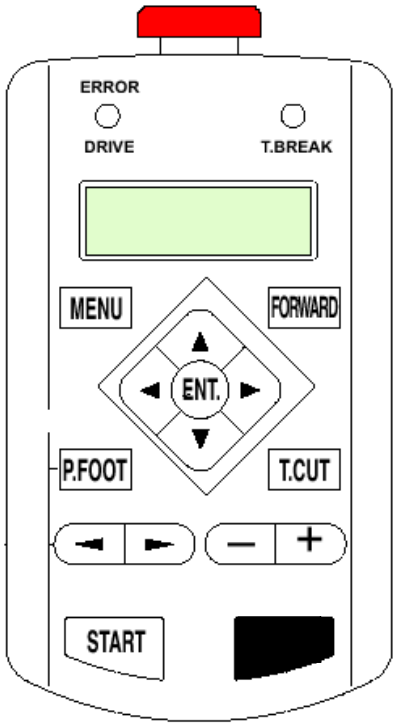
5. Click the Send Pattern Icon. The design will transfer from your PC to the machine.

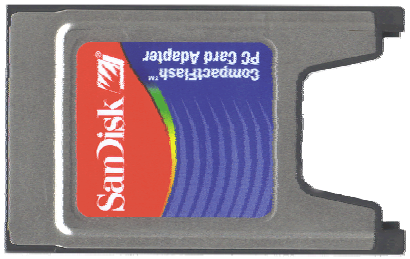


Transfer by Compact Flash Card

What to Buy

The slot located on the side of the machine's control panel accepts flash memory cards, to allow you to transfer designs into memory from a computer. To do this, you'll need to buy the 3 items shown on this page from most stores that sell computer or digital camera supplies.

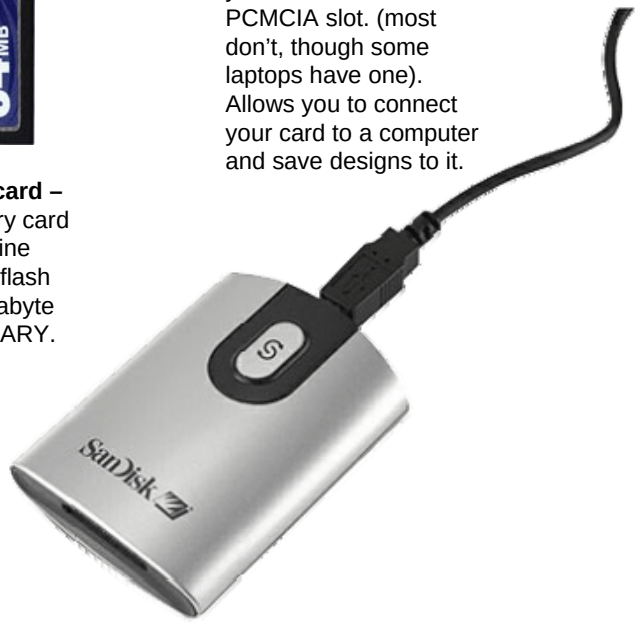




1. **PCMCIA Adapter –** Allows the card to fit into the machine's flash card slot. For PC's (some laptops) that also accept PCMCIA cards, there is no need for (3) the USB to compact flash adapter. NECESSARY.

2. **Compact Flash card –** This is the memory card itself. Your machine accepts compact flash cards up to 1 Gigabyte in size. NECESSARY.

3. **USB to compact flash card reader –** needed if your PC does not have a PCMCIA slot. (most don't, though some laptops have one). Allows you to connect your card to a computer and save designs to it.



NEXT: ALTERNATE FORMS OF FLASH MEDIA

Transfer by Compact Flash Card

Other Types of Flash memory (What not to Buy)

Your HAPPY machine was designed to accept other types of Flash cards, but none have worked as successfully as Sandisk-brand compact flash cards. For your assistance, we've identified other types of flash memory cards available below. We have attempted to show the cards approximately to scale with each other. Note that compatibility with these types may improve as revisions of the machine's on-board firmware and hardware are released.

GOOD

SanDisk brand Compact Flash card: This has worked with the greatest success with HAPPY machines, and is widely available.

Other brands of compact Flash card: Some other types work, although not all.

Memory Stick: This has been the least successful of the other Flash media types

SD Card: Few brands of this type have been found to work.

SmartMedia Card: Few brands of this type have been found to work.

Other Types of Adapter Sleeves: All-in-1 adapter sleeves have had limited success, even Sandisk brand.

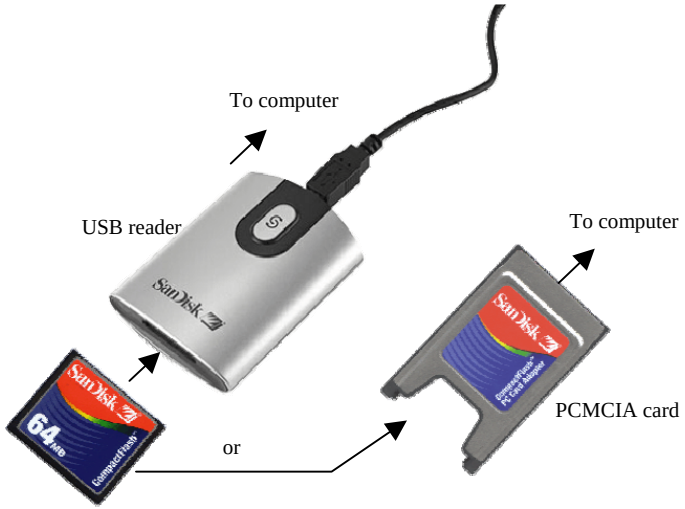
NEXT: HOW TO USE YOUR COMPACT FLASH CARD

Transfer by Compact Flash card

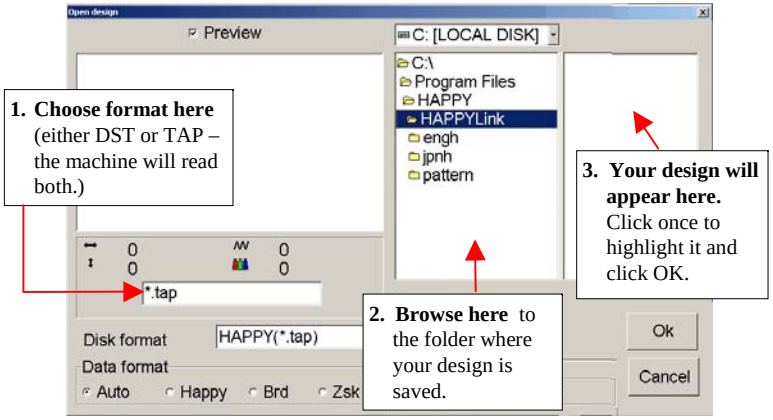
How to Use Compact Flash Cards to Transfer Designs

Follow the 9 steps on these pages to transfer designs from a PC into your HAPPY machine with a Compact Flash card.

1. **Connect the Compact Flash card to your computer.** Insert the card into a PCMCIA adapter (if your laptop has this type of slot) or otherwise insert it into the USB reader.



2. **Start HAPPYLINK and open the design** you wish to transfer from File… Pattern Open. You'll see the dialog box below appear. Follow the directions.

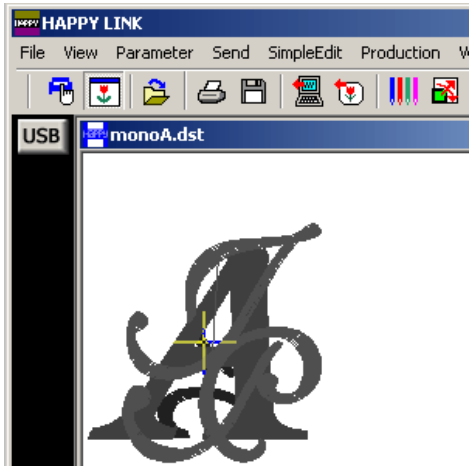


Transfer by Compact Flash card

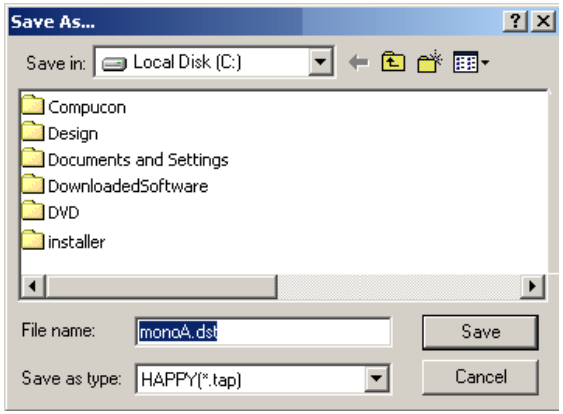
How to Use Compact Flash Cards to Transfer Designs

Follow the 9 steps on these pages to transfer designs from a PC into your HAPPY machine with a Compact Flash card.

3. **(optional step) Set the color sequence.** Click on the icon shown below to do so. Or if you choose, you can set colors in your machine.



4. **Save the file to the Compact Flash card.** Click on File…Save As. The dialog box shown below appears. Follow the directions below to save, ***then close HAPPYLINK.***



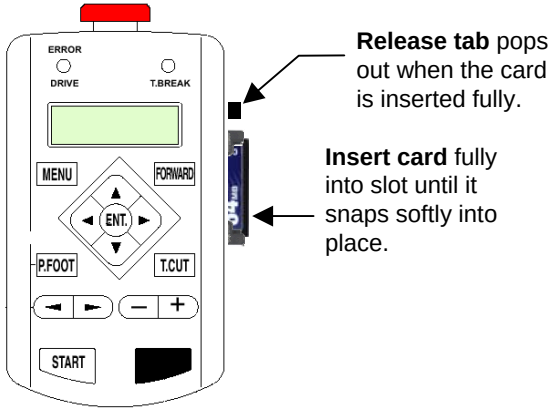
5. **Click on Safely Remove Hardware Icon** to shut off the card**.** You'll find this icon at the lower-right edge of the screen near the clock. Continue until the message "It is now safe to remove" appears.

Transfer by Compact Flash card

How to Use Compact Flash Cards to Transfer Designs

Follow the 9 steps on these pages to transfer designs from a PC into your HAPPY machine with a Compact Flash card.

6. **Insert the Flash card into the machine.** You'll need to insert the card into the PCMCIA adapter sleeve.



7. **Go to the Card screen** in the control panel to read the card. From the main (drive) screen press MENU and use the arrow keys to go to CARD and press ENT.

8. **Find your design in the list.** Any DST & TAP designs will show automatically in a list. Choose your design with the blue arrow keys and press ENT.

9. **Press ENT to return to the main (drive) screen.** Once the design is imported from the CARD screen, press the ENT button until you've returned to the main Drive screen, where image of your design should now appear. (The next step will be to set the colors in the Needle screen.)

NEXT: CHAPTER 3: COMPLETE STEPS IN A TYPICAL SEWING JOB

Chapter 3: The Complete Steps for a Typical Sewing Job

Use this section as a condensed, all-in-one reference for all the steps involved in a typical sewing job. Be sure to follow the topics in order as listed.

1. **Machine Set-Up Checklist**
   - Design
   - Backing & Hoops
   - Machine prep
2. **Design Transfer: Complete steps**
   - USB
   - Compact Flash card
3. **Design Set-Up**
   - Setting color sequence with the “needle” screen
   - Matching and locating within a hoop with the “frame” screen
4. **Hooping**
5. **Frame Trace**
   - Verifiying fit and position within the hoop
6. **Sewing**
   - Sewing: Setting sewing speed
   - What to look for to refine your sewing run
   - Handling interruptions: thread breaks, replacing bobbin thread, returning to sewing position
7. **A practical, live example: running a tension test design**
   - An illustrated example (tension test design) of sections 1-4 using an actual design

1. Pre-Prep Checklist

Follow this advance prep checklist before any sewing job:

- **Machine Prep: Threaded and Oiled**
  - ***Properly oiled.*** At the very least, ensure 1 drop of oil on the rotary hook.
  - ***Bobbin properly threaded.*** New bobbin, properly threaded, and tensioned. Ensure that the bobbin case is inserted FULLY into the rotary hook.
  - ***Upper thread properly threaded.***
    - **Are all the colors for the design installed on the machine?** If this is a production job, use quality, well-cared-for thread cones. Also ensure that you've checked with your customer on any specific colors.
    - **Are all colors properly threaded ?** Ensure that at least the threads being sewn are threaded correctly at all points (thread feeds smoothly between metal disks of upper tension knob, spins the sensor wheel and lower tensioner wheel. Pull any loose, slack thread out from any thread, especially around the thread cones. Additionally, all thread ends should be docked in the thread holder behind the needles or in the thread holding spring.

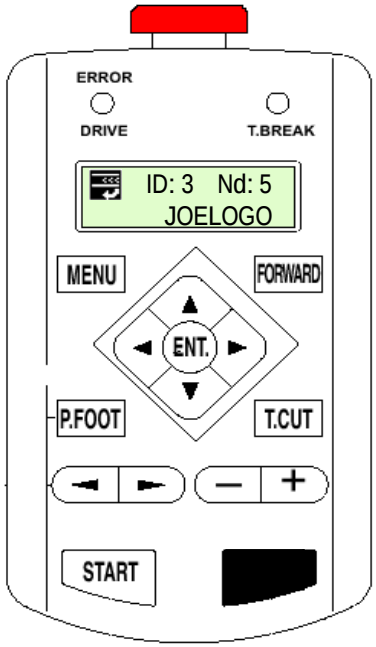
- **Design Prep**
  - ***The digitized design:*** Be sure to check the following:
    - **Was it digitized specifically for the material or garment you intend to sew on?** If not, be prepared to run at least 1 test run to check for quality. Different fabrics and garments sometimes require different digitizing techniques. Stock designs, for example, may sew well on 1 garment type but not another.
    - **Know the design size.** We'll go over this later in this chapter. But remember, designs can sometimes be scaled from their original size, but not always. It is always best if the design was created for the intended sew size.
    - **Color sequence:** be sure that you know the color sequence of the design, which should be provided by the digitizer, the stock design catalog, or if you are the digitizer, get this from the software that you created it in.
- **Other Sewing Material Prep**
  - ***Hoop:*** Choose the smallest possible hoop that fits the design with some room to spare. If the design barely fits, go to the next larger size.
  - ***Backing and other material:*** Have the appropriate backing, topping or other material ready. You can read more about this in Chapter 5: Additional sewing options.

2. Getting the Design in to the Control Panel

Steps to Transfer a Design by USB

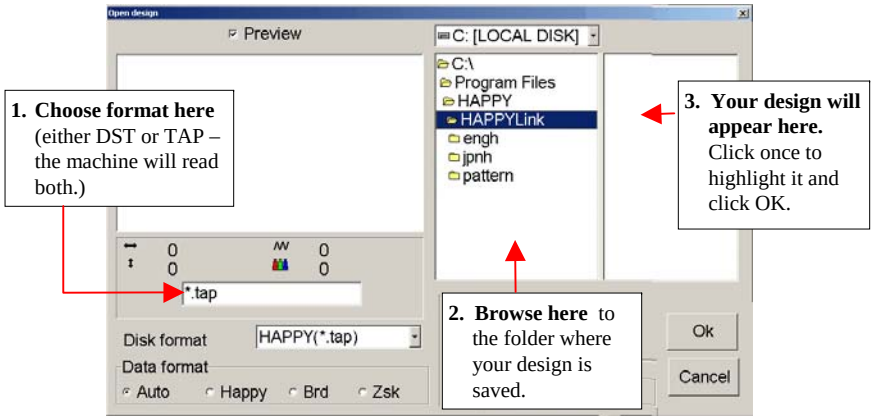
Follow these steps to transfer your design by USB cable.

1. Ensure that the machine is powered on and at the main (drive) screen. Your PC will only be able to transfer designs from this screen.



This is the main (drive) screen.

2. Connect the USB cable if you haven't already done so.



1. Choose format here (either DST or TAP – the machine will read both.)

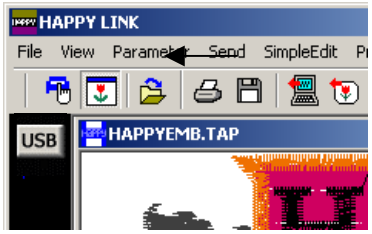
2. Browse here to the folder where your design is saved.

3. Your design will appear here. Click once to highlight it and click OK.

4. Open your design by clicking on File…Pattern Open. The above dialog box appears. Follow the directions indicated above, and your design should open (in grey tones) into HAPPYLINK.

3. Launch the HAPPYLINK program and check to ensure the USB icon is lit.

5. Click the Send Pattern Icon. The design will transfer from your PC to the machine.



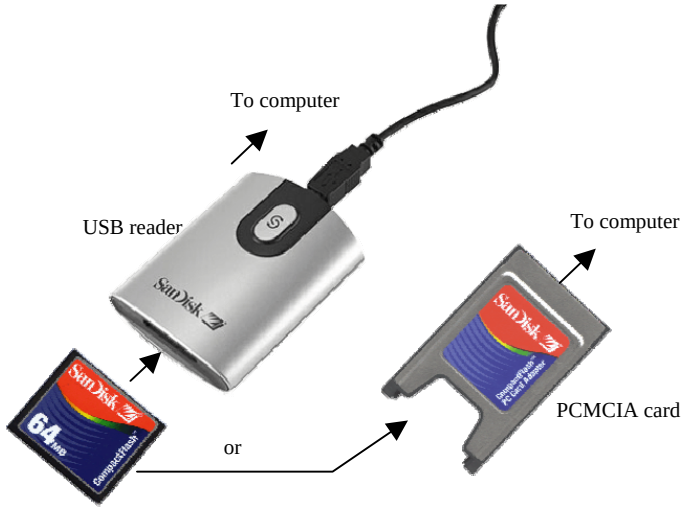
Send Pattern icon

2. Getting the Design in to the Control Panel

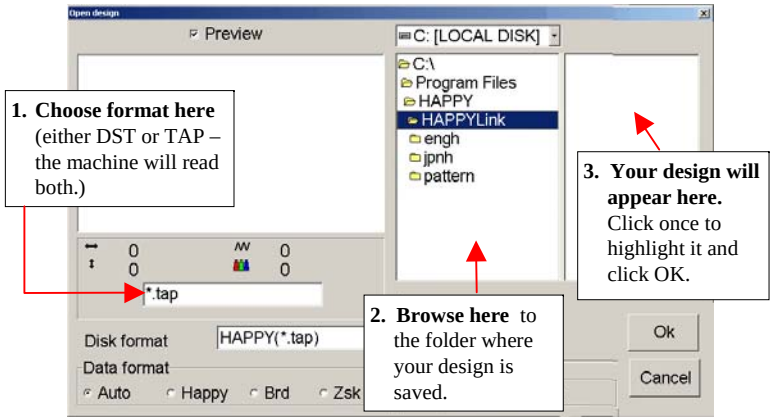
Steps to Transfer a Design by Compact Flash Card

Follow the 9 on these pages to transfer your design by Flash card.

1. **Connect the Compact Flash card to your computer.** Insert the card into a PCMCIA adapter (if your laptop has this type of slot) or otherwise insert it into the USB reader.



2. **Start HAPPYLINK and open the design** you wish to transfer from File… Pattern Open. You'll see the dialog box below appear. Follow the directions below.

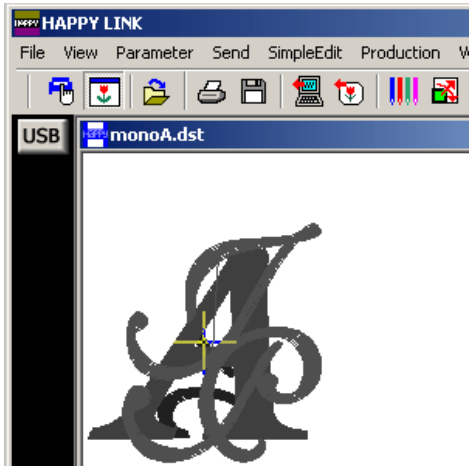


2. Getting the Design in to the Control Panel

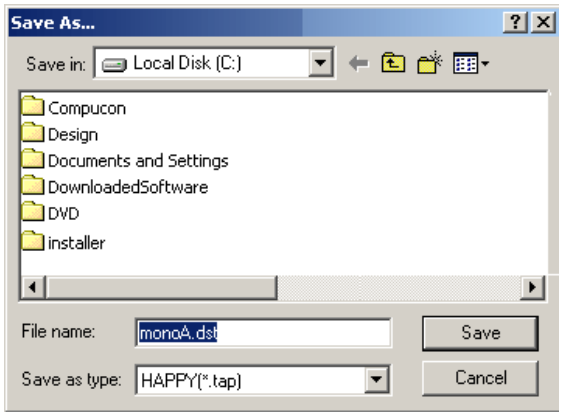
Steps to Transfer a Design by Compact Flash Card

Follow the 9 on these pages to transfer your design by Flash card.

3. **(optional step) Set the color sequence.** Click on the icon shown below to do so. Or if you choose, you can set colors in your machine.



4. **Save the file to the Compact Flash card.** Click on File…Save As. The dialog box shown below appears. Follow the directions below to save, ***then close HAPPYLINK.***



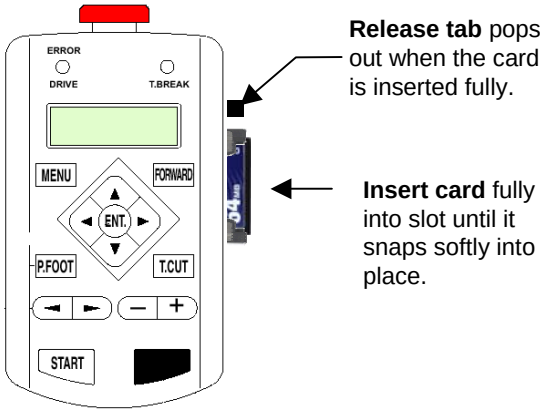
5. **Click on Safely Remove Hardware Icon** to shut off the card**.** You'll find this icon at the lower-right edge of the screen near the clock. Continue until the message "It is now safe to remove" appears.

2. Getting the Design in to the Control Panel

Steps to Transfer a Design by Compact Flash Card

Follow the 9 on these pages to transfer your design by Flash card.

6. **Insert the Flash card into the machine.** You'll need to insert the card into the PCMCIA adapter sleeve.



7. **Go to the CARD menu** in the control panel to read the card. From the main (drive) screen press MENU and press the arrow keys to go to the CARD option and press ENT.

8. **Find your design in the list.** Any DST & TAP designs will show automatically in a list on the right. Choose your design with the blue arrow keys and press ENT.

9. **Press MENU again to return to the main (drive) screen.** Once the design is imported from the CARD screen, press the MENU button until you've returned to the main Drive screen, where name of your design should now appear. (The next step will be to set the colors in the Needle menu.)

3. Setting Design Colors & Settings

Follow the steps on this page to set the color sequence for the design.

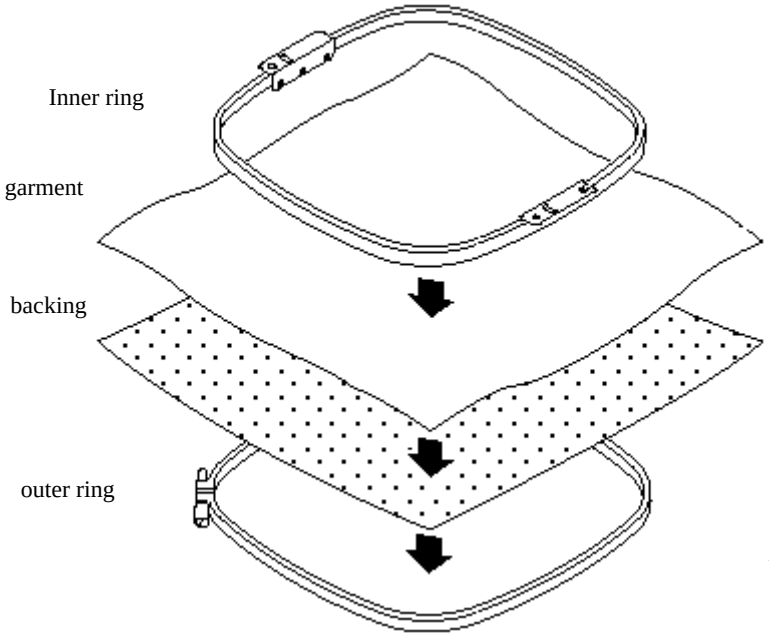
How to Set the Color Block Sequence for A Design:
Follow steps 1-5 on the right to set the color sequence for a design. When finished, press MENU to return to the main menu, and then MENU again to return to the main sewing screen.

1. **Press MENU and arrow down or up to NEEDLE.** Then press ENT to enter the Needle screen.
2. **A list of color block numbers appear.** If the design's colors have never been set up, all color blocks will be assigned needle "0".|
3. **Choose a color block** using the up- and down- arrow keys
4. **Assign that block a needle number** using the left and right arrow keys.
5. **Arrow up or down** to the next color block and repeat the procedure until you've assigned a needle number to all of the color blocks.

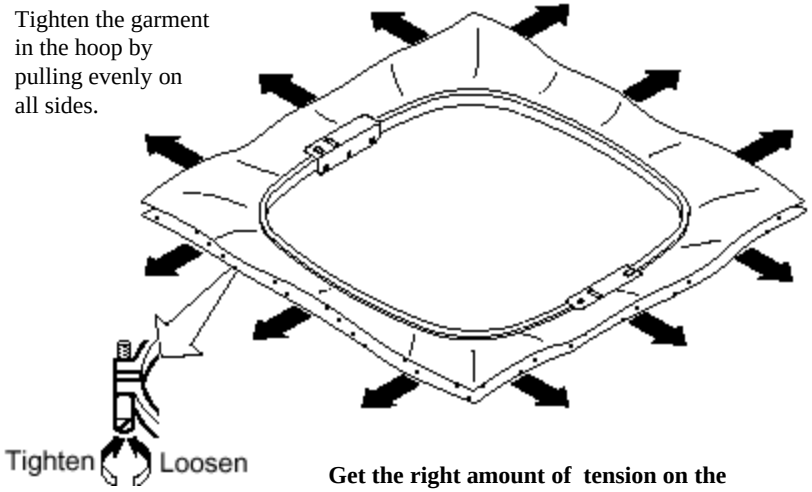
4. Hooping

As mentioned in Chapter 1, hooping contributes heavily to sewing quality. Be sure to follow these guidelines when hooping a garment.

1. **Choose the smallest hoop that will fit your design.** This results in better-quality sew-outs, but ensure that there is at least a little extra room in the hoop as a safety margin.
2. **Choose an appropriate backing or stabilizer for the garment and the design.** Depending on how stable or "stretchy" the garment is, you may need heavier, more stable backing (i.e. 1-2 layers of heavy cutaway) or lighter backings (simpler tear-away)
3. **Align the garment straight in the hoop –** In order for the design to sew level, the garment needs to be hooped level.



Tighten the garment in the hoop by pulling evenly on all sides.



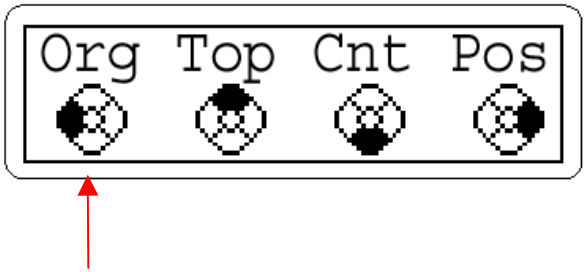
Adjustment screw compensates for different garment thicknesses.

Get the right amount of tension on the garment:
Too tight – hoop leaves "burn marks on the garment.
Too loose – garment will "pucker" as more stitches are sewn onto it.

5. Checking Fit and Position in the Hoop

At this stage, you're almost ready to begin sewing. First, it's also important to verify that the design fits using the Trace. Follow the steps shown below.

1. **Go to the main Drive sceen.**
2. **Ensure that the design is at the Origin point** by checking that the origin symbol is showing. If you need to return to the Origin, hold MENU until the menu shown at the right appears, then press the right arrow key to return to origin as indicated by the screen.
3. **Press START** to let the machine begin tracing. The hoop will begin to move, and the presser foot will "point" to where the edges of the design will sew. Check to ensure that the design does not sew near the edges of the hoop. You can hold the START button to slow the trace movement.
4. **If not satisfied with the location, return to the Origin** by holding the MENU key down and pressing the right arrow key as in step (2) above.
5. **Move the design** by moving the arrow keys.
6. **Go back to step 3 and repeat** if desired. You can watch the trace as many times as you wish until you're confident that the machine will clear the hoop.



This symbol indicates that to return to the Origin, press the left arrow key.

6. Sewing

If you've followed all the previous steps carefully, just press START to begin sewing. While the machine should continue to sew until the design is finished, watch the sew-out, especially if you are just learning, and follow the guidelines on this page.

1. **Set the machine's top speed with care.** While your machine is capable of sewing at top speed on a regular basis, consider these general points:

    - ***Use top speed only when absolutely necessary*** to ensure longer machine life.
    - ***Higher speeds increase peak tensions on thread*** causing the design to sew more tightly than normal, and increase the risk of thread breaks
    - Set machine speed based on your vibration and noise tolerance. Depending on the mounting surface where you've installed your machine, you may find some speeds more "ideal" than others.

2. **Watch the design carefully to check for problems.** This is important if you intend to run a large number of designs on the machine. Look out for:

    - ***Efficient digitizing –*** are all unnecessary color changes eliminated? Was the design created in the most efficient sequence?
    - ***Thread breaks that crop up in the same spot*** – this is something that can be fixed with Stitch Sweeper on later runs.
    - ***Quality of the sew-out*** – quality problems can be fixed with adjustments to tension, hooping, or in fixing the design in a digitizing program.

Upper Tension Test and Adjustment

Upper tension is one of the most important adjustments you can make to maximize sewing quality and minimize problems. A good tension test design at the very least samples all of the threads, in satin stitching, in several directions. Follow the steps in this exercise to (1) to sew the design, then (2) adjust tension accordingly until tension is properly adjusted.

1. **Transfer the tension test design** called "htest12" into your control panel. You can download this from www.happyemb.com in the support section.

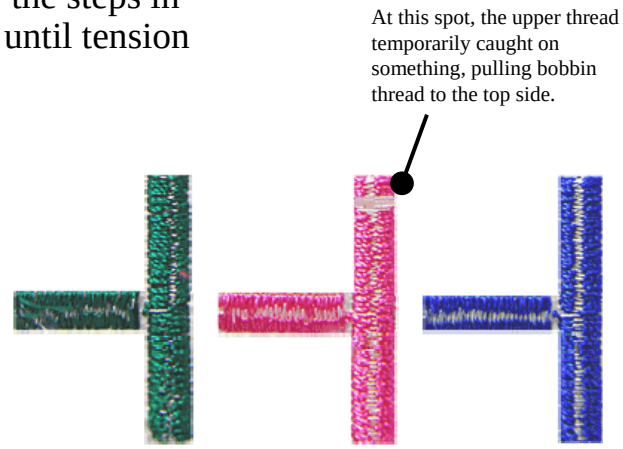
2. **Ensure that the bobbin** tension has been set correctly using the drop test. (review Chapter 2– "Bobbin Loading and Tension")

3. **Set the color sequence** In the Needle screen to 1, 2 ,3 ....etc to 12

4. **Hoop an ideal fabric** (2 layers of cutaway backing is usually good enough)

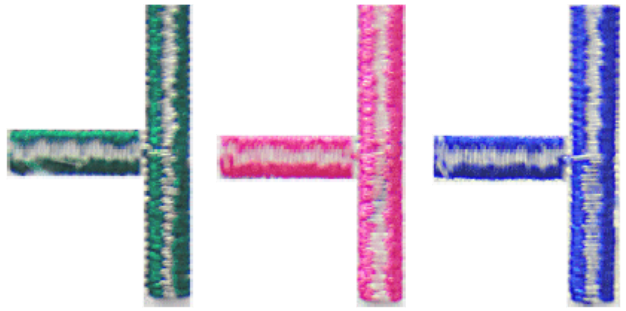
5. **Sew a sample** on the 32 cm square hoop.

6. **Examine the results by looking at the reverse side.** Check each satin sample to ensure there is a white strip of bobbin thread 25%-33% in the center. Then, if:
   - **Bobbin strip is very thin or non-existent: *that thread is very loose.*** Tighten using the upper tension knob for that needle.
   - **Bobbin strip is a little thin but consistent: thread is slightly loose.** Tighten using the upper tension knob for that needle.
   - **Bobbin strip is wide to a large degree,** some of it being pulled around to the front: **That thread is very tight.** Loosen using the upper tension knob for that needle.
   - **Bobbin strip is only slightly wide:** The thread is slightly over-tight. Loosen using the lower tensioning knob for that thread.



Colored thread far too loose. Tighten with upper knob.

These are slightly too loose. Tighten using the lower tension knob.



On re-sewing, these 3 sample colors look a lot better.

7. **Note: Make big adjustments.** When tightening or loosening, make several full turns in either direction (turning the knob just a few clicks in either direction will not make any difference in tension.)