# Installation, Operation, and Maintenance manual for the EMT 10/12T embroidery peripheral

- Twelve-Head Embroidery Peripheral
- 10 Needles with automatic color change
- Automatic Trimmers
- Caps, Tubular, Sash Frame
- CE

Melco Embroidery Systems

A Saurer Group Company

Part Number 10161 Revision A

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# Table of Contents

## General



## 1. Installation



## 2. Operation



## 3. Hoops and Cap Frames

## 4. Recovery Methods



## 5. Maintenance



## 6. Troubleshooting Guide



## 7. Status Messages



## 8. Glossary



## Index

# Multi-Head Embroidery Peripheral
# EMT 10/12 Specifications

**Maximum embroidery speed**

1000 stitches per minute, 800 stitches per minute on caps

**Number of Heads**

12

**Number of needles**

10 per sewing head

**Dimensions**

238.8"w X 60.3"h X 47.5"d
6.06meter X 1.53meter X 1.20meter

**Weight**

3,960 lbs
1,800 kg

**Shipping weight**

4,224 lbs
1,920 kg

**Power requirements**

220V/230V/240V/single phase/50/60Hz

**Noise level and test conditions**

Equivalent continuous A weighted sound pressure level at 1.0 meters from the floor is 84db.

The peak C weighted instantaneous sound pressure level is 84db.

The noise level was measured sewing a test design at 750 spm.

**Recommended power conditioning equipment**

Power line conditioner

**Embroidering field size**

11" x 16"
28cm x 40.4cm (per head)

**Intended use**

The EMT 10/12 is designed to embroider on textile products which are placed easily in a Melco embroidery hoop. The machine should not be used on thick leather, wood, plastic, or other dense material.

# Safe Operating Principles

The EMT 10/12 will embroider stitches in a safe and controlled manner when used as outlined in this manual.

Thread break sensors stop the machine automatically when a fault is detected. The machine will stop at the end of each design.

- Operators/maintenance personnel must be trained to Melco approved standards.
- No untrained persons are permitted within the designated working area around the machine.
- Keep the table top area clear during operation.
- Do not interfere with moving machine parts during operation.
- Intervention is permitted during embroidery once the operator stops the machine.
- Keep the working area clean.

Read the entire manual prior to operation.

# Explanation of Symbols

Caution!

Indicates a machine component will move. Keep clear!

Shock hazard. No user replaceable parts behind this label. Do not open!

Pinch point, Keep clear!

Pinch point, Keep clear!

Pinch points, Keep clear!

Needle pinch point, Keep clear!

Use a fork lift.

# 1. Installation

## Machine Working Environment

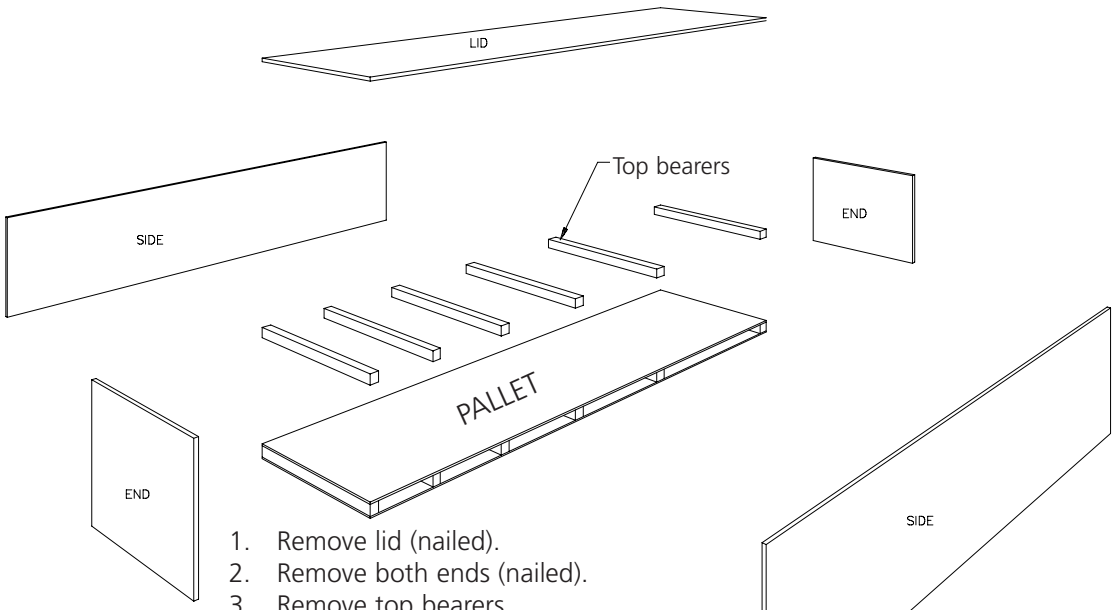
The EMT 10/12 peripheral must be positioned on a hard dry flat surface capable of supporting a machine weight of 3,960 lbs (1,800kg). A working corridor of 1.5m (4.9 ft.) must be provided around the machine's perimeter for operation and maintenance. The area surrounding the machine should have adequate lighting, and the ambient room temperature should not fall below 55 degrees F (13 degrees C).

## Moving the Crated Machine

Do not attempt to manually lift or move the EMT 10/12. Use a fork lift to move the crated machine. Place the lifting forks as diagrammed on the crate.

## Removing the Crate

The crate is constructed as illustrated in Figure 1-1. Disassemble according to steps in Figure 1-1. When fully dismantled, the crate, packing material, and wrapper should be disposed of safely LEAVE THE MACHINE ON THE PALLET.




1. Remove lid (nailed).
2. Remove both ends (nailed).
3. Remove top bearers.
4. Remove sides (2x).
5. Remove hermetically sealed bag.
6. Remove hold down nuts (4x).
7. Remove any packaging and preservation material.

**Figure 1-1**

## Positioning the Machine

The operator's kit contains 8 M20 jacking screws and nuts. Screw each nut onto a screw until the nut contacts the head of the screw. Each nut should be finger-tight. Place one nut/screw assembly into each machine leg (8) until the screw contacts the pallet.

Position the fork lift as shown in Figure 1-2. Lift the machine clear of the pallet and move to its designated area. Ensure there is enough room to gain access to all sides of the machine, then lower gently to the floor.

**Figure 1-2**

Retrieve the 8 machine floor pads from the operator's kit. Lift the machine 2" (5cm) off the floor with the fork lift. Place one floor pad rubber-side down under each machine leg. Adjust each jacking screw down to the dimple in the center of the pad. Lower the machine and remove the fork lift.

The machine must be leveled in the X and Y plane. Use a level on the main chassis to measure each plane. Adjustments are made by turning the jacking screws. Jacking screws should not protrude more than 0.47" (1.2cm) below the machine leg (see Figure 1-3). When the machine is level, tighten the nuts down to the machine leg with a wrench.

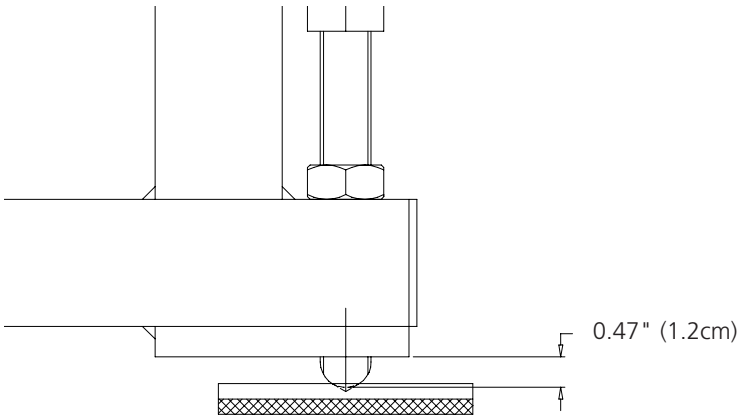



**Figure 1-3**

**DO NOT ATTEMPT TO RAISE OR LOWER THE LIFT TABLE.**

## Removing the Shipping Clamp

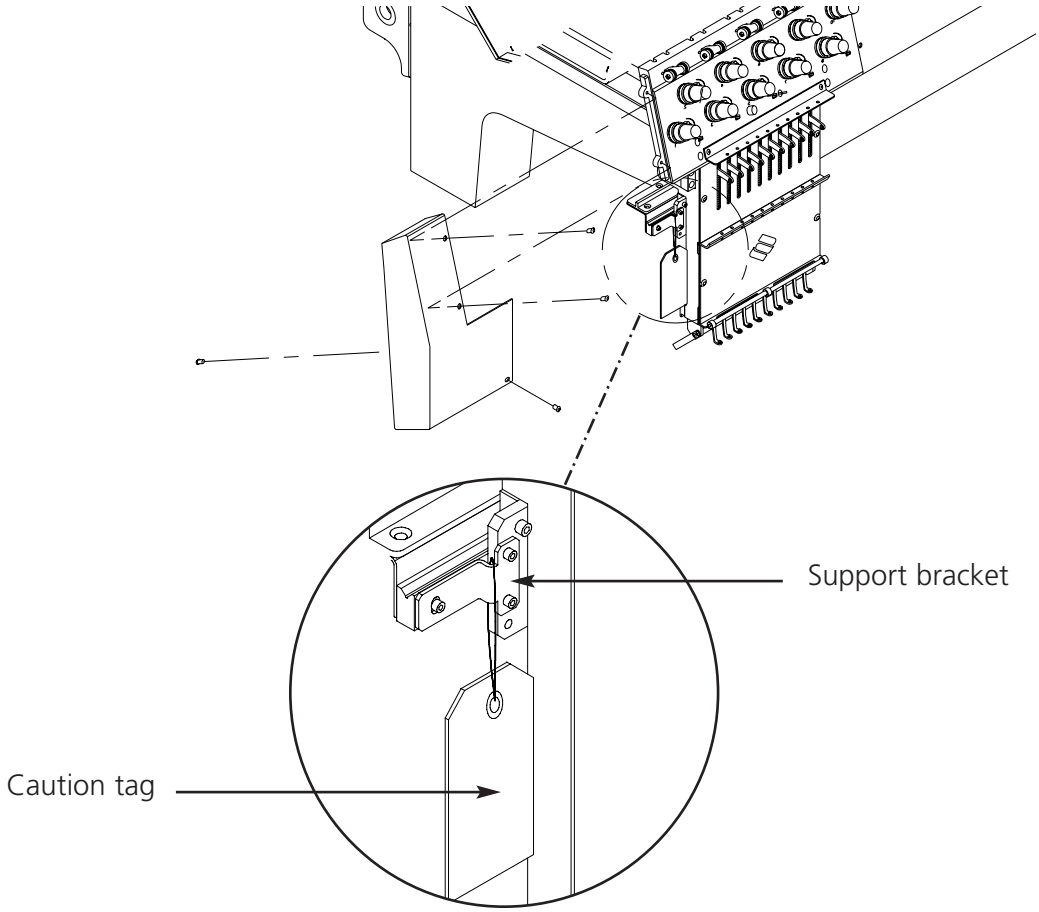



**Figure 1-4**

1. Remove the support bracket from the machine (a caution tag is attached to the bracket as a reminder).
2. Manually index the color change mechanism to set the needle cases to needle 5 or 6. To do this, refer to page 4-3 in this manual.
3. Install the end cover as shown in Figure 1-4. The screws for the covers are installed on the machine.

## Connecting the Monitor and Keyboard

The following step must be performed by a qualified electrical engineer. DO NOT connect the main power supply now. Always use anti-static wristbands when working with printed circuit boards.

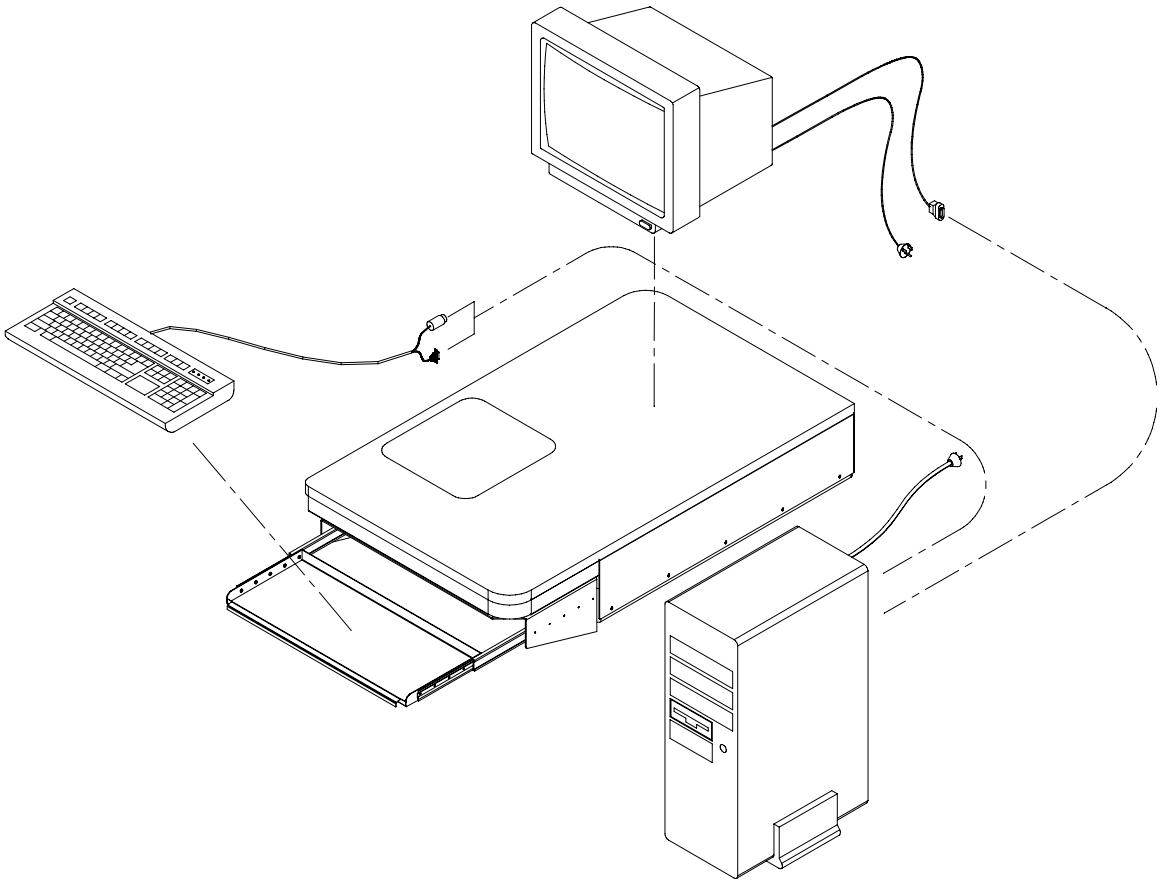


**Figure 1-5**

The monitor and the keyboard must each be connected to the computer as shown in Figure 1-5. The monitor power cord should be plugged into the power distribution box. The keyboard has two connectors; one for the keyboard and one for the trackball. Each must be plugged in to the proper terminal.

## Positioning the Tabletop

The tabletop is shipping in a position that is perpendicular to its normal operating position. This is to minimize shipping size and cost. Figure 1-6 shows a side-view of the tabletop in its shipping position.

1. Remove the socket head cap screws (see item A in Figure 1-6) and washers. There are 3 locations along the tabletop where you must remove these socket head cap screws.

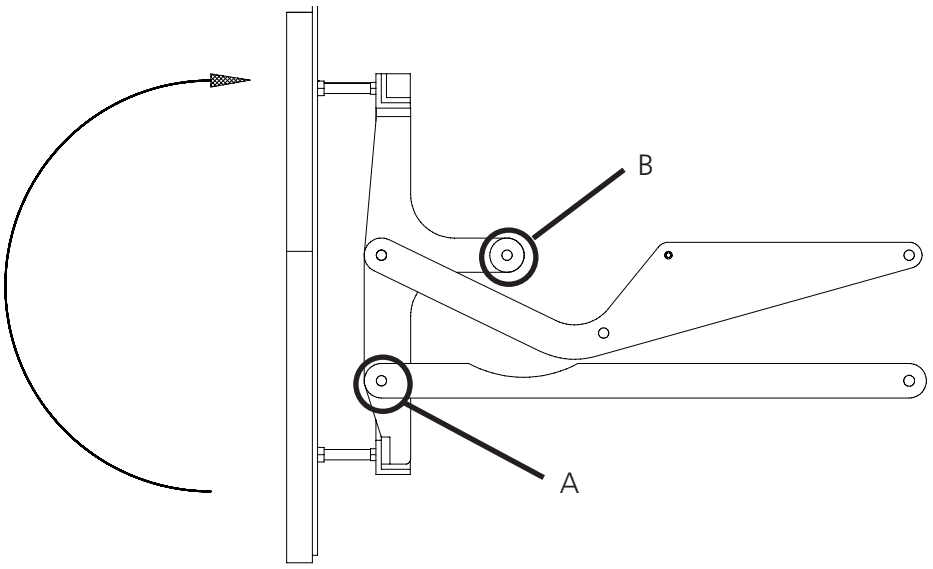



**Figure 1-6**

2. Lift the bottom of the tabletop UP (as shown in Figure 1-6); 2 people are required to do this.
3. Using the washers, insert the socket head cap screws into the holes in the tabletop frame (item B in Figures 1-6 and 1-7).
4. Tighten all the socket head cap screws.

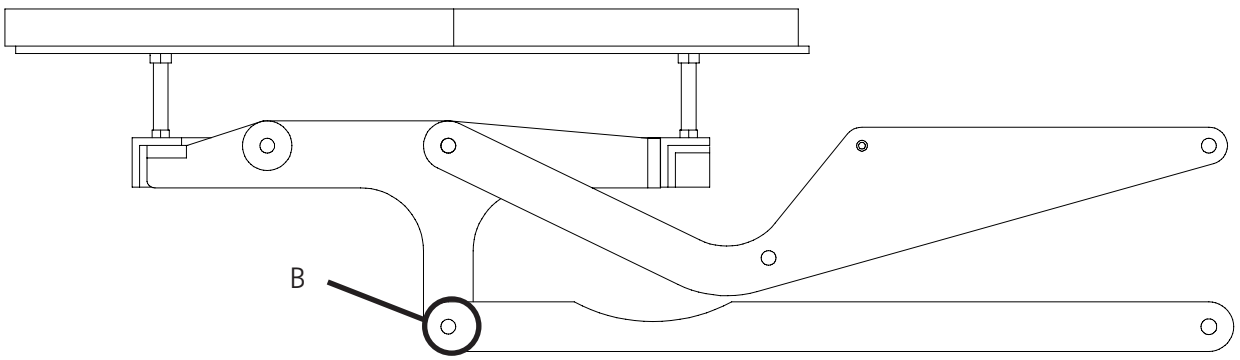



**Figure 1-7**

## Connecting Power Cables

1. Assure the power switch is in the OFF position.
2. A certified electrician should wire/install a 220 volt single phase female outlet (15 Amp minimum service) of the type shown in Figure 1-9.
3. Connect the power cord (shown in Figure 1-8) to the power socket.
4. The power connection must be within 6 feet (2 meters) of the right rear end of the machine.

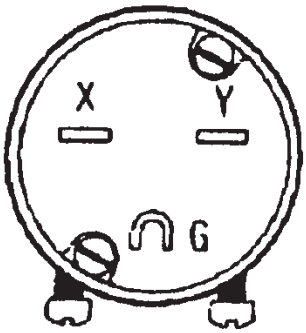



**Figure 1-8**

**Receptacle, Single**

| | |
|---|---|
| Part Number | **88030610** |
| NEMA Type | 6-15R |
| Color | Brown |
| Rating | 15A/250VAC |
| Approvals | UL, CSA |

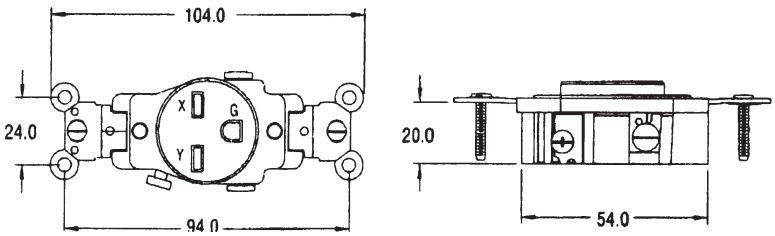
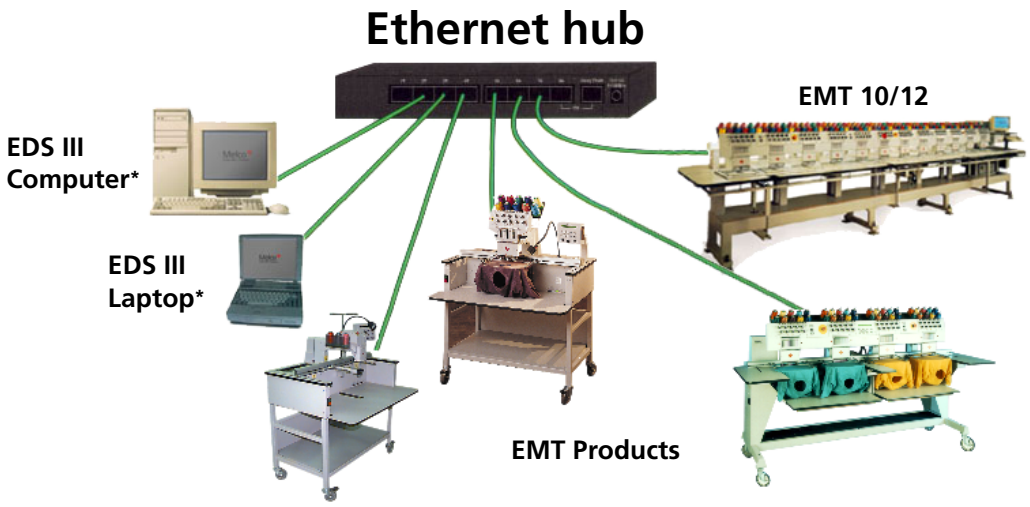



**Figure 1-9**

## Attaching the Peripheral to a Network

The EMT 10/12 is compatible with Ethernet network technology. With Ethernet, peripherals connect to a wiring hub, and the hub connects to an EDS III computer. The hub is a small electronic device that contains a number of cable jacks and diagnostic lights. The peripherals and EDS III computers can plug into any port on the hub. You can connect as many peripherals or computers as your hub can hold. If you have more peripherals or computers than your hub has ports, you can string 2 (or more) hubs together.

Refer to Figure 1-10 for a sample Ethernet network.




**Each cable may be up to 100 meters (327 feet) long. Hubs may be daisy-chained for more capacity or distance.**

**Figure 1-10**

# 2. Operation

This chapter outlines machine operation; in addition, operators must attend a Melco approved training course prior to operating the machine.

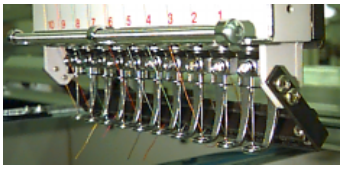

**Figure 2-1**

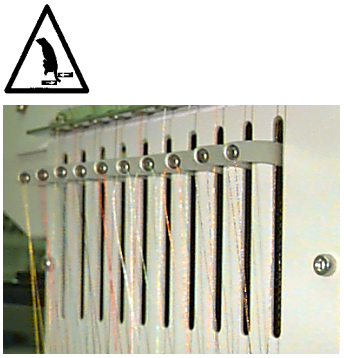
## Hazards of Operation

**Caution Below are risk areas or danger points encountered during operation. Always wear eye protection while operating the machine to prevent injury in the event of a needle break.**

### Needles During Operation

Do not place body parts or other foreign objects under the needles during operation.



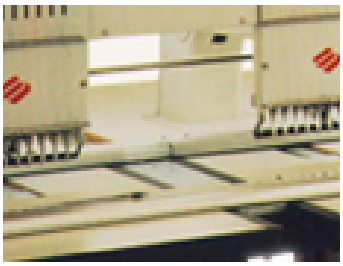


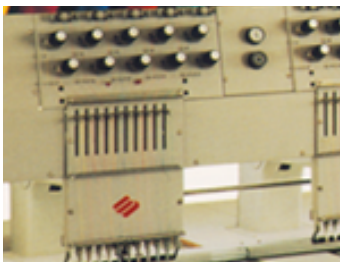
### Take-up Lever Oscillation

Do not touch the take-up levers during operation

### Pinch Points

Do not rest hands or other objects on the table top during operation. Do not reach behind needle case during operation with or without table top in place.



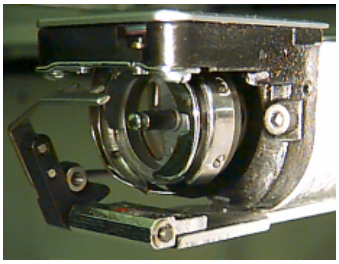


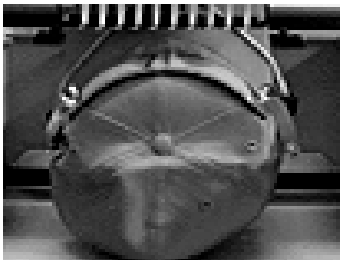
### Needle Case Movements

Do not place hands or other objects on or around the needle case during operation.

### Rotary Hook Rotation

Do not attempt to change bobbin thread during operation. Do not place hands or other objects in the rotary hook area during operation.





### Cap Frame Pinch Points

Do not touch the cap frame, driver, or driver bar during operation.

## Threading

Refer to Figure 2-2 and follow the steps on the next page to thread the EMT 10/12. Keep clear of the user station to avoid inadvertently starting the machine.

The EMT 10/12 arrives with thread routed through the proper thread path. The easiest way to add new thread cones is to place the new thread on the thread tree, and tie the new thread to the old thread in a square knot. From the needle end, carefully pull the new thread into the thread path.

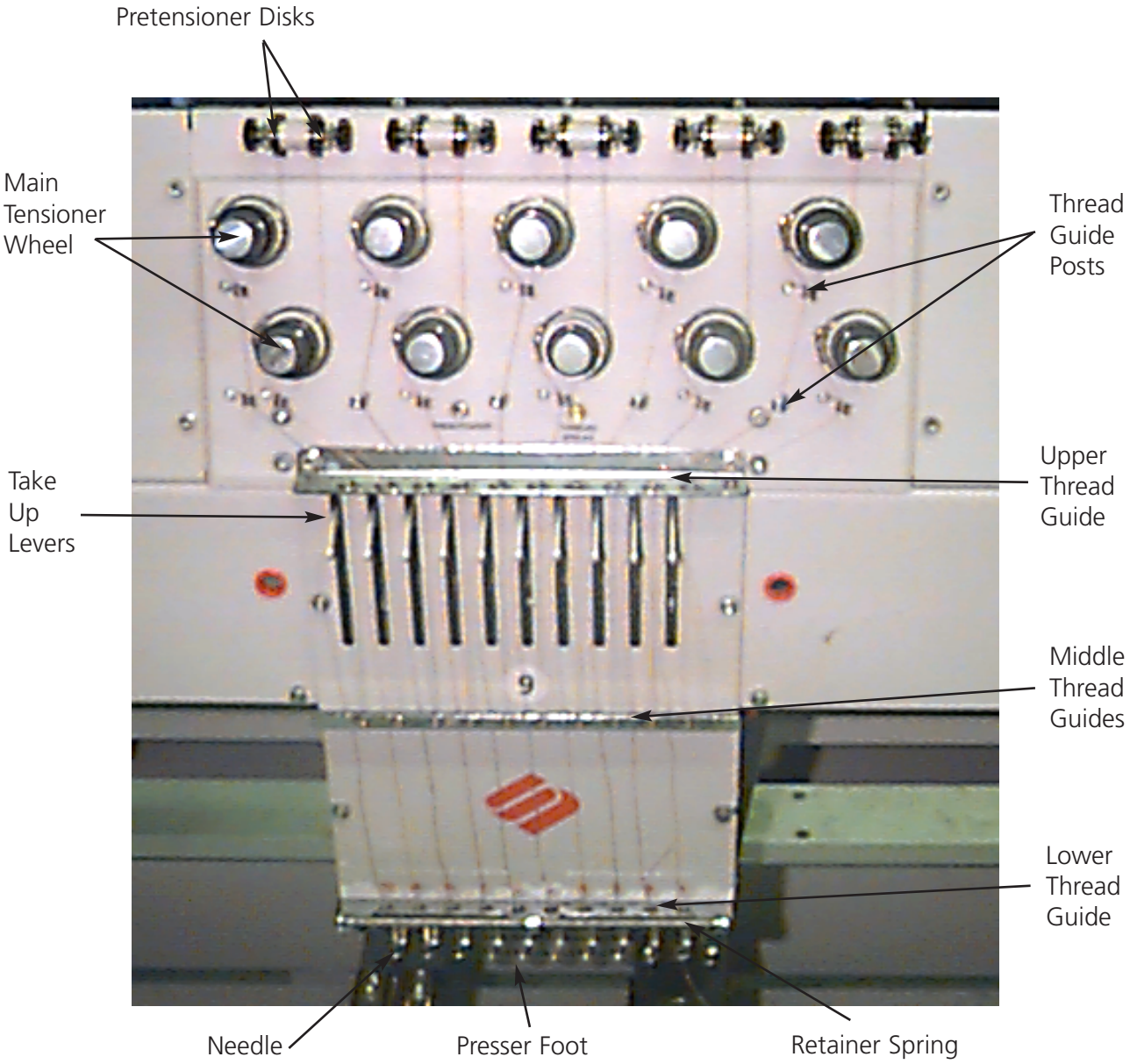



**Figure 2-2**

To start new, push the thread tubes up from the bottom of the thread tree, and remove the magnetic strips from the front of each head. Place a cone of thread onto the stand and push the first few inches of thread into the supply tube. Use a can of compressed air to blow the thread through the supply tube. Do not aim compressed air at other personnel.

If compressed air is unavailable, use the monofilament provided in the operator's kit. Push the monofilament up through the supply tube, then "hook" the thread on the cut in the monofilament and pull the thread through the tube.

The following procedure outlines threading a single needle. Repeat as needed. Refer to Figure 2-2.

1. Pull the thread from the guide hole down between the pretensioner disks (see Figure 2-3).
2. Route the thread down to the main tensioner wheel (see Figure 2-4).
3. Wrap the thread around the wheel clockwise 1 and 1/2 times.
4. Route the thread over the tension check spring.
5. Route the thread down through the thread guide post(s). Threads using the top tensioners have two posts, threads using the bottom tensioners have one post.
6. The upper thread guide is just above the take-up levers. Route the thread through it.

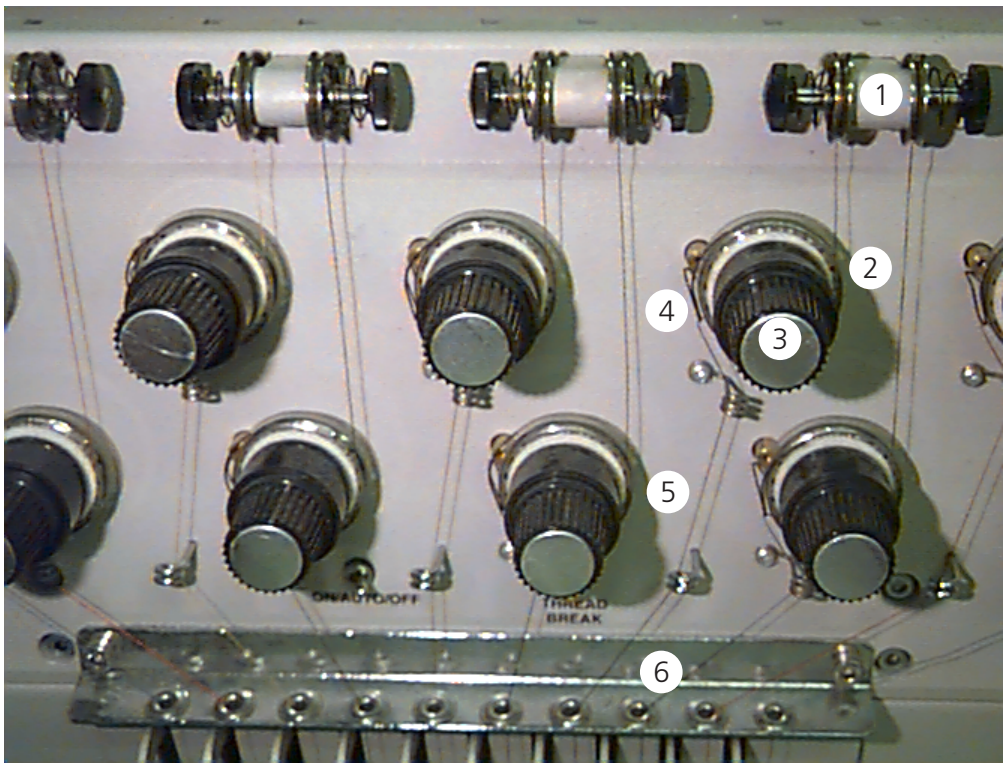



**Figure 2-3**

7. The middle thread guide is just below the take-up levers. Route the thread though the hole facing outward, from back to front.

8. Bring the thread through the take-up lever eye, from right to left.

9. Route the thread straight down to the middle thread guide, through the hole facing downward. Pull on the thread and observe the check spring; it should move up and down to break contact with the thread break sensor.

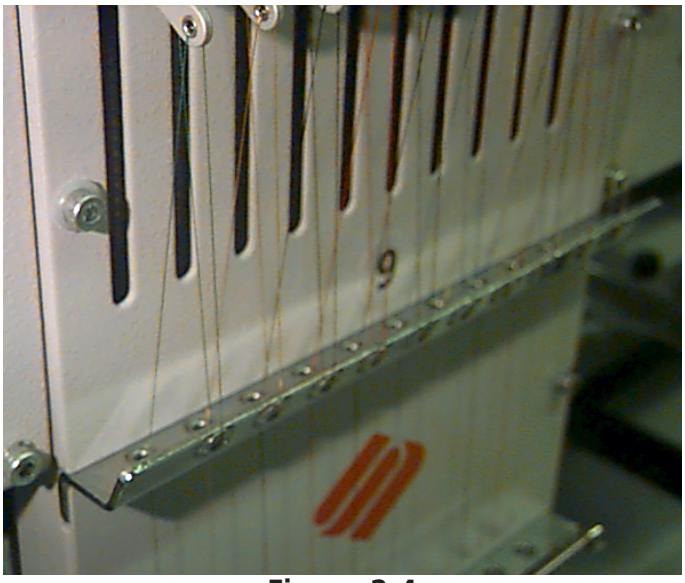


**Figure 2-4**

10. Drop the thread through the lower guide, just above the presser foot.

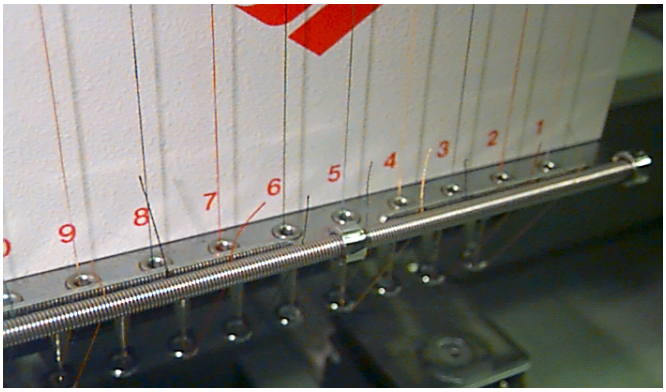



**Figure 2-5**

11. Run the thread through the eye of the needle, from front to back.

12. Pass the thread through the center of the presser foot.

13. Pull on the thread until you feel tensioner pressure.

14. Fasten the thread to the retainer spring and trim the end to about an inch in length.

15 Set the tension to equal 80-120 grams required to pull the thread at the needle end.

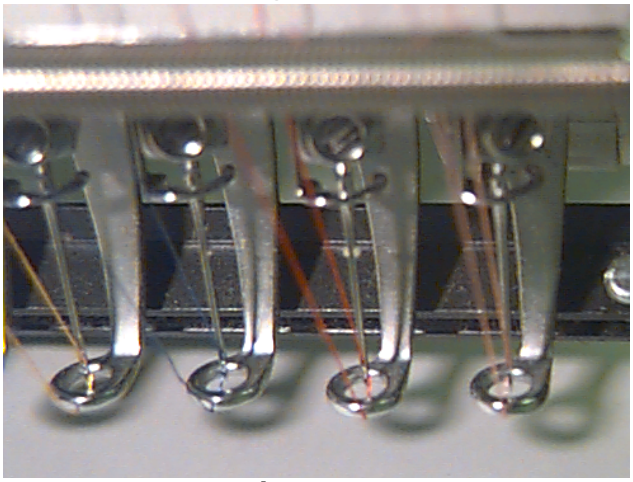


**Figure 2-6**

## Tensions

Embroidery tensions are controlled on both the upper and bobbin thread. The following table outlines when to adjust tensions.

| Problem | Solution |
|---|---|
| Bobbin thread showing on top of garment | Top tension too tight and/or bobbin tension too loose |
| More than 1/3 of column showing bobbin thread on back of garment | Bobbin tension too loose and/or top tension too tight |
| Less than 1/3 of column showing bobbin thread on back of garment | Bobbin tension too tight and/or top tension too loose |
| Design puckering | Top and/or bobbin tension too tight |
| Top thread in design loose (looping) | Top tension too loose |

### Top Tensions

#### Pretensioners

The purpose of the pretensioner is to hold the thread taut for the main tensioner. The thread should pull easily through the pretensioners.

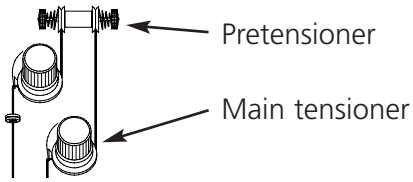



**Figure 2-7**

#### Main tensioners

Sets the upper tension. Tighten tension by turning the knob clockwise. Loosen by turning counterclockwise.

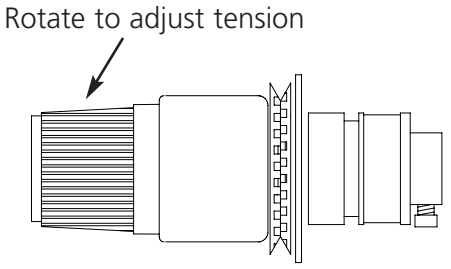



**Figure 2-8**

### Bottom Tension

Leave 2-3 inches (5-7.5cm) of thread hanging free.
Insert the bobbin and case with the pigtail facing up.
With an in-line tension gauge, set the tension at approximately 7-14 ounces (20-40 grams) required to pull thread from the bobbin.
**Never attempt to remove or insert the bobbin while the machine is operating.**

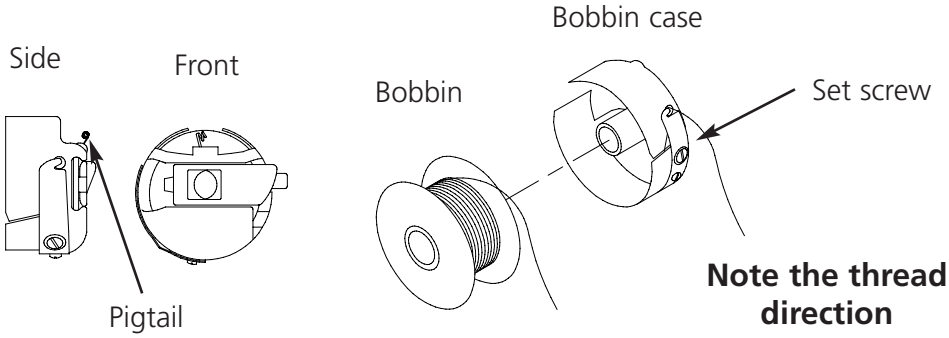
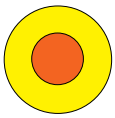



**Figure 2-9**

## Keypad



Any one of three emergency stop buttons stop all sewing motion immediately. To reset, twist slightly to the right and the button snaps back into place.

Starts embroidering.

Stops machine motion. Machine remains stopped until  is pressed.

Used to "frame forward" or "frame backward" when machine is stopped.

Toggles the hoop carriage speed fast or slow.

Moves the needle position to the right in the embroidery field (hoop moves left). Also used with the color change enable to perform manual color changes.

Moves the needle position to the left in the embroidery field (hoop moves right). Also used with the color change enable to perform manual color changes.

Moves the needle position back in the embroidery field.

Moves the needle position down in the embroidery field.

A rack enable switch; hold down and use the arrow keys to position the rack.

A color change enable switch; hold down and use the left and right arrow keys to move the needle case for a color change.

### Stopping in Mid-Run

You may stop sewing at any time by pressing  . This will not affect the stitching, nor will it affect the "stored" copy of the design. Restart sewing by pressing  .

## Control Panel

Turn the power ON to the computer and the Control Panel (Figure 2-10) will appear. Buttons and fields are grayed out if you do not have the proper security level, or when that command or function is not available.

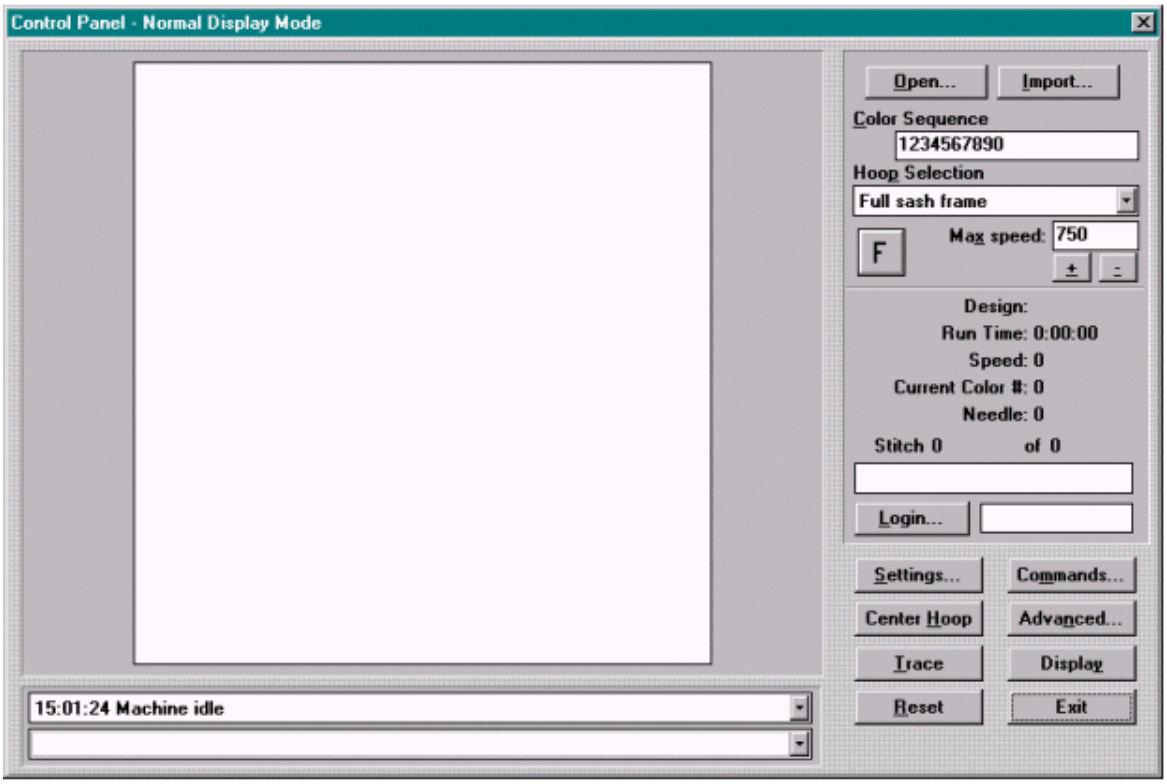



**Figure 2-10**

The information below describes the functions and features of the Control Panel.

### Display window

The display window shows designs at the scaled size for the selected hoop. Hoops are scaled to fit the display area. When a design is sewing, you can switch between the Normal Display Mode and the Real Time Display Mode by clicking on the Display button. Normal Display Mode shows the entire design in the display area. Real Time Display Mode displays the design in a light grey color and shows progress up to the current stitch count with the original chosen palette colors used in the design.

### Buttons

**Open...**
Opens the File Open dialog box. Used to load a design into the machine memory.

**Import...**
Opens the Import dialog box. Used to load a design from non-DOS diskette into machine memory.

**Login...**
Opens the Operator Login dialog box. Allows operators to log onto the system.

**Settings...**
Opens the Settings dialog box.

**Commands...**
Opens the Commands dialog box.

**Center Hoop**
Moves the rack to the center of the selected hoop.

**Advanced...**
Displays the Advanced Settings dialog box.

**Trace**
Traces the design (does not embroider) to verify the design will fit in the selected hoop.

**Display**
Changes between Normal and Real Time views.

**Reset**
Resets the current design back to the beginning.

**Exit**
Displays the Exit dialog box (Figure 2-11). Make your selection and click OK.

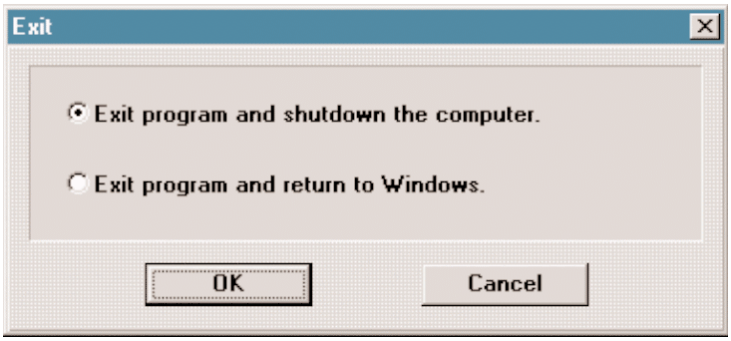



**Figure 2-11**

### Other Fields in the Control Panel

**Color Sequence**
Used to select the desired color sequence.

**Hoop Selection**
Displays the currently selected hoop; click to change.

**Max Speed**
Displays maximum sewing speed in stitches per minute. Contains values between 300 and 1000 in increments of 10. May be increased and decreased in increments of 50 by pressing the ALT+ and ALT- keyboard combinations. May also be increased and decreased in increments of 50 by pressing the **+** and **-** buttons under the Speed Edit field.

**Orientation F**
Displays the current orientation; click to change or use the CTRL F key combination to step through different orientations.

**Design**
Shows the currently loaded design name.

**Run Time**
Displays the elapsed time since start button was pressed, including all stops.

**Speed**
Displays the current sewing speed.

**Current Color #**
Displays the color sequence position.

**Needle**
Displays which needle is currently sewing.

**Stitch Count**
Displays how many stitches have been sewn so far, and how many total stitches are in the design. Below the counter is a "fuel gauge" visually showing how complete the design is.

**Status Field**
Located under display window, this displays all of the sewing and error messages generated since the program was started. This field is scrollable.

## Opening Designs

To open a design and load it into machine memory, click on Open.. from the Control Panel. This will display the Open dialog box (Figure 2-8). Browse to the drive or directory of your choice, then click on the file name. Click OK to open the design.

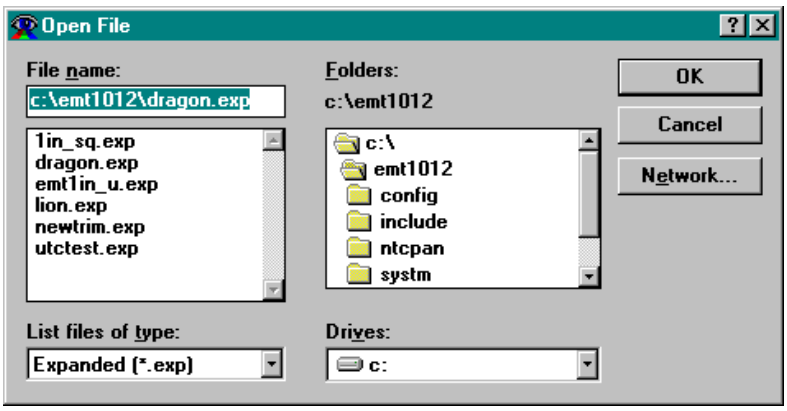



**Figure 2-12**

## Importing Designs

You have the option of importing designs that are not in the DOS format. When you import other designs, their format is automatically translated.

From the Control Panel, click on Import... to display the Import dialog box (Figure 2-9). You can change drives and choose from a variety of common formats.

Once you find the design you want, click on the file name then click on OK. The design will be loaded into machine memory.

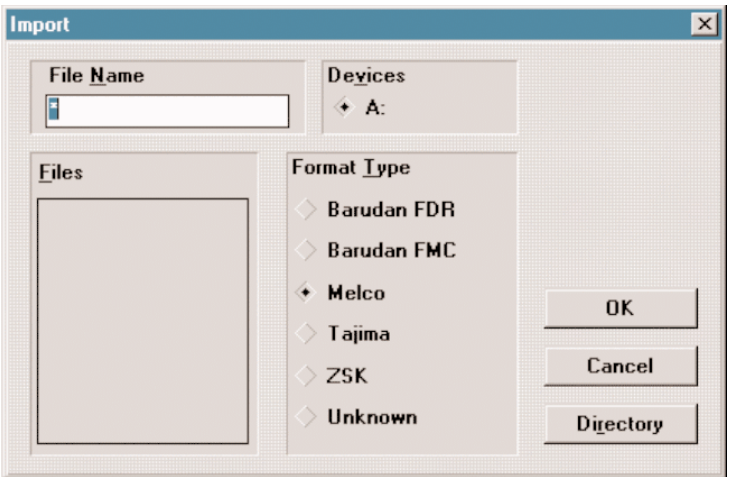



**Figure 2-13**

## Color Sequence

You may set the colors (up to 99) and sequence for each design. To do this, click once in the Color Sequence edit field and you will see a blinking edit bar. You can use the Backspace key to back up and delete any existing numbers or enter a color combination of your own.

The valid entries in this field are as follows:

- **1-9, 0:** Represent the needle numbers on each head (0 represents 10).
- **L:** An **L** indicates the Learn Mode; in Learn Mode,the machine will pause at each color change and prompt the operator to set a new color manually. If this field is left blank, the peripheral automatically enters Learn Mode.

- **A:** An **A** indicates an applique pause. When the peripheral encounters an **A**, it pauses and moves the rack out (towards the operator). Pressing ⚠ moves the rack back to the last embroidery position and resumes embroidering.
- **P:** A **P** inserts a pause after this color change and awaits the operator to manually restart. Additionally, the machine will pause after EVERY color change thereafter, and await an operator restart. Press ⚠ to restart. Used if you want to stop at every color.
- **S:** An **S** replaces a color change. It will NOT change colors, however, and must be restarted by the operator manually. It will not stop at subsequent color changes. Press ⚠ to restart. Used if you want to perform a manual color change.
- **– (dash):** A **–** causes the machine to skip this color change and continue sewing on the same needle.
- **H:** An **H** inserts a pause after the color change ONLY. Press ⚠ to restart. Often used when a thread color must be changed during a design.

## Hoop Selection

Click on the Hoop Selection drop-down arrow in the Control Panel to select a hoop size. The new hoop will appear in the Design window. The Design window will show how the design will fit into the selected hoop. A dialog box will appear prompting you to ensure you have the proper hoop size selected each time you load a new design; press ⚠ to restart.

## Changing the Design Orientation

Design orientation allows you to sew sideways, upside-down, or even backwards. On the Control Panel is a small button with a capital "F". Click on this button until the desired orientation is displayed. Figure 2-14 shows all of the possible orientations. You can also press ALT F on the keyboard to change orientation. The Display window will update your orientation after a few seconds.

**Figure 2-14**

## Max Speed

Sets the maximum run speed (as long as the speed does not exceed the Limit Speed; refer to the Security Section of this chapter). Max speed is adjustable from 300 spm minimum to 1000 spm; there are 3 ways to change the sewing speed:

- Type the desired speed (in increments of 10) in the speed edit field
- Press the ALT + and ALT - key combinations to raise or lower the speed in increments of 50
- Click the **+** or - buttons under the speed edit field to raise or lower the speed in increments of 50

If you alter the speed while a design is sewing, the change will take place immediately.

Note: The actual run speed (shown in the Job Status area of the Control Panel—Figure 2-15) displays the actual embroidery speed. The actual and max may differ slightly, depending on the complexity of the design.

## Job Status

The middle-right area of the Control Panel displays the status of the current design, as shown in Figure 2-15. It lists the design name, the run time (including all stops), the sewing speed, the current color number, the current needle, the current stitch count, and the total number of stitches in the design.

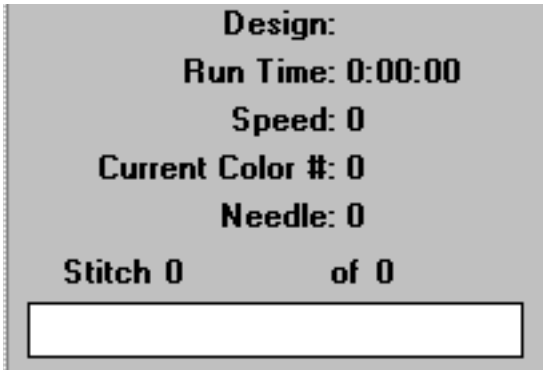



**Figure 2-15**

## Operator Login

From the Control Panel, click on Login... to display the Operator Login dialog box (Figure 2-16).

Enter the user name and password to login.

Refer to the Security section of this chapter for more information.

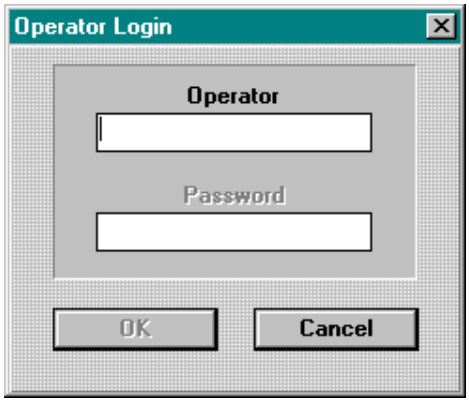



**Figure 2-16**

## Settings

To display the Settings dialog box (Figure 2-17), click on Settings... from the Control Panel. A description of the settings follows.

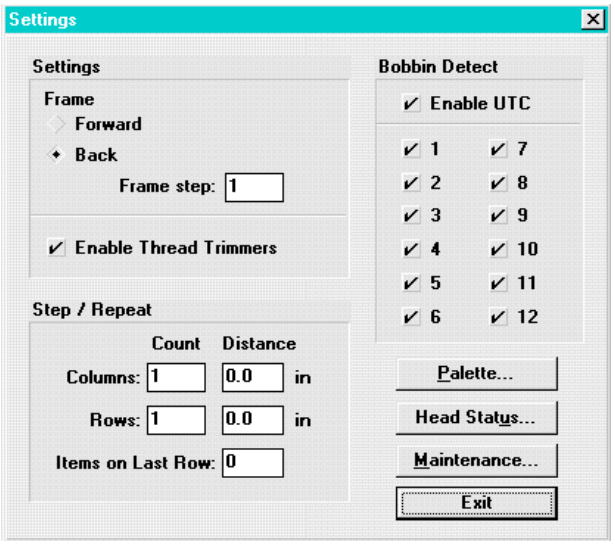



**Figure 2-17**

**Frame**

Holding  down allows the operator to Frame through a design; when **Back** is selected, the machine moves backward stitch by stitch. When **Forward** is enabled the machine moves forward stitch by stitch. Default is Back.

Note: When framing, the first 15 stitches are framed through slowly, one at a time. After the first 15 stitches, it steps through the number of stitches entered in the Frame Step box at a faster rate.

**Frame Step**
Sets the number of stitches accumulated for each frame move. Available numbers are 1-50; default is 1.

**Enable Thread Trimmers**
Trimmers (including the cutters, pickers, and grabbers) are enabled when the box is checked. When enabled, thread will be trimmed at every color change, trim dataset, end of design, trim command, and when the consecutive number of jumpstitches (entered in the Jump Stitch Count in the Advanced... Settings dialog box) are encountered. When disabled, the cutters, pickers, and grabbers are disabled. Default is On.

**Step/Repeat**
If you want to sew the same design several times on a single garment, you can use the Step And Repeat function.

This example demonstrates how the Step And Repeat function works. Assume you have a logo design measuring two inches wide and one inch high, and you want two rows with five logos in each row, a third row with only two logos, and half an inch between each logo (remember metric units are also possible if you have Windows set up to display metric units).

Follow the steps below to duplicate this pattern:

1. Under Count, enter 5 for Columns and 3 for Rows.
2. Under Distance, enter 2.5 for Columns and 1.5 for Rows.
3. Enter 2 in the Items on Last Row box.
4. Return to the Control Panel and click on Center Hoop.
5. Go to the Advanced dialog box and select Enable Center Design.
6. Return to the Control Panel and open a design.

The result will be the same as shown in Figure 2-18, with the layout centered in the middle of the hoop. You can use the Step and Repeat function with any design and duplicate it as many times as will fit within the defined hoop.

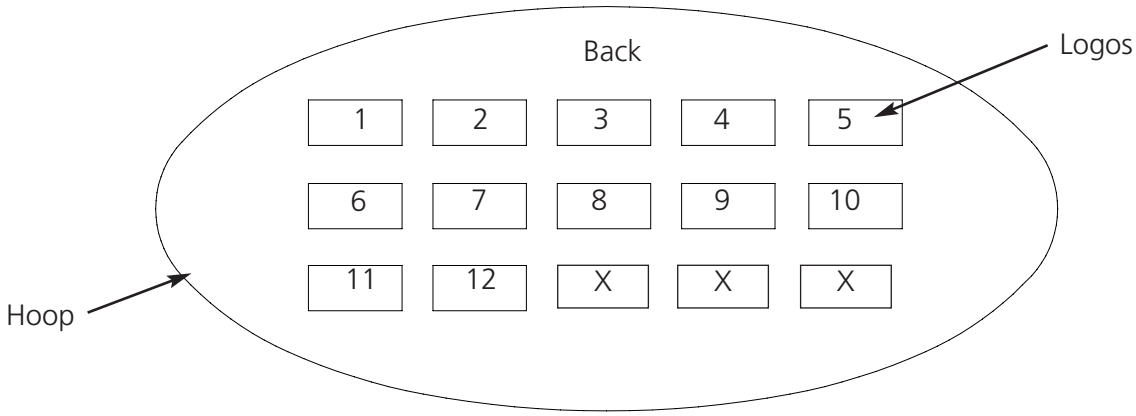



**Figure 2-18**

**Bobbin Detect**
The UTC is enabled when there is a check in the box; the UTC detects the absence of bobbin thread and stops the machine automatically. You can toggle on or off the bobbin detect for each head individually if the Enable UTC box is checked; if the Enable UTC box is not checked, all bobbin detecting features for each head are turned off. Default is On for all heads.

**Palette...**
Displays the Change Palette Colors dialog box (Figure 2-19).

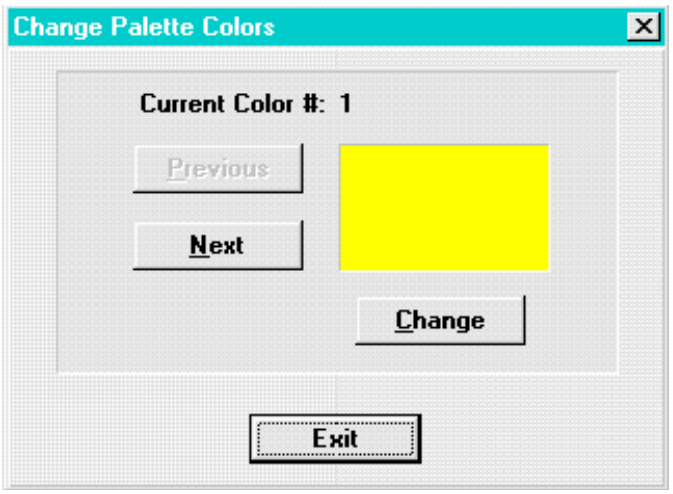



**Figure 2-19**

**Head Status...**
Displays the Head Status dialog box (Figure 2-20). This dialog box displays whether the switch located on the head is in the ON, OFF, or AUTO position (refer to Chapter 4 for more information).

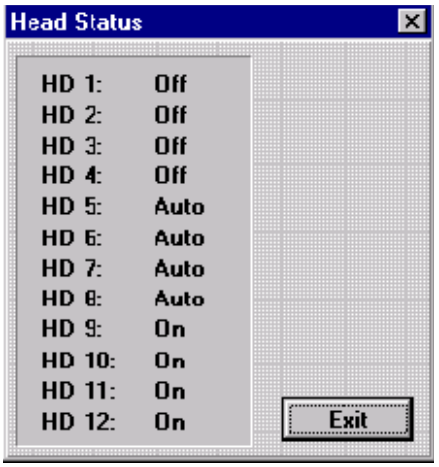



**Figure 2-20**

**Maintenance**
Displays the Maintenance Timers dialog box (Figure 2-21). The Maintenance Timer dialog box shows the time remaining for each of the maintenance timers. If any of the timers show a zero or negative numbers, that timer has expired and the machine maintenance for that time interval should be performed. After the maintenance has been performed, click the reset button associated with that maintenance requirement. A confirmation dialog box will appear.

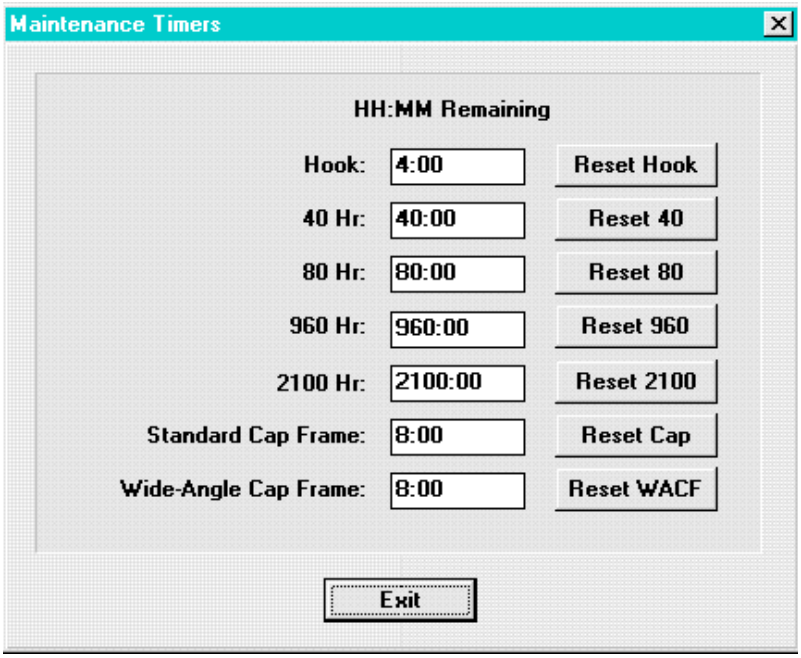



**Figure 2-21**

Each time a maintenance timer reaches zero, a dialog box pops up indicating that you need to perform that maintenance. Refer to the Maintenance chapter for more information.

**Exit**
Returns to the Control Panel.

## Commands

To display the Commands dialog box (Figure 2-22), click on Commands... from the Control Panel. A description of the settings follows.

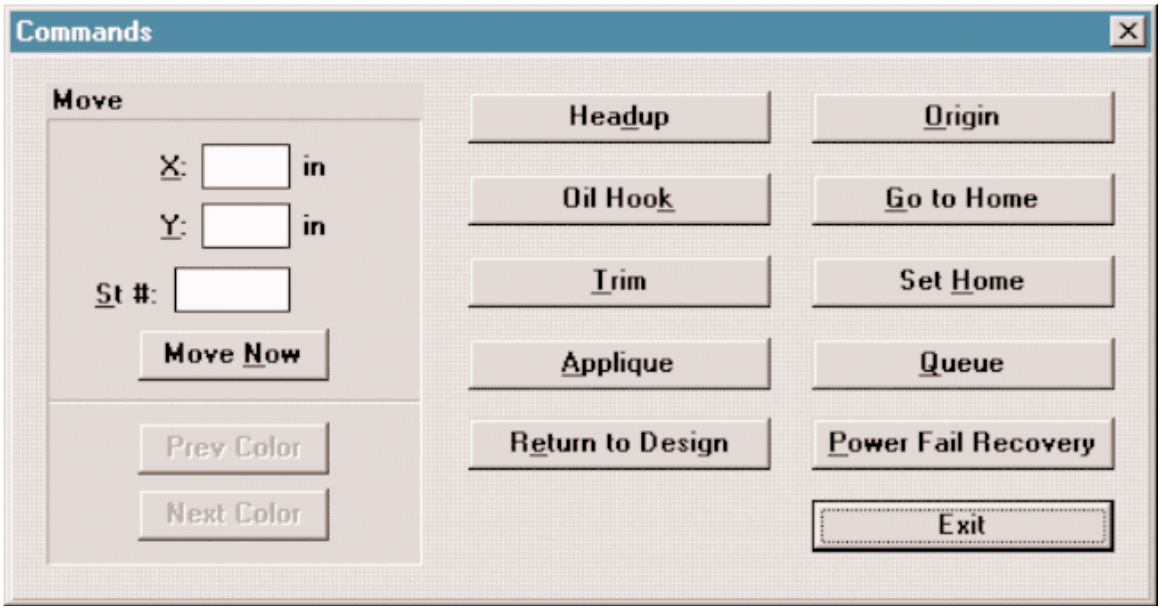



**Figure 2-22**

**Move**

The sash frame (also known as the rack) may be moved with the keypad or via the Move option (see Figure 2-22).

Within the Move field, there are two boxes for X/Y coordinates, and a box for a stitch number (St #). You can specify the exact position in the sewing field that you want the rack to move to, or, if a design has been selected, you can enter the stitch number.

Click on Move Now to move the rack to the specified location.

You can move to the next or previous color change, as well, by clicking on the appropriate button.

**Headup**
Forces the machine to go to headup.

**Oil Hook**
Forces the machine to go to the proper position for oiling the hook (refer to the Maintenance chapter of this manual for more information).

**Trim**
Forces the machine to perform a trim.

**Set Home**
Forces the rack to set its Home position. Normally, the Home position is automatically set the first time a design is loaded after powerup.

**Applique**
You must stop the machine before using the Applique button. When used, the rack will center left and right and will move all the way forward. Hit the start button on the machine and the rack will return to its previous position the machine will continue sewing where it left off.

**Return to Design**
If you stop a design before it is finished and manually jog the rack, click on Return to Design to return to the last stitched position. Press  to begin embroidering again.

**Origin**
Moves the rack immediately to the origin of the design currently being sewn.

**Go to Home**
Forces the rack to go to its Home position (Home must be set first).

**Queue**
Click on this button after starting the system to re-queue the last design that was sewn on the machine.

**Power Fail Recovery**
The Power Fail Recovery function allows sewing to resume after the machine has suffered a loss of power. Refer to Chapter 4 for more information.

**Exit**
Returns to the Control Panel.

## Center Hoop

Click on this button to move the rack to the center of the selected hoop. If Home has not been set, The EMT 10/12 will automatically find home, then center the hoop. This function is not permitted while the machine is embroidering or after a job has started.

## Advanced Settings

None of the features contained within the Advanced Settings screen are needed for day-to-day embroidery. Consequently, this screen is not available to users with an **Operator** security level. To access this screen, click on the Advanced... button in the Control Panel. Following is a description of the functions that are available in this screen:

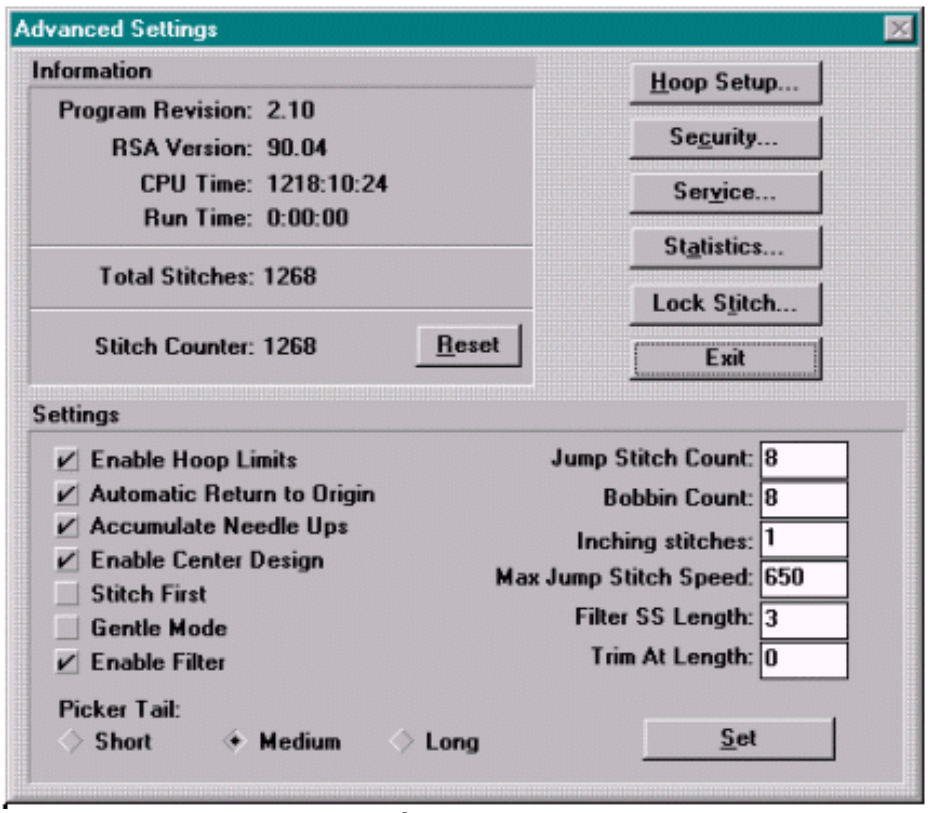



**Figure 2-23**

**Information zone**

This zone displays the revision levels of the EMT 10/12 software and RSA files. It also displays the number of hours the EMT 10/12 has been turned on (since it was installed) and the run time (the time the machine has been sewing). The total stitches field displays the total stitches sewn on the peripheral and may not be reset. The stitch counter displays the number of stitches sewn since the last time the counter was reset; the reset button resets the stitch counter.

### Hoop Setup

Assuming you have proper security privileges, you may create new hoop sizes and types. **Before setting up a new hoop, you must center an existing hoop.** Click on Advanced..., then click on Hoop Setup to display the Hoop dialog box (Figure 2-24).

You may specify a hoop as Round, Square, Oval, Rectangle, Cap or Wide Cap. Enter the hoop dimensions and center.

Note: To find the hoop center, measure from the center of the needle plate to the center of the custom hoop in the **X** and **Y** direction.

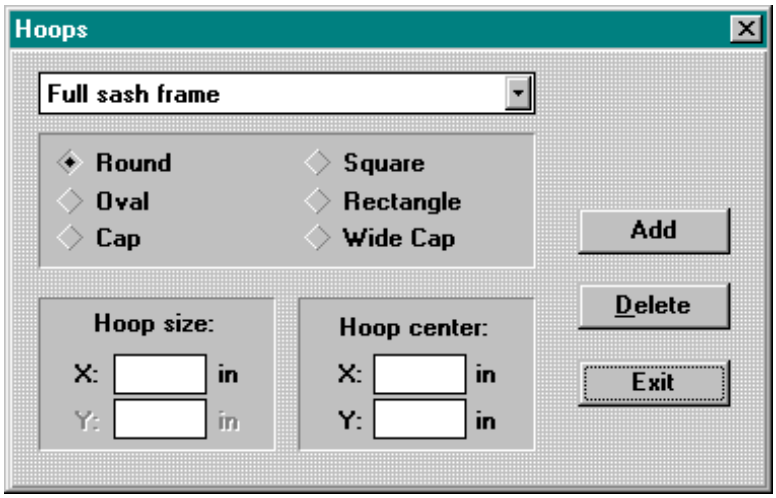



**Figure 2-24**

If you try to define a hoop with extents that are bigger than the maximum sewing field, the values will automatically be changed to the machine's maximum values.

Note: The unit of measurement will be in inches if the Windows Control Panel is set for English units. If Metric units are selected, the display will be in centimeters.

Once you have set up the new hoop, click Add to include it on the standard list.

If you want to delete a hoop, highlight it and click on Delete. The hoop will disappear from the list. The exceptions to this are the Cap Frame and Full Sash Frame, which cannot be deleted.

When finished defining hoops, click on Exit to return to Advanced Settings.

## Security

Permits restricted access to certain areas of the operation software. Click on Advanced..., then click on the Security button to display the Security dialog box (Figure 2-25).

The Operator Names buttons are used to change operator options or add new operators (explained later in this Chapter).

The Limit Speed field sets the maximum sewing speed for the machine. The speed set here will be the maximum selectable speed from the Control Panel.

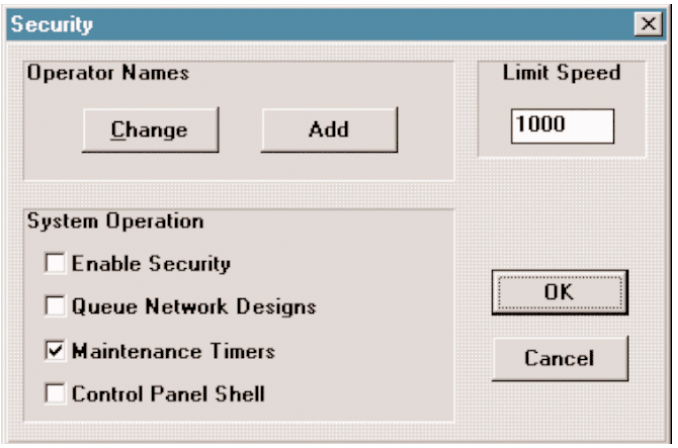



**Figure 2-25**

**Enable Security**
If checked, this forces operators to login before the Control Panel will start.

**Queue Network Designs**
Automatically loads a design sent over the network.

**Maintenance Timers**
Enables and disables the maintenance timer feature.

**Control Panel Shell**
Changes the system shell from the Windows Program Manager or Windows Explorer to the EMT1012.exe program. When the Control Panel Shell is enabled, Windows functions are not available.

## Security levels

Following is the list of all available security levels. You can change a user's access at any time by clicking on the Change button (refer to the next section for more information).

**Operator**: In the Control Panel, the Advanced... button is grayed out.

**Supervisor**: In the Advanced Features dialog box, the Security, Service, and Statistics buttons are grayed out.

**Manager**: The Change and Add buttons are grayed out, and the Notes button in the Service dialog box is grayed out.

**Maintenance:** Has access to all levels of security except the Change and Add Operator areas; these buttons are grayed out.

**Master**: Has unlimited access to all functions.

### Changing an operator

To change the options for an operator, click on the Change... button in the Security dialog box. This displays the Edit Operator dialog box (Figure 2-26).

Select the operator to be edited from the operator name drop down field. Click on Delete to delete the operator, or select the new security level for the operator and click on the Set SL button.

If the Allow Exit box is checked, it means this user can exit the Control Panel to Windows.

To change the password, type in the new password and click on the Set PW button.

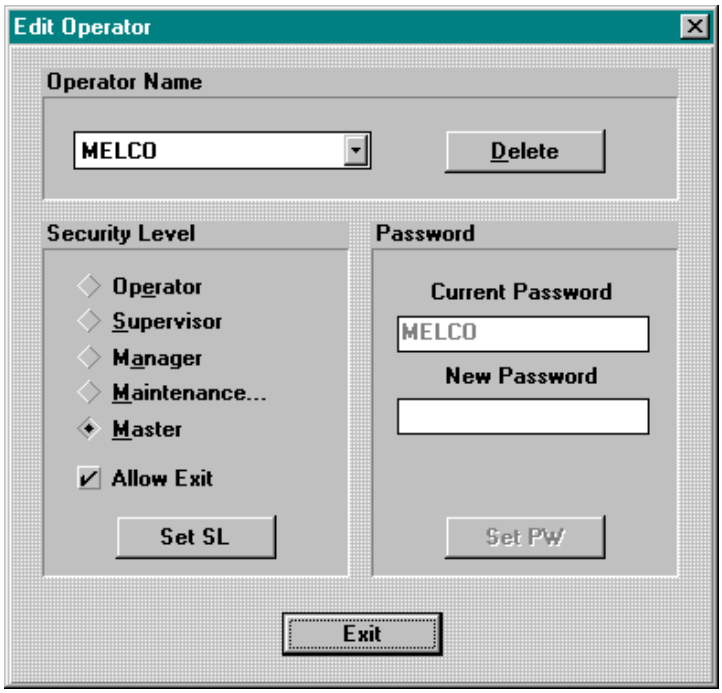



**Figure 2-26**

Click OK to return to the Security dialog box.

### Adding an operator

To add a new operator, click on the Add... button in the Security dialog box. This displays the Add Operator dialog box (Figure 2-27).

Type in the operator's name and enter the password. Select the available security level for the new operator.

If the Allow Exit box is checked, it means this user can exit the Control Panel to Windows.

Click OK to save changes and return to the Security dialog box.

Click Cancel to discard changes and return to the Security dialog box.

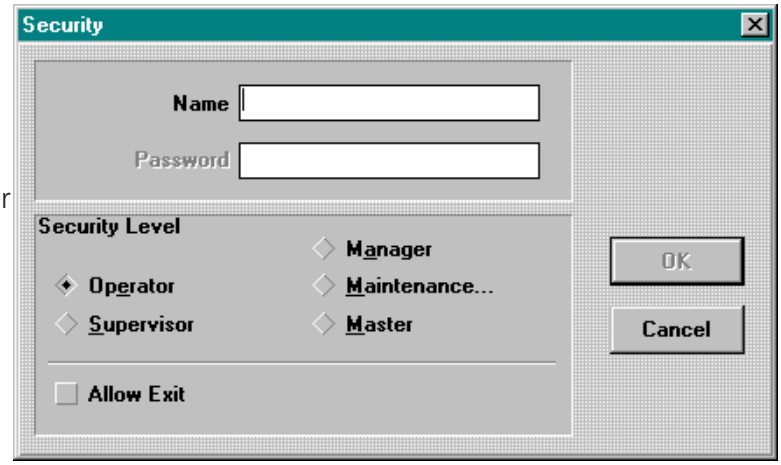



**Figure 2-27**

## Service

Most maintenance functions available on the EMT 10/12 are available through the Service dialog box (Figure 2-28). The functions found on this screen should only be used by a qualified service person. A brief description of the functions follows:

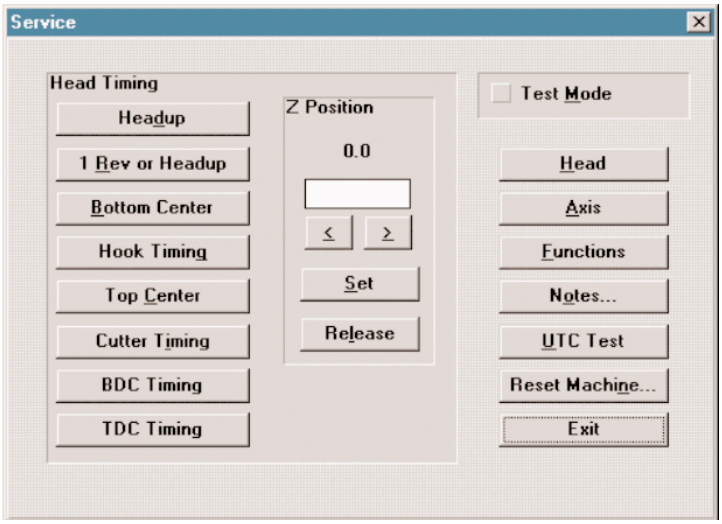



**Figure 2-28**

### Head Timing

The buttons found in the Head Timing section of this dialog box are primarily used for tasks such as Lubrication, Head Timing, etc.; refer to the Operator Maintenance chapter or the Technical manual for more information.

### BDC Timing

The Bottom Dead Center Timing button will put you into a mode used for adjusting the needle clamp. By pressing the BDC Timing button, the machine will automatically set the first needle to bottom dead center position to adjust needle depth. To end the BDC Timing Mode, press the BDC Timing button again.

### TDC Timing

The Top Dead Center Timing button will put you into a mode used for adjusting the needle clamp. By pressing the TDC Timing button, the machine will automatically set the first needle to top dead center position to adjust the needle clamp. Press the frame button on the machine to set the next needle into position for adjustments. To end the TDC Timing mode, press the TDC Timing button again.

### Z Position

Displays the current Z shaft position in degrees. You can enter a new Z position and click **Set** to rotate the shaft to the new position. Or you can enter a value (in degrees) in the Z position field and use the arrow buttons to change the Z position forward or back, using your entered value as the increment. When **Release** is checked, you can turn the shaft manually.

**Test Mode**
Puts the machine in test mode — a diagnostics mode that continuously runs designs and ignores thread breaks.

**Head, Axis, Misc. Functions**
Opens the Head, Axis, or Misc. Functions dialog boxes. This dialog box is intended for use only by technicians for troubleshooting the sewing heads, the x,y, and z axis, and other miscellaneous functions.

**Notes**
Opens the Service Notes dialog box. This dialog box is intended to allow service personnel to keep notes that will be accessible during future maintenance sessions. Edit the notes as desired and click Save to save changes or Cancel to discard changes.

**UTC Test**
Puts the machine in the UTC test mode to verify the UTC is operational. A dialog box will appear and you may physically toggle the UTC. When the machine detects a UTC error, it will beep. Click OK to stop the UTC test. This mode is not available if the machine is running.

**Reset Machine**
Resets the EMT 10/12 to its default settings. A confirmation dialog box will appear.

**Exit**
Closes the Service dialog box. Note: If the machine is not at Headup and you click Exit, the machine will automatically move to its Headup position.

### Statistics

Click on **Advanced...**, then on the Statistics button to display the statistics dialog box (Figure 2-29). The Statistics dialog box contains the start and end date, and start and end time fields. By entering values into these fields, you can gather information from any date range and from any time range within those dates.

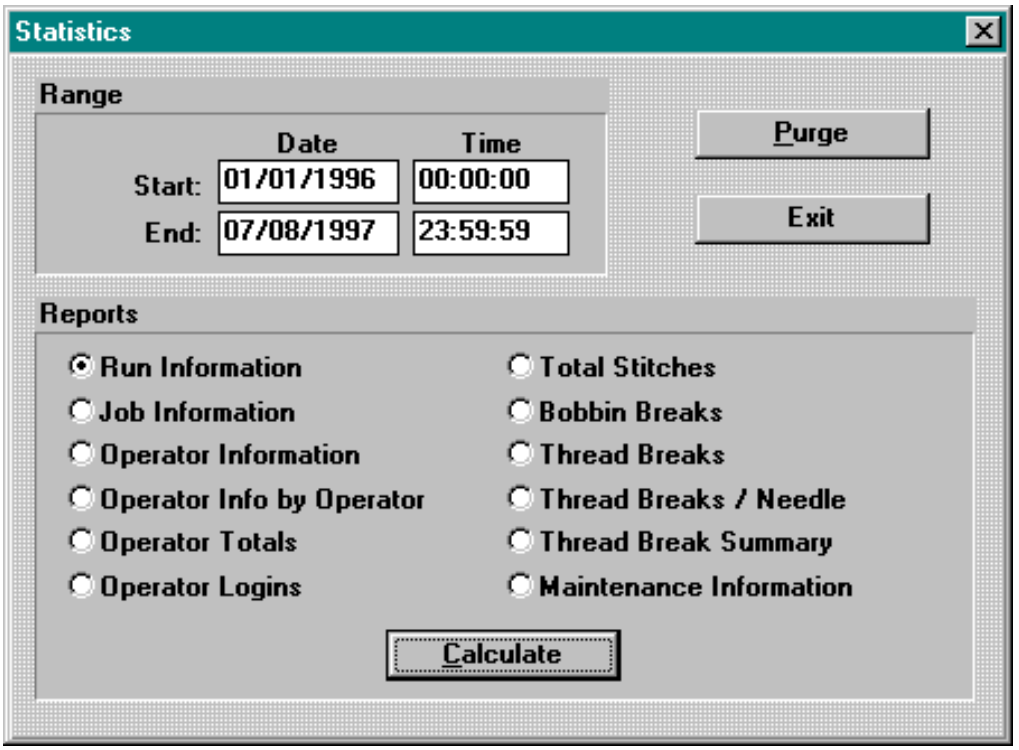



**Figure 2-29**

The type of report to be generated is selected in the Reports section of the Statistics dialog box. All the available types of reports are shown. When you have entered all the necessary information, click on the Calculate button and the report will be generated and the results will be displayed.

The EMT 10/12 stores its statistical information in a standard dBase IV file.

### Statistical Reports

There are a number of reports available, including:

- Job information
- Operator information
- Design information
- Pieces produced
- Time per job
- Thread breaks
- Stitches per job

You can double-click on a line of any report to display the Extended Information dialog box for that report.

Figure 2-30 shows an example report (a Run Information report).

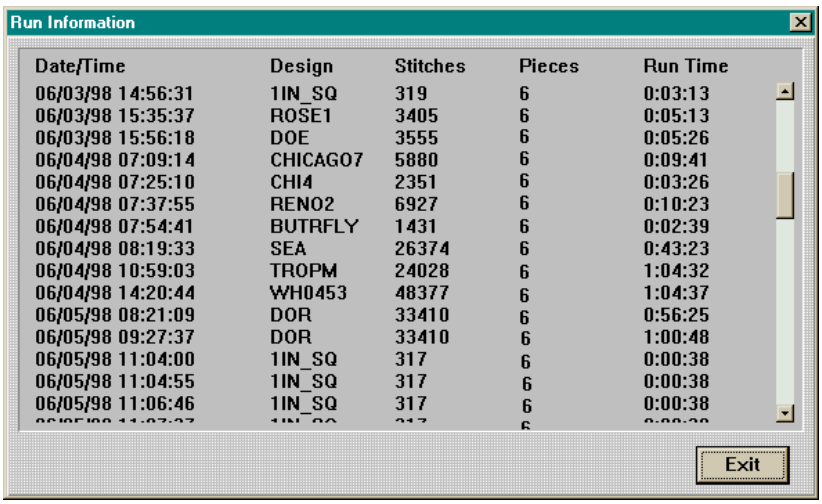



**Figure 2-30**

Figure 2-31 shows the Extended Run Information for that report.

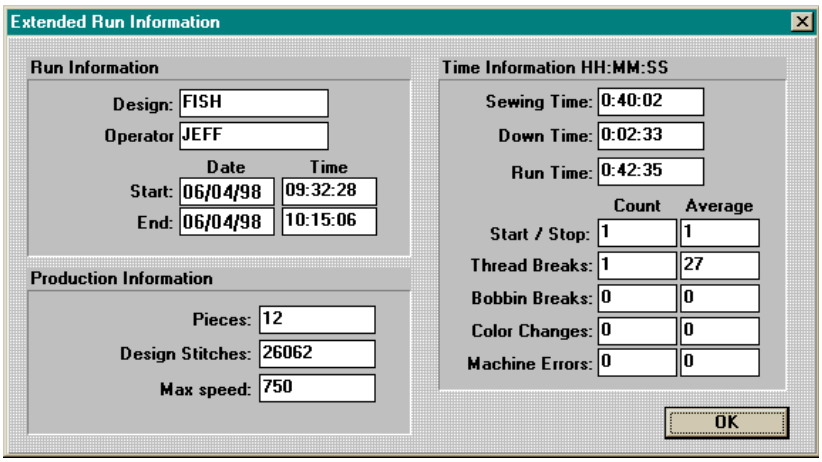



**Figure 2-31**

Note: Operator information is calculated based on the operator who is logged in when the design is started, NOT who is logged in when the design is completed.

The Purge button displays the Purge Records dialog box (Figure 2-32). This dialog box is used to remove records from the machine database log file.

- **Record Count** indicates the number or records currently in the database.
- **First and Last Record** dates show the date range for all the records.

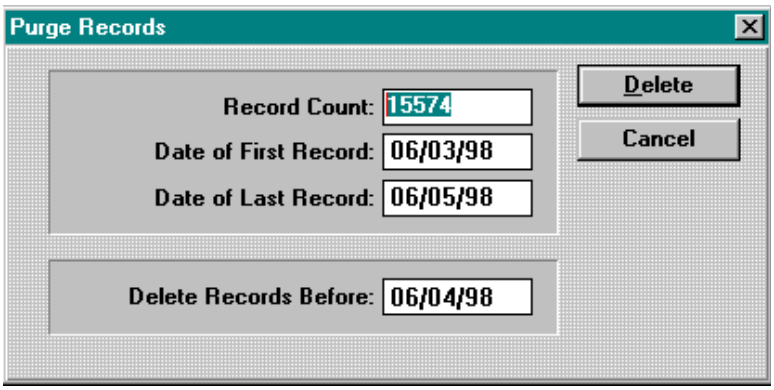



**Figure 2-32**

To delete old records enter a date in the Delete Records Before field and click on delete. The system will ask for verification before deleting records.

The EMT 10/12 stores its statistical information in a standard dBase IV file.

### Lock Stitches

Click the Lock Stitch... button to display the Lock Stitch dialog box (Figure 2-33). Select the appropriate lock stitch pattern and click Ok. The numbers below refer to the numbers in Figure 2-33 (the numbers do not appear on the dialog box).

1 No lock stitch
2 Standard EMT 10/12 lock stitch
3 Standard EDS III lock stitch
4 1 back lock stitch
5 2 back lock stitch

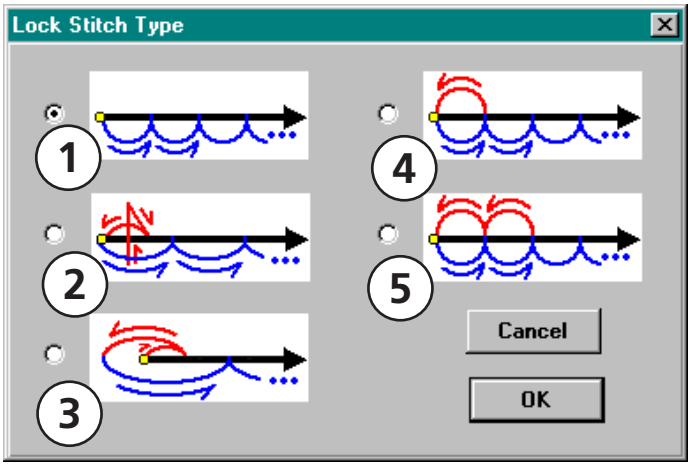



**Figure 2-33**

### Settings

**Enable Hoop Limits**
This option will prevent the machine from sewing through the selected hoop (also called spiking a hoop) by checking the frame limits. Default is On.

**Caution! If you do not enable hoop limits, you may cause damage to your EMT 10/12 and/or any hoops (including cap frames) that are installed!**

**Automatic Return to Origin**
When enabled, this feature returns the machine to the origin when sewing is completed. Default is On.

**Accumulate Needle ups**
When needle is up (after a trim) and the design has jump stitches (or moves to a new point in the design) the machine makes those stitches into one motion. Default is On.

**Enable Center Design**
Makes the current needle position the center point for sewing. When enabled, the center of the design becomes the center point. Default is On.

**Stitch First**
Depending on how the design is punched, may cause lock-stitches to sew outside of the design area. ON (stitch-n-move) forces the needle into the cloth at that point. OFF (move-n-stitch) changes the first stitch into a move, then sews on the next stitch. Default is Off.

**Gentle Mode**
Reduces the maximum stitch length permitted at a given speed. Forces slower rack movements, but yields better embroidery. Analogous to the "gentle cycle" of a washing machine.

**Enable Filter**
The Filter converts jump stitches into a single stitch. Use Trim at Length to insert automatic trims.

**Picker tail**
Allows you to select the length of thread tail left after a trim. Default is medium.

**Jump stitch count**
The amount of consecutive jump stitches that will force an automatic trim. The machine performs the trim before the jump stitches are made. Default quantity is 8. Allowed quantity is 0-20 (0 disables the function).

**Bobbin Count**
The number of stitches the machine will make after detecting the absence of bobbin thread. Default is 8. Allowed quantity is 0-50 (0 disables the function).

**Inching Stitches**
The quantity of "slow stitches" the machine will make at the beginning of sewing before it goes to full speed. Default quantity is 1. Allowed quantity is 1-20.

**Max Jump Stitch Speed**
This is the maximum speed the machine will perform jump stitches; the default is 650. Allowed range is 300-950.

**Filter SS Length**
Sets the shortest stitch length allowed when the Filter is enabled.

**Trim at Length**
A function of the Filter. Sets automatic trims at stitches as long or longer than specified here. Default is 0 (0 disables the function).

**Set**
Saves the setting changes. If you make changes to the Settings, you must Set the changes before exiting the Advanced Settings dialog box. If you do not click Set before exiting, you will be prompted to save before exiting.

## Trace Function

The Trace function allows you to trace the outline of a design within the hoop before it is sewn. This provides an opportunity to replace or adjust the hoop, if needed. Use the following procedure to make sure your design fits in the specified hoop:

1. Load a garment into a hoop and attach the hoop to head #1.
2. Select the appropriate hoop size.
3. Select a design.
4. Click on the Trace button.

The hoop will move to trace the outline of the design beneath the currently selected needle. If you stop the trace (by pressing  ) before it is completed and move the rack manually with the keypad, the trace will be recalculated and will start over from the beginning of the design when you try to continue the trace (by pressing  ).

# 3. Hoops and Cap Frames

## Preparing the Material

Whether you are sewing flat goods, tubular goods (such as sweatshirts), or caps, you must first place your material into an appropriate hoop. The EMT 10/12 has the same hooping versatility as all of the sewing peripherals in the Melco line of embroidery equipment.

## Hooping

Whenever you hoop material, make sure that it is straight, fold-free, and stretched tightly. Follow these steps for proper hooping.

1. Use the right size hoop for the job. The design should fit inside the hoop with a small margin of space between it and the hoop, but without a lot of extra material.

Note: The Trace function allows you to check if a design will fit in the hoop. Refer to Chapter 2 for more information.

2. Place the outer hoop on a flat surface with the hoop's mounting bracket facing up. Refer to Figure 3-1.

3. Loosen the adjusting screw on the outer hoop.

4. Place some backing material on top of the outer hoop. Make sure that you have enough backing to cover the entire hoop area.

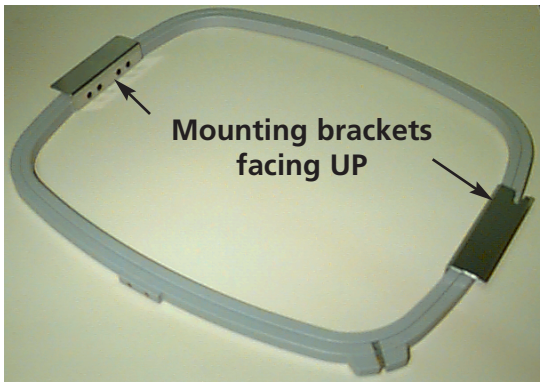



**Figure 3-1**

5. Place your material on top of the backing with the finished side facing up.

Note: Many people prefer to make a practice sewout before embroidering the garment. Although this is not essential, making a practice sewout of any design is an excellent way to prevent problems.

6. Press the inner hoop into the outer hoop with the fabric and backing between them. Tighten the material by pulling the outside edges of the material slightly.

Note: When sewing on knits and jersey materials, do not overstretch the material. These materials will stretch out of shape and distort the resulting sewout.

7. Tighten the adjusting screw on the outer hoop. Tightening this screw will not tighten the fabric, it simply secures it. Tightening the screw too much can "burn" a permanent circle in your material.

## The Sash Frame

The sash frame consists of aluminum beams attached to the drive motors. Most garment hoops will attach to this sash assembly, but for oversize materials and cap frames, a different sash arrangement must be used (which is explained in more detail later in this section).

### Attaching Hoops To The Sash Frame

To attach hoops to the sash frame, simply lay the hoop with the brackets on the frame, align the mounting holes with the holes in the brackets, and install the thumb screws snugly. Never attempt to attach hoops to the sash frame while the machine is operating.

Do not use pliers or other tools to tighten these screws, or damage may result. Use a coin to loosen the screws if they are too tight to loosen by hand.

The hoops fit together as shown in Figure 3-2.

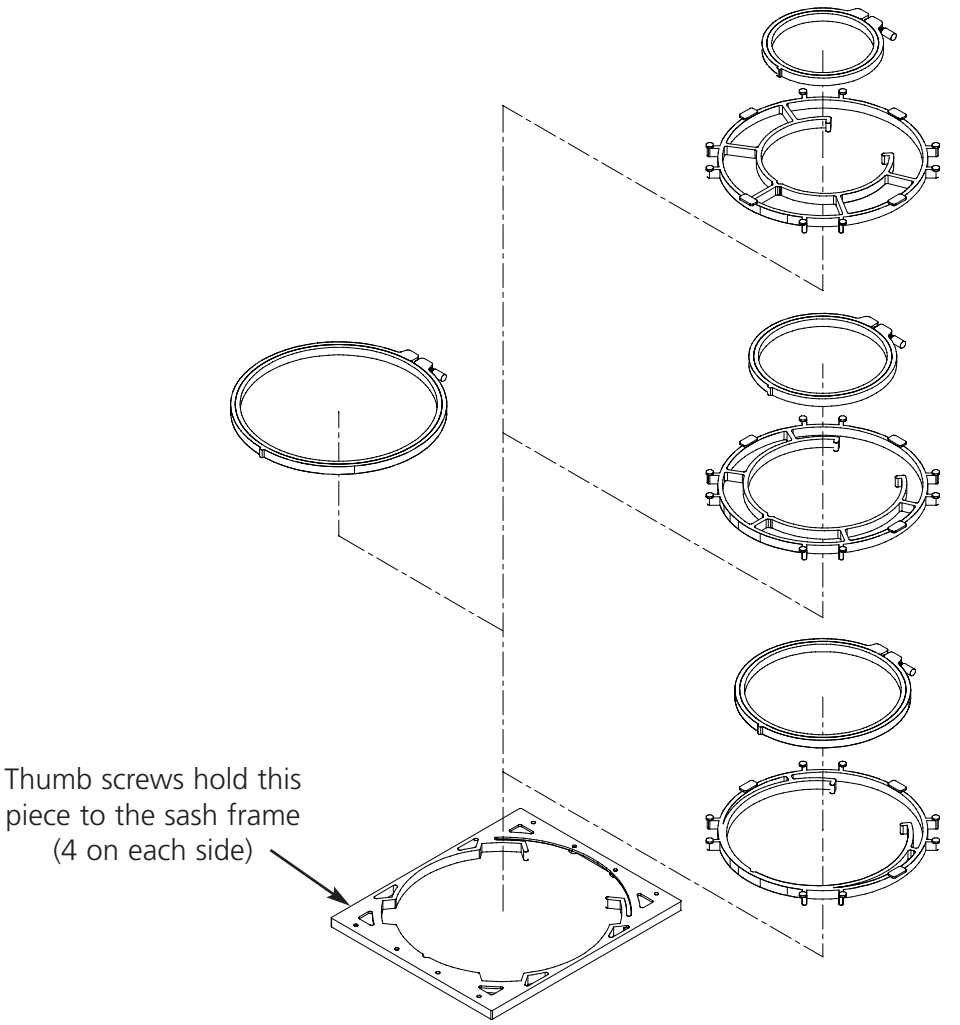



**Figure 3-2**

### Disconnecting the Sash Frame

In order to attach cap frames, sew tubular goods, or perform certain types of service adjustments, you must disconnect the sash frame before lowering the sewing table. Only qualified operators or maintenance personnel should perform this task.

1. Remove all hoops. Select the Full Sash Frame hoop.

2. Using the keypad, press and until the lower edge of the sash frame is at the forward part of the sewing table and far enough to the left to expose the six socket head cap screws.

3. Remove the plexiglass cover and remove the two socket head cap screws beneath it. Refer to Figure 3-3.

3. Referring to Figure 3-4, remove the 4 socket head cap screws labeled "A" from the sash frame. Do not loosen or remove any other screws or nuts.

4. Referring to Figure 3-5, slide the sash frame forward and remove the two socket head cap screws labeled "B" from the Y-axis bearing supports. Do not loosen or remove any other screws in this area. Repeat this step at all 3 Y-axis bearing support locations, which are between heads 3-4, 6-7, and 10-12.

5. Referring to Figure 3-5, remove the two socket head cap screws designated as "C" at the far end of the sash frame (located below sewing head #12). Do not loosen or remove any other screws in this area.

6. Slide the loose part of the sash frame to the left and to the front until it sits only on the front and left end of the drop table. Do not remove the sash from the table. The table may be lowered with the sash frame still on the table top without interfering with cap or tubular frames.


**Figure 3-3**

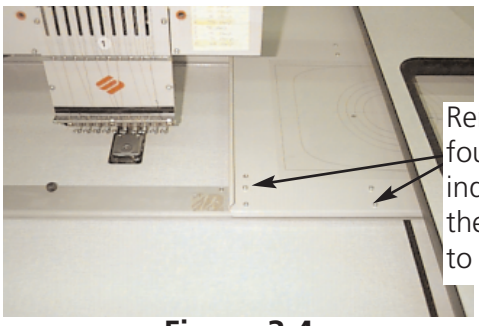



**Figure 3-4**

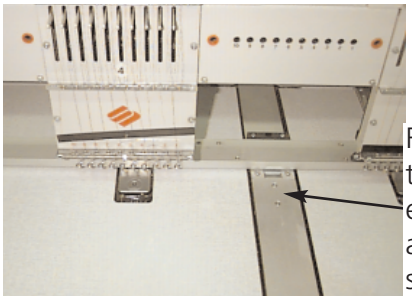



**Figure 3-5**

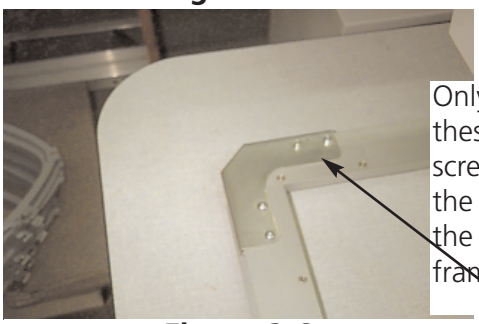



**Figure 3-6**

### Lowering the Table

A crank-type handle is underneath the table, located near the user station. Unfold the handle and rotate in a counter-clockwise direction to lower the table. If the table does not move freely, check for an obstruction. Keep rotating until the table stops at the full down position, then fold the handle back underneath.

## Oversize Flat Goods

Designs that are too large to fit into a standard hoop can be sewn using the full sash frame. Figure 3-7 shows a portion of the maximum sewing area. With the full sash frame you can stretch bulk material across the width of the frame.

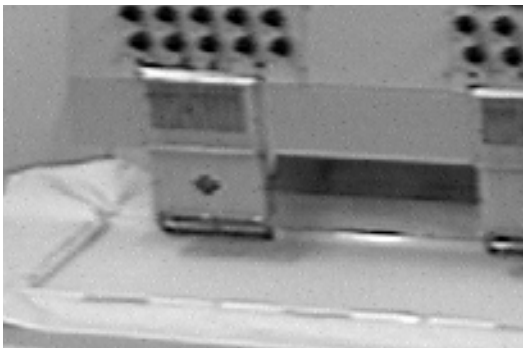


**Figure 3-7**

Note: The sewing table must be in the full up position.

1. To install the full sash frame, remove all hoops, tubular goods arms, and cap frames, and reverse the steps on the preceding page.

2. The clip supports consist of four sections of aluminum. Install the shorter clip support at the left end of the sash frame and secure it with the screws used for standard hoops.

3. Attach the rear clip support to the rear of the sash frame aligning the holes used to attach standard hoops. Secure it with the screws used for the standard hoops.

4. Attach the front clip support to the front of the sash frame. It will attach like the rear clip support. Refer to Figure 3-6.

5. Lay the fabric across the sash frame centered between the clip supports and the individual sewing heads.

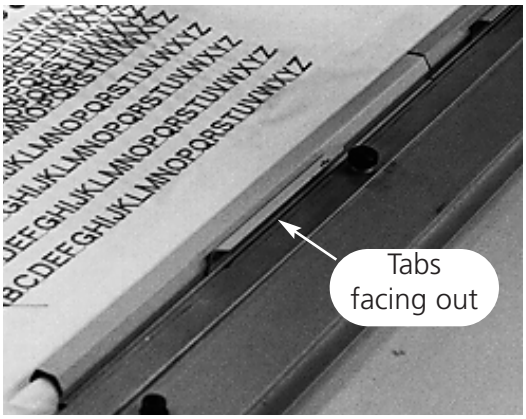



**Figure 3-8**

6. Beginning in the rear, push the clamps down over the rear clip support. **Make certain the tabs face away from the sewing field** (refer to Figure 3-8).

7. Pull the fabric taut and push the clamps over the front clip support bar. Make sure the lifting tabs face away from the sewing field. With the clamps in place, the fabric should be taut and free of any wrinkles. Once the clamps are in place, you can begin sewing.

## Tubular Goods

For tubular garments (pillow cases, jacket sleeves, etc.), use a tubular hoop.

Note: You must remove the sash frame and lower the sewing table below the cylinder arm before using a tubular hoop.

1. Attach the tubular frame support arms to the rear portion of the sash frame. Use four thumb screws for each support arm (refer to Figure 3-9).

2. Insert the hoop frames by sliding the side brackets underneath the spring clips on the support arms. The bracket with the open-ended slot goes on the right side (refer to Figure 3-10). Make certain that the slot engages with the pin in the support arm, and that the brackets are fully seated beneath the spring clips.

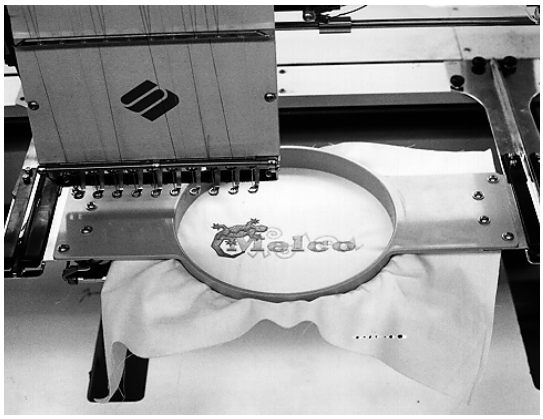


**Figure 3-9**

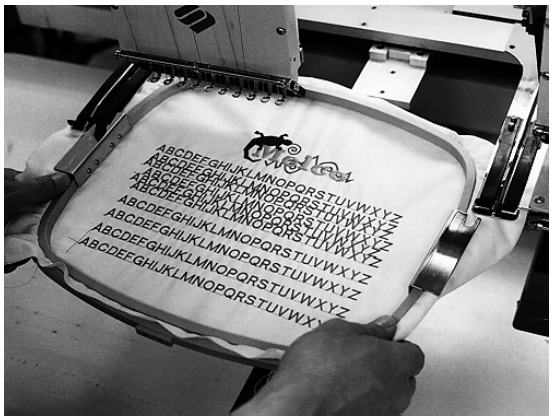


**Figure 3-10**

## Hooping with Standard Cap Frames

Follow these steps to properly hoop a standard cap or visor.

Note: The sewing table must be completely down.

1. Insert the cap frame into the cap gauge.
2. Open the cap frame cover with the latch on the frame's left side and lift so that it rests on the stop on the right side of the gauge.

Note: If you use backing, place it in the cap before loading the cap into the frame.

3. Slide the top of the cap around frame. Keep the sides of the cap inside the frame's outer edges. Push the cap onto the frame as far as possible. On most caps, you will need to turn the sweat band inside-out. If there is a braided rope trim across the bill, pull it to the back of the cap and out of the sewing area.
4. Snap the bill holders (the bungy cords) over the bill. Pull the cap front tight on the frame.
5. Close the frame's cover. Keep the cap as straight, fold-free, and tight as possible.

## Attaching the Standard Cap Frames

Before you can attach the cap frames to the EMT 10/12, you must install the standard cap drivers.

**You must select the proper cap frame hoop in the Control Panel. Failure to do so may result in damage to your equipment!**

To install the drivers, follow these steps:

1. Center the sash frame assembly in both X and Y directions using the arrow keys on the keypad.

2. Disconnect the standard sash frame (refer to the Flat Garments section) and lower the sewing table to its lowest position to gain access to the cap frame mounting brackets.

3. Under the #1 cylinder arm, locate two mounting brackets:

   - A dove-tail bracket under the needle area.
   - A bracket with a round hole at the rear of the cylinder arm.

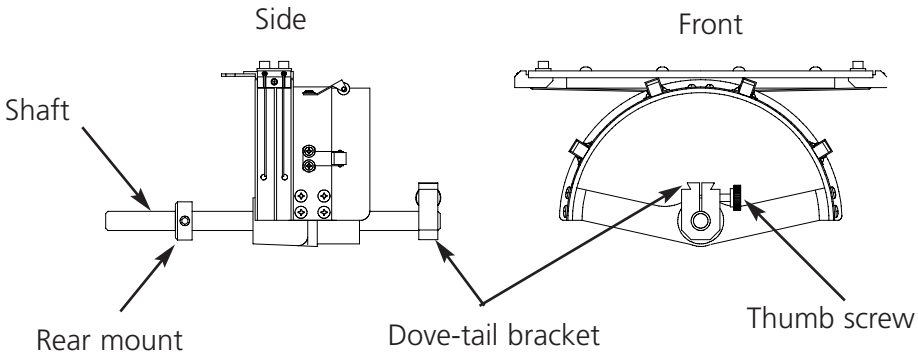



**Figure 3-11**

4. Loosen the thumb screw on the rear bracket.

5. Loosen the thumb screw on the dove-tail bracket.

6. Insert the cap driver shaft into the hole in the rear mounting bracket. At the same time, guide the dove-tail mount into the dove-tail bracket.

7. Push the cap driver shaft into the bracket hole as far as it will go. Refer to Figure 3-12.

8. Tighten the thumb screws on both the rear mounting bracket and the dove-tail bracket.

9. At the rear of the driver is the driver bracket. This bracket fits over the holes used to attach a standard hoop and is secured using the same thumb screws. Make certain that the screws are tight.

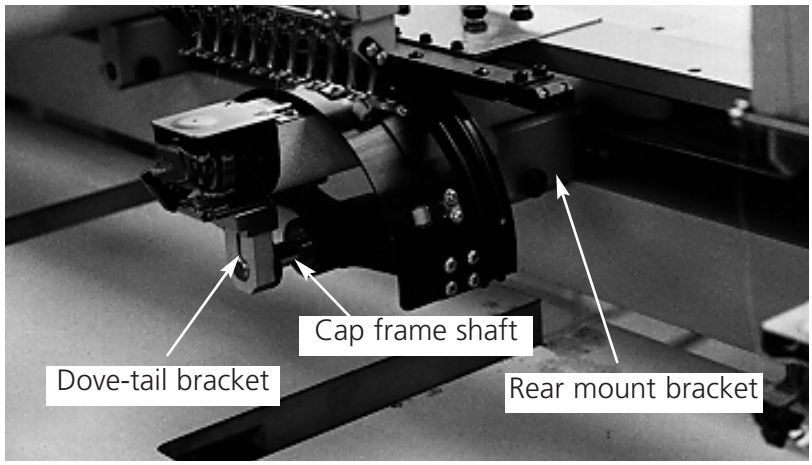



**Figure 3-12**

10. Repeat this procedure on all the heads that will be sewing caps.

### Raised Needle Plates

Raised needle plates may improve embroidery quality on caps. When cap frames are attached, the curve of the frame leaves extra space between the cap and the needle plate. To eliminate the space and ensure high-quality embroidery, a qualified operator or maintenance person should install raised needle plates as described below. See Figure 3-13.

Note: When using a raised needle plate, use spacers to raise the presser foot.

1. From the Control Panel, click on Advanced..., then click on Head Timing, then Go To Headup.
2. Turn the machine power OFF.
3. Disconnect the sash frame and lower the sewing table.
4. Remove the two screws that attach each standard needle plate and replace the standard plates with the raised plates. Use the same screws to attach the raised needle plates.
5. Remove the lower cover on the front of each head. It is not necessary to remove any thread.
6. Using a small flat-bladed screwdriver, push the standard spacer up to the top of the presser foot driver assembly (see Figure 3-13).
7. Shim spacers come in two thicknesses: 0.020" and 0.040". Each shim spacer has five holes, which will cover half of the needles in each sewing head. The raised needle plates are 0.090" higher than a standard needle plate, so you should add two 0.040" spacers to both sides of each sewing head.

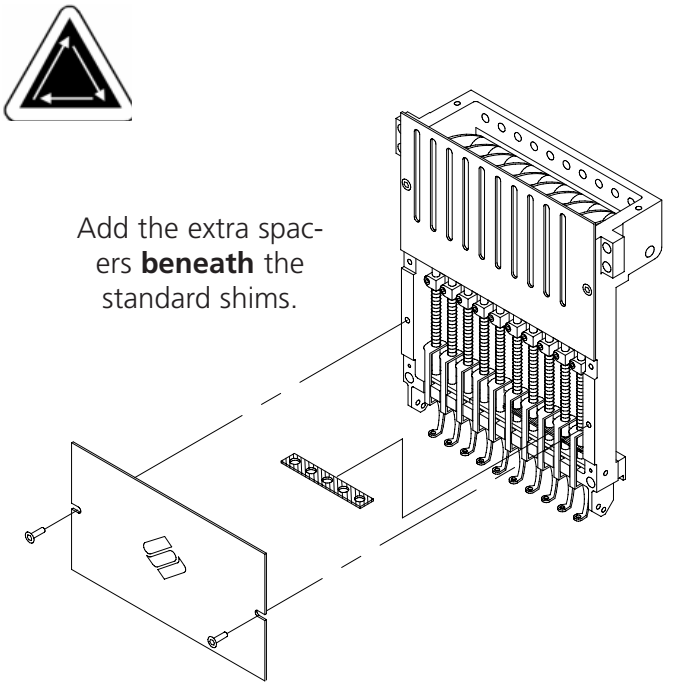



**Figure 3-13**

8. The spacers must be cut on one side with a pair of scissors prior to installation. Refer to Figure 3-14 for the correct areas to cut.

9. Slide the spacer (with the cut side facing upward) in between the presser foot bars and the needle driver bars (beneath an uncut spacer, if possible). Use a small flat-bladed screwdriver to push the spacer over the needle driver bars.

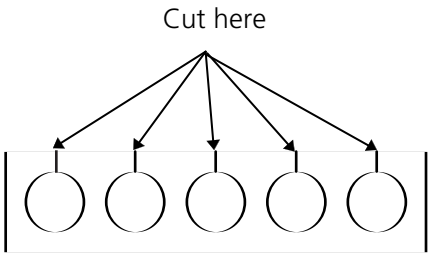



**Figure 3-14**

10. Turn the power back ON when spacers are installed on all of the sewing heads.

11. Use the keypad to move the needles to needle #3.

12. From Advanced Features, click on Service, Head Timing, then Bottom Dead Center.

13. Check to verify the presser foot is clearing the needle plate by 0.030 to 0.050" (.75 to 1.25 mm.). If needed, add or remove the necessary combination of the 0.020 or 0.040 spacers to achieve the appropriate clearance.

Note: Overcompression of the presser foot springs may damage the springs and impair the quality of the embroidery.

14. Click on Head Up. Use the keypad to move the needles to needle #8, then repeat steps #12 and #13.

15. Replace the lower needle case covers when all of the presser foot drivers have been correctly shimmed.

When you return to sewing flat or tubular goods, reverse the above procedure to remove the raised needle plates and the extra spacers.

## Wide-Angle Cap Frames

The wide-angle cap frame allows you to embroider on nearly 270° of a cap's crown. The wide-angle cap frame comes bundled in a kit, and each kit includes:

- The cap frame
- The cap frame driver
- The cap frame gauge
- The tensioner
- The interface bracket(s)

Following is a brief description of each kit component:

**The cap frame**
The cap frame holds the cap during embroidery.

**The cap frame driver**
The cap frame driver attaches to the beam on your Melco peripheral and moves the cap frame during embroidery.

**The cap frame gauge**
The cap frame gauge attaches to a table or other solid surface and holds the cap frame so you can hoop the cap easier.

**The tensioner**
The tensioner attaches to the cap frame driver and increases tension in the crown of the cap during embroidery. This increased tension helps improve embroidery quality, particularly on non-structured caps.

**The interface brackets**
The interface bracket mounts on the driver bar of the cap frame driver. This bracket acts as the interface between each cap frame driver and the Melco peripheral.

**You must select the proper cap frame hoop in the Control Panel. Failure to do so may result in damage to your equipment!**

## Needle plates

The wide-angle cap frame is designed to be used with regular needle plates. You do not need to change to raised needle plates to use the wide-angle cap frame.

## First time installation and adjustment

The first time you install the wide -angle cap frame driver on the EMT 10/12, you must perform the following adjustment; failure to do so will result in an excessive wear to the cap frame driver and reduced embroidery quality.

1. Move the tabletop all the way down and remove all 12 Cap Insert Covers.

2. Make sure that the cap supports are extended; if they are not, extend them (refer to Chapter 4 of this manual for more information).

3. Make sure that the 3 socket-head cap screws along the interface bracket (Figure 3-15) and the 4 socket-head cap screws which hold the bearing housing (Figure 3-16) are slightly loose.

4. Move the beam all the way back (towards the rear of the peripheral) using the peripheral keypad.

5. Install the driver on sewing head #1; guide the cap driver shaft into the hole in the rear mounting bracket. At the same time, insert the driver dove-tail support bracket into the female dove-tail mounting bracket refer to Figure 3-17.

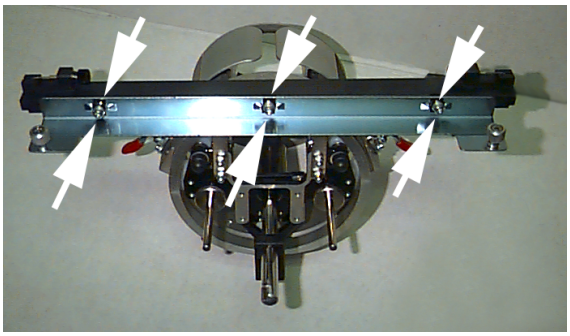


**Figure 3-15**

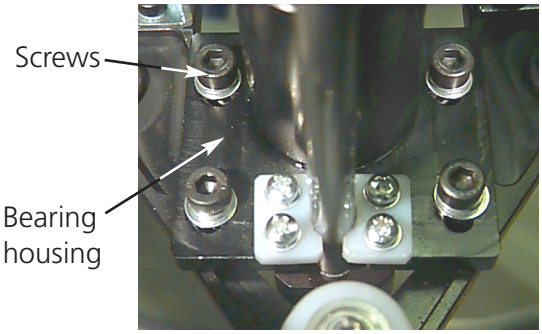



**Figure 3-16**

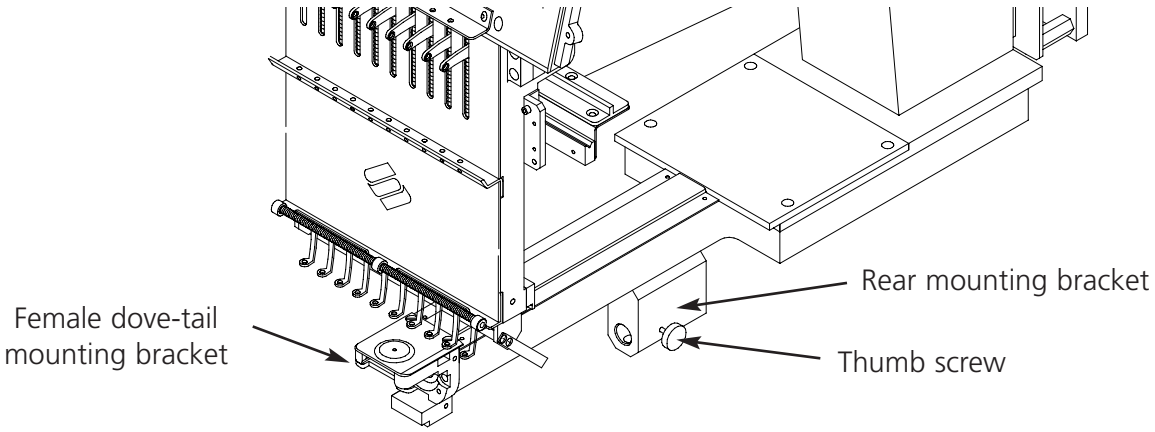



**Figure 3-17**

6. Push the cap driver shaft into the hole in the rear mounting bracket until it reaches the positive stop.

Note: When pushing the driver shaft into the hole in the rear mounting bracket, make sure the cap supports are positioning over the needle plate. This prevents the shaft from binding.

7. Tighten the thumb screws on the rear mounting bracket and on driver dove-tail support bracket (see Figure 3-18).

8. Position the driver cap supports on the needle plate (see Figure 3-19), center them to the needle plate hole and in the same time adjust their position in up/down direction by moving driver up/down on the slots in the bearing housing and slightly tighten at least one socket-head cap screw on the bearing housing using the 4mm hex allen wrench. The cap supports should touch the needle plate lightly and the driver should slide freely from front to back without any restriction; the cap supports should not have any visible side to side movement.

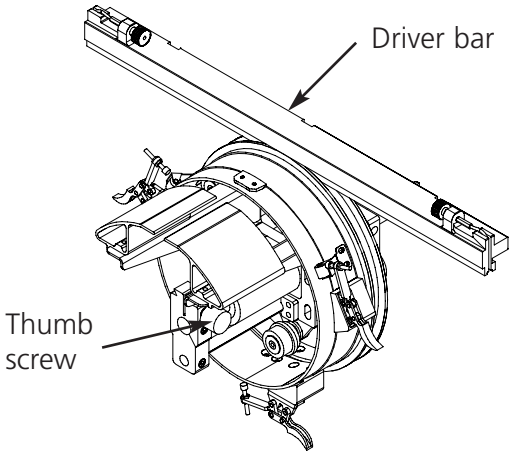



**Figure 3-18**

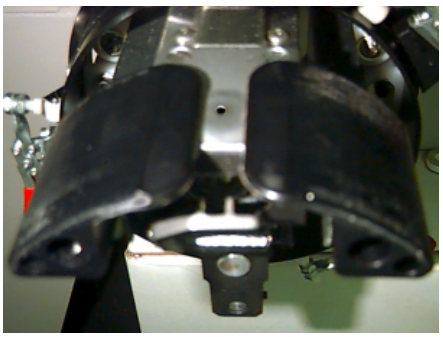


**Figure 3-19**

9. Push on the driver bar to move the driver from front to back several times to make sure the driver moves freely. Tighten all 4 screws on the bearing housing.

10. Apply the number sticker that is provided to the driver bar and to the head if it wasn't marked at the factory. The drivers should always be installed on the same head of the same peripheral they are adjusted on; when you install the drivers on the peripheral at a later date, make sure the numbers correspond.

11. Repeat steps 3 through 11 for the remaining drivers on the remaining heads.

12. Using the peripheral keypad, move the beam to the front of machine and connect the cap driver to the beam (with the two interface bracket thumb screws).

13. Tighten the 3 socket-head cap screws along the interface bracket until they barely contact the bracket using the 3mm hex allen wrench. The interface bracket should still be able to move in up-down direction. Refer to Figure 3-20 for screw location.

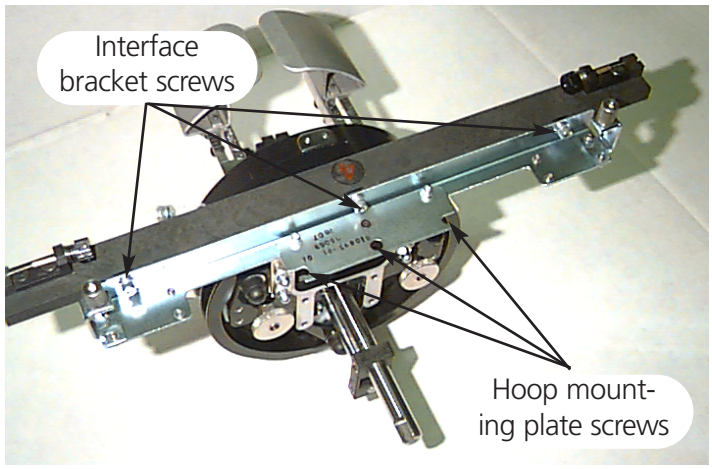



**Figure 3-20**

14. Level the interface bracket. To do this, first move the beam all the way to the left, using the peripheral keypad. Make sure that there is no gap between the driver bar and driver ring (see Figure 3-21). If needed, press down lightly on the bar and tighten the corresponding socket-head cap screw on the interface bracket slightly. Then move the beam all the way to the right and repeat the procedure.

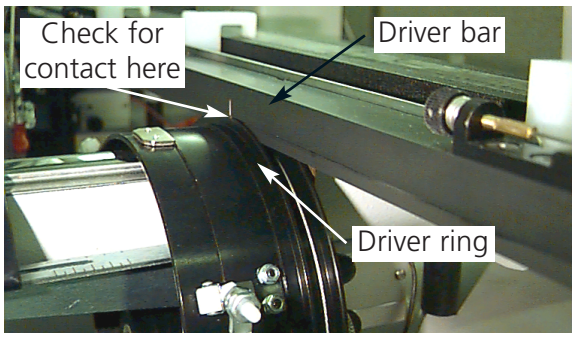



**Figure 3-21**

15. Repeat moving the driver all the way to right and left, watching closely to ensure that the driver bar firmly contacts the driver ring and moves with no visible restriction. If the driver bar does not firmly contact the drive ring, loosen the 3 socket-head cap screws and repeat step 15.

16. Carefully and firmly tighten all 3 socket-head cap screws along the interface bracket without allowing the bracket to move.

17. Repeat steps 13 through 17 for the remaining 11 drivers on sewing heads 2 through 12.

18. Select the **Wide-Angle Cap Frame** hoop size and **Hoop Center** from the Control Panel on the EMT 10/12.

Your wide-angle cap frame drivers are fully adjusted and ready for use.

**IMPORTANT**

If you wish to use the adjusted cap frame option on a different peripheral, check the adjustment on the new peripheral to ensure proper sew quality.

## Installation

The steps in this section describe how to install the driver after it has been previously installed and adjusted. If you have not installed the driver previously, refer to the First Time Installation and Adjustment section. To install the cap frame driver on the EMT 10/12, follow these steps:

Tip

Check the bobbin thread before you install the driver; if you run out of bobbin thread you must remove the cap frame to change the thread. This may result in lost registration.

1. Lower the table top all the way.
2. Select the **Wide-Angle Cap Frame** hoop size from the Control Panel on the EMT 10/12.
3. Center the hoop by clicking on the Hoop Center button in the Control Panel.
4. Under the cylinder arm, locate the cap frame mounting brackets (see to Figure 3-22):
   - The female dove-tail mounting bracket under the needle area
   - The rear mounting bracket (with a round hole at the rear of the head)

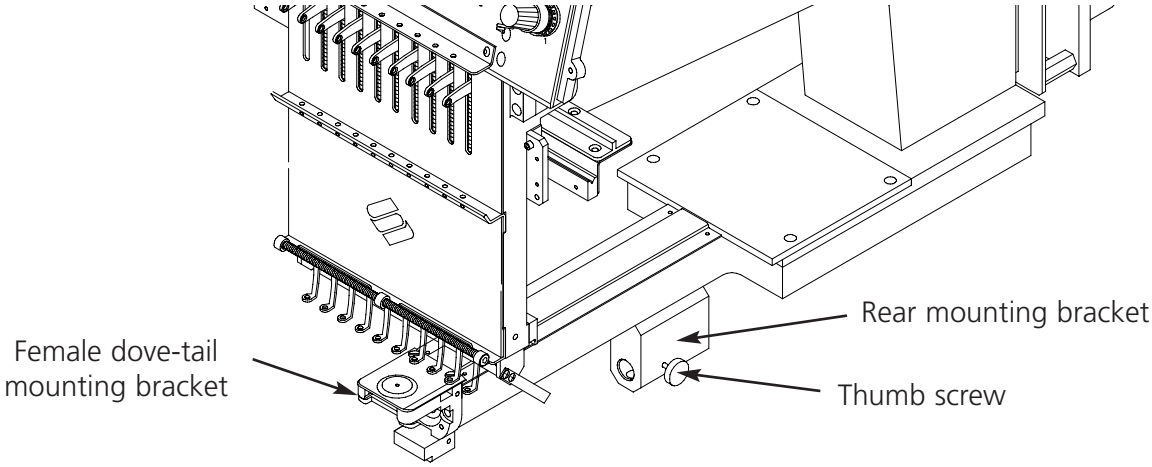



**Figure 3-22**

5. Loosen the thumb screw on the rear mounting bracket.

6. Loosen the thumb screw on the male dove tail bracket on cap frame driver (Figure 3-23).
7. Guide the cap driver shaft into the hole in the rear mounting bracket. At the same time, insert the male dove-tail bracket into the female dove-tail mounting bracket.
8. Push the cap frame driver shaft into the bracket hole until it reaches a positive stop..
9. Tighten the thumb screw on the rear bracket.
10. Tighten the thumb screw on the male dove-tail bracket.
11. Connect the wide-angle cap frame driver to the beam using the thumb screws on the interface bracket.
12. Repeat this procedure for each head.

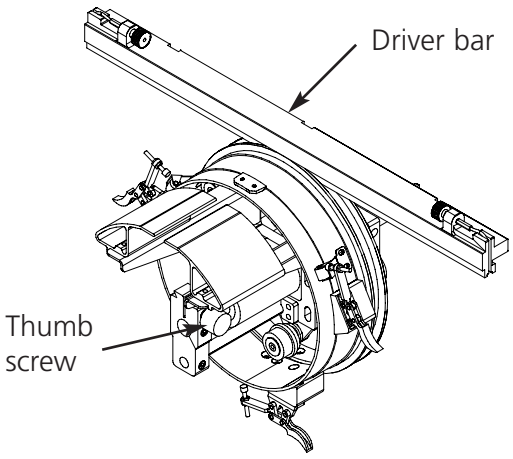



**Figure 3-23**

Note: The first time you install the wide-angle cap frame driver on the peripheral, perform the adjustment procedure in the previous section.

Tip

Always install the driver on the mounting brackets first, then attach the driver to the beam. This will improve overall sew quality.

## The tensioner

To install the tensioner, follow these steps:

1. Loosen the two thumb nuts on the back of the wide-angle cap frame driver (see Figure 3-24).

2. Insert the tensioner guides into the two holes in the front of the wide-angle cap frame driver (through the two thumb nuts on the rear).

3. Tighten the two thumb nuts.

Figure 3-25 shows an installed tensioner.

Note: You may need to adjust the tensioner slightly to provide optimal tension for caps with different crown heights. Simply loosen the thumb nuts and slide the tensioner to its appropriate location, then retighten the thumb nuts.

Reverse these steps to remove the tensioner.

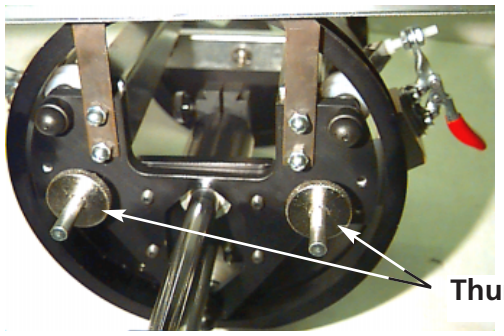



**Figure 3-24**

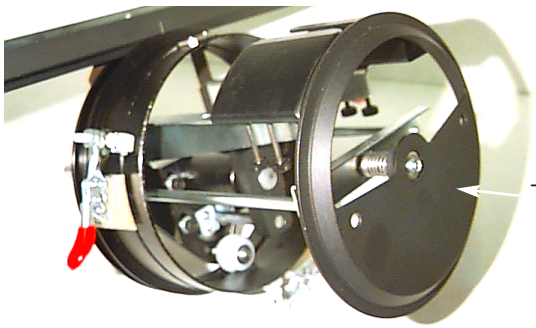



**Figure 3-25**

## The cap frame gauge

To install the cap frame gauge, tighten the clamp until the gauge is held firmly. Figure 3-26 shows a mounted cap frame gauge.

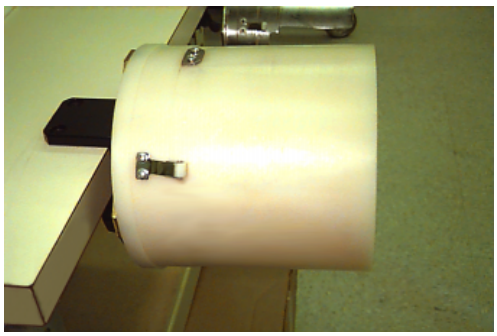


**Figure 3-26**

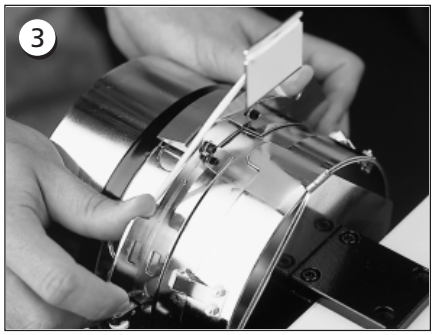
## Hooping with the wide-angle cap frame

Hooping on a wide-angle cap frame should be as straight-forward and simple as hooping on a regular cap frame. Follow the steps outlined below to hoop on your wide-angle cap frame:

1

First, attach the cap gauge to a stable surface.


The cap frame has a metal strap, with a buckle at its end. Make sure this buckle is attached by screws in its OUTSIDE two holes, NOT the inside two holes.




Now, slide the cap frame onto the gauge, making sure the locating element on the cap gauge fits into the cap frame's notch, and the cap frame slips firmly under the two roller clips.


For the best sew quality, use the rubber strip; it provides appropriate spacing and hoop tension. Drape the strip over the gauge...


...placing the ends BETWEEN these clip posts and the cap gauge.


Appropriate backing can now be placed around the rubber strip. The backing stays OUTSIDE the posts and is pushed BENEATH the locator. You may use several layers of backing.

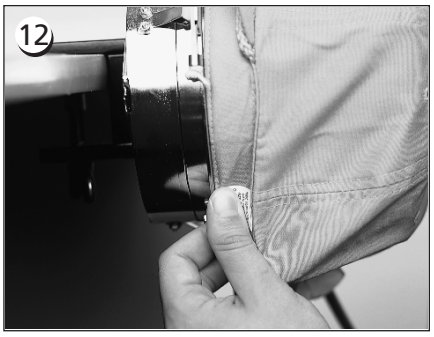

Next, prepare the cap for sewing. Open the back fastener.


Lower the sweatband completely.

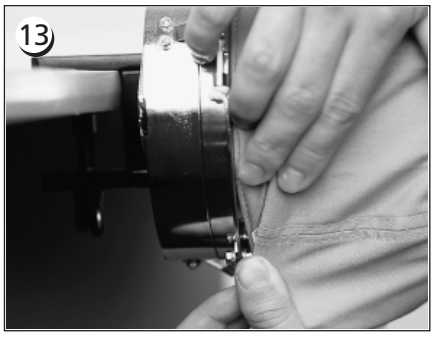

If the cap has a braid, move it around the cap to the inside and under the brim as shown.


If the braid has a tail on the inside, trim it short to keep it clear of embroidery. Leave only about 1/4" of braid from where it's sewn to the cap.

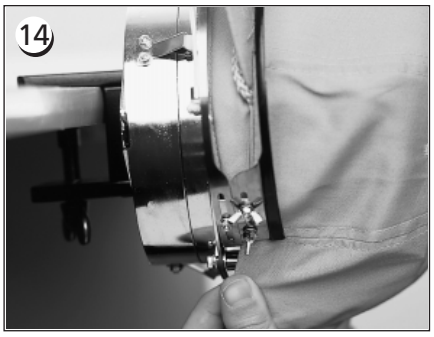

Now place the cap on the cap frame. The sweatband should be under the locator, and the brim should be centered and pointing up.



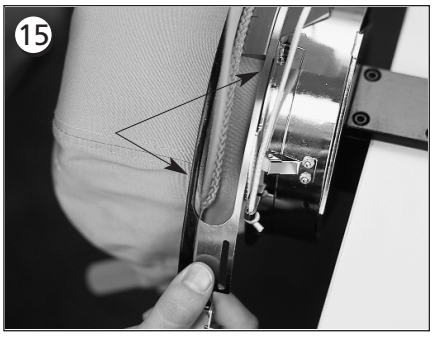

Pull the side of the sweatband toward the cap frame and down.




Flatten any "bunching" of the sweatband by folding it over and toward the hoop.




To secure the sweatband, swing the metal strap up and over the sweatband and the cap's brim.

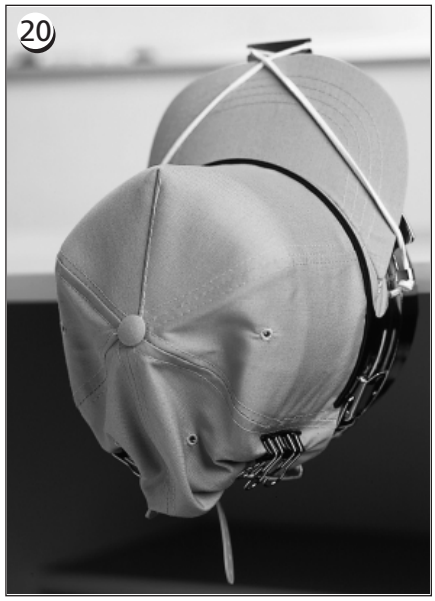



Close the metal strap, making sure one band of the strap fits in the groove on the locator...and the other band lies cleanly along the brim edge.

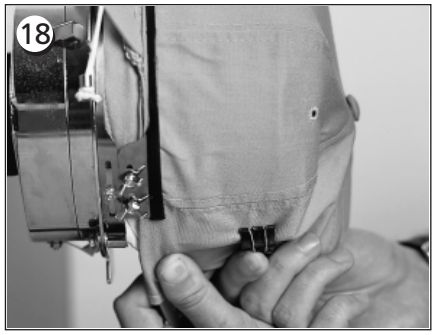
16
To achieve a snug fit of the cap frame's metal straps, perform step 17 whenever you change cap styles.

Step 17 does not need to be performed if the cap style has not changed. In this case, simply latch and close the buckle.

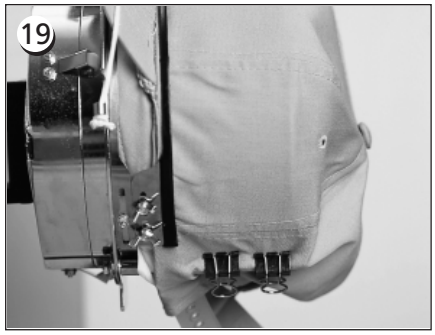

Loosen the wing nuts on the strap, latch and close the buckle...then push down on the strap above the wing nuts with a hard tool. Use MODERATE pressure when doing this. Retighten the wing nuts.




You may now remove the cap hoop from the gauge. Remember to also remove the rubber strip. Your cap is now properly hooped.

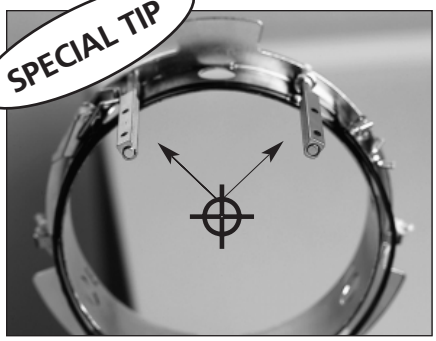



Pull the elastic brim holders over the cap's brim to the front. Pull the wrinkles out of the cap using light tension. To secure the cap fabric, attach two clips...



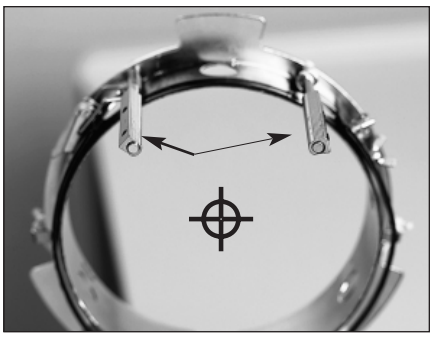

...to each post. The clips are applied with the handles angled down and toward the center of the cap.

SPECIAL TIP



Make sure the posts are aligned properly with the center of the cap frame.

This is how they should look!



If they look like this, readjust them.

If the posts are bent and touching the cap gauge, bend them back into position.

## Place the hooped cap on the driver

Unclip the 3 clamps on the cap frame driver (see Figure 3-27). Slide the frame onto the driver, snapping it into place. Secure the 3 clamps on the driver.

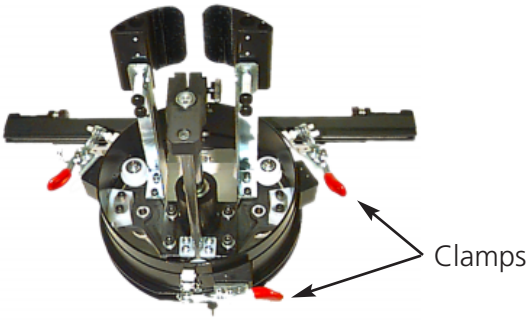



**Figure 3-27**

Tip You may need to pull the beam forward to get the cap on the driver.

**Caution! You MUST fasten all 3 clamps on the driver; failure to do so may result in damage to the clamps or the peripheral.**

**You must select the proper cap frame hoop in the Control Panel. Failure to do so may result in damage to your equipment!**

## Using the tensioner

The tensioner attaches to the cap frame driver and increases tension in the crown of the cap during embroidery. This additional tension helps improve embroidery quality, particularly on non-structured caps. The tensioner also increases embroidery quality on slouch and short-crowned caps, but because the tensioner reduces the embroidery field's height by approximately 0.23in (6mm) you may not be able to use the tensioner without modifying the design to reduce overall height.

If you try to use the tensioner without compensating for the height of the design, you will see reduced embroidery quality near the top of the design. The tensioner will contact the needle plate and prevent the beam from moving as far as is needed for the design height.

The tensioner needs to be adjusted differently for each type of cap used on your peripheral. To adjust the tensioner, simply loosen the thumb nuts and slide the tensioner disk in or out, then retighten the thumb nuts (see Figure 3-28). The disk should push the crown of the cap out slightly (increasing the tension). There is not a "rule of adjustment" because of the variety of caps available today.

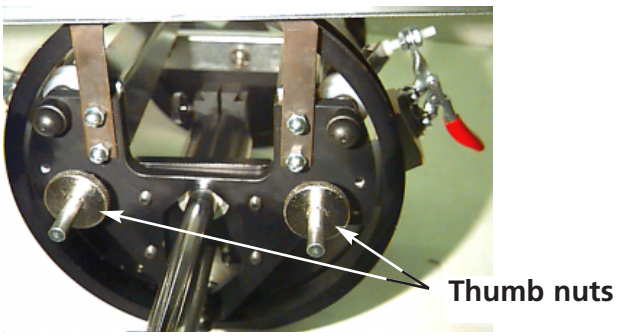



**Figure 3-28**

Tip Do not adjust the tensioner to fit so tightly that the spring (pushing the tensioner out) is completely compressed. If you do, the tensioner disk may restrict the cap's movement during embroidery, resulting in a loss of registration and reduced embroidery quality.

## Sewing field

The height of the sewing field varies on caps because of the variation in crown sizes. You can use the following formulas to calculate the height of the sewing field for different crown sizes:

**Y=A - 1.18**
**X=14.25"**

Where:
**Y**= height of the sewing field in inches
**A**=height of the crown in inches

**Y=A - 30**
**X=362mm**

Where:
**Y**= height of the sewing field in millimeters
**A**=height of the crown in millimeters


Remember, if you are planning to use the tensioner it reduces the embroidery field's height by approximately 0.23in (6mm).

## Cap designs

Designs that embroider well on flats may not embroider as well on caps because of the uneven tension a cap frame provides. Here are some ideas to help improve embroidery quality on your wide-angle cap frame:

- To help eliminate slippage, digitize from the center out; start in the center of the design and embroider one side of the cap then return to the center and embroider the other.
- Complete entire design elements as you go around the side; for example, if you have lettering with shading, embroider a letter, then its shading, then move on. This helps to eliminate the push-pull tendency of the fabric of the cap.
- If you have a lot of running stitches in a design, consider converting them to satin stitches. Running stitches have a tendency to lose registration.
- With large designs, try to alternate the direction of the stitches. This helps to eliminate the push-pull tendency of the fabric of the cap.
- Use more underlay stitches to help stabilize the design and prevent distortion. Six panel caps need more underlay in the center where the seam is.
- Using a fusible nonwoven backing on six panel caps helps hold the two front panels firmly together.

Modifying your designs to embroider on cap may give you more trims and color changes, but it will also provide you with much better embroidery quality.

# 4. Recovery Methods

This chapter provides information on how to recover from broken threads, missed stitches, mechanical failures, and power outages. Operators and maintenance personnel must attend a Melco approved training course prior to operating or maintaining the machine.

## Thread Break Switch

Each head has a thread break switch below the tensioners with ⚠ (ON), ∞ (AUTO), and ▽ (OFF) positions (see Figure 4-1). The switch controls whether the individual head stitches as it moves through a design. The table below summarizes the functions of the switch.

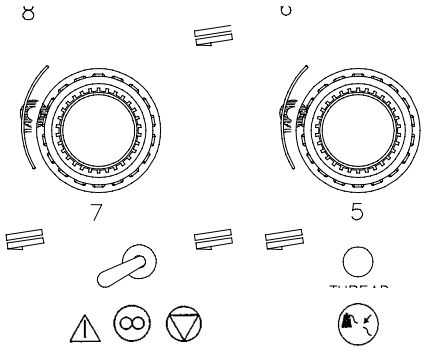



**Figure 4-1**

| Setting | Result |
|---|---|
| ⚠ | Sews during thread break and framing recovery. Use to restitch an area. |
| ∞ | Only heads with thread breaks will sew during thread break recovery or framing. Should be used for normal operation. |
| ▽ | Disables the sewing head. |

## Thread Break Indicator LED

Next to each Thread Break Switch is a yellow LED that signals a thread break (refer to Figure 4-1). When a thread break is detected, the LED on that particular head will be illuminated to show where the break is located. A blinking LED indicates an under-thread break while a steadily glowing LED indicates an upper-thread break.

## Frame Function

Frame Back or Frame Forward allows movement back or forward through the current design.

Change the framing direction in the Option menu. When the machine is stopped,use ◀ as described below to frame through the design.

Press ◀ until the beam moves FORWARD or BACK the number of stitches set in the Frame Step field in the Settings dialog box. Release the key

**OR**

Press and hold ◀ until the beam moves several stitches. Release the key.

**OR**

Press and hold ◀ for about five seconds, then release it. The rack will move until ▽ is pressed again.

If stitches need to be resewn only on head 2, you would:

1. Frame back to the area that needs to be resewn.
2. Set the thread break switch on head 2 to ⚠ .
3. Leave all other heads set to ∞ .
4. Press ⚠ and resew the problem area.
5. When you reach the point where you pressed ▽ all the heads will sew.
6. Reset the thread break switch on head 2 to ∞ .

## Power Failure Recovery

The Power Failure Recovery function allows sewing to resume after the machine has suffered a loss of power. Follow these steps to resume sewing:

1. Turn the main power switch to ON and wait for the software to fully load.
2. If you see a status bar message that says "Off color index," use the keypad to move the needle cases until the needle in use when the power went off is the selected needle again. If the keypad does not move the needle cases, you must move the cases manually. Refer to the Manual Color Index Adjustment procedure later in this chapter; if not, go to step 3.

3. If the color index is set correctly, but you see a status bar message that says "Not at headup," click on Command..., then Headup; if not, go to step 4.

4. Click on Command..., then Power Fail Recovery.

5. The machine will perform a trim, find home, then return to the last stitch made before the power loss and allow you to resume sewing from that point.

Note: To maximize your ability to recover from a power loss, designs should be stored on the hard drive, and daily setup should include Hoop Center, Enable Center Design, and Automatic Return To Origin. Although they are not a part of Power Fail Recovery, these three steps will enable you to perform a "manual" recovery if the above procedure fails.

6. If the Power Fail Recover option does not work:

Select Hoop Center, then reload your design. Use the Frame Forward procedure until you reach the last stitch sewn before the power loss and restart at that point. If you know the stitch number, use the Move Command (and enter the Stitch number). You can also use the Next/Prev color command to help find where you are.

## Manual Color Index Adjustment

There is a row of LEDs in between two sewing heads on the EMT 10/12 (Figure 4-2). One of these lights will be illuminated at all times, corresponding to the current needle. If there are no lights illuminated, or if the message "Off color index" appears and moving the needle cases with the keypad has no effect, adjust the color index manually.

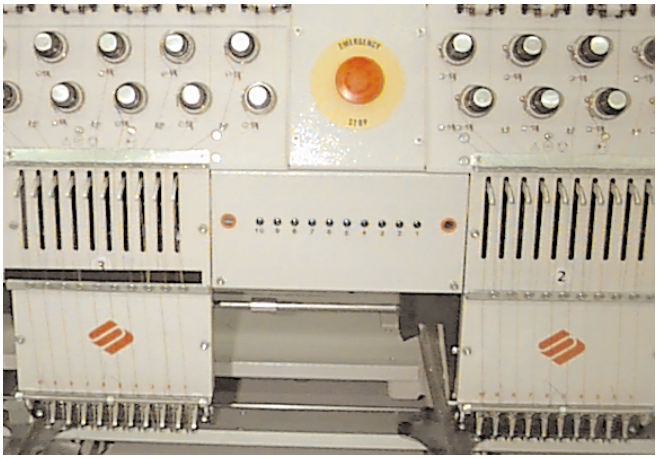


**Figure 4-2**

1. Use the keypad to move to needle #1.

2. With the machine power ON and stopped, find the knob next to the X drive shaft between heads 6 and 7 (see Figure 4-3).

3. Slowly turn the knob back and forth while watching the LEDs on the front.

4. When one of the LEDs lights up, you are on the color index.

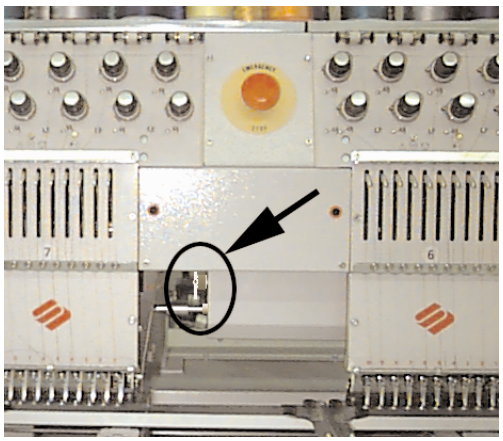


**Figure 4-3**

## Installing a Needle

Each needle has a needle clamp set screw holding it in place as shown in Figure 4-4. Use the small flat-blade screw driver from the tool kit and follow these steps to replace a needle:

1 Turn the set screw counterclockwise until the needle can slide down and out of the needle bar.

2. With the scarf of the new needle toward the rear of the head, slide the needle into the needle bar as far as it will go, and re-tighten the set screw.

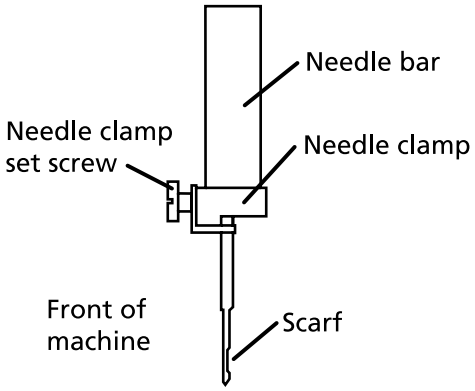



**Figure 4-4**

# 5. Maintenance

This chapter outlines machine maintenance; in addition, maintenance personnel must attend a Melco approved training course prior to maintaining the machine.

## Cleaning

### Exterior Surfaces

Clean outer plastic surfaces once per month with a soft, clean cloth, a mild detergent and water. Wring out the cloth before wiping the surfaces. Do not get water or any other fluids inside the machine or on any of the working mechanical surfaces.

Note: If an accidental spill occurs, turn the machine off, disconnect it, then wipe up excess fluid with a clean dry cloth and allow the machine to dry completely before turning the power on.

### The Rotary Hook Area

1. Clean this area once per week with the machine power OFF.
2. Remove the 2 needle plate screws and needle plate.
3. Clean the exposed area with the brush supplied in the operator's kit.

### Trimmer Assemblies

1 Clean the trimmer areas once per week with the machine power OFF.

2. Remove the 2 needle plate screws and needle plate.
3. Use a small brush to clear away thread and dust.

## Lubrication

Follow this lubrication schedule to prolong the life of your machine. Any tools or supplies needed are provided in the operator's kit. Do not attempt to lubricate the machine while it is in operation.

| LUBRICATION POINT(S) | LUBRICANT (AMOUNT) |
|---|---|
| **Every 4 hours** | |
| Rotary Hook | Sewing machine oil (1 drop) |
| **Every 8 hours** | |
| Standard cap frame | Sewing machine oil (1 drop) |
| Wide-angle cap frame | Sewing machine oil (1 drop) |
| **Every 40 hours** | |
| Upper connecting rod | Sewing machine oil (1-3 drops) |
| **Every 80 hours** | |
| Upper needle bar | Sewing machine oil (2-3 drops) |
| Lower needle bar | Sewing machine oil (2-3 drops) |
| Needle bar driver | Sewing machine oil (3-5 drops) |
| Lower connecting rod | Sewing machine oil (1-2 drops) |
| Linear Bearing | Sewing machine oil (1 drop) |
| Trimmer knife drive arm | Sewing machine oil (1 drop) |
| Trimmer picker base shaft | Sewing machine oil (1 drop) |
| **Every 960 hours** | |
| Trimmer cam mechanism | Grease (small amount) |
| **Every 2100 hours** | |
| Color change cam | Grease (small amount) |
| Take-up lever cam and follower | Grease (small amount) |
| Wide-angle cap driver shaft | Sewing machine oil (10 drops) |
| Bevel gears | Grease (small amount) |

## Performing Maintenance

Each time a maintenance timer reaches zero, a dialog pops up indicating that you need to perform that maintenance and will lead you through performing the maintenance step by step. From this dialog box you can also view all the timers, reset the timer, or cancel the dialog box.

If you cancel the dialog box without resetting the timer, the dialog box will be displayed again after each successive design is completed.

**Note: Do not reset a maintenance timer without performing the required maintenance!**

## 4 hour Schedule

### Rotary Hook Lubrication

1. With the machine stopped, look under the sewing bed to gain access to the rotary hook area.
2. Remove the bobbins and bobbin cases from the hook assembly for each head..
3. Click OK in the maintenance step through dialog box to continue. This moves the rotary hook assembly into the correct position for lubrication.
4. Oil the hook as shown in Figure 5-1. Repeat for each head.
5. Replace the bobbins and bobbin cases.
6. Click OK in the maintenance step through dialog box to finish the required 4 hour maintenance.

**Caution! If you use a spray lubricant, do not get any oil on the UTC assembly over the hook or the UTC may not function properly.**

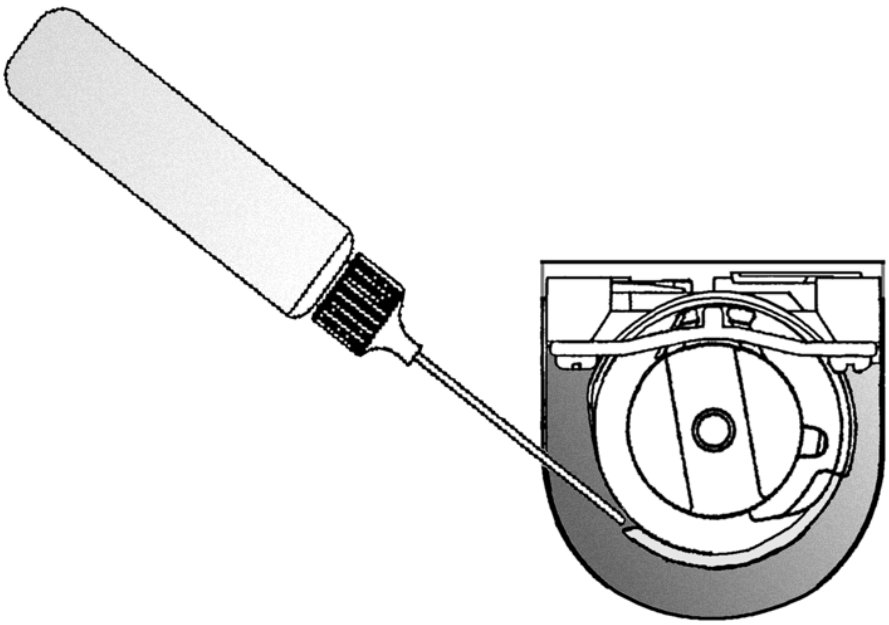


**Figure 5-1**

### 8 Hour Schedule

This time will only accumulate when a cap frame is in use. You may leave the driver attached to the peripheral to perform these maintenance steps.

**Caution! If you do not enable hoop limits for this lubrication section, you may cause damage to your EMT 10/12 and/or any hoops (including cap frames) that are installed!**

**Caution! You MUST have the proper cap frame size selected in the Hoop Selection area of the Control Panel. Failure to do so may cause damage to your cap drivers and/or EMT 10/12.**

#### Standard Cap Frame

To perform the 8 hour lubrication for the Standard cap frames (large and small), follow these steps:

1. The maintenance step through dialog box will appear for the 8 hour scheduled maintenance.
2. Select the proper hoop size from the list provided in the maintenance dialog box.
3. Click OK in the maintenance step through dialog box to continue. This will center the hoop, which will position the drivers in the proper position for lubrication.
4. Lubricate as shown in Figure 5-2. Use one drop of oil on each side of the driver.

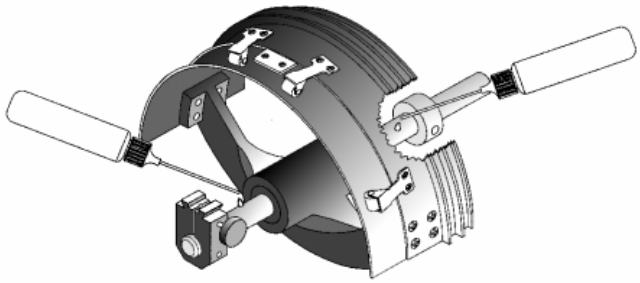


**Figure 5-2**

5. Click OK in the maintenance step through dialog box to continue. The rack will now move back and forth in the **Y** direction. This will help distribute the oil.
6. Click OK in the maintenance step through dialog box to finish the 8 hour maintenance.

### Wide-Angle Cap Frame

To perform the 8 hour lubrication for the Wide-Angle cap frame, follow these steps:

**Caution! If you do not enable hoop limits for this lubrication section, you may cause damage to your EMT 10/12 and/or any hoops (including cap frames) that are installed!**

**Caution! You MUST have the proper cap frame size selected in the Hoop Selection area of the Control Panel. Failure to do so may cause damage to your cap drivers and/or EMT 10/12.**

1. The maintenance step through dialog box will appear for the 8 hour scheduled maintenance.
2. Select the proper hoop size from the list provided in the maintenance dialog box.
3. Click OK in the maintenance step through dialog box to continue. This will move the the x-carriage to the front of the machine (as far as the hoop limit will allow).
4. Wipe the lint off both driver shafts (see Figure 5-3). Place one drop of oil on the Driver shaft guide (the bottom shaft) as close to the cap frame driver as possible.
5. Click OK in the maintenance step through dialog box to continue. This will move the x-carriage to the rear. Wipe the lint off both shafts. Place one drop of oil on the driver shaft guide at the plastic pad (see Figure 5-4).

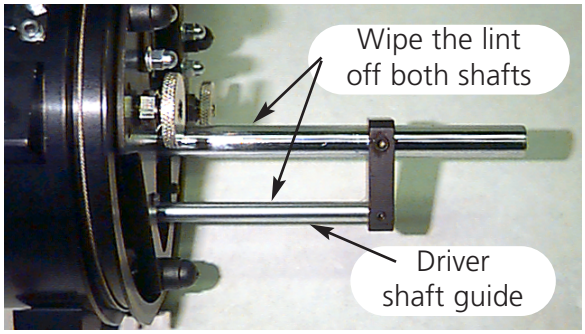



**Figure 5-3**

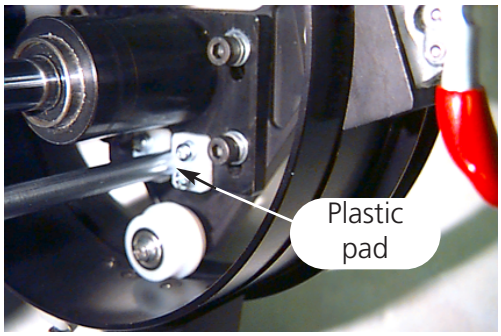



**Figure 5-4**

6. Click OK in the maintenance step through dialog box to continue. The x-carriage will now move back and forth to distribute the oil.
7. Click OK in the maintenance step through dialog box to finish the 8 hour maintenance.

## 40 Hour Schedule

### Upper Connecting Rod Lubrication

1. The maintenance step through dialog box will appear for the 40 hour scheduled maintenance. Click OK in the maintenance step through dialog box to continue. The needle cases will move to needle #1.

2. Figure 5-5 shows the lubrication hole inside the machine (the plate with the red dot is not visible in this view). To access this hole, insert the oiler through the hole as shown. Use a flashlight if needed. Repeat for each head.

3. Click OK in the maintenance step through dialog box to finish the 40 hour maintenance.

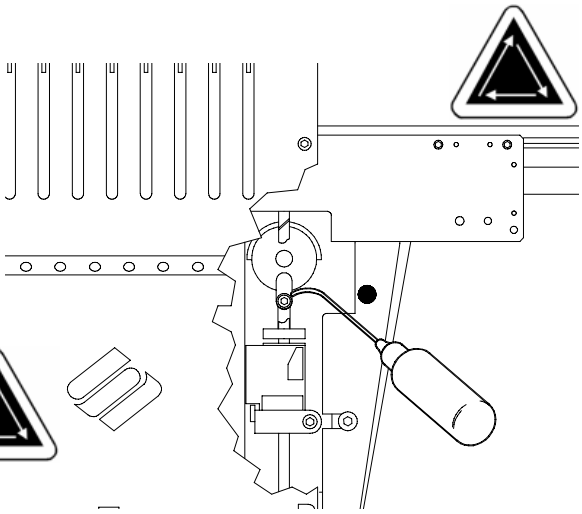


**Figure 5-5**

## 80 Hour Schedule

The maintenance step through dialog box will appear for the 80 hour scheduled maintenance. The maintenance step through dialog box will lead you step by step through each of the different lubrication steps.

### Upper Needle Bar Lubrication

The needle bars must be lubricated at both the upper and lower ends. The needle bars for each sewing head are accessed from the front of the needle case. Observe the slots for the take-up levers. Look inside the slots, just to the right, and you will see the needle bars. Do not attempt to lubricate unless the machine is stopped.

To lubricate the upper area, place the oiler tube through the slot and place one or two drops of oil onto each needle bar in the location shown in Figure 5-6. Repeat for each head.

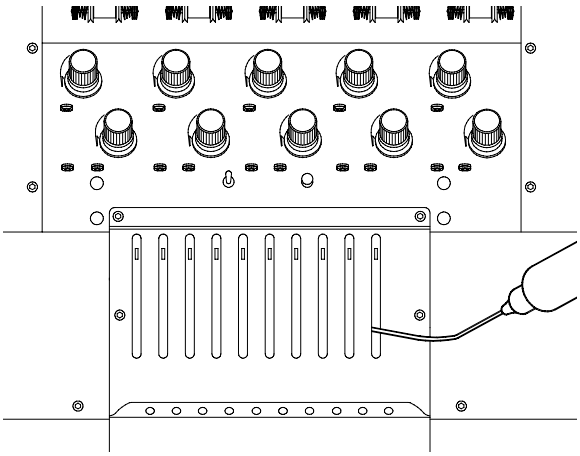


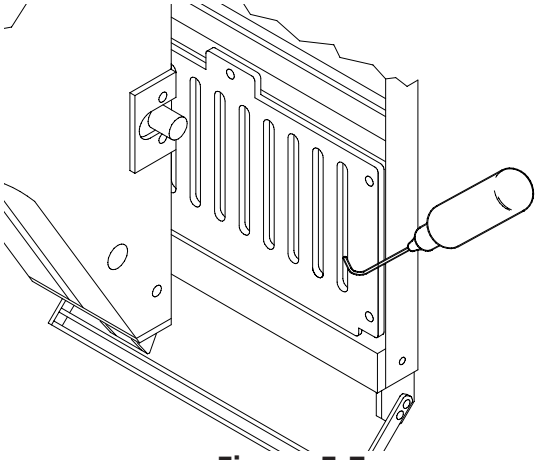
**Figure 5-6**

Note: A slight bend in the oiler tube makes it easier to reach the needle bars.

When the lubrication is completed, Click OK in the maintenance step through dialog box to continue the 80 hour maintenance.

### Lower Needle Bar Lubrication

1. To lubricate the lower area, Click OK in the maintenance step through dialog box to move the needle cases to needle #10.



2. From behind the needle case, place one or two drops of sewing machine oil onto needle bars one through six in the location shown in Figure 5-7. Repeat for each head.

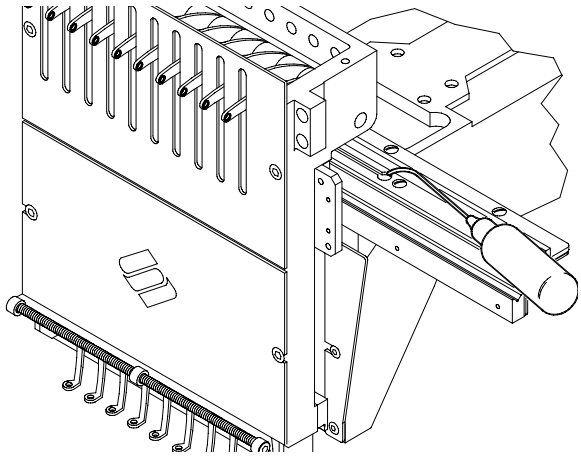
**Figure 5-7**

3. Click OK in the maintenance step through dialog box to move the needle cases to needle #1.
4. From behind the machine, place one or two drops of sewing machine oil onto needle bars seven through ten. Repeat for each head.
5. When the lubrication is completed, Click OK in the maintenance step through dialog box to continue the 80 hour maintenance.

### Needle Bar Driver Lubrication

Do not attempt to lubricate the machine unless it is stopped.

1. With the needle cases already on needle #1, access the puddle slot through the holes with red bushings on the panels between each head.



2. Locate the puddle slot on the top (shown here in Figure 5-8 with the panel removed), right side of the linear bearing guide. Place three to five drops of sewing machine oil in the slot at sewing heads 1-12.
3. Click OK in the maintenance step through dialog box to move the needle cases to needle #10.
4. Locate the puddle slot located on the top, left side of the linear bearing guide. Place three to five drops of sewing machine oil in the slot. Repeat for each head.

**Figure 5-8**

5. When the lubrication is completed, Click OK in the maintenance step through dialog box to continue the 80 hour maintenance.

### Lower Connecting Rod Lubrication

Do not attempt to lubricate the machine unless it is stopped.

1. With the needle cases already on needle #10, Click OK in the maintenance step through dialog box to rotate the Z-axis into the correct lubrication position.
2. At the far left end of the machine (head #12), use a small flashlight to look through the red-lined hole. Oil where indicated in Figure 5-9. Repeat for each head.
3. When the lubrication is completed, Click OK in the maintenance step through dialog box to continue the 80 hour maintenance.

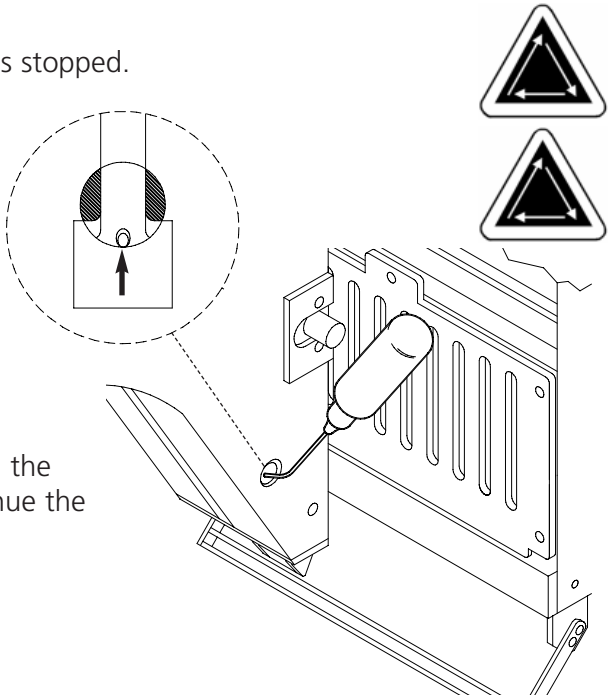


**Figure 5-9**

### Linear Bearing Lubrication

1. The needle cases are already on needle #10. Figure 5-10 shows the bearing track with the panels removed. Insert the oiler (with the tip pointed downward to the bearing track) through the hole with the red bushing.
2. Place one drop of oil on the left linear bearing track. Repeat for all sewing heads.
3. Click OK in the maintenance step through dialog box to move the needle case to needle #1.
4. Place one drop of oil on the right linear bearing track. Repeat for each head.
5. When the lubrication is completed, Click OK in the maintenance step through dialog box to continue the 80 hour maintenance.

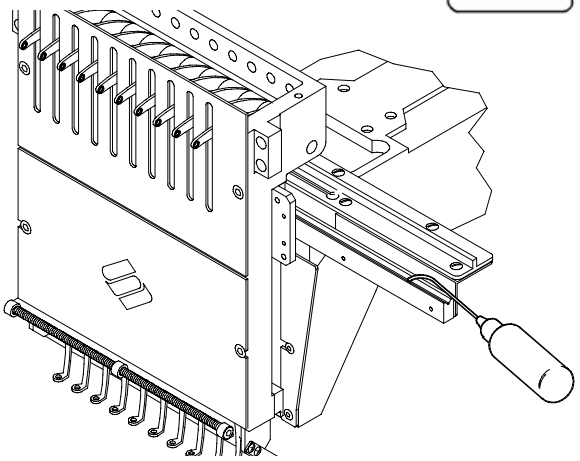


**Figure 5-10**

### Trimmer Knife Drive Arm Lubrication

Push the "E Stop" button to power down the drives. Remove the needle plate to access the trimmer areas shown in Figure 5-11. Lubricate these areas by placing one drop of sewing machine oil in each of the indicated locations. When the lubrication is completed, Click OK in the maintenance step through dialog box to continue the 80 hour maintenance.

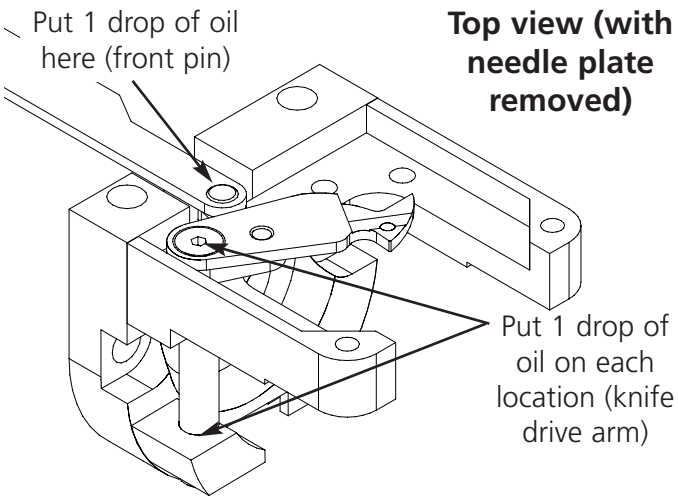



**Figure 5-11**

### Trimmer Picker Base Shaft Lubrication

Lubricate the Trimmer Picker Base Shaft by placing one drop of sewing machine oil in each of the indicated locations in Figure 5-12. When the lubrication is completed, Click OK in the maintenance step through dialog box to continue the 80 hour maintenance.

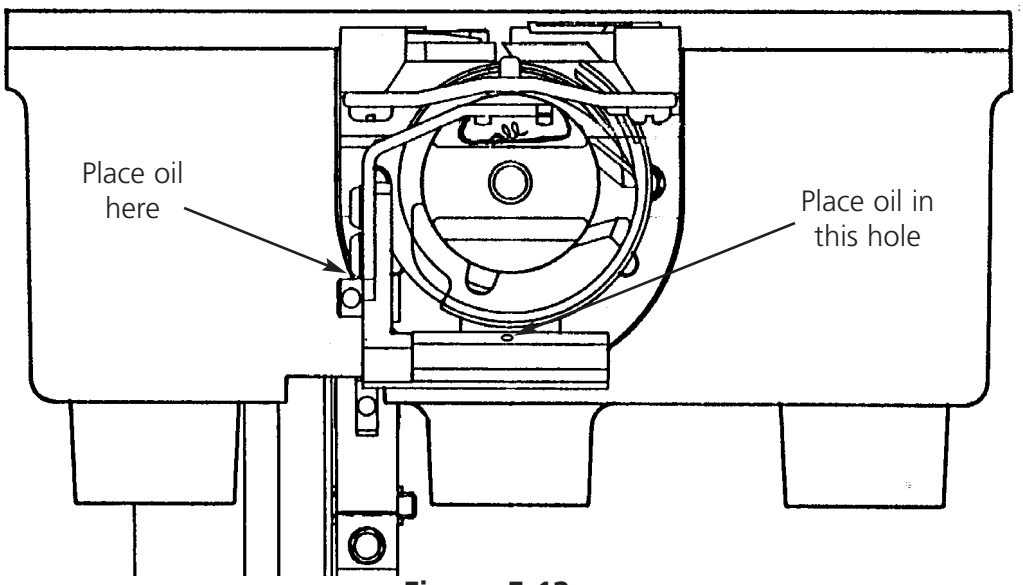



**Figure 5-12**

## 960 Hour Schedule

### Trimmer Cam Assembly Lubrication

The maintenance step through dialog box will appear for the 960 hour scheduled maintenance. Refer to the EMT 10/12 technical manual for access to the trimmer cam assembly.

## 2100 Hour Schedule

The maintenance step through dialog box will appear for the 2100 hour scheduled maintenance. The maintenance step through dialog box will lead you step by step through each of the different lubrication steps.

### Color Change Cam

To lubricate the Color Change Cam, refer to the following steps:

1. Click OK in the maintenance step through dialog box to move the needle case to needle 10.
2. Remove the front cover between heads 6 and 7 to access the color change box.
3. Refer to Figure 5-14 to lubricate the color change cam; USE A SMALL AMOUNT OF GREASE to lubricate all the color change cam pins.
4. Click OK in the maintenance step through dialog box to move the needle case to needle 1, then back to needle 10. This will help distribute the grease.

**Figure 5-14**

5. Reinstall the front cover between heads 6 and 7.
6. Click OK in the maintenance step through dialog box to continue the 2100 hour maintenance.

### Take-up Lever Cam and Follower

To lubricate the Take-up Lever Cam and Follower, refer to the following steps:

1. Remove the access panels between the heads (each panel has 2 red bushings in it). Two allen head screws hold the panels in place.
2. Click OK in the maintenance step through dialog box to move the needle case to needle #1. Use a cotton swab and a SMALL AMOUNT OF GREASE to lubricate the take-up lever cam and follower (refer to Figure 5-15). Use a flashlight if necessary.
4. Repeat for each head.
5. Replace the panels.
6. Click OK in the maintenance step through dialog box to continue the 2100 hour maintenance.

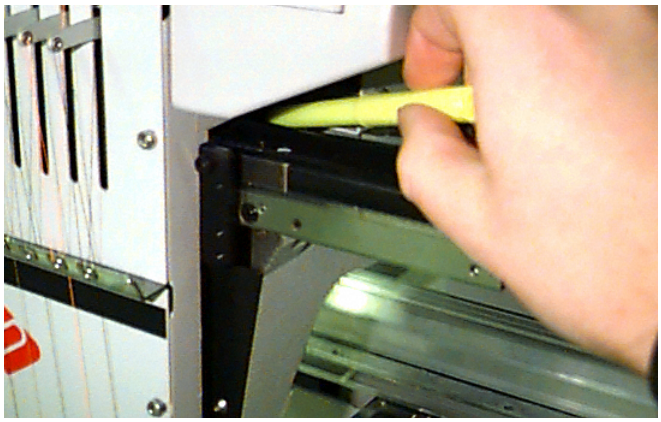


**Figure 5-15**

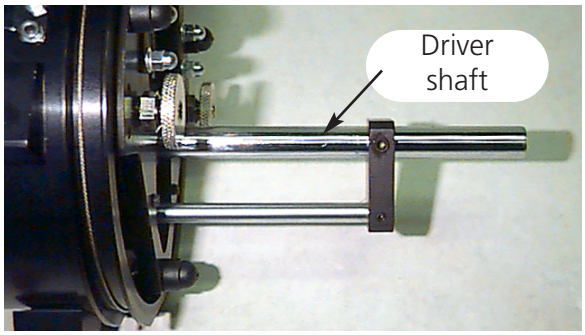



**Figure 5-16**

### Driver shaft lubrication

1. Wipe any lint off the driver shaft (see Figure 5-16).
2. Loosen the 2 screws holding the rear support bracket using the 2mm hex wrench (see Figure 5-17). Remove the rear support bracket.
3. Lower the driver shaft and driver shaft guide until the bearings are exposed (see Figure 5-18).
4. Place 10 drops of oil on the bearings.
5. Push the driver shaft and driver shaft guide up through the bearing housing. Attach the rear support bracket and tighten the 2 screws.
6. Click OK in the maintenance step through dialog box to continue the 2100 hour maintenance.

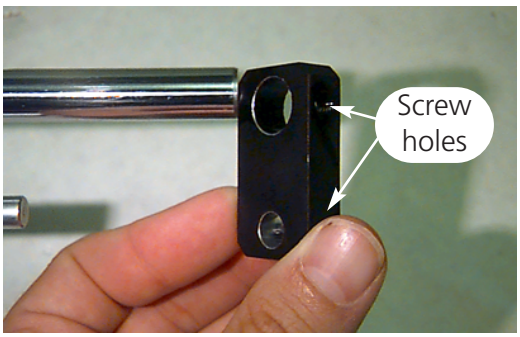



**Figure 5-17**

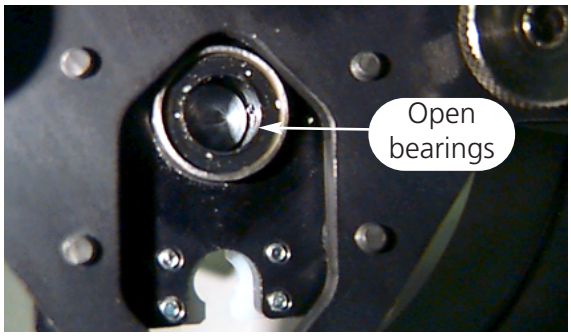



**Figure 5-18**

### Bevel Gear Lubrication

At the rear of each head on the EMT 10/12 is a set of Bevel Gears. To lubricate the Bevel Gears, refer to the following steps:

1. Remove the bevel gear cover. This cover is held in place by 2 screws (see Figure 5-19); remove these 2 screws.

2. Apply a small amount of grease directly on the bevel gears (see Figure 5-20).

3. Replace the cover. Repeat for each head.

4. Click OK in the maintenance step through dialog box to finish the 2100 hour maintenance.

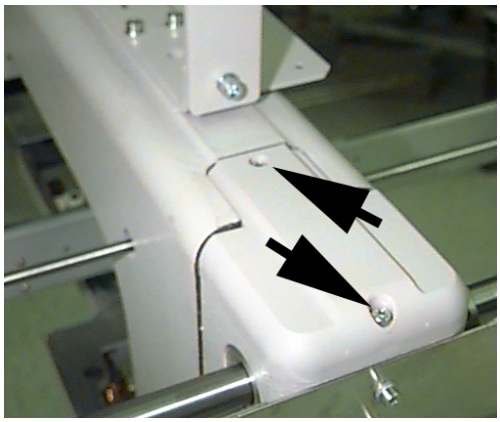


**Figure 5-19**

**Figure 5-20**

# Replacement Parts

## Fuses

There are 3 operator-replaceable fuses. If a fuse must be replaced, use this chart for appropriate fuse ratings. Do not use a fuse with any rating other than what is listed here:

Rating: 5A/250V
0.5A/250V
1.6A/250V

Fuses are all Time delay, High Interrupt.

## Tool Kit

The tool kit contains the following items and is included in the operator's kit:

| | | |
|---|---|---|
| 12-piece standard ball hex set | Right angle screwdriver | 1/16" ball allen wrench |
| Phillips #2 screwdriver | Short straight screwdriver | 9/64" ball allen wrench |
| Straight small screwdriver | Tool handle | 5/23 ball allen wrench |
| Phillips offset screwdriver | Tool extension | 6-piece metric ball hex set |

### Operator Kit

Following is a list of the items contained within the operator's kit:

| PART NUMBER | DESCRIPTION |
|---|---|
| 005408-01 | HOOP, 18CM RND |
| 005409-01 | HOOP, 15CM RND |
| 007535-01 | HOOP SET, 21CM ROUND W/ARM |
| 008316-01 | BRACKET, INTFC, HOOP REAR |
| 006454-01 | HOOP, 36X30, W/INSERT |
| 008257-01 | BRACKET, HOOP, I/F, 36X30 |
| 006795-01 | MONOFILAMENT |
| 005413-01 | FRAME, 18CM RND |
| 007594-01 | BRACKET, INTFC, 25CM, 2 HB |
| 007595-01 | BRACKET, INTFC, 25CM, SLO |
| 007592-01 | HOOP, RND, 25CM W/ARMS |
| 006793-01 | FRAME, 21CM RND |
| 005407-01 | FRAME, 15CM RND |
| 761002-01 | BOBBIN, WHITE |
| 008355-01 | PACKING HOOPS |
| 008490-01 | CASE, BOBBIN, SM |
| 008499-01 | BOBBIN, ALUMINUM |
| 008177-01 | CLIP, BORDER, FRAME, 300MM |
| 007598-01 | CLIP, BORDER, FRAME, 220MM |
| 008454-01 | BOTTLE, OIL, W/CAP |
| 007729-01 | KIT, TOOL, EMC10/12 |
| 008294-01 | NEEDLE, ORGAN, DB X K5 |
| 995489-01 | FIXTURE, GAUGE, PIN, BARREL |
| 010456-01 | MS WINDOWS 95 |
| 004668-01 | MS-DOS, 3-1/2" |

### Spare Parts

To help reduce down-time, Melco offers 2 spare parts kits for the EMT 10/12. The first kit (p/n 10280) is for mechanical parts only:

| PART NUMBER | DESCRIPTION |
|---|---|
| 001528-01 | CLAMP, NDL, ASSY |
| 001532-01 | BAR, NDL |
| 001535-01 | SPRING, PRESSER FT |
| 001537-01 | SPRING, HLDR, NDL BAR |
| 001828-01 | SCREW, SET, DNL CLAMP |
| 001840-01 | CLAMP, STOP, NDL BA |
| 001858-01 | SHAFT, GUIDE, NDL BAR |
| 008484-01 | LEVER, TAKE UP, ASSY |
| 001990-01 | RESIPROCATOR, ASSY |
| 002637-08 | SCREW, SKT HD CAP, M5X8M |
| 004643-01 | SCREW, NDL PLATE |
| 005577-01 | BUMPER, WASHER |
| 005600-01 | KNIFE, SPRING, FIXED |
| 005615-01 | PICKER |
| 005617-01 | KNIFE, MOVABLE |
| 005702-01 | GUIDE, THD, THD TREE |
| 005704-01 | TUBING, .125 ID X .187 |
| 007080-01 | KNOB, ADJ, PRETENSIONER |
| 006520-01 | PLATE, NDL, UTC |
| 006671-01 | PRESSER, UNDER THREAD |
| 007503-01 | PLATE, GUIDE, NDL |
| 007505-01 | SHIM, NDL CS |
| 007506-01 | FELT, NDL CS |
| 007507-01 | RAIL, GUIDE, T/U LEVER |
| 008471-01 | VELCRO, GRABBER, FLARRED |
| 007547-01 | TENSIONER, THREAD, MAIN |
| 007591-01 | DAMPER, NDL CLAMP |
| 007823-01 | FUSE, 15 AMP, 3AB SLO-BLO |
| 007824-01 | FUSE, 20 AMP, 3AB SLO-BLO |
| 007825-01 | FUSE, 3AG SLO-BLO, GLASS |
| 007826-01 | FUSE, 3AG SLO-BLO, GLASS |
| 007924-01 | FOOT, PRESSER, ASSY |
| 008039-01 | PIVOT, TRMMR DRV |
| 008043-01 | BLADE, GRABBER |
| 009000-01 | HOOK, ROTARY, SM BOBBIN |
| 008490-01 | CASE, BOBBIN, SM, W/SPRING |

The second kit (p/n 10281) contains both electrical and mechanical parts.

| PART NUMBER | DESCRIPTION |
|---|---|
| 001528-01 | CLAMP, NDL, ASSY |
| 001532-01 | BAR, NDL |
| 001535-01 | SPRING, PRESSER FT |
| 001537-01 | SPRING, HLDR, NDL BAR |
| 008395-01 | SOLENOID, JUMP |
| 001828-01 | SCREW, SET, DNL CLAMP |
| 001840-01 | CLAMP, STOP, NDL BA |
| 001858-01 | SHAFT, GUIDE, NDL BAR |
| 008484-01 | LEVER, TAKE UP, ASSY |
| 001990-01 | RESIPROCATOR, ASSY |
| 002637-08 | SCREW, SKT HD CAP, M5X8M |
| 003452-01 | SOLENOID, PICK |
| 004643-01 | SCREW, NDL PLATE |
| 009898-01 | UTC, ASSY |
| 011066-01 | PCB, CPU, EMT1 |
| 005523-01 | PCB, CONT, INT |
| 011342-01 | PCB, CLR CHNG |
| 007743-01 | PCB, THD BRK |
| 005535-01 | PCB, HOME/LIMI |
| 010576-01 | PCB, LV DRVR |
| 005577-01 | BUMPER, WASHER |
| 005600-01 | KNIFE, SPRING, FIXED |
| 005615-01 | PICKER |
| 005617-01 | KNIFE, MOVABLE |
| 005702-01 | GUIDE, THD, THD TREE |
| 005704-01 | TUBING, .125 ID X .187 |
| 007080-01 | KNOB, ADJ, PRETENSIONER |
| 011131-01 | PCB, REMOTE KE |
| 006520-01 | PLATE, NDL, UTC |
| 006671-01 | PRESSER, UNDER THREAD |
| 007503-01 | PLATE, GUIDE, NDL |
| 007505-01 | SHIM, NDL CS |
| 007506-01 | FELT, NDL CS |
| 007507-01 | RAIL, GUIDE, T/U LEVER |
| 008471-01 | VELCRO, GRABBER, FLARRED |
| 007547-01 | TENSIONER, THREAD, MAIN |
| 007591-01 | DAMPER, NDL CLAMP |
| 007621-01 | CUTTER, SOLENI |
| 007671-01 | AMPLIFIER, SER |
| 007803-01 | PCB, ESTOP CON |
| 007823-01 | FUSE, 15 AMP, 3AB SLO-BLO |
| 007824-01 | FUSE, 20 AMP, 3AB SLO-BLO |
| 007825-01 | FUSE, 3AG SLO-BLO, GLASS |
| 007826-01 | FUSE, 3AG SLO-BLO, GLASS |
| 007924-01 | FOOT, PRESSER, ASSY |
| 008039-01 | PIVOT, TRMMR DRV |
| 008043-01 | BLADE, GRABBER |
| 009000-01 | HOOK, ROTARY, SM BOBBIN |
| 008490-01 | CASE, BOBBIN, SM, W/SPRING |
| 344924-01 | STRAP, WRIST |

# 6. Troubleshooting Guide

## Thread breakage

| PROBLEM | POSSIBLE CAUSES | SOLUTIONS |
|---|---|---|
| Design | Stitches are too short and/or too dense | Check the design for short and/or dense stitches, and edit the design to remove them |
| Needles | Incorrect needle for thread size being used | Replace with a compatible needle |
| | Needle is bent, damaged, or dull | Replace needle |
| | Needle position is incorrect | Install the needle correctly (see needle installation) |
| | Needle scarf and/or needle eye is burred | Replace needle |
| Thread | Incorrect thread size for the needle being used | Replace with a compatible needle |
| | Poor quality thread | Replace with a high quality thread or spray silicone on thread cone |
| | S-twist (right twist) thread being used | Replace with a Z-twist (left twist) thread |
| | Improper threading | Thread correctly (refer to threading section) |
| Upper/bobbin tension | Upper/bobbin tension too tight | Loosen upper/bobbin tension |
| | Ratio of upper thread to bobbin thread incorrect | Adjust upper and/or bobbin tension (see tension section) |
| | Incorrect check spring tension/stroke | Adjust/replace check spring (refer to the technical manual) |
| Fabric and hoops | Fabric is hooped loosely | Tighten fabric in the hoop (see hooping section) |
| | Inadequate backing allows fabric to pull into needle plate hole | Increase number of backing pieces |
| Rotary hook | Hook timing is incorrect | Adjust hook timing (refer to the technical manual) |
| | Rotary hook does not rotate smoothly | Clean, oil, or replace |
| Bobbin | Bobbin is damaged | Replace bobbin |
| | Bobbin thread feeds poorly | Repair or replace bobbin |
| Thread path | Scratches or burrs on thread path | Remove scratches with emery cloth |
| Needle depth | Needle depth is incorrect | Adjust needle depth (refer to the technical manual) |

## Skipped Stitches

| PROBLEM | POSSIBLE CAUSES | SOLUTIONS |
|---|---|---|
| Needles | Needle is bent or damaged | Replace needle |
| | Incorrect needle for the thread size being used | Replace with a compatible needle |
| | Needle is installed incorrectly | Install needle correctly (see needle replacement section) |
| Needle depth | Needle bar lowest dead point is incorrect | Adjust needle depth (refer to the technical manual) |
| Rotary hook | Hook timing is incorrect | Adjust gap (refer to the technical manual) |
| | Hook point is dull | Replace hook |
| Upper/bobbin tension | Bobbin thread does not feed out smoothly | Replace the bobbin and/or bobbin case |
| | Upper thread does not feed out smoothly | Adjust the upper tensions |
| Presser foot | A weak or broken presser foot prevents the needle from coming out of the fabric smoothly | Replace or strengthen the spring (refer to the technical manual) |
| Thread | Thread twist is too tight | Use the appropriate thread or consult the service department for suggestions |
| | Thread is too elastic to form an adequate loop | |
| Check spring | The check spring stroke is too high | Adjust the check spring stroke (refer to the technical manual) |
| | The check spring tension is too high | Decrease the tension |

## Needle breaks

| POSSIBLE CAUSES | SOLUTION |
|---|---|
| Needle is bent | Replace needle |
| Needle installation is incorrect | Install correctly (see needle replacement section) |
| Needle strikes the rotary hook | Adjust hook timing refer to the technical manual) |
| Poor needle quality | Replace needle |
| Dull needle tip | Replace needle |
| Needle is too small for the fabric | Replace with compatible needle |
| Needle strikes the needle plate | Adjust position of the needle case (refer to the technical manual) |

## Loose Stitches

| POSSIBLE CAUSES | SOLUTIONS |
|---|---|
| Upper thread tension too low | Adjust the upper thread tensions (see tension section) |
| Bobbin tension too low | Adjust the bobbin case set screw |
| Uneven thread size | Replace with quality thread |
| Upper tension inconsistent | Clean tensioner parts |
| Rotary hook timing is incorrect | Adjust hook timing (refer to the technical manual) |
| Inadequate rotary hook lubrication | Lubricate the rotary hook (see the rotary hook lubrication section) |
| Design density too tight | Decrease density (refer to the EDS manual for design editing) |

## Other issues

| ISSUE | SOLUTIONS |
|---|---|
| Bird Nesting | Thread may be wrapped around the hook assembly; check hook (refer to the technical manual) |
| Burrs | Check the needle plate or run the thread test design |

## Wide-angle cap frame

### Poor sew quality everywhere in sewing field

| Possible cause | Possible remedy |
|---|---|
| Hooping is incorrect (too tight) | Use appropriate thickness rubber strap |
| | Do not pull the fabric as tight on the hoop gauge while hooping. |
| Incorrect driver adjustment | Refer to the First Time Adjustment section of the manual. Repeat adjustment if necessary. |
| Design problems | Refer to the Cap Designs section of the manual. Fix design if necessary. |
| Cap supports are not all the way out or are interfering with the Cap Frame | Move cap supports all a way out. Make sure that cap frame does not interfere with cap supports. |
| Guiding pads are too loose/tight | Readjust pads ensuring free movement, without extensive free play or binding. |
| | Oil the guide shaft as recommended in the manual. |

### Poor sew quality on sides (but the middle is ok)

| Possible cause | Possible remedy |
|---|---|
| Hooping is incorrect (too tight) | Use appropriate thickness rubber strap. |
| | Do not pull the fabric as tight on the hoop gauge while hooping. |
| Post(s) are out of position (or bent) | Bend post(s) back. |
| | Re-adjust radial position of post(s). |
| | Make sure post(s) do not interfere with the cap supports. |
| Clips are installed incorrectly | Install clips as shown in the manual. |
| No backing (or not enough backing) | Use stiffer backing or add an additional layer(s) of backing. |

### Poor sew quality near crown of cap

| Possible cause | Possible remedy |
|---|---|
| Incorrect design location (too close to the crown) | Move design away from crown |
| Design is too big to fit | Refer to the Sewing Field section of the manual to determine allowable sewing field; reduce design in Y-direction if necessary. |
| Disk tensioner interferes with the needle plate | Remove disk tensioner |
| | Reduce design in Y-direction to prevent disk-needle plate interference. |

### Poor sew quality near cap brim

| Possible cause | Possible remedy |
|---|---|
| Incorrect design location (too close to the brim) | Move design away from the brim |
| Design is too big to fit | Refer to the Sewing Field section of the manual to determine allowable sewing field; reduce design in Y-direction if necessary. |
| Brim interferes with sewing head | Check hooping (specifically, the elastic cord on the cap frame). |

**Clips will not stay on the posts (they keep "popping off")**

| Possible cause | Possible remedy |
|---|---|
| Post(s) are out of position | Re-adjust radial position of post(s). |
| Rubber strap is NOT between post and gauge | Re-hoop cap as recommended by manual. |

**Cap frame buckle will not close or stay closed**

| Possible cause | Possible remedy |
|---|---|
| Post(s) are out of position | Re-adjust radial position of post(s). |
| Metal strap is too tight | Re-adjust the strap tension (loosen tension). |

**Cap frame metal strap is slipping too much toward the sewing field**

| Possible cause | Possible remedy |
|---|---|
| Metal strap is too tight | Re-adjust the strap tension (loosen the tension). |
| Metal strap is not in the cap frame locator groove | Re-hoop cap as recommended by manual. |

# 7. Status Messages

## Control Panel Messages

**Frame Forward/Backward**: The machine is currently framing forward or backward.

**In test mode**: The test mode (set via the Test Mode dialog box) is active.

**Machine error**: This is a general error message - the specific error will be displayed on the status bar message area.

**Machine Idle**: The machine is ready, but not currently sewing.

**Machine Running**: The machine is currently operating.

**Stopped -- bobbin break, head #**: The machine has stopped sewing due to a bobbin thread break at a specified head.

**Stopped -- color change**: The machine is waiting for a manually-specified color.

**Stopped -- thread break, head #**: The machine has stopped sewing due to a thread break at a specified head.

**Stopped -- waiting for start key**: The machine has been stopped during sewing and is waiting to resume.

## Status Bar Messages

**#1 Machine initialized, ready for operation**: RSA file successfully loaded and machine initialized properly.

**#2 Incompatible RSA file has received an invalid X or Y seek home command, check RSA file version, reinstall compatible version if necessary**: Invalid X/Y axis command received at the controller from the host computer, incompatible software between RSA and host.

**#3 Rack home was not set, operator must clear obstructions set X and Y home, click command button and set home button, contact service if problem persists**: Either an error was detected when setting home or one must set home before trying to do a X/Y position command. Home will be set the first time a design is selected after power-up or if a hard reset was performed, home needs to be set.

**#4 Incompatible RSA file has received an invalid thread grabber message, check RSA file version, reinstall compatible version if necessary**: Received an invalid thread grabber command from host, incompatible software between RSA and host.

**#5 Thread grabber home not set, click advanced, service, and grabber home buttons to continue**: Command was received from host to do grabber function, but home has not been set. Go to grabber function in service menu and set grabber home.

**#6 Incompatible RSA file has received an invalid type 2 command, check RSA file version, reinstall compatible version if necessary**: Received an invalid type 2 command (design download) from host, incompatible software between RSA and host.

**#7 Incompatible RSA file has received an invalid type 3 command, check RSA file version, reinstall compatible version if necessary**: Received an invalid type 3 command (Operator commands) from host, incompatible software between RSA and host.

**#8 Incompatible RSA file has received invalid head timing command, check RSA file version, reinstall compatible version if necessary**: Invalid Z axis command received at the controller from the host computer, incompatible software between RSA and host.

**#9 Off color index, stopped between colors, manually move the needle case until needles are aligned correctly**: Color change motor not on index when trying to do Z command or color change command. Manually turn color change motor to index position and redo last command.

**#10 Z motor is not turning, check for obstructions, shutdown and restart the machine, contact service if problem persists**: Z axis motor not completing commanded move in proper allotted time. Z axis timer is set up for 1 sec to complete commanded move or to complete one rotation (stitch) while sewing. This will cause Z motor to stop.

**#11 Hoop limit detected, needle will hit hoop, make sure hoop is large enough for the design**: Commanded X/Y motion will cause needle to hit hoop. Either restart job with corrected start position or select a larger hoop.

**#12 Controller missed Z headup index pulse, shutdown and restart the machine, contact service if problem persists**: Z axis motor should generate a output signal every time motor pass through headup encoder. This signal generates an interrupt to 188 CPU to synchronize Z motor position with electronic position generated by PMD controller. If this signal is missed, Z motor will stop.

**#13 Thread break detected,**: Machine stops after detecting 3 consecutive thread breaks in row. Machine will then backup 5 stitches.

**#14 Grabber not home, thread grabber is not retracted, check for obstructions, then shutdown and restart the machine, contact service if problem persists**: Thread grabber not in home position. When machine is initialized, grabber motor tries to find home position but can't, or grabber was at home when started sewing but has since lost index signal or grabber motor has moved.

**#15 Trimmer not home, check for obstructions under needle plate, shutdown and restart the machine**: Trimmer cam home sensor has moved off home while sewing, or not at home position when start key pressed. Operator must try to manually put trimmer to home before continuing.

**#16 Z motor is binding, check for obstructions, shutdown and restart the machine, contact service if problem persists**: Z axis motor is not keeping up with operator selected sewing speed. Z axis motor position is about half revolution (2000 encoder counts) behind where it should be with respect to trajectory generator output. This will stop machine sewing and halt Z motor.

**#17 Embroidering complete, end of design**: Machine has just finished sewing selected design.

**#18 Not at headup, click command button then headup to continue**: Z motor not at headup position required to perform selected operation. (start key, color change, trim, head up) Do a headup command, then redo last command.

**#19 Thread trimmer disabled by settings button preferences, thread trimmer is not available**: Operator tried to do a trim now command, but thread trimmer is currently disabled. Go to setting menu and enable trimmers.

**#20 Outside of hoop, use manual jog keys to move back into embroidery area**: X/Y rack position is outside of selected hoop limits. Do manual jog to inside of selected hoop or select a larger hoop.

**#21 Pausing after color change, press start key to continue**: Machine has stopped for manual color change, waiting for operator to manually select next needle. The machine stops because of a Pause ( P ) in color sequence table.

**#22 Machine memory cleared, factory default settings restored, machine ready for operation**: All machine parameters have been set to default values, either a new RSA has been installed, detecting a different version level, or the operator did a system reset from the service menu.

**#23 Learn color change, enter new color and press start**: Machine has stopped for color change, waiting for operator to enter selected needle. Color change learn mode is selected by an 'L' in color sequence, which will stop machine at every color change for operator to manually enter needle number, in turn will create a new color sequence table. This is called 'learn mode', teaches machine color sequence as you do a job for the first time.

**#24 Color change motor has stalled, check for obstructions, shutdown and restart the machine, contact service if problem service**: Color change motion took too long to complete.

**#25 No design ready, open a design before trying to embroider**: You must load a design before pressing the start button.

**#26 Thread grabber is binding, check for obstructions, shutdown and restart machine**: Thread grabber motor was command to either extend or retract position and took to long to finish motion.

**#27 Rack is binding in either X or Y direction, check for obstructions, shutdown and restart the machine, contact service if problem persists**: The X/Y motors did not complete commanded motion in the allotted time. This means RSA software didn't calculate correct profile for current Z sewing speed to complete motion by 120 degree of Z axis.

**#28 Off color index and not at headup, operator must manually move color change carriage until needles are aligned correctly and click on the command button and headup button to continue**: If machine is off both index and headup at power-up, the machine can't correctly initialize either problem without possible damage to machine. Operator must try to correct either problem before continuing with go headup or color change command.

**#29 Z motor driver fault, check for obstructions, shutdown and restart the machine, contact service if problem persists**: Check motor driver card or call for factory-authorized service.

**#30 Color change motor driver fault**: Unable to clear color change motor fault.

**#31 Emergency stop button engaged**: Emergency stop button is pushed in.

**#32 Serious DSP error, CPU halted, shutdown and restart the machine, contact service if problem persists**: Power-up initialization detected an error while trying to initialize X, Y, Z or C motor controller (PMD DSP). Controller would not release its busy signal. This error makes machine unusable and halts the 188 CPU.

**#33 Y motor driver fault, check for obstructions, shutdown and restart the machine, contact service if problem persists**: Y motor fault was detected when trying to do some Y motor function, either motor command or start sewing. Software tries to clear fault condition by toggling the brake line but fault will not clear.

**#34 Color change DSP control channel not responding, shutdown and restart the machine, contact service if problem persists**: PMD controller not responding to selected color change command. All commands require PMD busy bit to be cleared before commands can be issued. This time-out is 600 ms.

**#35 Thread grabber motor driver fault, check for obstructions, shutdown and restart the machine, contact service if problem persists**: Every time a thread grabber function is performed, motor fault status is checked, if set, controller toggles brake line to clear fault condition. If fault doesn't clear error message will appear.

**#36 Stitch length greater than “trim on stitch length”, click on advanced button and check settings**: Telling operator stitch is longer than operator selected parameter trim on stitch length xx' and will turn stitch into needle up or force a thread trim.
**#37 X motor driver fault, check for obstructions, shutdown and reset the machine, contact service if problem persists**: X motor fault was detected when trying to do some X motor function either a motor command or start sewing command. Software tries to clear fault condition by toggling the brake line but fault will not clear.

**#38 X rack is not moving or home detector is broken, check for obstructions, shutdown and restart the machine, contact service if problem persists**: Home must be set before sewing can start, so that machine knows where to put stitches.Home is defined as zero position for this axis. If X motor can't find its home sensor within allotted time, 10 sec, motor stops with this error.

**#39 Y rack is not moving or home detector is broken, check for obstructions, shutdown and restart the machine, contact service if problem persists**: X/Y home must be set before sewing can start, so machine knows where to put stitches. Home is defined as zero position for this axis. If Y motor can't find its home sensor within allotted time, 18 sec, motor stops with this error.

**#40 Rack position is outside of software embroidery limits, use manual jog keys to move back into embroidery area**: Commanded X/Y motion exceeded electronic limits of the machines sewing field. Saturn does not have limits.

**#41 Not at headup, click command button then headup button to continue**: Color change command exceeded 5 sec allotted time to change needles. Look for some mechanical bind in color change assembly.

**#42 Bobbin thread break detected**: Machine stops after detecting xx amount of consecutive bobbin breaks. This count is entered in setting menu under bobbin count. Machine will backup total number of stitches equal to bobbin count.

**#43 Hoop not compatible with machine setting, match hoop to hoop selection on control panel**: Selected hoop does not match electronic switch in cap driver.

**#44 Apply appliqué and press start**: Machine has detected an appliqué stop (A) in color sequence. Machine stops and waits for operator to apply appliqué to the design. Press start to resume sewing.

**#45 Rack limit exceeded, reset design, start over repositioning design so that it fits in frame**: Commanded X/Y motion caused hardware limit switch to be detected by.

**#46 80188 ES segment register was automatically corrected, contact service if this message persists**: Software jumped its tracks and corrupted the stack.

**#47 Machine embroidery parameters restored to factory default values**: Factory defaults restored.

**#48 Picker is not retracted, check for obstructions, press start to continue**:The picker is not retracted.

# 8. Glossary of Embroidery Terms

## A

**ACTIVE WINDOW**
The window that you are currently using. Also called the current window.

**ALPHABETS**
Lettering styles that are ready to use for embroidery. Alphabets can also be designs that are brought to the screen using letters of the alphabet. An example of this would be Sports Symbols.

**APPLICATION WINDOW**
The first window to appear when EDS III is opened. The Application Window has three menu bar items; File, Peripheral, and Help.

**APPLIQUE**
The art of using fabrics to enhance a design or to reduce the stitch count.

**ARTWORK**
A design or cartoon used to digitize.

**AUTO DELETE**
An option that automatically deletes designs from the sewing peripheral after the design has sewn once.

**AUTO RUN**
An option that automatically sends a design to the beginning of the job queue, allowing you to sew without making any selections from the peripheral menus.

**AUTO TRIM**
An option that automatically inserts a trim command between each alphabet letter used in a design.

**ARC ANGLE**
The center of lettering sewn on a circle. This position is given in degrees, 0É at the top of the circle,180É at the bottom.

**ARC FROM CENTER**
When the position of the needle prior to sewing is at the center of the circle. The distance from the center of the circle to the bottom of the lettering is the radius.

**ARC NORMAL**
When the position of the needle prior to sewing is on the circumference of the circle.

**ASD**
The file extension given by EDS III to a design that is sent to the peripheral.

## B

**BACKING**
Fabric used for stabilizing that is added to the back of a garment to be embroidered.

**BEAN STITCH**
A form of running stitch where the stitch is made forward, then back to the original needle penetration point, then forward again. Also known as a triple run.

**BIRD NEST**
A tangled mass of thread that gets jammed in the needle plate. Sometimes it is caused by improper tensions.

**BIT PAD**
Another name for a Digitizing Tablet.

**BLOCK**
A designated group of stitches that can be scaled, rotated, repositioned, deleted, cut, copied and pasted.

**BLOCK EDIT**
The term used for changing a defined group of stitches.

**BOBBIN**
The reel or spool that holds the under thread of machine sewing. The under thread itself.

## C

**CENTER DESIGN**
Positing the design in the center of the sewing field.

**CHAIN STITCH**
A stitch used to outline and detail a chenille design.

**CHENILLE**
A form of embroidery with a deep pile that uses heavy yarns and has no bobbin thread. Commonly used for high school letter jackets.

**CLICK**
Pressing and releasing a mouse button in one quick motion.

**CLIPBOARD**
A temporary storage area in the computer's memory. Data in the storage area can be copied to another place.

**CND**
The three letter extension given to a Condensed file. See Condensed Format for more information.

**COLUMN FILL**
An option to turn wide column or satin stitches into a series of shorter stitches.

**COLUMN STITCH**
A stitch formed with one needle penetration on either side of a column. Also referred to as a satin stitch or a steil stitch.

**COLUMN WIDTH**
The width of the actual side-to-side needle penetrations in a column or satin stitch. In EDS III, the width can be increased or decreased in increments of 10% from 90% to -90%.

**COMPLEX FILL**
A method for digitizing fills where the computer automatically determines the various independent segments that are required in making the complete fill of an irregular shape.

**CONDENSED FORMAT**
A coding format that includes only the data for the Mk entries and function commands created during digitizing. This format allows you to scale the design up or down as well as change the density and stitch length of the design.

**COPY**
A command that keeps the design in the current window and also stores it in a temporary memory called the clipboard.

**CURSOR**
An icon used to indicate your position on the computer screen.

**CUT**
An editing function used to take selected stitching out of a design and store it in the clipboard. From there it may be pasted to a different place.

## D

**DATASET**
A basic set of instructions to produce an embroidery design.

**DEFAULTS**
Values that are automatically used unless you override them with different values.

**DENSITY**
The vertical distance between two lines of stitching, measured in points.

**DESIGN FILE**
Any design stored on your hard disk or floppy disk. A file name can have up to eight letters, a period, and a three letter extension.

**DIALOG BOX**
A box displayed on your computer screen that prompts you to give information, such as a selection from a list of options, or a file name.

**DIGITIZING**
Converting artwork into a series of commands that can be read by an embroidery machine with the use of a special device.

**DIGITIZING TABLET**
A board used to communicate with a computer or an embroidery machine while creating a design.

**DIGITRAC**
The original Melco computerized digitizing system which uses an exceptionally large surface and its own vertical stand.

**DIRECTORY**
A named group of computer files stored on one of your computer drives. The hard drive of your computer is usually the C directory. Floppy diskettes are inserted into the A or B drive.

**DISK**
A computer data storage device which is accessed in the hard drive or one of the floppy drives.

**DISKETTE FORMAT**
The manner in which a disk has been prepared to accept information.

**DITHERED COLORS**
A combination of a solid color and a pattern.

**DOUBLE CLICK**
Pressing the mouse button quickly two times.

**DRAG**
Holding down the mouse button while moving the mouse. This is usually done to move an object on the screen or to highlight text.

**DROP-DOWN MENU**
A list of available commands that displays when you click on a menu option. Commands displayed in black are accessible, commands that are displayed in gray or half tone are not.

## E

**EDIT**
Changing a design file by adding, deleting or moving Mk points, or by inserting and deleting functions.

**EMBROIDERY POINT**
A unit of measure equal to one tenth of a millimeter or 1/254th of an inch.

**EXP**
The three letter extension given to an Expanded file.

**EXPANDED FORMAT**
A coding format that includes the data for every stitch in the design.

**EXPORT**
Copying a design from the computer to a non-DOS format diskette or paper tape.

**EXTENSIONS**
The last part of a file name after the period. It can be up to three characters long and is used to identify the type of file.

## F

**FILE**
A related collection of information, named and often stored on a disk.

**FILE NAME**
The unique identifier given to a design that is stored on a computer. The file name can have up to eight characters, a period, and an up to three letters extension.

**FILL STITCH**
A series of running stitches used to cover large areas.

**FORMAT**
Preparing a disk to receive information. All new disks must be formatted, but reformatting a disk destroys any information stored on it.

**FUNCTION**
An action caused by a command in a design such as Trim, Color Change, Needle Up, etc.

## G

**GRAPHICAL ROTATION**
Angling a design in the Layout window using the mouse to click and drag the rotation box around the object.

**GRAPHICAL SCALING**
Making a design larger or smaller in the Layout window using the mouse in a click and drag motion.

**GROUP OBJECTS**
Objects that have been locked together on the screen.

## H

**HARD DISK**
A sealed area in your computer with a read/write head and auxiliary memory.

**HOOP**
A device made of wood, metal, or plastic used to hold a garment or fabric taut during the embroidery process.

**HORIZONTAL SPACING**
Additional spacing that may be added between Alphabet letters.

## I

**ICON**
A small graphic representation of something larger.

**IMPORT**
Bringing a design file into the EDS III program from a non-DOS formatted diskette or paper tape.

**INSERT**
Adding additional information to an existing design.

## J

**JUMP STITCH**
A frame movement without a needle penetration. It function allows you to make a stitch longer than the maximum stitch length of your machine.

## L

**LAYER BY COLOR**
Used to show specific colors of a design on the computer screen.

**LAYOUT WINDOW**
The screen in which you can digitize designs, open files on the hard disk, import designs from floppy disks, export designs, modify designs, and create lettering.

**LETTER WIDTH**
The overall width of each letter, NOT the column width. In EDS III changes to letter width can be made in increments of 10% from +30% to -30%.

**LINE CENTER BOTTOM**
When lettering is centered horizontally and above the position of the needle prior to sewing.

**LINE CENTER MIDDLE**
When lettering is centered horizontally and vertically from the position of the needle prior to sewing.

**LINE NORMAL**
When the bottom left of the lettering is the needle position prior to sewing. The sewing will stop at the bottom right and will not return to the original position.

**LINE SPACING**
Adding space between lines of lettering. Line space is determined by adding the letter height to the amount of blank space you want between the lines.

**LIST BOX**
A box, usually with a scroll bar, that appears within a dialog box and displays available options.

**LOAD FILL**
Accessing a fill pattern for inspection or changes.

**LOCK GROUP**
One or more objects that have been joined together.

**LOCK STITCH**
Three or more stitches placed closely together to prevent the embroidered stitches from pulling out. Also know as a tie-off stitch.

## M

**MAXIMIZE**
The small button to the right of the Title Bar with the up arrow. Used to enlarge a window to its fullest extent.

**MAXIMUM STITCH LENGTH**
The longest stitch your embroidery machine is capable of sewing before performing a jump stitch. The maximum stitch length for Melco is 127 pts.

**MINIMIZE**
The small button on the right of the Title Bar with the down arrow. Used to reduce a window to an icon.

**MODIFY MK BUTTON**
An option that changes the position of a Mk point or changes the Mk to a different type of Mk.

**MOSS STITCH**
The "loopy" part of a chenille design. The height of the loop is controlled by the height of the needle.

**MULTIHEAD**
An embroidery machine with more than one sewing head.

## N

**NEEDLE UP**
A command used to move from one part of a design to another without stitching.

**NON-DOS FORMATS**
Any disk format other than DOS that is supported by EDS III, such as: Melco, Tajima, Barudan, ZSK.

**NORMAL STITCH**
A command that resets the stitching to a regular running stitch. It also brings the needle down to the sewing position after a needle-up function is performed.

## O

**OBJECT**
Any design from a disk, paper tape, or lettering brought in to the Layout window. Several objects can be in one window at one time.

**OBJECT FILE**
A code format where each object has its own separate set of parameters. Condensed, expanded and lettering designs can all be saved together as an Object File.

**OBJECT ORDER**
A list showing the sewing order of a group of objects.

**OBJECT PARAMETERS**
A dialog box which allows you to change the scale, rotation, orientation, or lock status of an object.

**OFM**
The three letter extension that identifies an Object file.

**ORIENTATION**
The direction that a design will sew. Melco uses an "F" to designate a normal sewing position.

**ORIGIN**
The point at which a design will start. Most designs will have x and y coordinates of 0,0; meaning that the design will start in the center and end in the center.

## P

**PAPER TAPE**
An older form of computer information storage in which the information is stored as a series of holes on a reel-to-reel paper tape.

**PARTITION LINE SEQUENCE**
Determines where the needle will penetrate on each line of stitching in a fill stitch.

**PERIPHERAL**
Any device that is attached to or run by the computer: Embroidery Machines, Paper Tape Punches, Digitizing Tablets, Printers, or Plotters.

**PERIPHERAL SETUP**
A dialog box that allows you to select Embroidery Peripherals in your network.

**PERIPHERAL STATUS**
A dialog box that displays information about a particular peripheral.

**POINT EDIT WINDOW**
One of the windows that is used to edit designs.

## R

**RADIUS**
The distance from the center to the circumference of a circle. The value of the radius controls the amount of curve in an arc.

**REGENERATE**
A command to redraw a design, used to see modifications in the current design.

**RESET STITCH**
See Normal Stitch.

**RETURN TO ORIGIN**
A command used to move the pantograph back to the origin of the design.

**RUBBER BANDING**
A command to view an edited portion of a design without regenerating the entire design.

**RUNNING STITCH**
A line of equally spaced stitches that are used to outline, underlay or add detail to a design.

## S

**SATIN STITCH**
A stitch formed with one needle penetration on either side of a column. Also called a column stitch or steil stitch.

**SAVE**
A command to overwrite a previously saved file without prompting you for a new file name.

**SAVE AS**
A command to store a design for the first time, or to store a modified design with a new name to prevent destruction of the original design.

**SAVE FILL**
A command to allow you to define fill information while digitizing.

**SCALING**
The process of changing the size, density or stitch lengths in a design.

**SCROLL BAR**
A bar that appears at the far right or bottom edge of a window or list box whose contents are not fully visible. Clicking on the arrows of the bar moves the viewing portion of the screen.

**SEND DESIGN**
A command that loads a design in the active window into one or more peripherals. The design can be a condensed, expanded, or object file.

**SHORT STITCHES**
Computer generated stitches that do not go all the way across a column at a curve or angle to prevent an excess of stitches at one point.

**SLANT ANGLE**
A command that slants lettering in one degree increments up to fifteen degrees, positive or negative.

**SPECIAL STITCH**
A user defined stitch that is digitized and stored temporarily in the computer memory. A Special Stitch is limited to 30 Mks or commands.

**STATUS BAR**
The area at the bottom of the computer screen that displays information about the active window or selected command.

**STITCH**
One needle penetration made by the embroidery machine.

**STITCH COUNT**
The number of stitches in a design.

**STITCH LENGTH**
The length of the running stitches in a design. Measured in points.

**STITCH LIST (condensed)**
Information showing the Mk points and functions that make up a design.

**STITCH LIST (expanded)**
Information showing the actual stitches and functions that make up a design.

**STITCH PROCESSOR**
An EDS III option that changes the size, densities, or stitch lengths of an expanded design.

**STORED SYMBOL**
A portion of a design that is digitized as a separate piece to be used multiple times within the same design. An example of this would be a leaves on a tree. You would digitize one leaf as a stored symbol then use that same leaf and place it on the tree at various different sizes and angles. This eliminates redigitizing the same design.

## T

**TIE OFF**
See Lock Stitch.

**TILE**
Allows you to put up to nine windows in the Application Window.

**TOOL SET**
The commands and options on the left side of the window represented by icons.

**TRANSFER DESIGN**
A command that sends Expanded or ASD files to the Peripheral.

## U

**UNDERLAY**
Stitches used to stabilize fabric and/or prepare the area for top stitching.

**UTC**
UTC is the Under Thread Control. It is a sensor mounted to the needle plate bracket that recognizes the absence of the bobbin thread. When the machine sews a certain number of stitches without bobbin thread, the UTC causes the machine to stop, back up that number of stitches, and display the error message, CHECK BOBBIN. The UTC also has a retaining tab that holds the inner basket of the rotary hook.

## V

**VERTICAL SPACING**
A command that stair steps your lettering up (positive value), or down (negative value).

## W

**WINDOW**
A rectangular area on your screen in which you view and work on designs.

## Z

**ZOOM**
A command that enlarges or reduces a portion of a design in the current Layout window, allowing you to edit with more precision. This command does not affect the sewing size of the design.