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BEVT Mechanical Guide

Chapter 1. Machine Basics

Chapter 2. Machine Care

Chapter 3. Trouble shooting
Chapter 1. Safety Instructions

This chapter contains information on the following.

1. Safety Instructions
2. Grounding Instructions
3. Warning Labels
1. Safety Instructions

Before using the machine make sure to read this manual thoroughly and follow all instructions.

The icons in the manual show the importance of the contents. Acknowledge the following descriptions beforehand.

<table>
<thead>
<tr>
<th>Icons</th>
</tr>
</thead>
<tbody>
<tr>
<td>⚠️ Warning</td>
</tr>
<tr>
<td>⚠️ Caution</td>
</tr>
</tbody>
</table>

⚠️ Warning

Safety information about protecting yourself.

⚠️ Caution

Important information about protecting the machine.

⚠️ Warning

This machine is made for an industrial use. This is an embroidery machine. Do not use for other applications.

Read the instruction manual thoroughly and acknowledge the operation before using the machine.

Only those that know how to operate the machine should run the machine. Do not let other personnel operate the machine.

Operate the machine only from the front. Do not load work to the machine from the back side.

Keep hands and face away from needles, take-up lever, trimmer, shafts, pulley, belts, gears, etc. Do not operate the machine without the protective covers for the shaft, pulley, belt, and gear in place.

Keep long, necklaces, and bracelets away from the machine while operating.

Only one person should operate the machine. One operator can start the machine while another operator is working on the machine accidentally. Be sure nobody is working on the machine before starting it. Close attention is necessary when the embroidery machine is used by or near children.
## Warning

Follow the electrical specifications instructed.

Do not modify or dismantle the machine. It can cause fire or malfunction.

Connect this embroidery machine to a properly grounded outlet only.

Connect the power plug firmly. Incorrect contact to the power plug may cause electrical shock.

Do not use the machine in the humidiated atmosphere. It can cause a fire or electrical shock.

Do not damage, modify, pull or twist the power cable. Heating or heavy load to the cable damages the cable and it can cause fire or electrical shock. Call for a service technician to fix the cable.

Keep water or chemical substances away from the controller. Disconnect the power to the machine and call a service technician.

Keep metal and foreign objects away from the controller, to avoid a short to the circuit, fire or electrical shock.

Disconnect the power to the machine and call a service technician if any foreign objects go into the controller.

## Caution

Adjustment of the machine

Stop the machine before threading the machine or checking the embroidery in process.

Disconnect the power to the machine before turning any shafts by hand.

Disconnect the power to the machine or turn OFF the machine power before opening the controller.
<table>
<thead>
<tr>
<th>Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid direct sunlight, heaters, boilers or any sources of heat from the machine. Do not use the machine outdoors.</td>
</tr>
<tr>
<td>Do not use the machine near heat. It may cause fire.</td>
</tr>
<tr>
<td>Clean the ventilation opening once a week. Use vacuum to clean the controller. Poor ventilation can cause fire or damage of the machine. Poor ventilation can cause an overheating error.</td>
</tr>
<tr>
<td>Unplug the power cable before servicing the controller. Residual power may cause electric shock. Wait for 4 minutes before opening the cover. Some parts in the controller can be very hot. Be sure not to burn your hands.</td>
</tr>
<tr>
<td>Use only attachments and parts recommended by Barudan. Wrong parts can damage the machine.</td>
</tr>
<tr>
<td>Do not use bent or wrong sized needles. It can break the needle or damage the fabric.</td>
</tr>
<tr>
<td>Do not force the fabric while sewing. It can cause the needle to break or bend.</td>
</tr>
<tr>
<td>Turn OFF all power switches and unplug the power cable after use.</td>
</tr>
</tbody>
</table>

*Follow the lubrication instruction on the machine.

### 2. Grounding Instructions

1) Apply grounding to the machine. Grounding avoids electric shocks. Power cable on the machine has plug with a grounding terminal. Use appropriate plugs or outlet which conform to the requirements of the power company or the law.

   Danger! : Not grounding the machine may cause electrical shock.

2) Ask for a service call if the power connection is not clearly understood.

3) Do not use adaptor to the power plug. Ask for a service call to connect the machine to another power source.

4) Ask for a service call from the power company to check the connection from the ground to the power outlet.

   *Check the voltage and capacity of the power source before plugging the power cable.
3. Warning Labels

GPay attention during operation to the parts labeled.

<table>
<thead>
<tr>
<th>Warning Labels</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Warning" /></td>
<td>Needle Hazard Warning Label</td>
</tr>
<tr>
<td><img src="image2" alt="Warning" /></td>
<td>Hair Warning Label</td>
</tr>
<tr>
<td><img src="image3" alt="Warning" /></td>
<td>Take-Up Lever Warning Label</td>
</tr>
<tr>
<td><img src="image4" alt="Warning" /></td>
<td>Frame Warning Label</td>
</tr>
<tr>
<td><img src="image5" alt="Warning" /></td>
<td>Hook Warning Label</td>
</tr>
<tr>
<td><img src="image6" alt="Warning" /></td>
<td>Belt Warning Label</td>
</tr>
</tbody>
</table>
Chapter 2. Introduction

This chapter contains the following information.

1. Specification
2. Advantage
# 1. Specification

1) **Design Capacity/Stitch Capacity**: 30 designs /10 million stitches

2) **Display**: LCD 320 x 240 16bit Color LCD

3) **Power Source**
   - AC100V Single
   - AC200V Single
   (+/-10%, 50/60Hz)

4) **Power Consumption**: 1KVA /Varies for each model

5) **Temperature**
   - 5 – 45 Degree Centigrade (Active)
   - -20 – 60 Degree Centigrade (Storage)

6) **Humidity**: 20 – 80 %RH, No condensation allowed

7) **Grounding**: Grounding resistance to be less than 1000ohm (Type 3 grounding)

8) **Main Motor**: 200V AC Servo Motor

9) **Pantograph Drive Motor**: AC Servo Motor

10) **Head Number**: 1

11) **Speed**: 200 – 1200rpm
    (Max Speed is defined for each model)

12) **Needle Number**: Max. 15 (Sliding Head)

13) **CF Card Slot**: X 1

14) **Trimmer Compatible**: Mark 5

15) **Thread Break Detection**

16) **USB Port**: USB1.1 (USB Board required)

17) **Networking System**: Ethernet (Ethernet Board required)

18) **COM Port**: 9600 – 115200bps (COM Board required)

19) **Capable to drive Cap Frames (Cylinder Bed Model)**

20) **Capable to drive borer**

21) **Compatible to Sequin Device (Factory Option)**

22) **Compatible to a Barcode Reader (Option)**

23) **Emergency Stop Switch (Factory Option)**
2. Advantage

1) Easy Operation
   The controller has a microcomputer and is designed for an embroidery machine. More reliable than multipurpose control system. Graphic User Interface with icons makes operating the machine easy.

2) High Speed Drive
   The microcomputer chooses most efficient speed automatically (200-1200 rpm). *
   Max. Speed may vary for each model.

3) Quiet Drive
   AC Servo driven main motor allows powerful and quiet drive. It also allows accurate speed control and stop position.
   AC Servo drives the pantograph at high speeds quietly.

4) Memory Capacity
   The memory capacity is 10 million stitches and in 30 memory locations.

5) Design Information
   Design Information such as total number of stitches, quantity produced, size. Thumbnail of the design can be seen on the screen.

6) Networking
   Optional Ethernet board allows the LAN networking of the machines. Networked machines can share designs and monitored in real-time.

7) USB Port
   Optional USB board allows a direct connection to the PC, receiving designs from a PC.

8) USB Memory Slot
   Read/load designs from the USB Memory. USB Memory hold more designs and stitches than a floppy disk.

9) Rotation, Mirror, Scale of the design
   The controller can rotate the design 90 degrees/in 1 degree steps and can create mirror image of the design. It also can scale the design length/width individually.

10) Automatic Origin Return
    When a design is finished sewing, the pantograph returns to the start position of the design automatically. Allowing repeat work to be efficient.

11) Automatic Appliqué Position
    The pantograph moves out to the programmed position, making it easier to lay the appliqué fabric correctly on the product. Can also be used to replace frames.
12) Other Functions
   a. The controller allows cycle embroidery 1-200 or infinite (Setting : 201)
   b. Automatic design conversion for socks.
   c. Automatic layout for the Matrix embroidery
      Creates a pattern arrangement controlling the number of times a pattern
      will sew horizontally and vertically and amount of space between each.
   d. The colors (Needle No.) in a design can be easily changed and saved.

13) Start position
   The start position of a pattern is saved.

14) Trace
   The area to be sewn is shown on the screen and traced out by the pantograph.

15) Stitch Back Feature
   Repairs stitches using the Stop key, stop the machine using the stop key, hold
   down the stop key till the pantograph reaches the desired position, and then
   let go.
   Press it again to stop the pantograph.

16) Automatic speed control, Jump
   The controller varies the speed of the machine automatically depending on the
   setting and stitch length to have better stitch quality. The controller gives
   automatic Jump Stitches as the stitch length reaches to set value. It also
   creates higher stitch quality.

17) Float
   The pantograph can be moved without sewing to have the designated position to
   start sewing.
   It also can move the pantograph directly to the designated position by typing
   in the stitch count.

18) Error Code
   Errors are displayed on the screen in icon form.

19) Stand-By(Resume)
   The machine can be turned OFF in the middle of a design. The machine resumes in
   the position where embroidery is stopped.
Chapter 3. Before Use

This chapter includes information on the following topics.

1. Automat
2. Turning ON /OFF the Machine
3. Origin Setting
4. Stand-by and Drive State
5. Switching Menu Icon Keys
6. Switching Screens
7. The Information on the Screen
8. The Information on the Extension Screen
9. Messages
10. Message to Start the Machine
11. Color Setting of the Display
1. Automat
1. LCD Display
   Shows machine status, icons, design information
   *Refer to “Contents on the display”

2. Icon key – the A, B, C, D, E-keys
   The operation buttons assigned to functions displayed by icons.

3. Origin LED
   When lit the pantograph is located at the origin.
   Blinks when the Jog Keys are assigned to other functions.

4. Origin Key
   Moves the pantograph to the origin.
   When the pantograph is located at the origin, it moves the pantograph to the
   previous position in stand-by state, the position of the last stitch in
   Drive mode.

5. Jog Keys
   Moves pantograph. Single stroke gives 0.1mm movement. Holding the button moves
   The pantograph in a continuous movement and the speed gradually increases.
   Used to move the cursor for selecting.

6. Page Key
   Switches screen
   *Refer to “Paging Screen”

7. Menu Key
   Switches the Menu Icon Keys
   *Refer to switching the Menu Icon Keys

8. Drive Key
   Places the machine in Drive mode, ready to sew.

9. Start Key
   The machine starts sewing.

10. Stop Key
    The machine stops sewing.

11. Float LED
    Lit when the pantograph is moving through a pattern without sewing.

12. Teach LED
    Lit when locating/changing existing function codes in a pattern.

13. COM (Serial) Por
    This is to connect with RS-232 Cable.
    This can be exchanged to LAN Card or USB Port.

14. PS / 2 Port
    The PS/2 port for optional barcode reader.
    Using barcode can skip some operations.

15. USB Memory Slot
    The USB Memory slot
    Designs are loaded/saved onto the USB Memory. It also loads the system
    Software for the automat.
2. Turning the machine ON/OFF

Turning the machine ON
Press POWER ON Switch.

Turning the machine OFF
Press POWER ON Switch to turn OFF.

3. Origin Set

When the machine is initially turned on the origin must be set.

1) Refer to “Turning ON/OFF the machine, turn ON the machine.
2) The display shows the screen below after showing BARUDAN logo.
   Press the E-Key to move back the pantograph to the origin.

*No operation would be allowed until origin setting finishes.
4. Stand-By and Drive Mode

The machine has two modes: Stand-By, when it is not in a sewing mode but turned on and the Drive mode, ready to begin sewing.
Refer to “Drive” in “Start Sewing”.

1) Stand-By mode: Usually machine is in the stand-by state when it is turned ON. It is the state when sewing preparation takes place. In this state, the design data can be selected and loaded. Typical appearance of the stand-by state

2) Drive Mode: A design is chosen and it is ready to sew. Typical appearance of the drive mode.
5. Menu Keys

5-1. Switching Menus

Menu keys (A - E) correspond to the icon commands directly above them on the LCD. The Menu key moves to the next set of commands. The icons change accordingly, while advancing though the various functions.

Press the menu key, to display the next set of commands (Menu 1 and Menu 2) are displayed as shown below.

Note: If you selected one of the Menu Icon Keys and you want to quit it, pressing the menu key exits the menu.

5-2 Menu Icon Keys

This explains all the Menu Icon Keys as shown below.

1) Speed Key
   Changes the machine speed.

2) Needle Change Key
   Manually changes the needle (Color).

3) Trimming Key
   Manually trims thread.

4) Manual Key
   Shows manual operation menu and parameter setting icon.

5) Memory In Key
   Reads a Pattern in to the machine memory through the COM Connection.
6) Memory Key
Shows designs in the memory and CF card. Outputs the design.
Shows drive mode.

7) Teach Key
Lists the color change codes in the design and allows them to be changed.

8) Float Key
Moves the pantograph through the design with stitch it.

9) Network Key
Reads design data from the server.

6. Switching the Screens
Press the Page Key to change screens.
When NOT in Drive Mode: ⇒ Basic Screen ⇒ Extension Screen 1 ⇒ Basic Screen ⇒
While IN Drive Mode: ⇒ Basic Screen ⇒ Extension Screen 1 ⇒ Extension Screen 2 ⇒
Basic Screen ⇒
Refer to “Screen Information” for screen contents.

1) Basic Screen

2) Extension Screen 1
Design information such as total stitch count, next color change, estimated run time.
3) Extension Screen 2
Press Page Key twice to show the extension page 2. It shows the
design and current needle location as it is sewing, the machine speed,
and the total stitch count.

The Page Key shows the Basic Screen. Going back to the Stand-By mode
automatically switches the screen to the Basic Screen.

7. Screen Information
Basic Screen Information

*The screen shows design information for the currently selected design.

1. The Memory Location of the Design
The number blinks when there is no design in that memory location.
The number would be highlighted when the design is rotated, scaled or mirrored.
2. Design Name.

3. Programmed Rotation. (Can be changed in the Drive Condition Menu)

4. Programmed Repeats set in the Drive Condition.

5. Indicates the correct stop position when it shows “TOP”.

6. Indicates the needle No.
   Shows “NO” when the position of the needle is incorrect.

7. It shows the distance the pantograph moved.
   INC : The distance form the last stitch.
   ABS : The distance from the start position.

8. Shows the speed of the machine when it is running.

9. Shows whether the data has High or Low speed Function.

10. Shows the current stitch count when in the Drive mode.

11. Total stitch count available in memory.

12. Shows the number of stitches backtracked.
    Shows the amount stitches backtracked with thread break detection, Stitch
    Back and Automending.

13. Displays menu icon or error messages.

8. Extension Screen Information

   1) Extension Screen 1 information.
      The Memory location, total number of stitches and the number of repetition
      are shown same as on the basic screen.

*Shows information on the currently selected design.
*In the Stand-By mode, the speed and current stitch count are not shown.
1. Shows the stitch count where the next color change exists and the needle No.

2. Shows estimated run time and max. speed.
   The run time is calculated from the remaining stitches and the sewing speed.
   This is an estimated run time.

3. The progress scale.

4. Stitch Progress

5. Color change marker

6. Total stitch count.

7. Total number of color changes.

8. The remaining number of stitches before the machine will stop to change bobbin.
   The Bobbin Counter feature must be turned on.

9. Thumbnail of the selected design.
   The thumbnail reflects rotation and scale if programmed to the design.

10. Shows the next 3 color changes.

2) Extension screen 2 information

1. 3D thumbnail of the design.
   The rotation, scale, satin stitch, sequin position are shown in the thumbnail.

2. Shows current speed.

3. The current stitch count.
9. Messages

Error messages display during operation display at the bottom of the basic screen. For example, the figure below shows the error message for a thread break.

Clearing the message
Press the E-Key or the Page Key to clear the message. The A to D-Key are not available while a message appears on the screen. First clear the message before execute other functions.

10. Message to Start the Machine

The icon for the Start Switch is shown below. A little above from the center of the screen the icon for the Stop Switch appears. Example: The Start Switch message for a manual trimming.
11. Setting Colors on the Display

11-1. Jog Key operation

The Jog Keys move the cursor through the list.

Choose a column with up / down key.

Left / Right key switch the page

The Jog Key chooses the color on the display.

Move Up / Down the cursor with Up/Down Key

Move Left / Right the cursor

11-2. Changing the Display Color

1) Press the Menu Key to display “Menu 1” as below.

2) Press the D-Key.

MENU 1

3) Press the E-Key.

4) Press the E-Key.
5) Press the A-Key.

6) The Color Set-Up Menu displays.
   Use the Jog Keys to select a color.

7) Choose the item.

8) Press the A-Key.
9) The color chart displays. Use the Jog Keys to select a color.

A-Key to goes back to previous screen.
Press the E-Key to save the change and go back to previous screen.

10) Press the MENU Key to go out from the Color Set-Up Menu.

11) Press the A-Key to Save changes.
11-3. Initializing the Color

Initializing the color display.

1) refer to “Changing the Color in the Display” and find the Color Set-Up Menu.
2) Press and hold the E-Key for 2 short beeps.

```
(A-Key)   (B-Key)   (C-Key)   (D-Key)   (E-Key)
```

3) Press the A-Key to start initialization.

```
COLOR init. ?
```

```
Yes No
```

Press the B-Key to Cancel the initialization.

11-4. Items that can have colors changed

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Default Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Shows all the items in the thumbnail in set color</td>
<td></td>
</tr>
<tr>
<td>No, Name</td>
<td>Memory Location, Design file name, Needle No.</td>
<td></td>
</tr>
<tr>
<td>rpm, st</td>
<td>Speed and Stitch Count</td>
<td></td>
</tr>
<tr>
<td>Icon</td>
<td>Icon</td>
<td></td>
</tr>
<tr>
<td>Back</td>
<td>Background</td>
<td></td>
</tr>
<tr>
<td>(Visual)</td>
<td>The background color of design thumbnail</td>
<td></td>
</tr>
<tr>
<td>(Drive)</td>
<td>The background color for Drive Mode</td>
<td></td>
</tr>
<tr>
<td>(Float)</td>
<td>The background color for Float</td>
<td></td>
</tr>
<tr>
<td>(NET AB)</td>
<td>The background color for Time-Out in the Network System</td>
<td></td>
</tr>
</tbody>
</table>
11—5. Changing Memory Design Color (Color Edit)

List the color for each code.
* Changes the color of the memory design bitmap and visual display.

1) Refer to “Changing the Color in the Display” and go to the color Setup Menu.
2) Press the C-Key.

3) The color list for each code displays. Use the Jog Keys to select the needle color you want to change.

* C01 ~ C15 = Needle Thread Colors

Optional Machine Device Colors:
SQ = Sequin Color
L1 ~ L6 = Chenille Looper Colors
B-L and B-R = Tape or Cording Colors. T = Tape, C = Cord.
(Note: T and C settings can be swapped by pressing and holding the Origin key)

4) Press the D-Key.
5) Change the color. Use the jog key and choose 3 primary colors, “R” ”G” ”B”.

6) Change the value using the A/B-Keys. The color pallet color changes depend on the entered value.

7) Press the D-Key to go back to the previous screen.
8) Press the C-Key to save the new color to the memory.
The bitmap image of the chosen memory design on the memory design control screen will be re-written with the new colors.

11-6. Changing Memory Design Color (Color change)
List the color for each code.
* Changes the color of the memory design bitmap and visual display.
1) Refer to “Changing the color in the display”, use the Jog Key and choose the needle color you want to change.

2) Press the C-Key.

3) Color Setup Screen Appears.
Use the Jog Key and choose the needle color to change.

Press the C-Key to go back to the Color Setup Screen.
4) Press the E-Key.

5) Use the jog key and choose a new color to change to.

Press the A-Key to change the color switching function icon.

6) Press the E-Key

7) Press the C-Key to save the new color pallet to memory. 
*The bitmap display of the chosen design will be rewritten on the Memory Control Screen.
If you do not want to save the new color to the memory, press the *MENU* Key to skip the Color setting screen.

### 11-7. Changing Tape / Cord on Memory Design Display

List the color for each code.

* Changes the color of the memory design bitmap and visual display.

1) Refer to “Screen Display Color Change” and go to the Color Setup Screen.

2) Press the C-Key.

3) Color Setup Screen will appear.
   Use the Jog Key and select “B-L” or B-R”.

4) Press the C-Key to save the change to memory.

* The bitmap image of the chosen memory design on the memory control screen will be changed here.

If you do not want to save the new color to the memory, press the *MENU* Key to skip the Color setting screen.
11—8. Rewriting Bit Map Image of Memory Design

Rewriting the Bitmap image of a Memory design with the same colors as the color list.

<Memory Control Screen>

1) Press the B-Key.

2) Press the D-Key to rewrite the Bitmap image on Memory Control Screen with the same colors as in the Color list.

Press the C-Key and then D-Key together, it rewrites the Bit Map displays for all the memory designs saved in Memory.

Press the B-Key to go back to the previous screen.

Press the Memory Design Control Key and confirm the color on the Memory Control Screen.
11—9. Initializing Function color pallet

Initializing the color in the color list.

1) Refer to “Changing the color in the display” and go to the Color Setup Menu.

2) Press the C-Key.

3) Press and hold the A-Key until it beeps twice.

4) Press the D-Key to start initializing.
Chapter 4. Manual Operations

This chapter contains information on the machines manual operations.

1. Color (Needle) Change
2. Trimmer
3. Thread Clamp
4. Appliqué
5. Frame Change
6. Bobbin Counter
7. Holding The Needle at the Dead Bottom Center
8. Sequin
1. Color (Needle) Change

1-1. Manual Color Change
Changing the color (Needle) manually.
1) Press the Menu Key to display “Menu 1” as below.

2) Press the B-Key

3) Press the A-Key for the needle with smaller No. Press the B-Key to the needle with larger No.

*When the machine is first powered on, the machine must be oriented to the correct Position. After following the steps above, the D14 message displays. Press the Start Key to orient the machine.

1-2. Color Change by Direct Needle.
Selecting a specific needle.
1) Press the Menu Key to display “Menu 1” as below.

2) Press the B-Key.

3) Press the C-Key for the needle with smaller No. Press the D-Key for the needle with larger No.
4) Press the E-Key to change the needle.

*When the machine is first powered on, the machine must be oriented to the correct Position. After following the steps above, the D14 message displays.

Press the Start Key to orient the machine

2. Thread Thrim

2-1. Thread trim operates the trimmer.

Manual trimming for both top and bottom thread.

1) Press the Menu Key to display “Menu 1” as below.

2) Press the C-Key

3) The Start Switch message displays.

Press the Start-Key to execute the trimming.
*The ON/OFF switch on each tension box (Head Switch) can also activate the trimmer. Turn the Head Switch OFF then ON. The green LED on the Tension Box blinks. Push the Start Switch to execute the trimmer. (Press the Start-Key while the Green LED on the Tension Box blinks)

2-2. Bobbin Trimming
Instructions for trimming the bobbin.

1) Press the Menu Key to display “Menu 1” as below.

2) Press the C-Key

3) Press the A-Key to trim the bobbin.

3. Thread Clamp
Instruction for releasing the thread clamp for easy threading.

1) Press the Menu Key to display “Menu 1” as below.

2) Press the D-Key

3) Press the A-Key to Open / Close the Clamp.
4. Appliqué

Appliqué rotates the main motor so that the presser foot can be pressed down manually to accurately position the frame or appliqué fabric.

1) Press the Menu Key to display “Menu 1” as below.

2) Press the D-Key.

3) Press the B-Key.

4) The Start Switch message appears.

5) Push the presser foot down by hand closer to the fabric. *Repeat the operation 1) to 4) to retrieve the needle bar.
5. Frame Change
Frame Change moves the pantograph forward to allow framing or positioning of an appliqué.

1) Press the Menu Key to display “Menu 1” as below.

2) Press the D-Key.

3) Press the C-Key.

4) The Start Switch message appears. Press the Start-Key to move the pantograph to the position pre-set.

5) Press the C-Key to go back to previous screen without moving the pantograph.

6. Bobbin Counter
Bobbin Counter stops the machine when a preset number of stitches is reached. By setting the number of stitches where a particular design normally runs out of bobbin, Bobbin can be replaced, avoiding missed stitches in a production piece. When the machine stops for the bobbin, it shows the message and the green LED on the Tension Box is lit.

Note: Set the counter at 0 to cancel the Bobbin Counter feature.
1) Press the Menu Key to display “Menu 1” as below.

2) Press the D-Key.

3) Press the D-Key.

4) Set the stitch count where the machine should stop. The previous setting appears on the screen.

5) Press the E-Key for 2 short beeps to save the count.

*Press the Page Key for the extension screen to find the estimated bobbin count. Refer to “Switching Screens”.

4–7
7. Holding the Needle at the Dead Bottom Center

This feature is only available for the Roll-to-Roll models.

1) Press the Menu Key to display “Menu 1” as below.

2) Press the D-Key.

3) Press the C-Key.

4) The machine requires a Start Switch.
Press the Start-Key.
The machine stops as the needles penetrates the fabric.

5) Repeat the operation 1) – 3) to return to the standard stop position.
8. Sequin

8-1 Sequin Setting Menu

The function only works with machines equipped with the sequin device.

1) Refer to “MC Parameter” and find MC parameter list.

2) Choose “Sequin Size L” or “Sequin Size R” for the right / left hand sequin device.

3) Press and hold the Origin Key for the 2 short beeps. The Sequin Setting Menu appears.

```
*** MC CHANGE ***

31:U:clmr      -----  
32:th:clmr      -----  
33:frame option 0  
34:Sequin sizel 0  
35:Sequin sizelr 0  
36:Special MC   -----  

default: 0
```

(A-Key)   (B-Key)    (C-Key)    (D-Key)    (E-Key)

Press the C and the A-Key at the same time to retrieve all the sequin head.
Press the C and the B-Key at the same time to feed a sequin on all sequin devices.
*It works while sequin device are at the bottom. (Ready to feed sequins)

4) Press the Manual Key to go out from the Sequin Setting Menu.

8-2. Head Adjustments

1) Refer to “Sequin Setting Menu”, find the menu.

2) Press D-Key to adjustment of the head.

```
(A-Key)   (B-Key)    (C-Key)    (D-Key)    (E-Key)

The ON/OFF switch on the Tension Box(Head Switch) activate the Feeder on the all Sequin Devices for the maintenance.
Head Switch ON  : Feed  
Head Switch OFF : Return
*It works even the Sequin Head is at top or bottom position.

Pushing the Switch to ON/OFF drives the Sequin Head Dwn/Up.
Press the Start-Key : The Sequin Heads Goes Down
Press the Stop-Key : The Sequin Heads Goes Up
*It only works for the sewing head with the Head Switch ON.
```
3) Press the D-Key to go out from the adjustment.

4) Press the MENU Key to return to the Basic Screen.
Chapter 5. Loading Designs

This chapter explains how to load designs to the machines memory.

1. Before Loading Designs
2. ABC Drive
3. Loading from PC
4. Saving to PC (COM)
5. Adding Stitches
1. Before Loading

Operations to be executed before loading a design.
Loading by ABC and COM are not available with the LAN port connection.

1) Selecting the device to load from
   Press the A-Key to choose a device.
   
   ABC → COM → JOG → ABC
   
   The icon above A-Key shows the selected device.
   The selected device is shown in the upper left hand corner of the screen.

2) Choosing a design
   *Same procedure as saving design.
   The list of the designs on the FD or on the machines Memory displays during this operation.
   Use the Jog Keys to select the design.

3) Pause, Cancel
   Same procedure as when saving designs.
   The loading can be paused or canceled.
   a) Press the E-Key during the loading to pause it.

   *Hold the E-Key if it does not pause.
b) Press the D-Key during the pause to cancel the loading. Press the E-Key to restart the loading.

2. ABC Drive

Transfers designs from an outside source to a temporary memory location to sew multiple designs quickly. Great for name dropping and quick jobs from a digitizing or editing system, uses a Memory location, therefore an empty memory location must be available.

ABC Drive will not work when machine is in Drive mode. Refer to “Loading from PC” for the connection.

1) Prepare the device sending the design.

2) Press the Menu Key to display “Menu 2” as below.

3) Press the A-Key

4) Press the A-Key to toggle the Device icon. Choose the ABC icon.

5) Display the designs in memory. Use the Jog keys to select a design. The Memory Slot for ABC Drive is automatically chosen. *1
6) Press the D-Key to set the data transmission speed. *2

![Keypad Image]

(A-Key) (B-Key) (C-Key) (D-Key) (E-Key)

7) Press the E-Key to start the ABC Drive.*3

![Keypad Image]

(A-Key) (B-Key) (C-Key) (D-Key) (E-Key)

8) When the machine receives the ABC Drive Design, it automatically over writes the Memory Slot.
   *Proceed 2) again at first to cancel the ABC Drive.
   Then press the A-Key to delete the ABC Drive Design and exit ABC Drive.

![Keypad Image]

(A-Key) (B-Key) (C-Key) (D-Key) (E-Key)

*1 A blank Memory location will automatically be chosen for ABC Drive.
   If the occupied location is chosen manually, the design in the location will be overwritten.
*2 Refer to “Loading from PC” for the data transmission speed.
*3 While in ABC Drive, the other Memory locations will be inactive.
*4 ABC Drive is only available with U Code (BARUDAN format).
   The design name for the ABC Drive Design will be “ABC_data”.

<ABC>

![Design Name Image]
3. Loading from PC

Designs can be loaded to the machines memory from a PC via the COM port.
The PC needs to have an RS-232C serial port.
The cable should be “Cross” or “Reverse” (null-modem cable).

3-1. Loading Designs from PC (COM)

Designs can be loaded to the machine memory from a PC using the COM port.

1) Prepare the device sending the design.

2) Press the Menu Key to display “Menu 2” as below.

3) Press the A-Key.

4) Press the A-Key to toggle the Device icons. Choose the COM icon.
   Refer to “Before Loading”.

5) Display the designs in memory.
   Using the Jog Keys, select an empty Memory location.
   The automat automatically chooses a blank memory location. *1

   *When an occupied location is selected, the ▼ icon does not display and
   it is not possible to load a design.
6) The B-Key toggles the Tape Code. *2
The D-Key toggles the data transmission speed. *3

<table>
<thead>
<tr>
<th>No.</th>
<th>Speed (bps)</th>
<th>x</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9 600</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1 4400</td>
<td>1.5</td>
</tr>
<tr>
<td>2</td>
<td>1 9200</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>2 8800</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>3 8400</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>5 7600</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>7 6800</td>
<td>8</td>
</tr>
<tr>
<td>7</td>
<td>11 5200</td>
<td>12</td>
</tr>
</tbody>
</table>

7) Press the E-Key to start loading.

8) Check if the device loading the design is ready.

*1 The automat chooses an empty Memory location automatically.
   Delete a design to create an empty location if the Memory is full.
*2 The B-Key toggles the Tape Code as U → F → EL. Other codes are not valid.
*3 The data transmission speed is chosen from the chart below.
The D-Key toggles the No. assigned to the speed.

3-2. Merging a Design (COM)
Merging designs via the COM port.
1) Prepare the device sending the design.
2) Press the Menu Key to display “Menu 2” as below.
3) Press the A-Key.
4) Press the A-Key to toggle the Device icons. Choose the COM icon.
*The icon at the upper left hand corner of the screen should be          

5) Display the designs in Memory. 
   Use the Jog keys to select a design. 

```
    * MEMORY *
     #05
   (A-Key)  (B-Key)  (C-Key)  (D-Key)  (E-Key)

(occupied) Above the C-Key

When an occupied Memory location is chosen, the icon   .

6) Press the C-Key to merge the design. 

    * MEMORY *
     #04
   (A-Key)  (B-Key)  (C-Key)  (D-Key)  (E-Key)

Press the C-Key again to cancel the merge.

7) Press the B-Key to toggle the Tape Code. *1
   Press the D-Key to choose the data transmission speed. *2
8) Press the E-Key to start merging.

9) Check that the device sending the design is ready to transfer.
   *1 Refer to “Loading Design from PC” for the data transmission speed.

4. Saving to PC (COM)

Loading designs from PC is available through the COM port. The PC needs to have RS-232C serial port. The cable should be “Cross” or “Reverse” (null modem). The machines with the LAN port cannot use the COM connection.

1) Prepare the device receiving the design.

2) Press the Menu Key to display “Menu 2” as below.

3) Press the B-Key.

4) Press the E-Key.

5) Press the B-Key.

6) Display the designs in Memory.
   Use the Jog Keys to select the design to be transferred. *1
7) Press the B-Key to choose a Code. *2
Press the D-Key to choose the data transmission speed. *3

8) Check that the device receiving the data is ready.

9) Press the E-Key to start saving to the PC (COM). *4

*1 The controller automatically selects an empty Memory location.
   Delete a design and create an empty location if the memory is full.

*2 The B-Key toggles the Tape Code as U → F → EL. Other codes are not valid.

*3 The data transmission speed is chosen from the chart below.
The D-Key toggles the No. assigned to the speed.

| No. | Speed (bps) | × 1  
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>9 6 0 0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1 4 4 0 0</td>
<td>× 1. 5</td>
</tr>
</tbody>
</table>
| 2   | 1 9 2 0 0   | × 2  
| 3   | 2 8 8 0 0   | × 3  
| 4   | 3 8 4 0 0   | × 4  
| 5   | 5 7 6 0 0   | × 6  
| 6   | 7 6 8 0 0   | × 8  
| 7   | 1 1 5 2 0 0 | × 12 |

*4 Cancelling the operation may take 10 seconds before it actually is canceled.

5. Adding Stitches
The machine must be out of Drive mode in order to add stitches.

5-1. Adding Walk Stitches using the Jog Keys
Walk stitches can be added with the Jog Keys. The Pantograph actually moves as the Jog Keys are operated.

1) Press the Menu Key to display “Menu 2” as below.
2) Press the A-Key.

3) Press the A-Key to toggle the Device icons. Choose the Jog icon.

*The icon at the upper left hand corner of the screen should be *

4) The designs in memory display.
   Choose a Memory location to save the jog movement.

5) Press the E-Key to add the stitches.
6) Press the C-Key to toggle between the Jump and Stitch icons.*1
   *The default setting is Jump.

7) Use the Jog Keys to move the pantograph to the desired location.

8) Press and hold the E-Key until you hear a short beep to write a Jump/Stitch
to the memory. *2

   *1 Choose a Jump or a Stitch to save to the memory.
   *2 The scale, rotation will effect the added stitches.

5-2. Copying Design
Instructions on how to copy a design and merge it to another.
1) Refer to “Adding Stitches” 1) - 5) , find the Jog Menu below.

2) Press the B-Key to merge another design to the selected design.

   The design to be merged must exist in another Memory location.
3) Use the Jog Keys to select the design to be copied. *1

![Diagram showing memory copy operation]

*1 The scale and rotation of the original design effects the copied design. The Jog stitches and the copied design can be added to a design.

4) Press the E-Key to start the Copy. *2

![Diagram showing memory copy operation]

*2 The designs are added in order of the operation.

Press the B-Key to go to the Jog menu.

The scale and rotation of the original design effects the copied design. The Jog stitches and the copied design can be added to a design.

*2 The designs are added in order of the operation.
Chapter 6. USB Memory

This chapter includes instruction on how to use the USB Memory.

1. Before Using USB Memory
2. Files on the USB Memory
3. Creating Folders on the USB Memory
4. Saving to the USB Memory
5. Loading from the USB Memory
6. Memory Back-Up
7. Loading the Back-Up Design
8. Deleting Designs on the USB Memory
9. Deleting Folders on the USB Memory
10. Saving Multiple Designs at a Time
11. Loading Multiple Designs at a Time

Refer to “System” to use the USB Memory as a System Disk.
1. Before Using the USB Memory

1) Functions

USB Memories have a large capacity and send/receive data much faster than Floppy Disks.

USB Memories have the following uses on the embroidery machine.

a. Store design files

Saves/loads design files in FDR format.

Saves/loads design files in Network format (PRJ).*

Stores design files in TFD format.*

Have a bitmap image image data for each design file.
The image can be viewed on PCs.

Back-Up all design files stored on the machine.

b. System software update

The USB Memory updates the system software quickly.

USB Memories can store multiple system softwares.

c. Editing

The design files on the USB Memory can be edited on PC.

PRJ format files also can be edited with LEM Server.

* A PRJ Format consists of a Design File, Program Parameters and a Bitmap Image File.

* The Automat cannot save the TFD format file on USB Memory. Use PC to save the TFD format file on the USB Memory.
2) USB Memory Basics

The USB Memory needs to have folders to store files.

A USB Memory can have folders up to 50.

- Max. 50 Folders
  - FDR Folder
  - FDR Folder
  - PRJ Folder
  - MEM Folder
  - TFD Folder

- Max. 100 Files
  - Design Files
  - Inactive
  - Max. 30 Files
  - Max. 100 Files
2) The USB Memory can handle 5 kinds of the folders.

1. **FDR Folder**
   - Stores FDR format design files
   - A FDR folder can store up to 100 FDR files.

2. **PRJ Folder**
   - Stores Network format (PRJ) files.
   - A PRJ folder can store up to 100 PRJ files.

3. **MEM Folder**
   - Backs up the machines memory.
   - Merging is not allowed.

4. **TFD Folder**
   - Stores TFD format design files
   - Created only on PC.

5. **Files not able to be handled**
   - The Automat cannot handle folders saved into another folder.

*Add extension behind of the folder name when creating folders on a PC.

**Example:**
- “ABC.fdr” for a FDR Folder
- “ABC.prj” for a PRJ Folder
- “ABC.mem” for a MEM Folder
- “ABC.TFD” for a TFD Folder

*Do not edit the “System” folder in the USB Memory.
   It may damage the system software.

3) Basic Operations

**Origin Key**: Switches screens for Design and Folders.

**Jog Keys**: Moves the cursor.
2. USB Memory Screen

The operations to view and edit the folders/designs in the USB.

1) Press the Menu Key to display “Menu 2” as below.

2) Press the B-Key.

3) Press the E-Key.

4) Press the D-Key.

5) The folders in the USB appear on the screen.

*The folders appear in the alphabetic order in each category.
*FDR Folders appear first and PRJ, MEM, TFD follow in order.
6) Press the Origin Key or the E-Key to view the files in the folder.

3. Creating a Folder

Instructions for creating folders on a USB Memory. (FDR, PRJ, MEM Folders)

Refer to “Before Using the USB Memory” for the folder format.

1) Refer to the “USB Memory Screen” and find it.

2) Press the C-Key.
3) Press the D-Key to choose a folder format.

4) Type in the folder name using the Jog keys and the origin key.

Use the Jog keys to select a letter.
Press the Origin Key or the B-Key to enter the letter.
Press the A-Key to delete the last letter.
Press the C-Key to cancel creating a folder and exit.
*A folders name can have 8 letters.

5) Press the E-Key to create the folder.
4. Saving to the USB Memory

Instructions to save the design files to FDR or PRJ folders.
*PRJ folders cannot store files in same name.

1) Refer to the “USB Memory Screen” and find it.

2) Press the A-Key.

3) Use the Jog keys to select the destination folder.

4) Press the B-Key to view the designs in the Folder.
Use the Jog keys to select a design file to save.
Press the A-Key for the previous screen.
Press the B-Key to toggle the USB Memory and Memory screen.
Press the C-Key to view the design property.

5) Press the E-Key to start saving.

*The design appears in alphabetical order.
*Each folder (FDR, PRJ, MEM) stores the design in a different format.
Refer to “Before Using the USB Memory” for the differences between each folder.

5. Loading from the USB Memory
Instructions for loading designs stored in FDR, PRJ, TFD folders on a USB Memory.

5-1. Loading from the USB Memory
1) Refer to the “USB Memory Screen” and find it.

2) Press the A-Key.

3) Use the Jog keys to select a design.
4) Press the B-Key.
   Use the Jog keys to select an empty Memory location. *1

   Press the A-Key for the previous screen.
   Press the B-Key to toggle the USB and Memory screen.
   Press the C-Key to view the design properties.

   *The Enter icon will not display and loading a design will not be possible.

5) Press the E-Key to start loading the design to the memory.

   *1 The controller automatically chooses an empty memory location.
   Delete designs to create an empty Memory location when all Slots are occupied.

5-2. Merging
1) Refer to the “USB Memory Screen” and display it.
2) Press the A-Key.
3) Use the Jog Keys to select a design file.

![Image of design selection]

(A-Key)   (B-Key)    (C-Key)    (D-Key)   (E-Key)

4) Press the B-Key to view the designs in the Memory. Use the jog keys to select a design to merge.

![Image of design viewing]

(A-Key)   (B-Key)    (C-Key)    (D-Key)   (E-Key)

Press the A-Key for the previous screen.
Press the B-Key to toggle the USB and Memory screen.
Press the C-Key to view the design property.
The icon above the D-Key turns into the Merging Icon.

5) Press the D-Key to merge the design.

![Image of design merging]

(A-Key)   (B-Key)    (C-Key)    (D-Key)   (E-Key)

Press the D-Key again for the previous screen.
6) Press the E-Key again to start the Merging.

6. Memory Back-Up

Instructions on how to back up the designs in the Memory. Merging is not allowed. This operation is not allowed in the Stand-By State.

1) Refer to “Creating a Folder” and create a MEM Folder. The icon above the A-Key will be when a MEM folder is chosen.

2) Press the A-Key.
3) Press the D-Key to start the Back-Up.

Press the A-Key or E-Key to cancel the Back-Up and go out from the menu.

7. Loading Design Back-Up

Instructions on how to load the design back-up into the machines memory.

1) Refer to the “USB Memory Menu” and display it.

2) Choose a MEM folder to load.

3) Press the Origin or the E-Key.

4) Press the A-Key.
5) Press the D-Key to start loading the Back-Up Files.

8. Deleting Designs on the USB Memory

Instructions on how to delete files from a USB Memory.

1) Refer to the “USB Memory Menu” and display it.

2) Use the jog keys to select the design to delete.

3) Press the B-Key.

4) Press the D-Key to delete the design.
Press the B or E-Key to cancel the deleting and exit.

9. Deleting a Folder

Instructions on deleting a folder from the USB Memory.
*When the folder is deleted all designs in the folder will be deleted as well.

1) Refer to "USB Memory Menu" and display it.

2) Use the jog keys to select the folder to delete.

3) Press the B-Key.

4) Press the D-Key to delete the folder.

Press the B or E-Key to cancel the deletion and go out from the menu.
10. Saving Multiple Designs at the same Time

1) Refer to “Saving to the USB Memory”, and display the screen.

2) Press the Origin Key to choose a design. A check mark appears.
   Press and hold the Origin Key to check the chosen and all following designs.
   Choose a checked design and press the Origin Key to retrieve it.

3) Press the E-Key to start saving the designs.

11. Loading Multiple Designs at the same Time

1) Refer to “Loading from the USB Memory”.

2) Press the Origin Key to display the folder contents.
   Press and hold the Origin Key to check the chosen and all following designs.
   Choose the checked design with the Jog Keys and press the Origin Key to retrieve it.
3) Press the E-Key to start loading designs.
Chapter 7. Memory

This chapter contains information on the following Memory functions.

1. Switching Designs
2. Design Information
3. Design Thumbnail
4. Production
5. Renaming the Design
6. Color Change Function Code
7. Thread Consumption
8. Deleting the Design
9. USB Memory Direct Drive

The machines memory capacity is 10 million stitches and 30 memory locations.
1. Switching Designs

Select a design from Memory.
The machine must be out of Drive mode.

1) Press the Menu Key to display “Menu 2” as below.

2) Press the B-Key.

3) The screen shows the list of designs in the memory and displays memory location, design name, and stitch count. When a location is empty it is shown with “—”.

4) Use the jog keys to select a design. Press the Origin Key to move the Pantograph to the Start Point of the design. *1

*1 Refer to “The Start Point” to place the pantograph where the design should start.
2. Design Information

Viewing design information.

The Design Information Screen has following contents.

- **Design No.**: The memory location of the design.
- **Stitch Count**: The stitch count of the design.
- **Pass**: Distance between the start and end points, shown as horizontal and vertical values, measured in tenths of millimeters.
- **Size**: Distance between the overall dimensions of the design measured in tenths of millimeters.
- **P1**: Distance from the start point to the bottom left corner of the design, measured in tenths of millimeters.
- **P2**: Distance between the start point and top right corner of the pattern measured in tenths of millimeters.
- **Free St**: Total number of stitches available in memory.

*The unit for the PASS, SIZE, P1 and P2 is 1/10mm.
* The screen shows “--- “ for the blank slot except the Design No.

1) Press the Menu Key to display “Menu 2” as below.

2) Press the B-Key.

3) Press the B-Key.

4) The Design Information Screen displays.

Press the B-Key for the previous screen.

*In the Stand-By mode, the Jog Keys toggle the Design Information Screen for all designs in memory location.
3. Design Thumbnail

Instructions for viewing the design thumbnail.

1) Press the Menu Key to display “Menu 2” as below.

2) Press the B-Key.

3) Press the D-Key.

4) The Thumbnail appears.

   Thumbnail of design, with Program parameters changed.

   Press either A – D Key to go back to the previous screen.

5) Press the E-Key to view the thumbnail of the Original Design.

   When program parameters have NOT been changed, his feature is not available.

   The Thumbnail of the Original Design
Press the either A - D Key to go back to the previous screen.
Press the E-Key for the previous screen.

4. Production
Instructions for displaying Production Statistics for patterns in memory.

1) Refer to the “Design Information” and display the pattern.

2) Press the A-Key.

3) Shows information on each pattern in memory. Tracks how many times each was sewn.
   Total stitches sewn for each pattern, and total number of times all patterns in
   the memory (combined) have been sewn.
   Press the D-Key until a long beep is heard, to reset the Stitch count and piece
   Count for the selected design.
   Press the E-Key until a long beep is heard to reset the Stitch count and
   Piece count for all designs in memory.

5. Re-naming the design
Instructions on renaming designs in memory.
The machine must be out of drive mode in order to rename a design.

1) Refer to the "Design Information" and find it.

2) Press the C-Key.
3) The Rename Screen displays.

![Rename Screen](image)

Use the jog keys to select a letter. Press the Origin Key or the B-Key to enter the letter. *1 Press the A-Key to delete the last letter.

4) Press the E-Key to save the new design name and go out from the menu. *2

6. Changing the Color Codes of a Design

Instruction on changing the color codes of the design using F-List.

1) Refer to the “Design Information” and display it.

2) Press the D-Key.

*1 The design name can contain a maximum of 8 characters. The first letter must be one an alpha character. Saving the design to a floppy disk or USB Memory converts the alpha characters to capital letters. Memory Back-Up does not convert the letters.

*2 Press the MENU Key to cancel the name change and exit the Rename menu.
3) The list of color changes displays. The list displays the total color change functions. Use the jog keys to select a code.

4) Press the A of B-Key to change the code. *The modified code will be highlighted.

7. Thread Consumption
Instructions on simulating thread consumption.
1) Refer to the “Design Information” and find it.
2) Press the E-Key.
3) Simulates thread consumption for each needle.

4) Press the D-Key.

5) The screen for configuring the simulation displays. Use the jog keys to select a column.

*1 2 Methods are available. The first is setting the fabric thickness and percentage of the bobbin thread against the top thread. The second is to change the ratio of the calibration.
<table>
<thead>
<tr>
<th>Item</th>
<th>Function</th>
<th>Range</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness</td>
<td>The thickness of the fabric measured in millimeters.</td>
<td>0.0 – 9.9mm</td>
<td>0.0mm</td>
</tr>
<tr>
<td>B. Thread Rate</td>
<td>The ratio of the bobbin thread against the top thread in satin stitches.</td>
<td>0 – 100%</td>
<td>50%</td>
</tr>
<tr>
<td>Adjusting Value</td>
<td>The calibration ratio of thread consumption.</td>
<td>100 – 200%</td>
<td>100%</td>
</tr>
</tbody>
</table>

8. Deleting a Design

Instructions on deleting a design from memory.
*The machine must be out of Drive mode to delete designs.

1) Press the Menu Key to display “Menu 2” as below.

2) Press the B-Key.

3) Press the E-Key.

4) Press the A-Key.
5) Refer to “Switching Designs” and find the menu. Use the jog keys to select a design.

6) Press the D-Key to delete the design file.

Delete all designs in memory by pressing the D-Key while the C-Key is held.

Press the A or E-Key to cancel deleting and go back to the previous screen.

9. USB Direct Drive
9-1. USB Direct Drive
Designs saved on the USB Memory can be sewn directly from the card.

1) Press the Menu Key to display “Menu 2” as below.

2) Press the B-Key.

3) Press the A-Key.
4) The list of the Folders on the USB Memory displays.

Press the B or C-Key to choose the Memory location for the design.

5) Press the A-Key.

6) The design file is listed in the Folder.
Use the jog keys to select a design to load.
7) Press the Drive Key to place the machine in Drive mode.
The selected file is loaded and the controller goes into Drive mode.

9-2. Searching a Design on the USB Memory
1) Refer to the “USB Direct Drive” and display the menu.

2) Press the D-Key.

3) The Lettering Menu pops up.
Use the Jog keys to select a letter.
Press the Origin Key or the B-Key to enter the letter.
Press the A-Key to delete the last letter.
Enter a Design File Name to be searched.

4) Press the E-Key to start searching.

5) The search result displays.
Use the jog keys to select design to load.

6) Press the Drive Key to place the machine in Drive mode.
The design file is loaded to the Memory and the machine is placed in Drive mode.
Chapter 8. Program Parameters

This chapter includes instructions on applying program parameters to a design.

1. Changing the Program Parameters
2. Setting the Sub-Soft Limits
3. Setting the Matrix Embroidery
4. Program Parameter List
1. Changing the Program Parameters

Program parameters control the appearance of a pattern when it is sewn. Changing Program parameters affects the selected pattern in memory. Changes to the Program parameters can only be made while the machine is in Stand-By state.

While in Drive mode, the Program parameters can only be viewed.
1) Refer to the “Switching Designs” and display the list.
   *The list will not display while in Drive mode.

2) Press the C-Key.

3) The Program List appears.
   Use the Jog keys to select a Program parameter.

* Basic Operations for the Jog keys

Cursor Up

Next Page

Previous Page

Cursor Down
4) Press the A or B-Key to change the value.

(A-Key)  (B-Key)  (C-Key)  (D-Key)  (E-Key)

Press the C-Key for the previous menu.

2. Setting the Sub-Soft Limit

The controller memorizes 3 embroidery areas to limit the movement of the Pantograph. These areas are called Sub-Soft Limits.

Register the Lower Left Corner (P1) and Upper Right Corner (P2) for each area. The pantograph movement would be limited to the rectangular area created by the 2 corners.

*Registering the 2 corners is done by moving the pantograph with the jog keys.
*The area for the Sub-Soft Limit is not larger than the Soft Limit Area in the Machine Condition Parameters (MC).

1) Refer to “Changing the Program Parameters” and display the list.

2) Use the jog keys to move the cursor “Frame type”.

3) Select the value 1 to 3.
   *0 leaves the Sub-Soft Limit inactive.

4) Press the Origin Key to display the screen below.
   *The screen below is for the first limit (Sub-Soft Limit 1).

5) Use the jog keys to move the Pantograph to find the lower left corner of the area.
   *Check if the P1 and V, H are surrounded by a rectangular. (P1 is chosen.)

6) Press the E-Key to register the position as P1.
   The screen automatically selects P2.
   (P2 and V, H are surrounded by a rectangular)
7) Register P2 (Upper Right Corner of the area).
   Move the Pantograph to find the Upper Right corner of the area.

8) Press the E-Key to register the location as P2.

9) Press the B-Key to start tracing the area.

10) Press the A-Key to toggle the setting menu for P1 and P2.

3. Setting up a Matrix
3-1. Setting the Design Size

   The feature automatically repeats the design in the Embroidery Area.
   The layout is calculated from the distance between the center of the pattern
   and the quantity entered.
   * This setting resets the Program setting #06 : Socks and #15 : Repeat.

1) Refer to the “Changing the Program” and find the list.
2) Use the jog keys to move the cursor to parameter #16.
3) Change the value to “1”.
4) Press the Origin Key to find the menu below.
5) Press the D-Key.

<table>
<thead>
<tr>
<th>***</th>
<th>PROGRAM</th>
<th>***</th>
</tr>
</thead>
<tbody>
<tr>
<td>#01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13:</td>
<td>GRP frame</td>
<td>0</td>
</tr>
<tr>
<td>14:</td>
<td>Frame type</td>
<td>0</td>
</tr>
<tr>
<td>15:</td>
<td>Repeat</td>
<td>1</td>
</tr>
<tr>
<td>16:</td>
<td>Matrix</td>
<td></td>
</tr>
<tr>
<td>17:</td>
<td>U repeat</td>
<td>1</td>
</tr>
<tr>
<td>18:</td>
<td>H repeat</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>default:</td>
<td>0</td>
</tr>
</tbody>
</table>

8—4
6) The setting menu displays.

7) Use the jog keys to select a column, press the A or B-Key to change the value.

8) Press the C-Key to redraw the screen for the new setting.

9) Press the D-Key to go back to the Program List.

10) Press the E-Key to change the following parameters automatically according to the new setting.

   MC Parameter #17 : V repeat
   #18 : H repeat
   #19 : V space
   #20 : H space
### 3-2. Automatic Repetition Setting

The feature automatically lays the maximum number of patterns in the embroidery area.

*This setting resets the Program setting #06 : Socks and #15 : Repeat.

1) Refer to the “Changing the Program Parameters” and display the list.

2) Move the cursor to column #16 with the Jog Keys.

3) Change the value to “1”.

4) Press the Origin Key to display the menu below.

5) Press the E-Key.

<table>
<thead>
<tr>
<th>Item</th>
<th>Function</th>
<th>Range</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloth</td>
<td>V: The Pantograph movement to V(X) in mm.</td>
<td>Regarding the Soft Limit</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>H: The Pantograph movement to H(Y) in mm.</td>
<td>Regarding the Soft Limit</td>
<td>100</td>
</tr>
<tr>
<td>Pitch</td>
<td>V: The size of the pattern to V(X) Direction in mm.</td>
<td>Regarding the Soft Limit setting</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>H: The size of the pattern to H(Y) Direction in mm.</td>
<td>Regarding the Soft Limit setting</td>
<td>0</td>
</tr>
<tr>
<td>Repeat</td>
<td>V: The pattern repetition to V(X) direction.</td>
<td>1 - 400</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>H: The pattern repetition to H(Y) Direction.</td>
<td>1 - 400</td>
<td>0</td>
</tr>
</tbody>
</table>
6) The setting menu appears.

7) Use the jog keys to select a column, press the A or B-Key to change the value.

8) Press the C-Key to redraw the screen for the new setting.

9) Press the E-Key to go back to the Program List.

10) Press the D-Key to change the following parameters automatically according to the new setting.

   MC Parameter #17 : V repeat
   #18 : H repeat
   #19 : V space
   #20 : H space
<table>
<thead>
<tr>
<th>Item</th>
<th>Function</th>
<th>Range</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frame</td>
<td>V  The Pantograph movement to V (X) in mm.</td>
<td>Regarding the</td>
<td>Frame</td>
</tr>
<tr>
<td></td>
<td>H  The Pantograph movement to H (Y) in mm.</td>
<td>Soft Limit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Space V  The size of the pattern to V (X) Direction in mm.</td>
<td>-1000 to 1000</td>
<td>Space</td>
</tr>
<tr>
<td></td>
<td>H  The size of the pattern to H (Y) Direction in mm.</td>
<td>-1000 to 1000</td>
<td></td>
</tr>
<tr>
<td>Margin</td>
<td>V  Set the margin along the frame to V(X) direction in mm.</td>
<td>Regarding the</td>
<td>Margin</td>
</tr>
<tr>
<td></td>
<td>H  Set the margin along the frame to H(Y) direction in mm.</td>
<td>Soft Limit</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>setting</td>
<td></td>
</tr>
</tbody>
</table>
## 4. Program List

<table>
<thead>
<tr>
<th>No. &amp; Icon</th>
<th>Item</th>
<th>Function</th>
<th>Range</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>V Scale</td>
<td>Left to Right Scales the pattern.</td>
<td>50 – 200 %</td>
<td>100%</td>
</tr>
<tr>
<td>2</td>
<td>H Scale</td>
<td>Top to Bottom Scales the pattern.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>ROT(Rotation)</td>
<td>Pattern 1 → 0 deg. 2 → 90 deg. 3 → 180deg. 4 → 270deg. Mirror Image</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Angle</td>
<td>Rotation in 1 degree increments.</td>
<td>0 – 89 degree</td>
<td>0 deg</td>
</tr>
<tr>
<td>5</td>
<td>Origin</td>
<td>Automatically returns the pantograph to the pattern origin when sewing is completed.</td>
<td>1 : Active 0 : Inactive</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Socks</td>
<td>Automatically repeats the pattern in a different position.</td>
<td>0 : Inactive 1 : Active</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The gap between the 2 patterns is set with the Jog Keys after the machine is put in Drive mode.</td>
<td>2 : Mirror 3 : Rotation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Creating a mirror image or rotating the original is available.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. &amp; Icon</td>
<td>Item</td>
<td>Function</td>
<td>Range</td>
<td>Default</td>
</tr>
<tr>
<td>-----------</td>
<td>------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>7</td>
<td>Appliqué</td>
<td>When the controller finds the “STOP” code, the Pantograph automatically moves as programmed in the following 2 parameters.</td>
<td>1 : Active 0 : Inactive</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>A. H. Offset</td>
<td>When the “Appliqué” parameter is active (1), the Pantograph comes out (H. Positive) and moves to Right (V. Negative) as much as the value set.</td>
<td>-3000 to 3000mm 0mm</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>A. V. Offset</td>
<td>When A. V. Offset is “0”, the Pantograph does not move to side.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Frame</td>
<td>The Pantograph offset at the end of the design.</td>
<td>1 : Active 0 : Inactive</td>
<td>Omm</td>
</tr>
<tr>
<td>11</td>
<td>F. H. Offset</td>
<td>When the “Frame” parameter is active, the Pantograph comes out (H. Positive) and moves to Right (V. Negative)</td>
<td>-3000 to 3000mm Omm</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>F. V. Offset</td>
<td>Cap frame setting. The setting automatically changes the speed of the machine and rotates the design 180 deg.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>CAP Frame</td>
<td></td>
<td>0 : standard 1-3 : Cap Frame</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>Frame Type</td>
<td>Choosing the Sub-Soft Limit. 0 for not using it.</td>
<td>0 - 3 0</td>
<td></td>
</tr>
<tr>
<td>No. &amp; Icon</td>
<td>Item</td>
<td>Function</td>
<td>Range</td>
<td>Default</td>
</tr>
<tr>
<td>-----------</td>
<td>----------</td>
<td>--------------------------------------------------------------------------</td>
<td>-----------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>15</td>
<td>Repeat</td>
<td>The parameter sets the Repetition of a design.</td>
<td>1 - 201</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>201 for infinite</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Matrix</td>
<td>It activates the automatic layout.</td>
<td>0 : Inactive</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 : Active</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>V(X) Repeat</td>
<td>Sets the repetition of the pattern in the Matrix layout.</td>
<td>Total of repetition (V + H) = 400</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>H(Y) Repeat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>V Space Width Direction</td>
<td>Sets the gap between the pattern.</td>
<td>-1000 to 1000mm</td>
<td>0mm</td>
</tr>
<tr>
<td>20</td>
<td>H Space Depth Direction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Start Dir.</td>
<td>Sewing order.</td>
<td>0 - 7</td>
<td>0</td>
</tr>
</tbody>
</table>

The black rectangle represents the first pattern to be sewn.
<table>
<thead>
<tr>
<th>No. &amp; Icon</th>
<th>Item</th>
<th>Function</th>
<th>Range</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>Swing Type</td>
<td>Sets the direction to scale the stitch length with the “Swing” parameter in the “MC” setting.</td>
<td>0 : V and H</td>
<td>1 : V(X) Only 2 : H(Y) Only</td>
</tr>
</tbody>
</table>

Matrix Sewing Order

Example. 3 patterns in width and 2 patterns in depth

```
Start Dir. 0            Start Dir. 1            Start Dir. 2            Start Dir. 3
1 → 2 → 3 → 4 → 5 → 6   1 → 2 → 3 → 4 → 5 → 6   1 → 2 → 3 → 4 → 5 → 6   1 → 2 → 3 → 4 → 5 → 6
Start Dir. 4            Start Dir. 5            Start Dir. 6            Start Dir. 7
1 → 3 → 5 → 2 → 4 → 6   1 → 3 → 5 → 2 → 4 → 6   1 → 3 → 5 → 2 → 4 → 6   1 → 3 → 5 → 2 → 4 → 6
```
This chapter contains information on sewing patterns in memory

1. Start Point
2. Drive Mode
3. Speed
4. Trace
5. Float
6. High Speed Float (By Stitch Count)
7. High Speed Float (By Color Change Code)
8. Color Change Code (Teaching)
9. Function Codes
10. Stitch Back
11. Automending
12. Stand-By Mode (Resume)
1. Start Point

Instructions for registering the designs Start Point. Each design in memory can have its own start point.

1) Select a design from Memory. Using the Jog keys move the pantograph to the location where the design should start sewing.

2) Press the Drive key to put the machine in Drive mode. The start point is Registered for the design.
   Refer to “Drive Mode” for the details.
   *The design first to be sewn does not have the Start Point.

3) Press the Origin Key to move the Pantograph to the Start Point already registered.
   *In the Stand-By mode, the Pantograph can move to the Start Point of the selected By pressing the Origin Key.
   *The Pantograph moves to the Absolute Origin (machine origin).

2. Drive Mode

Instruction for putting the machine in Drive mode.
The machine can start sewing only in the Drive mode.

1) Move the Pantograph to the Start Point with the Jog Keys,
   Refer to the “Start Point”.

2) Press the Drive Key to put the machine in Drive mode.

3) Press the Start or Stop Switch to start/stop sewing.

4) Press and hold the Drive Key for 3 seconds to exit Drive mode.
   *The machine beeps when the machine is out of Drive mode.

3. Speed

Instructions for changing the sewing speed. The sewing speed can be changed while the machine is sewing.

1) Press the Menu Key to display “MENU 1” as below.

2) Press the A-Key.
3) Speed Menu appears.
Press the A or B-Key to change the speed by 10 rpm step.
Press and hold the C-Key and then press A or B-Key to change the speed by
50 rpm step.

4. Trace
4-1. Trace
*Be sure the Frame Limit parameters in the MC (Machine Condition) are correctly set
before using this feature.

The Pantograph traces a rectangle to see if the
machine is sewing at the right position and right size.
This feature is only available in Drive mode BEFORE sewing begins.
*The rectangle refers to the Programs (Scale, Rotation, Matrix and etc).

1) Press the D-Key.

2) The Trace Screen appears.

The border Line of the area can be sewn
The design to be sewn

The screen shows whether the design fits into the bordered area.
3) The design moves as the Pantograph moves with the Jog Keys.

The Border Line is normally blue. The line turns yellow then red, as the design gets closer to the border line.

4) Press the A-Key to start the Trace.

*If the design does not fit within the border, the machine makes a beep and stops the trace in that direction. Re-position the pattern or resize the design so that it fits within the border.

4-2. Outline Trace

*Be sure the Frame Limit parameters in the MC (Machine Condition) are correctly set before using this feature. The Pantograph traces the outline of the design to see if the machine is sewing at the right position and right size.

This feature is only available in Drive mode and BEFORE sewing begins. *The outline refers to the Programs (Scale, Rotation, Matrix and etc).

1) Press the E-Key to start the Outline trace.

*If the design does not fit within the border, the machine makes a beep and stops the trace in that direction. Re-position the pattern or resize the design so that it fits within the border.
5. Float

Float moves the pantograph through the design without sewing.

1) Press the Menu Key to display “MENU 2” as below.

2) Press the D-Key.

3) The Float Screen appears.

Press the Start Switch for the Float.

※ Exiting Float

a) Press to stop the machine.

b) Press the Menu Key to display MENU 2.

c) Press D key to exit.
6. High Speed Float (By Stitch Count)
Instructions for floating to a specific stitch in a design.
1) Refer to the “Float” and display the Float Screen.

2) Press the A or B-Key to change the stitch count by 1.
(The stitch count on the screen blinks)

Press and hold the C-Key then press the A or B-Key to change the stitch count by 1000.

3) Press the E-Key to move the Pantograph to the position where the stitch count is appointed.

※ Exiting Float
a) Press to stop the machine.
b) Press the Menu Key to display MENU 2.
c) Press D key to exit.

7. High Speed Float (By Color Change)
Instructions for floating through a design by color change.
1) Refer to the “Float” and display the Float Screen.

2) Press the Menu Key to display “MENU 2” as below.

3) Press the C-Key
4) The Color Change Screen appears. Find a color change position to locate the Pantograph. Press the A-Key to find the previous color changes. Press the B-Key to find the following color changes.

5) Press the E-Key, the pantograph moves to the selected color change location.

※ Exiting Float

a) Press to stop the machine.
b) Press the Menu Key to display MENU 2.
c) Press the D-Key
d) Press C key to exit.

8. Color Code Change (Teaching)
Instructions for changing the color codes while running the machine.

1) Press the Menu Key to display “MENU 2” as below.

2) Press the C-Key
3) Press the Start Key.

4) The machine will stop sewing when it reaches the next color code or stop code.

5) The controller shows the current code appointed.

Press the A or B-Key to change the Color Code.
Press the C-Key to convert it into the Stop Code.

6) Press the Start Switch to resume sewing with the new code.

The figure below shows how the Color Code changes.

C06 → C04

※ Exiting Float

a) Press to stop the machine.
b) Press the Menu Key to display MENU 2.
c) Press C key to exit.
9. Function Codes

Instructions for changing Function codes while the machine is sewing.
Use this feature with High Speed Float (By Stitch count) to change the Function code of the desired stitch.
Refer to the “Function Codes” for details about Function codes.

1) Press the Menu Key to display “MENU 2” as below.

2) Press and hold the C-Key until the machine beeps twice.

3) The Function Code Screen appears.
Press the A or B-Key to change the Function Code.

4) Press the E-Key to update the Memory for the new Function Codes.
The figure below shows how the function code changes.
None (Standard stitch) → Jump(JP) stitch

※ Exiting Float
a) Press the Menu Key to display MENU 2.
b) Press C key to exit.
10. Stitch Back

Stitch Back repairs stitches using the Stop key.
1) Stop the machine with the Stop key.

2) Press and hold the Stop-Key to start the Stitch Back. The Pantograph goes back through the design.

3) Hold the Stop-Key, it will stitch back even if the Stop Key is released. Press the Start-Key to stop the Stitch Back. The Pantograph can go further back by holding the Stop Switch again.

4) Press the Start-Key to begin sewing and cover the stitches already sewn with the new stitches.

11. Automending

Automending backs up the machine to repair missed stitches. Press and hold the Automending Switch at the Tension Box while the machine stops.

The Pantograph back track the sewing and the stitch count will follow. The Pantograph stops back tracking, when the Automending Switch is released. The sewing head on the Automending has the red LED on the Tension Box lit. The Start Switch starts the sewing at the point were the machine back up to.

1) Stop the machine with the Stop-Key.

2) Press and hold the Automending Switch at the Tension Box on the sewing head which need to do the cover sewing. Release the Automend switch when the pantograph has reached the desired position.

3) Press the Start-Key to start the sewing.

3) The MC settings work after the Automending.

#12 : Overlap - Overlap stitches after the Automending. Default : 4

#13 : Auto Start - The automatic start after the Automending. Default : Inactive

The Auto Start option makes the machine stop after Automending or not.

When it stops : The machine stops where the Automending ends and makes Stitch Back automatically for the stitch count which the Overlap parameter sets.

When it goes on : The machine would not stop at the end of the Automending and All the heads starts sewing.

*Back track with the Automending and then hold the Stop-Key for the Stitch Back when many stitches need Automending. The Stitch Back back tracks without holding the Stop-Key after 30 stitches.
12. Stand-By (Resume)

Stand-by is when the power to the machine is cut while it is in Drive mode, and the machine is ready to resume sewing at the position it left off at.

1) Turn ON the power of the machine.

2) Press the E-Key to find the machines origin.

3) The Stand-By Screen displays.

   Press the D-Key to continue sewing.
   Press the E-Key to exit Stand By.

   The machine does not continue the sewing and the machine will exit you out of Drive mode.

---

(A-Key)   (B-Key)   (C-Key)   (D-Key)   (E-Key)
Chapter 10. Teaching

This chapter contains the instruction for changing Function codes. This method of T
Each is quicker than chaning codes while the design is sewing.

1. Color Codes

2. All Function Codes
1. Color Codes

Instructions on changing Color Codes using Teach.
The machine must be out of Drive mode.
Refer to the “Function Codes” for the description of the Codes.
1) Press the Menu Key to display “MENU 2” as below.

2) Press the C-Key.

3) The Color Code Screen displays.
Press the E-Key to search the next Color Change Code.

4) Press the A or B-Key to change the Code.

5) Press the E-Key to save the change and search next Code.
The figure below shows how the Code was changed.  \( \rightarrow C07 \)
2. All Function Codes

It is also possible to change all function codes in a design with the Teach function. The machine must be out of Drive mode. Refer to the “Function Codes” for the descriptions of the Codes.

1) Press the Menu Key to display “MENU 2” as below.

2) Press and hold the C-Key

3) The Function Code Screen displays. Press the E-Key to search the next Code.

*The screen automatically closes if a function code is not found.
*It searches only consecutive jumps more than the MC setting of “Trim Jump. The machine automatically trims the thread when consecutive jumps are found that exceed the number programmed in this parameter.

4) Press the A or B - Key to change the Function Code.
5) Press the E-Key to save the change and search the next Function Code. The figure below shows how the Function Code was changed. → COO
Chapter 11. MC (Machine Condition)

This chapter contains information on the machine’s machine conditions.

1. Changing the Machine Conditions (MC)
2. Resetting the Machine Conditions (MC)
3. Description of Machine Condition parameters
1. MC Change
Instructions for changing the Machine Conditions

1) Press the Menu Key to display “MENU 1” as below.

2) Press the D-Key.

3) Press the E-Key.

4) Press the A-Key

5) The MC List appears.
   Use the jog keys to select a parameter.

*** MC CHANGE ***

- Basic Operations

*Cursor UP

Next Page

Previous Page

Cursor Down
6) Press the A or B-Key to change the value.

*The new values are not saved at this time. They are saved when MC is exited.
*The new values would not be valid if the power is cut before saving.

7) Press the Manu Key when all the settings are done.

8) Press the A-Key to save the new value.

Press the B-Key to cancel the change and close the list.
2. **MC Reset**

Instructions on initializing the MC parameters, resetting them back to factory defaults. This operation is only available in the Drive state.

1) Refer to the “MC Change” to find the MC List.

2) Press and hold the E-Key for 2 short beeps.

3) Press the A-Key to initialize the MC Parameters.

Press the B-Key to cancel the initialization.
### 3. MC List

<table>
<thead>
<tr>
<th>No. &amp; Icon</th>
<th>Item</th>
<th>Function</th>
<th>Range</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Borer 1</td>
<td>Enter the number of the needle that has the borer.</td>
<td>0 - Max Needle No.</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Trim Jumps</td>
<td>Controls the number of jump stitches above which the thread trimmer will cut the thread.</td>
<td>0 - 9</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Lock Stitch</td>
<td>Automatic lock stitches after a trim. It converts first stitch into the lock stitch.</td>
<td>1 - 4 &amp; 11 - 14</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Clamp Type</td>
<td>The thread clamp control when start sewing after a trimming.</td>
<td>1 - 3</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Slow up count</td>
<td>Controls the machine speed at the start of sewing to 180 RPM for these specified amount of stitches, then ramps up to the normal sewing speed.</td>
<td>3-15</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Trim Type</td>
<td>0 : Trimmers off</td>
<td>0~3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 : Moves the Pantograph 0.4mm to right before trimming.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 : Reverse the Pantograph then trimming.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 : Pull the thread with the Slider then trimming as 1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 : Same as 1 only the thread behind the fabric is shorter.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. &amp; Icon</td>
<td>Item</td>
<td>Function</td>
<td>Range</td>
<td>Default</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>--------------------------------------------------------------------------</td>
<td>------------------</td>
<td>---------</td>
</tr>
<tr>
<td>7</td>
<td>Trim Dir</td>
<td>Sets the direction the pantograph moves after a thread trim.</td>
<td>0 or 1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 : moves in the H direction towards the machine origin to avoid interference between the frame and machine.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 : moves in the V direction towards machine origin.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Trim Vector</td>
<td>Determines the distance the pantograph moves, in mm, before a trim.</td>
<td>0 - 50</td>
<td>15</td>
</tr>
<tr>
<td>9</td>
<td>Low Speed</td>
<td>Selects the speed at which the Low Speed function will operate.</td>
<td>200 - Max. Speed</td>
<td>450rpm</td>
</tr>
<tr>
<td>10</td>
<td>Jump Divide</td>
<td>Selects the maximum stitch length that the machine sews in a single head revolution. A stitch longer than the programmed value is divided into two stitches.</td>
<td>30 -127</td>
<td>127</td>
</tr>
<tr>
<td>11</td>
<td>Stitch Back</td>
<td>Controls the number of stitches the machine will automatically back up at a thread break.</td>
<td>0 - 7 st</td>
<td>4 st</td>
</tr>
<tr>
<td>12</td>
<td>Overlap</td>
<td>Designates the number of stitches to overlap in automend.</td>
<td>0 - 7 st</td>
<td>4 st</td>
</tr>
<tr>
<td>13</td>
<td>Auto Start</td>
<td>If on, during automend, the machine automatically starts all heads without the operator pressing the Green Start button when the machine has sewn stitches to mend. Use with caution!!</td>
<td>0 - 3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 : Starts after the Automending framing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 : Starts after the Automending framing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 : Starts after the Appliqué framing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 : Starts after the Appliqué framing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. &amp; Icon</td>
<td>Item</td>
<td>Function</td>
<td>Range</td>
<td>Default</td>
</tr>
<tr>
<td>-----------</td>
<td>------</td>
<td>----------</td>
<td>-------</td>
<td>---------</td>
</tr>
<tr>
<td>14</td>
<td>![Swing Icon]</td>
<td><strong>Swing</strong></td>
<td>The distance in tenths of millimeters that is added or subtracted from the length of a stitch.</td>
<td>-15 to 15</td>
</tr>
<tr>
<td>15</td>
<td>![Frame Start Icon]</td>
<td><strong>Frame Start</strong></td>
<td>Determines when the panto starts to move in relation to the needle.</td>
<td>45 - 135</td>
</tr>
<tr>
<td>16</td>
<td>![S. Frame (Spectacle Frame) Icon]</td>
<td><strong>S. Frame (Spectacle Frame)</strong></td>
<td>Sets the machine up for spectacle frame, allowing you to execute pantograph movements exactly as programmed.</td>
<td>0 - 2</td>
</tr>
<tr>
<td>17</td>
<td>![Needle Down Icon]</td>
<td><strong>Needle Down</strong></td>
<td>Determines if the needle is lowered after a thread break, for easier threading.</td>
<td>0 - 1</td>
</tr>
<tr>
<td>18</td>
<td>![Appliqué Icon]</td>
<td><strong>Appliqué</strong></td>
<td>Sets the presser foot height when the Appliqué command is executed.</td>
<td>60 - 120</td>
</tr>
<tr>
<td>19</td>
<td>![T. Break Icon]</td>
<td><strong>T. Break</strong></td>
<td>The machine is designated to stop automatically when the top thread is broken. Normal value is three, meaning the machine requires three consecutive thread break detection’s before stopping.</td>
<td>1 - 9</td>
</tr>
<tr>
<td>20</td>
<td>![O Admit Icon]</td>
<td><strong>O Admit</strong></td>
<td>Determines the number of O data stitches allowed when the pattern is read into memory.</td>
<td>0 - 9</td>
</tr>
<tr>
<td>No. &amp; Icon</td>
<td>Item</td>
<td>Function</td>
<td>Range</td>
<td>Default</td>
</tr>
<tr>
<td>------------</td>
<td>--------------</td>
<td>--------------------------------------------------------------------------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>21</td>
<td>Combine Data</td>
<td>Determines the smallest stitch length allowed when pattern is read into memory. Stitches smaller than the allowed length are combined into larger stitches.</td>
<td>0 – 9</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 : No combination.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 – 9 : Combines the stitch smaller than set length. (0.1mm/unit)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ex. The setting 5 combines the 0.4mm or smaller.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Right Limit</td>
<td>Sets right soft limit - allowable distance panto can move to the right of the mechanical origin.</td>
<td>0 – 3200mm</td>
<td>115mm</td>
</tr>
<tr>
<td>23</td>
<td>Left Limit</td>
<td>Sets the left soft limit - allowable distance panto can move to the front of the mechanical origin.</td>
<td>0 – 3200mm</td>
<td>115mm</td>
</tr>
<tr>
<td>24</td>
<td>Back Limit</td>
<td>Sets back soft limit - allowable distance panto can move to the front of the mechanical origin.</td>
<td>0 – 3200mm</td>
<td>110mm</td>
</tr>
<tr>
<td>25</td>
<td>Front Limit</td>
<td>Sets front soft limit - allowable distance panto can move to the back of the mechanical origin.</td>
<td>0 – 3200mm</td>
<td>110mm</td>
</tr>
<tr>
<td>26</td>
<td>LCD Mode</td>
<td>Sets the background color scheme.</td>
<td>0 – 1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 : Top-Standard, Bottom-Standard</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 : Top-Standard, Bottom-The Icon color</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.&amp; Icon</td>
<td>Item</td>
<td>Function</td>
<td>Range</td>
<td>Default</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>-----------------</td>
<td>---------</td>
</tr>
<tr>
<td>27</td>
<td>LCD Bright</td>
<td>Changes the brightness level of the LCD screen.</td>
<td>1:Dimmest</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2:Normal</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3:Bright</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Roll to Roll</td>
<td>Not Active</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>29</td>
<td>WS System</td>
<td>Not Active</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>30</td>
<td>Clamp Frame</td>
<td>Set the Clamp Frame to use</td>
<td>0 or 1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 : No clamp frame used</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 : Clamp frame used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Warm up speed</td>
<td>Set the machine speed for the warm-up function.</td>
<td>200–1300 rpm</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td></td>
<td>※This function works for the Elite Pro II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Warm up end</td>
<td>Set a load factor of main shaft for the warm-up function.</td>
<td>50–100%</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When the set value is set 100, the warm-up function doesn't work.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>※ This function works for the Elite Pro II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Frame option</td>
<td>Not Active</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>34</td>
<td>Sequin Size L1</td>
<td>Value for sequin</td>
<td>0–50</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(Left hand Device)</td>
<td>SQ:L1・・Device on left side</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>R1・・Device on right side</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>TSQ:L1・・Left side on</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Sequin Size R1</td>
<td>Value for sequin</td>
<td>0–50</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(Right hand device)</td>
<td>R1・・Right side on Left device</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>※Refer to the correspondence table of SQ(V1)/(V2) TSQ(V1)/(V2) for value</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>for sequin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Network type</td>
<td>Not Active</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>No. &amp; Icon</td>
<td>Item</td>
<td>Function</td>
<td>Range</td>
<td>Default</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------</td>
<td>--------------------------------------------------------------------------------------------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>37</td>
<td>Marker type</td>
<td>Laser Marker operation&lt;br&gt;1: Turns ON when the machine is not sewing (default).&lt;br&gt;2: Turns On only in “Drive mode” and not sewing.&lt;br&gt;3: Same as above item 1 + it resets to ON when the machine is powered ON.&lt;br&gt;4: Same as above item 2 + it resets to ON when the machine is powered ON.</td>
<td>1-4</td>
<td>1</td>
</tr>
<tr>
<td>38</td>
<td>Borer2</td>
<td>Enter the number of the needle that has the borer. 0: No borer used</td>
<td>0– Max Needle No.</td>
<td>0</td>
</tr>
<tr>
<td>39</td>
<td>Borer3</td>
<td>Enter the number of the needle that has the borer. 0: No borer used</td>
<td>0 - Max Needle No.</td>
<td>0</td>
</tr>
<tr>
<td>40</td>
<td>Sequin size L2</td>
<td>Value for sequin&lt;br&gt;SQ:L2: Not available&lt;br&gt;R2: Not available&lt;br&gt;TSQ:L2: Left side on Right device&lt;br&gt;R2: Right side on Right device (Origin)&lt;br&gt;※Refer to the correspondence table of SQ(V1)/(V2) TSQ(V1)/(V2) for value for sequin.</td>
<td>0 –50</td>
<td>0</td>
</tr>
<tr>
<td>41</td>
<td>Sequin size R2</td>
<td>SQ Reel detection (On left device)&lt;br&gt;0: Not available&lt;br&gt;1~10: The value is set to the sensitive for detection</td>
<td>0 –50</td>
<td>0</td>
</tr>
<tr>
<td>42</td>
<td>Presser foot</td>
<td>Not Active</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>43</td>
<td>Rotary sequin</td>
<td>Not Active</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>44</td>
<td>TSQ detect L</td>
<td>SQ Reel detection (On left device)&lt;br&gt;0: Not available&lt;br&gt;1~10: The value is set to the sensitive for detection</td>
<td>0–10</td>
<td>0</td>
</tr>
<tr>
<td>45</td>
<td>TSQ detect R</td>
<td></td>
<td>0–10</td>
<td>0</td>
</tr>
<tr>
<td>46</td>
<td>Special MC</td>
<td>Not Active</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Chapter 12. Network

This chapter contains information on utilizing the optional networking system.
*LAN Board are the extension board equipped with an Ethernet Port.

1. Before Using the Network System
2. Registration of the Operator Code
3. Break Call
4. Operator Call
5. Time-Out
6. Downloading Design (Direct Download)
7. Downloading Design (Scheduled Download)
8. Scheduling
9. Information on the Designs Scheduled
10. Automat ID
11. LAN Board Set-Up
12. Initializing the LAN Board
13. LAN Board Parameters
1. Before Using the Network system

This feature is only available for machines with the LAN Board.

1) Introduction

Networking between the Sever (PC) and embroidery machines through LAN connection.
*LAN Board is required for each machine.

Advantages of a Network System
The server can send designs to designated machine.
Operators can download designs from the Server.
The machines can upload designs to the Server.
The Server logs the machine status on a real time basis.
The Network System automatically recovers the connections between the Server and the embroidery machines.

2) Operations

The Network has 2 major functions.
Logging the machine status

Uploading/Downloading the designs

3) File Formats for Networking System

The file downloaded from the Server is converted into the PRJ file. *1

4) Stop/Cancel design file transmission

The Uploading/Downloading can be stopped or canceled during the operation.

a) Press the E-Key to stop the transmission. *2

b) The D-Key cancels the operation while the transmission is stopped.
Press the E-Key to resume the transmission.
5) The following equipment is required to build the Network System.
   BEVT Automat
   Barudan Options
   LAN Board
   Server Software

   The Items to be prepared by Users
   PC with Windows 2000 or XP preinstalled. LAN Port required.
   *Refer to the instruction manual of the Server Software.
   LAN Cable *3
   Hub 4

   *1 A PRJ File contains design data file, Program Parameters and a bitmap image of the design.

   *2 Hold the E-Key if the transmission does not stop.
   The controller cancels the transmission only when it is stopped.

   *3 The LAN cable may vary up to the connection schematic.
   Refer to the following examples.

   *4 The schematic of multiple embroidery machines requires HUB(s).

Ex. 1 : A Server vs an embroidery machine
   *Use the “CROSS” LAN Cable

Ex. 2 : The Server vs multiple embroidery machines
   *Use the “STRAIGHT” LAN Cable
2. Registering the Operator Code
Instructions on registering the operator code with the Automat.

2-1. Reporting the Operator Code
Reporting the current operator to the server.

1) Press the Menu Key to display “MENU 2” as below.
2) Press the E-Key

![Menu Key Image]

3) Press the A-Key.

![Operator Code List Image]

4) The Operator Code List displays.
   Use the jog keys to select the operator code.

![Operator Code List Image]

5) Press the E-Key to report the current operator code to the Server.

Press the A-Key to cancel the report and return to previous screen.
2-2. Registration of the Operator Code

1) Refer to the “Reporting the Operator Code” and find the Operator Code List.

2) Use the jog keys to select an operator code.
   *Select a blank id to register a new code, select an occupied id to edit it.

3) Press the C-Key.

4) The Registration Screen displays.

   * WORKER ID *

   W03

   (A-Key) (B-Key) (C-Key) (D-Key) (E-Key)

   Use the jog keys to select a letter.
   Press the Origin Key or the B-Key to enter the letter. *1
   Press the A-Key to delete the last letter.

5) Press the E-Key to register/finish editing the Operator Code. *2

   (A-Key) (B-Key) (C-Key) (D-Key) (E-Key)

   Press the C-Key to cancel the Registration/Edit of the Code and return to the previous screen.

12–5
*1 An operator code can have a maximum of 8 characters.

*2 Press the Network key to cancel the Registration/Edit.

2–3. Deleting the Operator Code
1) Refer to the “Reporting the Operator Code” and display the Operator Code List.
2) Use the jog keys to select a code.

Press the B-Key to delete the Code.

![Operator Code List]

3) Press the D-Key to confirm and delete.

![Confirmation Screen]

Press the B or E-Key to cancel return to the previous screen.

3. Break Call
Instructions on how an operator reports he is on break and that the machine is not sewing.
*Refer to the the Server Software instruction manual for operation instructions.

1) Press the Network Key.

2) Press the B-Key.
3) The controller reports the break to the Server.

4) Press the B-Key again at the end of the break.

4. Operator Call
Instructions for placing a call to the server.
*Refer to the Server Software instruction manual for operation instructions.
1) Press the Menu Key to display “MENU 2”.

2) Press the E-Key.

3) Press the C-Key to call the Server.

5. Time-Out
Instructions to report that the machine is not in production.
*Refer to the Server Software instruction manual for operation instructions.
1) Press the Menu Key to display “MENU 2” as below.

2) Press the E-Key

3) Press the D-Key to report the Time-Out.
※ The D-Key is highlighted while selected.
Press the D-Key again to notify the end of the Time-Out to the server.

(A-Key)     (B-Key)     (C-Key)     (D-Key)     (E-Key)

6. Downloading Designs (Direct Download)

Designs that are willing to be downloaded need to be at their specific location before downloading.
*Refer to the Server Software instruction manual for operation instructions.

1) Press the Menu Key to display “MENU 2” as below.

2) Press the E-Key

(A-Key)     (B-Key)     (C-Key)     (D-Key)     (E-Key)

3) Press the E-Key.

(A-Key)     (B-Key)     (C-Key)     (D-Key)     (E-Key)

4) Press the A-Key.

(A-Key)     (B-Key)     (C-Key)     (D-Key)     (E-Key)

5) The list of designs in Memory display.
Use the jog keys to select an empty Memory location.

(A-Key)

* MEMORY *

#01: ENHICK 3037st
#02: BAR082A 57096st
#03: BARO00N 5059st
#04: HIKAWARI 9549st
#05: ----------- -----------

Press the A-Key to return to the previous screen.
*Choose an occupied memory location to delete the design file and download another design.

(A-Key)     (B-Key)     (C-Key)     (D-Key)     (E-Key)

12–8
6) Press the E-Key.

7) The Lettering Screen for the design file name displays. Type in the file name of the design to download.

8) Press the E-Key to start downloading.

7. Downloading Designs (Scheduled Download)

Designs need to be appointed to machines before downloading.
*Refer to the Server Software instruction manual for operation instructions.

1) Press the Menu Key to display “MENU 2” as below.

2) Press the E-Key

3) Press the E-Key.
4) Press the A-Key.

5) The list of designs in the Memory displays. Use the jog keys to select an empty Memory location.

6) Press the E-Key to start downloading.

8. Appointed Designs
The Server can appoint designs to machines. The machine downloads the design and sews. This feature helps provide an ideal production schedule.

1) Press the Menu Key to display “MENU 2” as below.

2) Press the E-Key.

3) Press the E-Key.
4) Press the B-Key.

```
(A-Key)   (B-Key)   (C-Key)   (D-Key)   (E-Key)
```

5) The list of appointed designs displays.

```
12... *
SCHEDULE *
TOTAL: 2

NET01: ESNICK 30377
NET02: BARUDAN 5059
NET03: ------- ------
NET04: ------- ------
NET05: ------- ------
```

```
(A-Key)   (B-Key)   (C-Key)   (D-Key)   (E-Key)
```

Press the B-Key to return to the previous screen.

---

9. Information about Appointed Designs

The instruction for viewing design information for the appointed designs.

1) Refer to “Appointed Designs” and display the list of the appointed designs.

2) Press the C-Key.

```
12... *
SCHEDULE *
TOTAL: 2

NET01: ESNICK 30377
NET02: BARUDAN 5059
NET03: ------- ------
NET04: ------- ------
NET05: ------- ------
```

```
(A-Key)   (B-Key)   (C-Key)   (D-Key)   (E-Key)
```
3) The design information for the appointed design displays.

Use the jog keys to switch designs.
Press the C-Key to return to the previous screen.

10. Automat ID

Instructions for registering the Automat ID.
1) Disconnect the LAN cable from the machine and turn ON the machine.
2) Press the Menu Key to display “MENU 2” as below.
3) Press the E-Key

4) The Registration Screen displays.

Use the jog keys to select a letter.
Press the Origin Key or the B-Key to enter the letter.
Press the A-Key to delete the last letter.
5) Press the E-Key to register the Automat ID and close the screen.

11. LAN Board Set-Up

Instructions for setting up the LAN board.

1) Refer to “Automat ID” and find the Registration Screen.

2) Press the C-Key to find the Set-Up Screen.

3) Use the jog keys to scroll through the options.

4) Press the C-Key to display the name screen.
5) Use the jog keys to select a letter.
Press the Origin Key or the B-Key to enter the letter.
Press the A-Key to delete the last letter.
Press the E-Key to move the cursor in the column to right.
*The lettering is available only for IP Address, Subnet Mask and Host Address.

![Net Setup Screen]

6) Press the C-Key to return to the previous screen.

![Arrow Screen]

7) Press the Menu Key again after all the parameters are programmed correctly.

8) Press the A-Key to save the changes.

![Confirmation Screen]

Press the B-Key to cancel the Set-Up and return to the previous screen.
12. Initializing the LAN Board

Instructions to initialize a LAN Board.

1) Displays the Set-Up screen (Refer to 11.LAN Board Set-Up).

2) Press and Hold the E-Key until it starts beeping.

   (A-Key) (B-Key) (C-Key) (D-Key) (E-Key)

3) Press A-Key to start initializing.

   NETWORK init. ?

   Yes No

   (A-Key) (B-Key) (C-Key) (D-Key) (E-Key)

Press B-Key to abort it.

13. The List of the LAN Board Parameters

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Description</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IP Address</td>
<td>The IP Address of the Automat</td>
<td>0. 0. 0. 0</td>
</tr>
<tr>
<td>2</td>
<td>Subnet Mask</td>
<td>Subnet Mask</td>
<td>255. 255. 255. 0</td>
</tr>
<tr>
<td>3</td>
<td>Host Address</td>
<td>The IP Address of the Server</td>
<td>0. 0. 0. 0</td>
</tr>
<tr>
<td>4</td>
<td>Host Port</td>
<td>The Port No. on the Server</td>
<td>0000</td>
</tr>
<tr>
<td>5</td>
<td>COM Speed</td>
<td>Data Transmission Speed</td>
<td>115200</td>
</tr>
</tbody>
</table>

※ The above settings are dependent on the server settings.
Chapter 13. System

This chapter contains the instructions for updating the machines system software.

1. System Software Update with the USB Memory.
2. Initialization of the Memory.
3. Date and Time Setting
1. **System Software Update with the USB Memory**

1) Turn OFF the machine power.

2) Insert the USB Memory with the System Software into the USB Slot on the Controller.

3) Press and hold the Start Key and turn ON the machine power.

4) Release the Key when the indication, “SYSTEM Version #=V.***” displays. Remove the Start Key after this, press and hold the Start Key again for 5 seconds.

5) Use the jog keys to select System Software from the list.

6) Press and hold the E-Key to start updating the System Software.

7) The controller beeps a long beep then restarts if the System Software Update was properly done.

2. **Initialization of the Memory**

Instructions to initialize the machines memory. *Be sure to back up the data before the initialization.

1) Turn OFF the machine.

2) Press and hold the B-Key and turn ON the machine.

3) Release the Key when the initialize message displays.

4) Press the A-Key to start the initialization. Press the C-Key to stop.
4. Date and Time Setting

Instructions for setting up the date and time.

1) Turn OFF the machine.

2) Press and hold the A-Key then turn ON the machine.

3) Release the A-Key after the controller beeps.

   Date/Time Setting Screen appears.

   ![Date/Time Setting Screen](image)

4) Press the A or B-Key to choose the value to change.

   ![A-Key and B-Key](image)

5) Press the D or E-Key to change the value.

   ![D-Key and E-Key](image)

6) Press the Page Key to save the new setting and restart the machine.
Chapter 14. Appendix

This chapter contains the following lists as a reference.

1. Function Codes
2. Error Messages
# 1. Function Codes

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Normal Stitch</td>
</tr>
<tr>
<td>JP</td>
<td>Jump Stitch</td>
</tr>
<tr>
<td>L</td>
<td>Low Speed</td>
</tr>
<tr>
<td>LJ</td>
<td>Low Speed Jump</td>
</tr>
<tr>
<td>H</td>
<td>High Speed</td>
</tr>
<tr>
<td>HJ</td>
<td>High Speed Jump</td>
</tr>
<tr>
<td>T1</td>
<td>Top Thread Trimming</td>
</tr>
<tr>
<td>T2</td>
<td>Bobbin Trimming</td>
</tr>
<tr>
<td>G1</td>
<td>Group 1</td>
</tr>
<tr>
<td>G2</td>
<td>Group 2</td>
</tr>
<tr>
<td>SE</td>
<td>Sub End</td>
</tr>
<tr>
<td>C00</td>
<td>Stop</td>
</tr>
<tr>
<td>C01</td>
<td>Needle Bar 1</td>
</tr>
<tr>
<td>C15</td>
<td>Needle Bar 15</td>
</tr>
<tr>
<td>S0</td>
<td>Sequin OFF</td>
</tr>
<tr>
<td>S1</td>
<td>Sequin ON</td>
</tr>
<tr>
<td>SJ</td>
<td>Sequin Jump</td>
</tr>
</tbody>
</table>

The following Codes are called as The Color Change Codes.

Depends on the Needle No. of the Machine.
## 2. Error Messages

<table>
<thead>
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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A01: [uestion mark]</td>
<td>No Battery.</td>
</tr>
<tr>
<td>A05: [uestion mark] [uestion mark] [uestion mark]</td>
<td>Wrong Code.</td>
</tr>
<tr>
<td>A07: [uestion mark]</td>
<td>IC Memory Error.</td>
</tr>
<tr>
<td>A08: [ull image]</td>
<td>Memory Full (Cancels the loading).</td>
</tr>
<tr>
<td>A11: [uestion mark]</td>
<td>No peripheral device was found. Turn ON the peripheral or check the connection.</td>
</tr>
<tr>
<td>A20: [uestion mark]</td>
<td>The Memory Slot has no design file.</td>
</tr>
<tr>
<td>A21: [uestion mark]</td>
<td>All Memory Slots have no design file.</td>
</tr>
<tr>
<td>A24: [uestion mark]</td>
<td>There is no Color Change Code following.</td>
</tr>
<tr>
<td>A26: [uestion mark]</td>
<td>No blank stroke of the Pantograph for the Socks feature.</td>
</tr>
<tr>
<td>A27: [uestion mark]</td>
<td>There is no Function Code following.</td>
</tr>
<tr>
<td>A28: [uestion mark]</td>
<td>Calculating. Please wait.</td>
</tr>
<tr>
<td>A29: [ull image]</td>
<td>Memory Full. Delete designs.</td>
</tr>
<tr>
<td>A34: [ull image]</td>
<td>Too many color changes. The 401st and following Color Change Codes will be deleted.</td>
</tr>
<tr>
<td>A35: [uestion mark]</td>
<td>Operation prohibited for the Spectacle Frame Setting in the MC Parameter.</td>
</tr>
<tr>
<td>A36: [uestion mark]</td>
<td>The operation is prohibited during Manual operation. “Appliqué” is active.</td>
</tr>
<tr>
<td>A37: [ull image]</td>
<td>USB Memory Full. Delete the designs in the USB Memory.</td>
</tr>
<tr>
<td>A38: [uestion mark]</td>
<td>No USB Memory. Insert the USB Memory.</td>
</tr>
<tr>
<td>A39: [uestion mark]</td>
<td>Loading/Saving Error. Retry/Check the USB Memory.</td>
</tr>
<tr>
<td>Message</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>A40:</td>
<td>Network broken.</td>
</tr>
<tr>
<td>A41:</td>
<td>The false loading of the design information.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>D01:</td>
<td>False Color Change due to the lock error of the Color Change Turret. Manually turn the Turret.</td>
</tr>
<tr>
<td>D03:</td>
<td>The Color Change Turret is not locked. Manually turn the Turret.</td>
</tr>
<tr>
<td>D04:</td>
<td>Needle Bar Positioner Error. Check the Board.</td>
</tr>
<tr>
<td>D05:</td>
<td>Unable to Color Change. Check the Clamp/Jump Solenoid if there is no stuck.</td>
</tr>
<tr>
<td>D06:</td>
<td>Main Motor Trip. Try to restart the machine. Turn OFF the power and check the bind by turning the Main Shaft with hands.</td>
</tr>
<tr>
<td>D07:</td>
<td>Main Motor Overload. Turn OFF the machine and check the bind by turning the Main Shaft with hands.</td>
</tr>
<tr>
<td>D09:</td>
<td>Start/Stop error.</td>
</tr>
<tr>
<td>D11:</td>
<td>Rotary Encoder Error. Check if it is working properly.</td>
</tr>
<tr>
<td>D12:</td>
<td>Slider Error. Move back the Slider to the original position. Check if the trimming is OK?</td>
</tr>
<tr>
<td>D13:</td>
<td>No further Stitch Back/Automending.</td>
</tr>
<tr>
<td>D14:</td>
<td>Push the Start Switch.</td>
</tr>
<tr>
<td>D16:</td>
<td>Bobbin break.</td>
</tr>
<tr>
<td>D19:</td>
<td>Stop for the Stop Code.</td>
</tr>
<tr>
<td>D20:</td>
<td>The end of the Automending.</td>
</tr>
<tr>
<td>D21:</td>
<td>![Image]</td>
</tr>
<tr>
<td>D22:</td>
<td>![Image]</td>
</tr>
<tr>
<td>D23:</td>
<td>![Image]</td>
</tr>
<tr>
<td>D26:</td>
<td>![Image]</td>
</tr>
<tr>
<td>D27:</td>
<td>![Image]</td>
</tr>
<tr>
<td>D28:</td>
<td>![Image]</td>
</tr>
<tr>
<td>D31:</td>
<td>![Image]</td>
</tr>
<tr>
<td>D33:</td>
<td>![Image]</td>
</tr>
<tr>
<td>D34:</td>
<td>![Image]</td>
</tr>
<tr>
<td>D35:</td>
<td>![Image]</td>
</tr>
<tr>
<td>D36:</td>
<td>![Image]</td>
</tr>
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</table>
Embroidery Machine

BEVT series

Mechanical Guide
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Chapter 1 - Machine Basics

Machine Installation

Tools Required for Installation
- Standard flat blade screwdriver
- Bubble level
- Hammer
- Crow bar

Site Preparation
The machine must be located near a grounded electrical outlet. At least 6” of clearance are necessary between the back of the machine and any walls. Also 36” of room are needed in front of the machine for normal working access. The machine should be placed on a sturdy, level work surface.
Electrical Requirements

Necessary for proper operation:

- A dedicated household type outlet
- 110-120 volts AC or 200-240 volts AC (depending on location)
- 600 watts service

If an extension cord is necessary, use a 3-wire appliance-grade cord with a minimum of 14 gauge wire, not longer than 50 feet.

NOTE: If receiving instruction on the machine, we still advise that the machine be unpacked prior to instruction.

CAUTION! Do not put any other appliances on the same line such as refrigerators, washers, dryers, air compressors, etc. The machine should be run on a dedicated line to prevent interference from other equipment and possible damage to circuit boards. Using a line conditioner will further eliminate power surges.

Unpacking and Setup

Inspect for Shipping Damage

Before unpacking the machine, inspect for external shipping damage! If the crate is cracked or damaged in any way, contact the freight carrier immediately! It may be necessary to follow specific procedures to claim the condition of the crate when it was received (i.e., a photograph of the packaging may be necessary). External damage is covered by the freight carrier, so it is important to distinguish between internal and external damage before proceeding. The machine is shipped complete on one skid, covered by one main plywood outer crate. As it is unpacked, inspect for internal damage or missing components. Please call the distributor immediately to report any internal damage before installing.

Unpacking the Machine

1. Remove the nails holding the top of the crate with a hammer.
2. Remove the three (3) 2”x4” braces using the hammer and crow bar.
3. Remove the plastic bag covering the machine.
4. The machine is ready to lift from the crate. To avoid damage to the machine, lift the machine only from sides. Do not lift from the front and back. This machine weighs 300 pounds. Make sure at least two people lift the machine. Lift the machine straight up and out of the crate and place on a sturdy work surface.
5. Remove the box containing the accessories from the crate. Verify that all accessories ordered are included. The box should also contain a tool kit with various spare parts.
**Leveling**

After placing the machine on its work table, make certain it is level. It may be necessary to adjust the leveling feet to prevent the machine from rocking back and forth. Using a bubble level, make sure the machine is as level as possible, checking it from side to side and also front to back.

**Grounding Instructions**

See Important Safety Instructions in the Overview chapter. This product must be grounded. In the event of malfunction or breakdown, grounding provides a path of least resistance for electric current, to reduce the risk of electric shock.

This product is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

**DANGER!** Improper connection of the equipment-grounding conductor can result in a risk of electric shock. The conductor with insulation having an outer surface that is green, with or without yellow stripes, is the equipment-grounding conductor. If repair or replacement of the cord or plug is necessary, do not connect the equipment-grounding conductor to a live terminal.

Check with a qualified electrician if grounding instructions are not completely understood, or if in doubt as to whether the product is properly grounded. Do not modify the plug provided with the product. If it will not fit the outlet, have a proper outlet installed by a qualified electrician.

This product is for use on a nominal 120V circuit, and has a grounding plug that looks like the plug (A) illustrated on the following page. A temporary adapter, which looks like the adapter illustrated in sketches B and C, may be used to connect this plug to a 2-pole receptacle as shown in sketch B if a properly grounded outlet is not available. The temporary adapter should be used only until a properly grounded outlet can be installed by a qualified technician. The green colored rigid ear, lug, and the like, extending from the adapter must be connected to a permanent ground such as a properly grounded outlet box cover.

Whenever the adapter is used, it must be held in place by the metal screw.
Note: If there is doubt as to whether an outlet box is properly grounded, consult a qualified electrician.

Illustration above may not match the type of connectors in your location.
Sewing Head Components

There are several types of Barudan sewing heads. However, basic components are the same for each.

1. **Thread Guide with Felt Pad Cover**
   - Holds thread in place to prevent tangling

2. **Pretensioners**
   - Adjust the top thread tension for each of the needles.

3. **Thread Break Detectors**
   - Detects thread breaks for both the top and bottom thread.

4. **Top Thread Tensioners**
   - Adjust the top thread tension for each of the needles.

5. **Take-Up Spring/Thread Break Detectors**
   - Helps form stitches. Used by machine to detect thread breaks.

6. **Thread Break Switch**
   - Enables/disables thread break detection on each head.

7. **Automend Button**
   - Controls the reversing of the pantograph for repair work or overstitching.

8. **Thread Detection LED**
   - LED shows top thread problem by blinking red, bobbin thread problem by blinking green, and slider error problem by blinking fast red.

9. **Take-Up Lever**
   - Pulls the thread through the fabric after the stitch has been made. Controls the flow of thread during stitch formation.

10. **Presser Foot**
    - Holds down the fabric during sewing.

11. **Thread Holding Spring**
    - Keeps the thread close to the long groove of the needle, keeping the thread straight.
Z9 Sewing Head
Threadin
g the
Sewing
Head

The machine is shipped with each needle pre-threaded. To quickly change the thread, place the new cone on the thread stand, and tie the end to the thread that is threaded through the tension unit with a square knot and gently pull it through the sewing head. Repeat for each needle. To completely rethread a sewing head, follow these steps which correspond to the diagram on the previous page.

Threading the Sewing Head

Refer to the

photograph on the previous page.
1. Place the circular felt pad on the thread stand before placing the new thread cone on the thread stand.

2. Pull the thread from the cone through the back of the eyelet on the thread stand that is directly above the cone.

3. Take the thread through the top eyelet of the first tensioner then to the right of the tensioner between the silver discs and through the bottom eyelet of the tensioner.

4. Take the thread to the right of the second tensioner and let it sit into the cutout between the two silver disks.

5. Take the thread over the white nylon disk from the right, go around 1 time.

6. Pull the thread to the right of the tensioner assembly and wrap it one and one-half times between the silver wheels and over the take-up spring.

   **NOTE:** To ensure proper threading, pull the thread down, and check that the take-up spring bounces up and down with the thread movement.

7. Thread through the top thread guide.

8. Thread through the next guide.

9. Thread through the third guide.

10. Pass the thread to the right of the take up lever, then through the next thread guide from back to front.

11. Thread the eyelet in the take-up lever from right to left.

12. Thread through the next thread guide.

13. Thread through the next thread guide.

14. Thread the small pigtail that circles the needle, immediately below the apron. Either pass the thread through from the top, or pass it through the small opening on the right side of the pigtail.

15. Thread the eye of the needle from front to back then through the large hole in the presser foot.
1-9 Machine Basics

BEVT Series Mechanical Guide
Sewing Head Controls

When using the machine, it may be necessary to understand how and whether thread breaks are detected.

Thread Break Detection

**Top/Bottom Thread Break Switch**

The Thread Break Switch enables both the top and bobbin thread detection. It is located on the front of the sewing head. The thread break switch is on when the switch is in the up position and off in the down position.

**Thread Break Detection**

The Thread Break detection is sensed by the white nylon disks. When the wheel for the needle sewing does not spin the machine stops and indicates a thread break.

Replacing Bobbins

The machine is shipped with bobbins in place, ready to sew. Follow these steps when replacing a bobbin. The bobbins are enclosed in the bobbin cases, which must be removed in order to replace the bobbin.
**Removing the Bobbin Case**

1. Make sure the needle is at the highest position by verifying that the word “TOP” is displayed on the screen. If not, rotate the main motor pulley so the needle is at the correct position.

   **NOTE:** It is necessary to remove the rear cover in order to access the main motor pulley.

2. Pull the bobbin case latch, and the case will slide out of the hook assembly.

**Inserting the Bobbin in the Case**

1. Place the bobbin in the case, so that the bobbin rotates clockwise when you pull the end of the thread.

2. Guide the thread into the slot on the side of the bobbin case.

3. Pull the thread under the tension spring and wrap it through the pigtail on the front of the bobbin case.

4. Leave several inches of thread hanging from the bobbin case.

**Replacing the Bobbin Case**

1. Hold the latch on the bobbin case open, positioning the case on the shaft of the hook assembly, ensuring that the bobbin remains in place.

2. Make sure the thread left hanging is on top.

3. Release the latch and press the bobbin case into position until a distinct “click” is heard. If the click is not heard, remove the bobbin case and try again.

   **CAUTION! Do not attempt to force the bobbin case into the hook assembly. If resistance is felt, remove the bobbin case, realign the case with the hook and reinsert it.**

**Stitch Theory**

To fix problems that may occur during sewing, it is important to understand how stitches are formed. Timing is the relationship between the rotary hook assembly and sewing needle. The hook and the needle must be in perfect synchronization to have properly formed stitches.
Needle Anatomy
The anatomy of the needle is an important factor in forming stitches.

**Eye**
Carries the top thread through the fabric and into the bobbin assembly.

**Scarf**
Small notch, or cutout, on the back of the needle that provides the clearance needed for the hook point to pass without striking the needle during stitch formation.

**Groove**
Small groove, or channel, on the front of the needle that provides the thread a place to sit, protecting it as the needle penetrates the fabric.

How Stitches are Formed
1. The needle starts downward and penetrates the fabric.
2. The needle reaches its lowest point, then begins to rise, forming a loop of thread behind the needle.
3. As the needle rises, the hook point passes behind the scarf, picking up the loop of thread from the back of the needle.
4. As the needle continues to rise, the point of the hook pulls the loop of thread down. This enlarges the loop.
5. The upper thread encircles the bobbin thread, forming a knot.
6. The knot is then drawn into the fabric by the take-up lever. The knot is tightened by the upper and lower tensions. The needle reaches its highest point and begins the downward motion, repeating the entire process.
Important Conditions for Forming Stitches

- The hook must approach the thread loop at the correct moment.
- The hook must pass within a given distance of the needle.
- The needle must be at the correct height.

Tension Adjustments

Tension is the tautness of the thread as stitches are formed. There are two tensions to consider when making adjustments. The top thread, located in the thread stand, is controlled by the top tension; and the bobbin thread, located in the bobbin case, is controlled by the bobbin tension. These tensions determine the quality of the embroidery. Factors such as the type of material you are using, the tightness of the fabric in the hoop, the backing used, the size and style of lettering, and the type of thread being used will all play a part in setting the proper tensions.

The top tension and bobbin tension work together to form stitches, but they are adjusted separately. Tension should be set to allow 33% bobbin thread to show on the reverse side of the embroidery. For example, if the bobbin thread is white and the top thread is blue, the underside view of the stitch will be white in the center, representing one third of the total stitching, and the outside edges will be blue, representing two thirds of the total stitching.
Creating/Running an “I” Test

An excellent way to test the tensions is by using the I test.

1. Using your Lettering/Digitizing software create a row of 40mm I’s, each to be sewn with a different needle. Sew one “I”, change to the next needle, sew another “I”, change to the next needle, and so on until all needle have sewn.

2. Turn the sample over and look at the back of the stitching. Proper tension would show two thirds top thread color and one third bobbin thread.

Well Balanced Tension
The top row of I’s in the illustration above show properly adjusted tension. Slight variations will occur, depending on the fabric, backing, thread type and letter size.

Bobbin Tension Problem
The middle row of I’s in the illustration above show almost no bobbin thread. All the letters have the same problem, so the bobbin tension needs adjustment. Bobbin tension, since it is controlled by one tensioning mechanism, will be consistent from one needle to the next. In this example, the tension should be looser.

Top Tension Problem
The bottom row of I’s in the illustration above show letters that look quite different from one another. Top tension will vary from needle to needle, since each needle tension is controlled by three different tensioning points. Letters #1, #2 and #7 show too much bobbin thread; letters #3, #4 and #9 have hardly any bobbin thread showing; letters #5, #6 and #8 show properly adjusted tension.

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When different problems show up on different letters, the problem is in the top tensions. Letters #1, #2 and #7 need the top tension loosened so the bobbin can pull more of the top thread to the back. Letters #3, #4 and #9 need the top tension tightened because there is too much of the top thread being pulled to the back.

**Adjusting The Top Tension**

There is a pretensioner for each needle. The pretensioners control the flow of thread from the cone to the top tensioners. The pretensioners are set, according to the type of thread used, to allow a smooth flow of thread to the top tensioners. The pretensioners should only need adjustment when changing from a light weight thread to a heavier weight, or vice versa.

**Adjusting the Pretensioners**

1. If the thread does not flow freely, loosen the pressure on the spring that holds the disk down by turning the thumb nut counterclockwise.
2. If the thread flows too freely, increase the pressure on the spring that holds the disk down by turning the thumb nut clockwise.

The top tensioners control the top thread tension. If the top tension is too tight, the bobbin will not be able to pull enough of the top thread to the back of the embroidery. Top tension that is too tight may cause thread breaks, needle breakage, or puckering of the fabric. If the tension is too loose, the bobbin will pull too much of the top thread to the back of the embroidery, causing the thread to loop on either the top side or the back side of the monogram, possibly both. The monogram will look rough, and will not lie smoothly on the fabric. The bobbin tension on the back side of the monogram will look very narrow.
It may be necessary to adjust the top tension to compensate for variances in material or thread. Generally when using a thicker material (e.g., heavy jackets) or thicker thread, the upper tension should be set more loosely.

**Adjusting the Top Tension**

1. The plastic knob on the top tension assembly is marked with a + and - , with an arrow between them. Turn the top tension disk **clockwise**, toward the + sign, to **tighten** the top thread tension.

2. Turn the top tension disk **counterclockwise**, toward the - sign, to **loosen** the top thread tension.

**Checking the Top Tension**

1. Make sure the take-up lever is at the highest position by verifying that the word “TOP” is displayed on the screen. If not, rotate the main motor pulley so the take-up lever is at the correct position.

2. Pull thread slowly, from front to back. Some resistance may be felt, but not so much that the thread feels as if it will break.

**Adjusting the Bobbin Tension**

The bobbin tension is set by adjusting the larger screw on the bottom of the bobbin case. To test the tension, insert a bobbin in the case and slowly pull the end of the thread. The thread should unwind slowly and smoothly out of the bobbin case, yielding a slight resistance. Experience will help you determine the correct degree of tension.

The tension is preset on all new bobbin cases, so readjusting bobbin tension is not often necessary. A poly-core, cotton-wrapped thread is recommended for the bobbin; however, other types will also work.

**CAUTION!** After continued use, an accumulation of lint or thread under the thread tension spring on the bobbin case may hold the spring away from the thread, diminishing the tension. **BEFORE MAKING ANY ADJUSTMENTS TO THE BOBBIN CASE,** check this area for lint or thread. If the built up lint or thread is overlooked, the operator could be adjusting bobbin tension to no avail. Over-tightening the bobbin tension will bend the top of the tension spring and the bobbin case will have to be replaced.

**Adjusting the Bobbin Tension**

1. Turn the screw on the bobbin case **clockwise** to **tighten** bobbin tension.

2. Turn the screw on the bobbin case **counterclockwise** to **loosen** the bobbin tension.
Once the tensions have been adjusted for the type of thread being used, only minor changes will be needed as the fabric, letter size, and alphabet style changes.

**Take-Up Spring Adjustment**

Located behind each upper plastic tension disc is a hook spring called the tension take-up spring. The tension take-up spring picks up the excess slack on the thread while the machine is sewing. This is particularly important when the machine is sewing small letters. The take-up spring may require adjustment for two reasons.

**Fabric Change**

It may be necessary to adjust the tension take-up spring when switching to very thin or very thick fabric. To sew on thinner fabric, lighten the tension on the take-up spring. To sew on thicker fabric, tighten the tension. Follow the steps listed below for adjusting the take-up spring tension.

**False Thread Breaks**

There may be a time when the machine is experiencing constant false thread breaks. The machine keeps stopping, but the thread is not broken. When this occurs, the tension take-up spring is too tight.

**Adjusting the Take-Up Spring**

1. To **loosen** the tension, insert a screwdriver into the post and turn **counterclockwise**, no more than 1/8 of a turn. Sew off a sample to check the tension. Repeat the procedure if necessary.

2. To **tighten** the tension, insert a screwdriver into the post and turn **clockwise**, no more than 1/8 of a turn. Sew off a sample to check the tension. Repeat the procedure, if necessary.

**Sewing Preparation**

Using the proper size hoop when embroidering finished goods ensures the best results. Before hooping, use Float, the H and V values or Perimeter Trace to determine the pattern size and choose a hoop slightly larger than the pattern. It is recommended to leave at least a 1/2” clearance around the pattern. The garment must be hooped straight and tight so the embroidery appears straight. It is best to use a framing board system which holds the hoop stationary so you can use both hands when straightening and smoothing the fabric.
Embroidery Placement Guidelines

The placement of a design on a garment is subject to many variables, such as customer preference, size and style of the garment, size and style of the design and the degree of difficulty in working with the garment. We have assembled some guidelines for placing designs on some popular garments. These measurements are approximate and refer to the center point of the entire design.

**NOTE:** Monograms and names should be placed on the left front unless otherwise specified. For children’s clothing, measurements should be scaled down.

<table>
<thead>
<tr>
<th>EMBROIDERY PLACEMENT GUIDELINES</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASH CLOTHS</td>
</tr>
<tr>
<td>HAND TOWELS</td>
</tr>
<tr>
<td>BATH TOWELS</td>
</tr>
<tr>
<td>SHEETS</td>
</tr>
<tr>
<td>PILLOW CASES</td>
</tr>
<tr>
<td>SHIRT POCKETS</td>
</tr>
<tr>
<td>SHIRT CUFFS</td>
</tr>
<tr>
<td>TIES</td>
</tr>
<tr>
<td>GOLF SWEATERS, SHIRTS</td>
</tr>
<tr>
<td>LADIES SWEATERS</td>
</tr>
<tr>
<td>ROBES, BLOUSES</td>
</tr>
<tr>
<td>SATIN JACKETS</td>
</tr>
<tr>
<td>FUR COATS</td>
</tr>
</tbody>
</table>

The chart below will help convert fractional inches to millimeters.
<table>
<thead>
<tr>
<th>FRACTIONAL INCH</th>
<th>MILLIMETER EQUIVALENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4</td>
<td>6.350</td>
</tr>
<tr>
<td>3/8</td>
<td>9.525</td>
</tr>
<tr>
<td>1/2</td>
<td>12.700</td>
</tr>
<tr>
<td>5/8</td>
<td>15.875</td>
</tr>
<tr>
<td>3/4</td>
<td>19.050</td>
</tr>
<tr>
<td>1</td>
<td>25.400</td>
</tr>
</tbody>
</table>

**Backing**

The use of backing materials and/or toppings will enhance the embroidery. The type of backing needed is determined by the fabric being embroidered. In most cases, backing will be needed to prevent stitches from pulling and distorting the garment. Backing materials give strength to unstable fabrics (knits) and a better appearance on woven fabrics (less puckering and pulling).

Fabrics fit into three general categories

- **Wovens** Non-stretch materials such as satin jackets, towels, denim and canvas.
- **Knits** Stretch materials such as sweaters, sweatshirts, jerseys and T-shirts.
- **Special** Non-woven, non-knit materials such as felt, leather or suede.

Backings are used with all knits and stretch fabrics, as well as with most thin or sheer fabrics.

**Backing Guidelines**

A loose knit fabric can be embroidered, but without selecting proper stitch density and backing, the garment can be stretched and possibly cut. The operator’s concern is to keep fabrics from stretching, puckering, or popping through the stitches during sewing. In general, thinner garments, need more stable backing.

Backings range from very lightweight tearaway to heavyweight cutaway, from iron-on to non-adhesive. All serve different purposes. The most universal backings are medium-weight tearaway or cutaway types.

Too much backing is just as bad as not enough. Use one piece of medium-weight backing or two pieces of lightweight backing as a general rule. Heavier fabrics generally have a tighter weave and will need less backing.

Backing should be cut to completely fit in the hoop, not just as a strip to fit across the center of the hoop. When working with an open weave fabric that should not move or gather, using spray adhesive on the backing will help keep the two together, adding stability.
Tearaway

Tearaway is a non-woven material that provides some of the stability of Softouch, but can be torn away like paper. It is used with non-stretch fabrics. It is hooped in the same manner as Softouch, but it is not strong enough for heavier knits or stretchy materials. Tearaway gives body to thin materials and is well suited for nylon jackets, blouses, sheets, etc. It will help reduce puckering and pulling on these fabrics.

Cutaway

Cutaway backings include a large assortment of fabrics: heavy nonwovens to stiff, woven cotton buckram; crinoline to supple, woven nylon polyester. A cutaway backing is a fuller product and provides more support than tearaway backing. Cutaway backings are generally more expensive but are more popular with experienced operators.

No-Show

Transparent backing used for light colored knit and stretch fabrics.

Water Soluble Topping

Water soluble plastic is used as a topping to prevent stitching from getting lost in knit fabrics, keep terry cloth loops down, and to allow greater clarification of intricate details.

Using Water Soluble Topping

1. Place water soluble topping on top of the fabric and hoop both.
2. After the embroidery process is complete, tear away the water soluble topping.
3. Spritz very lightly with warm water to dissolve water soluble topping.
4. A soft bristle brush may be used to help remove remaining water soluble topping particles. Pass the brush lightly over the top of embroidery to raise up the topping. Embroidery should not be left damp or wet longer than a few minutes.
Needle Types

The type of needle used is determined by the type of fabric being embroidered.

- **Normal Point**
  Normal point needles pierce, or split, the threads of the fabric without cutting them. Using normal point needles results in the cleanest possible stitch.

- **Ball Point**
  Ball point needles deflect and slip between the threads of the fabric. Ball point needles are best suited to fine knits and wovens, which have a tendency to snag or run.

- **Wedge Point**
  Wedge point needles have a cutting edge to penetrate non-woven materials. Wedge point needles are used only for leather and similar materials.

Needle Insertion

When the machine is received, all needles should be in place. However, from time to time, it may be necessary to change a needle.

**Replacing a Needle**

1. Turn off the main power to the machine.
2. Make sure the needle bar is at the highest position by verifying that the word “TOP” is displayed on the screen. If not, rotate the main motor pulley so the needle bar is at the correct position.
3. Loosen the needle clamp screw located at the bottom of the needle bar and remove the needle.
4. Insert the new needle as far up as possible. Make sure the groove on the needle is facing the front of the sewing head. An improperly inserted needle will not only not sew, but can damage the hook assembly.
5. Tighten the needle clamp screw to secure the needle.
# Needles/Backings Chart

The following chart was taken from Stitches magazine. Use it as a quick reference for the material covered in this chapter.

<table>
<thead>
<tr>
<th>FABRIC</th>
<th>NEEDLE SIZE/TYPE</th>
<th>BACKING</th>
<th>TOPPING</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canvas</td>
<td>80/12WP or NP</td>
<td>1T</td>
<td>No</td>
<td>Hoop tightly to keep from slipping in hoop.</td>
</tr>
<tr>
<td>Coated/Waterproof Fabric</td>
<td>80/12 WP, BP, Teflon</td>
<td>1T</td>
<td>No</td>
<td>Heavyweight fabrics may not require backing.</td>
</tr>
<tr>
<td>Corduroy</td>
<td>80/12 WP or NP</td>
<td>1T</td>
<td>Yes</td>
<td>A higher stitch density, as well as topping, may be necessary to prevent stitches from sinking into the wale.</td>
</tr>
<tr>
<td>Cotton Sheet-</td>
<td></td>
<td></td>
<td></td>
<td>High density or very detailed patterns may require more backing.</td>
</tr>
<tr>
<td>Denim</td>
<td>80/12 WP or NP</td>
<td>1T</td>
<td>Optional</td>
<td>Reduce speed if needle begins to heat up or if thread breaks occur.</td>
</tr>
<tr>
<td>Dress Shirt (Woven)</td>
<td>70/10 to 80/12BP</td>
<td>1T</td>
<td>Optional</td>
<td>Topping recommended for highly detailed patterns or pique knits.</td>
</tr>
<tr>
<td>Golf Shirt (Cotton/Poly Knit)</td>
<td>70/10 to 80/12BP</td>
<td>1C</td>
<td>Optional</td>
<td>Topping recommended for highly detailed patterns or pique knits.</td>
</tr>
<tr>
<td>Golf Shirt (100% Cotton)</td>
<td>70/10 to 80/12BP</td>
<td>2C or 3T</td>
<td>Optional</td>
<td>Topping recommended for highly detailed patterns or pique knits.</td>
</tr>
<tr>
<td>Leather</td>
<td>70/10 to 80/12WP</td>
<td>1T</td>
<td>No</td>
<td>Reduce sewing speed. Use the smallest needle possible for the weight of the leather to avoid the formation of large holes that could cause the embroidery to tear out of the garment. Lightweight leathers may require more backing.</td>
</tr>
<tr>
<td>Lingerie or Silk</td>
<td>70/10 BP or NP</td>
<td>2T</td>
<td>Yes</td>
<td>Reduce sewing speed. Use a thinner thread (#50 or #60) and decrease the needle size to 60/8 for very fine fabrics. Because fabric tears easily, increase column width on letters, without increasing the letter size, to avoid close needle penetrations. Use caution when removing excess tearaway and topping.</td>
</tr>
<tr>
<td>Lycra® or Spandex®</td>
<td>70/10 to 80/12BP</td>
<td>1C</td>
<td>Optional</td>
<td>Use round hoop. Stretch the garment to wearing size in hoop so finished embroidery will not be distorted when garment is worn. Explain to customer that though the embroidery may look puckered, it will stretch into shape when the garment is worn.</td>
</tr>
<tr>
<td>FABRIC</td>
<td>NEEDLE SIZE/TYPE</td>
<td>BACKING</td>
<td>TOPPING</td>
<td>COMMENTS</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------</td>
<td>---------</td>
<td>---------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Nylon Windbreaker</td>
<td>70/10 to 80/12BP or NP</td>
<td>None</td>
<td>No</td>
<td>If garment slips in hoop, which can cause registration problems, wrap the hoop with masking or twill tape to provide a rough surface to grip more tightly.</td>
</tr>
<tr>
<td>Satin Jacket</td>
<td>70/10 to 80/12BP or NP</td>
<td>0 or 1</td>
<td>No</td>
<td>If garment slips in hoop, which can cause registration problems, wrap the hoop with masking or twill tape to provide a rough surface to grip more tightly.</td>
</tr>
<tr>
<td>Sweater Knit</td>
<td>70/10 to 80/12BP</td>
<td>1 or 2C</td>
<td>Yes</td>
<td>Tightly woven knits may need just one layer of backing. Wide wale bulky knits may require more topping. Plastic wrap is preferred on bulky knits because it prevents the wales from poking up through the stitching after repeated washings.</td>
</tr>
<tr>
<td>Sweatshirt</td>
<td>70/10 to 80/12BP</td>
<td>1 or 2C</td>
<td>Optional</td>
<td>Highly detailed patterns may require 2 layers of backing.</td>
</tr>
<tr>
<td>Terry cloth</td>
<td>80/12 WP or NP</td>
<td>1T</td>
<td>Yes</td>
<td>Plastic wrap is preferred because it prevents the terry loops from poking up through the stitching after repeated washings.</td>
</tr>
<tr>
<td>Vinyl</td>
<td>80/12NP</td>
<td>1T</td>
<td>No</td>
<td>Reduce sewing speed. Use the smallest needle possible for the weight of the vinyl to avoid forming large holes that could cause the embroidery to tear out of the fabric. To avoid hoop marks, hoop the backing then adhere the vinyl to it with double-sided tape. Lightweight vinyl’s may require more backing.</td>
</tr>
</tbody>
</table>

BP = Ball Point, NP = Normal Point, WP = Wedge Point
Chapter 2 - Machine Care

Cleaning the Machine

It is important to clean the machine before oiling. Keep all areas of the machine clean of built-up lint and dust.

- Both a soft-bristle and a stiff-bristle brush as well as a shop vac should be available for routine cleaning.
- An air compressor is useful for cleaning hard to reach areas.
- A mild spray cleaner can be used on the table top to clean up excess oil that may splatter when the machine is oiled.

A maintenance log, attached to the machine, is recommended. Keep a chart of the daily, weekly, etc. maintenance performed on the machine.

Machine Lubrication

Different parts of the machine require different types of lubricants and different lubrication frequencies. The diagrams and charts on the following pages are a guide for the lubrication schedule necessary to keep the machine running properly.

The machine should always be turned off before it is oiled. Oiling procedures are based on an 8 hour workday.
EBEVT-Z901CA Oiling Diagram
<table>
<thead>
<tr>
<th>PART IDENTIFICATION</th>
<th>LUBRICANT</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotating Hook</td>
<td>A1</td>
<td>Barudan machine oil Clear (mineral) oil for sewing machinery</td>
</tr>
<tr>
<td>Drive Shaft</td>
<td>B1</td>
<td>Barudan machine oil Clear (mineral) oil for sewing machinery</td>
</tr>
<tr>
<td>Hook Shaft Bushings (2)</td>
<td>B2</td>
<td>Barudan machine oil Clear (mineral) oil for sewing machinery</td>
</tr>
<tr>
<td>*Needle Bars/Turret Plate Oil Pad</td>
<td>B3</td>
<td>Barudan machine oil Clear (mineral) oil for sewing machinery *Wipe lightly with cotton swab saturated in oil.</td>
</tr>
<tr>
<td>Needle Bar Crank Rod</td>
<td>C1</td>
<td>Bearing oil</td>
</tr>
<tr>
<td>Take-Up Drive Lever</td>
<td>C2</td>
<td></td>
</tr>
<tr>
<td>Needle Bar Drive Lever (2)</td>
<td>C3</td>
<td></td>
</tr>
<tr>
<td>Needle Bar Drive Links (3)</td>
<td>C4</td>
<td></td>
</tr>
<tr>
<td>Needle Bar Driving Block</td>
<td>C5</td>
<td>Bearing oil</td>
</tr>
<tr>
<td>Take-Up Lever</td>
<td>E1</td>
<td>Lithium grease spray</td>
</tr>
<tr>
<td>Take-Up Lever Cam Groove</td>
<td>E2</td>
<td></td>
</tr>
<tr>
<td>Presser Foot Cam (2)</td>
<td>E3</td>
<td></td>
</tr>
<tr>
<td>Guide Plate</td>
<td>E4</td>
<td></td>
</tr>
<tr>
<td>Lower Connecting Gear</td>
<td>F1</td>
<td>Wheel bearing grease</td>
</tr>
</tbody>
</table>
BEVT-Z1501CB Oiling Diagram
# BEVT-Z1501CB Oil Chart

<table>
<thead>
<tr>
<th>PART IDENTIFICATION</th>
<th>LUBRICANT</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotating Hook A1</td>
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<td>Every 4 to 6 hours</td>
</tr>
<tr>
<td>Drive Shaft B1</td>
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<td>Once a week</td>
</tr>
<tr>
<td>Hook Shaft Bushings (3) B2</td>
<td>Barudan machine oil Clear (mineral) oil for sewing machinery</td>
<td>Once a month</td>
</tr>
<tr>
<td>Needle Bars/Turret Plate Oil Pad B3</td>
<td>Barudan machine oil Clear (mineral) oil for sewing machinery *Wipe lightly with cotton swab saturated in oil.</td>
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</tr>
<tr>
<td>Needle Bar Crank Rod C1</td>
<td>Bearing oil</td>
<td>Once a week</td>
</tr>
<tr>
<td>Take-Up Drive Lever C2</td>
<td></td>
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</tr>
<tr>
<td>Needle Bar Drive Lever (2) C3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Needle Bar Drive Links (3) C4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Needle Bar Driving Block C5</td>
<td>Bearing oil</td>
<td>Once a month</td>
</tr>
<tr>
<td>Take-Up Lever E1</td>
<td>Lithium grease spray</td>
<td>Every 6 months</td>
</tr>
<tr>
<td>Take-Up Lever Cam Groove E2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presser Foot Cam (2) E3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guide Plate E4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Connecting Gear F1</td>
<td>Wheel bearing grease</td>
<td>Every 6 months</td>
</tr>
</tbody>
</table>
BEVT-Z1501C Oiliping Diagram

2-6 Machine Care

Barudan

BEVT Series Mechanical Guide
<table>
<thead>
<tr>
<th>PART IDENTIFICATION</th>
<th>LUBRICANT</th>
<th>FREQUENCY</th>
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<td>Presser Foot Cam (2) E3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H/V Linear Bearing Rails E4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pantograph Guide Shaft (not pictured) E6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Connecting Gear F1</td>
<td>Wheel bearing grease</td>
<td>Every 3 months</td>
</tr>
</tbody>
</table>
**Bobbin Case Maintenance**

In a normal production setting, the bobbin case should be cleaned/checked every 4 to 6 hours. Brush lint and dust out of the bobbin case. Failure to keep the bobbin case clean can cause tension problems. If tension is adjusted without first removing dust and lint, the tension spring on the bobbin case can be bent too far and the bobbin case will need to be replaced.

**Cleaning the Bobbin Case**

1. When the bobbin case is removed for cleaning, check the lever for wear.
2. Brush lint and dust out of the bobbin case with a small, soft-bristle brush.
3. Replace the bobbin in the bobbin case and test the tension.

**Hook Assembly Maintenance**

The hook assembly should be cleaned every 4 to 6 hours when the machine is used in a normal production setting. The hook assembly should be oiled every 4 to 6 hours.

**Cleaning the Hook Assembly**

1. Remove the bobbin case from the hook assembly.
2. Brush any lint or dust from the hook assembly with a small stiff-bristle brush. If you can’t remove all the lint/dust with a brush, use compressed air to blow the hook assembly clean.

It is best to oil at the end of the day, when the machine will be idle, so excess oil can drip off the assembly.

**Oiling the Hook Assembly**

1. With all lint and dust removed from the hook assembly, place one small drop of clear sewing machine oil in the raceway. A hypodermic oiler works best because it offers greater control over how much oil is dispensed.
2. Sew off the machine on practice cloth to prevent oil stains on production goods.
## Chapter 3 - Troubleshooting

### Quick Fixes

There are a number of problems that may occur while sewing that can be simply remedied.

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine Won’t Power Up</td>
<td>Machine was stopped using the EMERGENCY STOP switch, or the machine has blown a fuse.</td>
<td>Turn the EMERGENCY STOP switch clockwise and release. Then, try powering machine on again. Check fuse.</td>
</tr>
<tr>
<td>Fabric Puckering</td>
<td>Garment hooped too loosely</td>
<td>Rehoop the garment, making sure it is taut.</td>
</tr>
<tr>
<td></td>
<td>No backing</td>
<td>Backing helps stabilize most fabrics - use the appropriate backing for the application.</td>
</tr>
<tr>
<td></td>
<td>Improper use of backing</td>
<td>Backing should be hooped along with the garment. If more stability is needed, backing or topping should be bonded to the garment.</td>
</tr>
<tr>
<td></td>
<td>Improper tension</td>
<td>Adjust the tensions so that only one third bobbin thread shows on the underside of the embroidery.</td>
</tr>
<tr>
<td>Machine Stops, Thread Not Broken</td>
<td>Sewing head is turned off, but thread break indicator switch is on</td>
<td>When heads are not in use, make sure the thread break indicator switch is off.</td>
</tr>
<tr>
<td></td>
<td>Improper threading</td>
<td>Make sure thread path is completely threaded.</td>
</tr>
<tr>
<td></td>
<td>Faulty take-up spring</td>
<td>Make sure the take-up spring is bouncing freely. If the problem continues, replace it.</td>
</tr>
<tr>
<td></td>
<td>Faulty ON/OFF switch</td>
<td>Call a technician.</td>
</tr>
<tr>
<td></td>
<td>Faulty PCB Board (Thread Break Indicator Board)</td>
<td>Call a technician.</td>
</tr>
<tr>
<td>PROBLEM</td>
<td>CAUSE</td>
<td>SOLUTION</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Needle Breaks</td>
<td>NOTE: Whenever you break a needle, make sure you find all parts of it before you continue sewing. A needle point that gets lodged in the hook assembly of the machine can cause the machine to bind up and stop running, possibly causing serious damage. Also check for burrs on the hook if parts of the needle are found under the throat plate.</td>
<td>Make sure the needle is inserted all the way into the needle bar shaft and the long groove is in the front. Make sure the needle clamp screw is tight.</td>
</tr>
<tr>
<td></td>
<td>Needle inserted improperly</td>
<td>Flow of thread is obstructed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the thread tension by pulling the thread through the eye of the needle. If it is excessively tight, check all threading points to make sure thread is not caught anywhere.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hook needs to be re-timed.</td>
</tr>
<tr>
<td></td>
<td>Needle too close to hook</td>
<td>Make sure hoop is big enough for work being done.</td>
</tr>
<tr>
<td></td>
<td>Needle hits hoop</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Needle is bent</td>
<td>Replace needle.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stitches Are Not Being Formed</td>
<td>Bobbin is empty</td>
<td>Replace with full bobbin.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not enough bobbin thread pulled out of bobbin case</td>
<td>There should be at least three (3) inches of thread hanging from the bobbin case when it is replaced.</td>
</tr>
<tr>
<td></td>
<td>Needle inserted improperly</td>
<td>Make sure the needle is inserted all the way into the needle bar shaft and the long groove is in front. Make sure the needle clamp screw is tight.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Timing is off</td>
<td>Re-time the hook.</td>
</tr>
<tr>
<td></td>
<td>Broken hook point</td>
<td>Replace the entire hook assembly.</td>
</tr>
<tr>
<td></td>
<td>Thread is not threaded through the take-up lever.</td>
<td>Check all threading points to make sure none have been missed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thread “Birdnests” Under Throat Plate Area</td>
<td>Improper threading</td>
<td>Check all threading points to make sure none have been missed.</td>
</tr>
<tr>
<td></td>
<td>Hooped too loosely</td>
<td>Fabric must be hooped securely, with proper backing.</td>
</tr>
<tr>
<td></td>
<td>Lack of lubrication in hook assembly. Even if the machine is oiled every day, this can happen when the machine is run long and hard.</td>
<td>Place one drop of oil in hook assembly oiling point.</td>
</tr>
<tr>
<td></td>
<td>Using a fill stitch on very small areas</td>
<td>Change to a satin stitch.</td>
</tr>
<tr>
<td></td>
<td>Tension problems</td>
<td>Adjust the tension. Remove the bobbin case and check the tension.</td>
</tr>
<tr>
<td></td>
<td>Faulty take-up spring</td>
<td>Replace the take-up spring.</td>
</tr>
<tr>
<td></td>
<td>Dull needle</td>
<td>Replace the needle.</td>
</tr>
<tr>
<td></td>
<td>Needle is too large, making hole in fabric</td>
<td>Change to a smaller needle.</td>
</tr>
<tr>
<td>PROBLEM</td>
<td>CAUSE</td>
<td>SOLUTION</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Thread Breaks</td>
<td>Flow of top thread is obstructed</td>
<td>Check the top tension, if it is too tight, see if the thread is caught on the tension disks, thread rack or thread spindle and make sure it is not looped around the take-up spring.</td>
</tr>
<tr>
<td></td>
<td>Machine running too fast for the particular application</td>
<td>Reduce speed.</td>
</tr>
<tr>
<td></td>
<td>Burr on bobbin case</td>
<td>Buff burr with emery and crocus cloth (available at hardware stores) or replace bobbin case.</td>
</tr>
<tr>
<td></td>
<td>Burr or excessive wear on hook</td>
<td>Hooks are not always repairable and buffing the hook may alter the timing. Replace the entire hook assembly.</td>
</tr>
<tr>
<td></td>
<td>Scratches, needle marks or burrs on throat plate top, hole, and underside</td>
<td>Polish flat surfaces with fine emery, then crocus cloth. Polish hole with emery or crocus cord.</td>
</tr>
<tr>
<td></td>
<td>Burr on front edge of hook</td>
<td>Polish with emery or crocus cloth. Clean after polishing and re-oil it.</td>
</tr>
<tr>
<td>Undetected Thread Breaks</td>
<td>Sensors are not detecting thread breaks.</td>
<td>Check if contacts are dirty. Or, the machine may be set for a boring device in MC Parameter 1. Check to make sure that the Borer parameter is at Ø.</td>
</tr>
<tr>
<td>Thread Break Is Frayed</td>
<td>Burr on eye of needle</td>
<td>Replace the needle.</td>
</tr>
<tr>
<td></td>
<td>Eye of needle becomes worn (especially when using metallic thread)</td>
<td>Replace the needle. Try an oversized needle with metallic thread.</td>
</tr>
<tr>
<td></td>
<td>Ceramic eyelet’s or ivory thread guides are worn or burred (especially when using metallic thread)</td>
<td>Polish lightly with crocus cord or replace if badly worn. For a temporary solution, apply clear nail polish over the worn spot.</td>
</tr>
<tr>
<td></td>
<td>Eye of needle too small</td>
<td>Change to a larger needle. When sewing with 40 weight rayon thread, it is recommended you use a 11/75 or 10/70 size needle.</td>
</tr>
<tr>
<td>Thread Frays and Breaks</td>
<td>Weak spot or knots in thread (this will show up as either a fray or a clean break)</td>
<td>This will show up as an infrequent break, if so, replace the thread.</td>
</tr>
<tr>
<td>Thread Looping</td>
<td>The take-up spring adjustment is incorrect.</td>
<td>Increase the take-up spring tension slightly to eliminate looping on the top of embroidery.</td>
</tr>
</tbody>
</table>
Take-Up Spring Replacement

After many adjustments, the take-up spring may begin to show wear. Adjusting the take-up spring may not correct tension problems. In this case, the take-up spring will have to be replaced.

Replacing the Take-Up Spring

1. Remove the outer tension knob, turning it counterclockwise until it comes off the tension assembly.
2. Remove the tension spring washer from the tension assembly post.
3. Remove the inner tension knob, including the spring that rests inside it.
4. Remove the first thread disc (with white felt discs), then the green felt disc.
5. Remove the white plastic plate (flat). You may need to push on it from behind with the blade of a flat screwdriver. Notice the position of the take-up spring in reference to the assembly port. There is a groove in back where the spring locks in place.
6. Remove the worn take-up spring.
7. Insert the new spring, placing it in the same position as the old one. Make sure the new spring rests against the brass post.
8. Replace the white plastic disc with the flat side facing you. Make sure it is firmly seated on top of the brass post (it will partially cover the post) so the take-up spring cannot go around the post. The white plastic disc traps the spring in place.
9. Replace the green felt disc.
10. Replace the thread disc with the white felt discs.
11. Replace the inner tension knob with the spring and washer resting inside it.
12. Replace the outer tension knob, turning it clockwise until it is secure, but not too tight, on the tension assembly.
13. Adjust the new take-up spring as described earlier in manual.
Hook Timing

Hook timing is probably the most misunderstood aspect of embroidery machine mechanics. It has nothing to do with the type of fabric or thread tension. Hook timing is the proper position of the hook assembly in relation to the needle in order to form a stitch. The hook is directly attached to the drive shaft, eliminating the need to routinely re-time it. Re-timing of the hook only becomes necessary due to external factors.

- Something gets caught in the hook assembly.
- The size of the needle is changed by more than one size.
- An accumulation of thread behind the hook pushes the hook out of line.

The most common indication that the hook timing needs adjustment is when the machine fails to form and complete a stitch.

Checking the Hook Timing

1. Leave the needle and bobbin threaded and remove the throat plate.
2. Set the machine to Needle #9.
3. Remove Back Center Cover.
4. Rotate main pulley to where the indicator points to 24 degrees. The point of the hook should be directly behind the needle. If not, the hook needs to be adjusted accordingly.
5. Check the hook-to-needle clearance. There should be approximately one half to one thread-width clearance between the hook point and the back of the needle. Improper adjustment would cause the hook point to miss the small loop and create a skipped stitch.
6. Replace the throat plate.
**Adjusting the Hook Timing**

1. Clean any thread debris or lint from the hook area with compressed air.

2. Loosen the three screws at the rear of the hook. This will permit advancing or retarding the hook.

3. Remove Back Center Cover.

4. Rotate main motor pulley to where the indicator points to 24 degrees. The point of the hook should be directly behind the needle. If not, the hook needs to be adjusted accordingly.

5. Check the hook-to-needle clearance. There should be approximately one half to one thread-width clearance between the hook point and the back of the needle. Improper adjustment would cause the hook point to miss the small loop and create a skipped stitch.

6. When the correct position has been attained, tighten the three screws on the hook.

7. Replace the throat plate.

8. Using a lettering or a digitizing system, create an **H O X** test as follows:
   - Using a block alphabet, program “H O X” in capital letters, 20mm high, into the machine. These letters are used because they encompass all the various directions of the pantograph.
   - Sew the letters.
   - Check for any irregularities in the sewing. If the machine is not properly timed, it will result in skipped stitches.

**Position Finger Adjustment**

The adjustable position finger is mounted in front of the hook assembly to secure the hook basket in place and balance the bobbin thread down the center of the embroidery. The position finger is adjustable in two directions, left to right, and front to back. Adjustment of the position finger is required if the bobbin thread is running left or right of center, or if the position finger was removed during the replacement of the hook assembly.

Sometimes the finger moves out of adjustment. When correct, the position finger nose, the protruding part, lines up centered with the hook assembly shaft.
Adjusting the Position Finger

1. Remove the throat plate.
2. Rotate the hand wheel until the needle reaches the lowest position, the bottom of its stroke.
3. Loosen the screw slightly, taking care to use the correct size screwdriver since the screw is very flat and easily stripped.
4. Carefully move the position finger, centering the nose to the needle. To make sure that the needle is being looked at the needle straight on, use the lubrication hole, behind the throat plate, as a reference. Visually line up the needle with this hole, then adjust the position finger.
   It is very critical that there is a gap between the nose and hook assembly. This gap should be approximately .5-.75mm to allow the bobbin and top thread to pass through this gap. Too small a gap will cause bird nesting and thread breaks.
5. Carefully re-tighten the screw.

Checking Needle Depth Manually

1. Make sure the sewing head is at Needle #1.
2. Power down the machine.
3. Open the bobbin case.
4. Remove the back center cover to gain access to the main pulley degree wheel.
5. Rotate the main pulley to where the needle is at it’s lowest point. The indicator on the pulley should be at 0 degrees.
6. Check that ½ of the eye of the needle can be seen below the hook basket. See illustration below.

Note: If necessary use a small flashlight to view the needle eye.

If the eye of the needle is out of adjustment, adjust the needle depth, see Needle Depth Adjustment.

Checking Needle Depth and Hook Timing with (optional) Gauge

The following instructions require Optional Needle Depth Gauge Part #HB220040. Hook timing and needle depth can be checked at the same time using the Needle Depth Gauge.

1. Make sure the sewing head is at Needle #1.
2. Power down the machine.
3. Remove the throat plate, if checking hook timing.
4. Remove the bobbin case.
5. Remove the back center cover to gain access to the main pulley degree wheel.
6. Rotate the main pulley so that the indicator point to 24 degrees. This is the position for hook timing.

Note: The hook point should be directly behind the needle. If not, see Adjusting the Hook Timing on page 7-15.

7. Insert the needle depth gauge where the bobbin case is inserted. The large diameter goes in first. **DO NOT FORCE THE GAUGE!** The gauge should slip in easily. Rotate the gauge gently with an upward motion if necessary. The tip of the needle should barely rub on the top of the gauge if the depth is adjusted properly.

Check the following:
- Make sure main pulley is set at 24 degrees.
- The needle depth is too low, if the gauge does not insert easily and is hitting the needle point.
- The needle depth is not deep enough, if the needle point does not touch the top of the gauge, even with little upward motion of the gauge.

**Note:** If the needle depth needs to be adjusted, see the following instructions.
Adjusting the Needle Depth

Note: Follow the instructions for checking the needle depth first before following these instructions.

1. Remove the middle thread guide and the front cover of the sewing head.
   
   **Note: The middle thread guide holds the front cover in place.**

2. Loosen the (2) adjusting screws for the Needle Bar Driver Fixing Base, see photo.

3. Adjust the Needle Bar Fixing Base up or down accordingly to achieve the proper needle depth. Tighten the adjusting screws when the proper depth is set.

   **Proper Needle Depth**
   
   • ½ the eye of the needle should be visible in the hook basket when the main pulley is set to 0 degrees.
   
   • When using the Optional Needle Depth Gauge, the tip of the needle should barely touch the top of the gauge when the main pulley is set to 24 degrees.

   **Note: If the needle depth cannot be set correctly, the needle bar driver needs to be removed and inspected. If the Needle Bar Driver is cracked or bent, proper needle depth may not be possible to set. See Needle Bar Driver Replacement**

   **Caution: Anytime the needle bar driver is cracked or bent, it needs to be discarded and replaced.**
Replacing the Needle Bar Driver

The Needle Bar Driver may become damaged and need replacement is the machine sews into a hoop or another obstruction. **If the Needle Bar Driver is cracked or bent, it needs to be replaced.**

The following instructions explain the removal of the Needle Bar Driver for replacement or inspections.

1. Remove the middle thread guide and the front cover of the sewing head to gain access to the Needle Bar Driver Assembly.
   
   **Note: The middle thread guide holds the front cover in place.**

2. Remove the Needle Bar Driver Assembly by removing the (2) adjusting screws as shown in the photo.
3. Loosen the (2) set screws that hold the Needle Bar Driver Pin in place.

4. Remove the Needle Bar Driver Pin and Needle Bar Driver.

5. Replace the Needle Bar Driver.

**Make sure the following is checked when reassembling the Needle Bar Driver Assembly**

- Make sure the Return Spring is inserted into the Needle Bar Driver correctly.
- The Needle Bar Driver Pin should be rotated so the bottom set screw aligns with the flat spot on the Needle Bar Driver Pin.
- The Pin should be pushed against the bottom of the Needle Bar Driver so there is no play, however the Needle Bar Driver must rotate freely and spring back with the return spring.
- Lubricate the Pin and Driver lightly from the top before reinstalling them.

6. Reinstall the Needle Bar Driver Assembly back into the sewing head. Then follow the instructions for Adjusting the Needle Bar Depth.