

B E X S

Instruction Manual



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Chapter 1. Safety Instructions

This chapter contains information on the following.

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

1. Important 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.

Icons



Warning

Safety information about protecting yourself.



Caution

Safety information about protecting the machine.



Caution

- ◆ 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 running 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 from the front. Do not load work to the machine from the backside.
- ◆ Keep hands and face away from needles, take-up lever, trimmer, shafts, pulley, belts, gears, etc. Do not operate the machine without the protect covers for the shaft, pulley belt and fear in place.
- ◆ Keep long hair, necklaces, and bracelets away from the machine while operating.
- ◆ Only one person should operate the machine. Having a multiple operators for one machine may be dangerous as one operator may start t the machine while another is working on it.
- ◆ Before starting the machine, be sure nobody is near the machine.
- ◆ Keep children away from the machine while operating.
- ◆ 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.
- ◆ Do not use the machine in the humid area. 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.



Warning

- ◆ Keep water or chemical substances away from the controller.
In case it happened, disconnect the power from the machine and call a service technician.
- ◆ Keep any metal items such as clips, safety pins scissors etc away from the controller to avoid a short to the circuit, fire or electrical shock.
- ◆ Keep vases, flowerpots, cups, cosmetics, medicine, and chemical substances away from the controller. They could cause fire or electric shocks.
- ◆ 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.



Caution

- ◆ Avoid direct sunlight, heaters, boilers or any sources of the heat from the machine.
Do not use the machine outdoors.
- ◆ Do not use the machine near the fire or flame. It may cause fire.
- ◆ Clean the ventilation opening once a week.
Never operate the machine with any air openings blocked. Keep ventilation openings of the machine free from the accumulation of lint, dust, and loose cloth.
- ◆ Unplug the power cable before servicing to the controller. Residual power may cause electric shock. Wait for more than 4 minutes before opening the cover.
Some parts in the controller can be very hot. Be sure not to burn your hands.
- ◆ Use only attachment and parts recommended by Barudan.
Wrong parts can damage the machine.
- ◆ Do not use bent or wrong sized needles.
It can make a needle break or fabric damaged.
- ◆ Do not force the fabric while sewing. It can cause the needle to break or bend.
- ◆ Turn off all power switches and unplug the power cable after use.

*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.



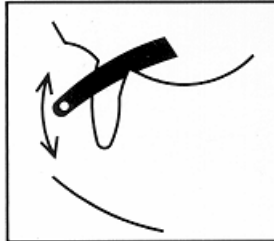
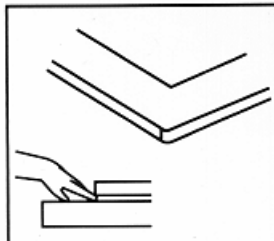
Danger! : Not grounding the machine may cause electrical shock.

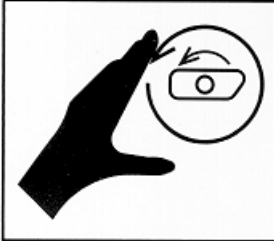

2. Ask for a service call if the power connection is not clearly understood.
3. Do not use adaptor to the power plug.
Ask for a service call to connect the machine to another power source.
4. Ask for a service from the power company to check the connection from the ground to the power outlet.

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

3. Warning labels

- Give attention during operation to the parts labeled.

Warning Labels	Contents
 <div data-bbox="496 443 963 683"> <p>⚠ WARNING</p> <p>Pointed needle will cause severe injury. Keep hand away from sewing head while operating.</p> </div>	Needle Hazard Warning Label
 <div data-bbox="496 792 963 1032"> <p>⚠ WARNING</p> <p>KEEP COVER CLOSED. Moving part can catch hair, finger, hand or clothes and will cause severe injury. Turn off power before servicing machine.</p> </div>	Hair Warning Label
 <div data-bbox="496 1144 963 1384"> <p>⚠ WARNING</p> <p>Moving part can cause injury. Keep hand away from sewing head while operating.</p> </div>	Take-Up Lever Warning Label
 <div data-bbox="496 1496 963 1736"> <p>⚠ WARNING</p> <p>Moving frame can cause severe injury. Keep hand away from table top while operating.</p> </div>	Frame Warning Label

Warning Labels	Contents
<div data-bbox="223 280 497 519">  </div> <div data-bbox="497 280 970 519"> <p>⚠ WARNING</p> <p>Rotating hook can cause severe injury.</p> <p>Keep hand away from rotating hook while operating.</p> </div>	<p>Hook Warning Label</p>
<div data-bbox="223 633 497 875">  </div> <div data-bbox="497 633 970 875"> <p>⚠ WARNING</p> <p>KEEP COVER CLOSED.</p> <p>Nip point will catch hair, finger, hand or clothes. and will cause severe injury. Turn off power before servicing machine.</p> </div>	<p>Belt Warning Label</p>

Chapter 2 Introduction

This chapter contains information on the following.

1. Specifications
2. Features

1. Specification

1. Design Capacity	100 designs
2. Stitch Capacity	1 design-1million stitches / Total capacity: 10 million stitches
3. Display	8.4 inch Color LCD 640 x 480 dots (VGA)
4. Temperature	5 – 45 Degree Centigrade (Active) -20 – 60 Degree Centigrade (Storage)
5. Humidity	20 – 80 % RH, No condensation allowed
6. Grounding	Grounding resistance to be less than 100Ohm (Type 3 grounding)
7. Trimmer Compatible	Mark 4, 5, 6
8. Thread Break Detection	
9. USB Ports	USB2.0 (Front: 1 port Back: 2 ports)
10. Network system	100BASE / 10BASE
11. Emergency Stop Switch (Some models do not apply)	
12. Option	Cap frames (For Cylinder machines), Sequin device, Automatic Lubrication system, Twin Sequin device, Light Curtain, Automatic Presser Foot Height Adjuster, Barcode, Laser Marker, Borer

2. Features

1. Easy Operation

The XS Automat is specially designed for Barudan embroidery machines. Linux is used for the OS, which allows high quality display and operation system. Graphic User Interface uses icons that are easily recognized for quicker learning of operations.

2. USB

X Series Automat has USB ports. This enables the use of USB memory stick devices and the following optional devices.

- Memory card reader -Barcode scanner
- Keyboard -Floppy Disk Drive

3. Standardized Networking Function

Barudan Embroidery machines can be connected to a Network server (computer) by LAN connection and able to send / receive embroidery design data.

Moreover, by using the optional Network software, LEM Server, machine production records and status can be viewed and reported from the server computer.

4. Large Memory Capacity

The memory capacity is 10 million stitches, with 100 memory locations.

5. High Speed Drive

The microcomputer automatically chooses the most efficient speed, in 10 rpm increments

*Max. Speed may vary for each model.

6. Quiet Drive

Inverter driven main motor allows powerful and quiet drive.

It also allows accurate speed control and stop positioning.

AC Servo Motor or 5 Phase Pulse Motor drives the pantograph at high speed and at the same time, quietly.

7. Automatic speed and Jump stitch control

The controller varies the speed of the machine automatically depending on stitch length for better stitch quality. The controller can also automatically convert long stitches to Jump stitches as set by a stitch length parameter for higher quality stitching.

8. Design Information

Design information such as total stitch, quantity produced, size, and thumbnail of the design can be seen on the screen.

9. Head Selection System

Sewing Head switches can be turned On/Off individually depending on Design data.
They can also be switched On/Off by programming on the Automat.

10. Stitch Length Adjuster

Swing parameter allows satin stitches to be automatically sewn slightly wider or narrower depending on the setting. This feature is helpful sewing small lettering when they need to be sewn with a bolder effect.

11. Automatic Appliqué Positioning

This feature moves the pantograph out to a programmed position, when the machine stops for an appliqué to be applied. This allows the operator to easily apply the appliqués to the garments. This can also be used for replacing frames at the end of sewing.

12. Socks

Automatic design conversion for socks.

13. Matrix Embroidery

Automatic layout for the Matrix embroidery.
Easy setting can create a repetition design.

14. The registration of the start position

The controller automatically saves the last start position of designs in memory. When you go to sew a design a second time, you can start from this same position.

15. Trace

The controller can show the area to be sewn on the screen and by a four-point trace and outline trace.

16. Stand-By (Resume)

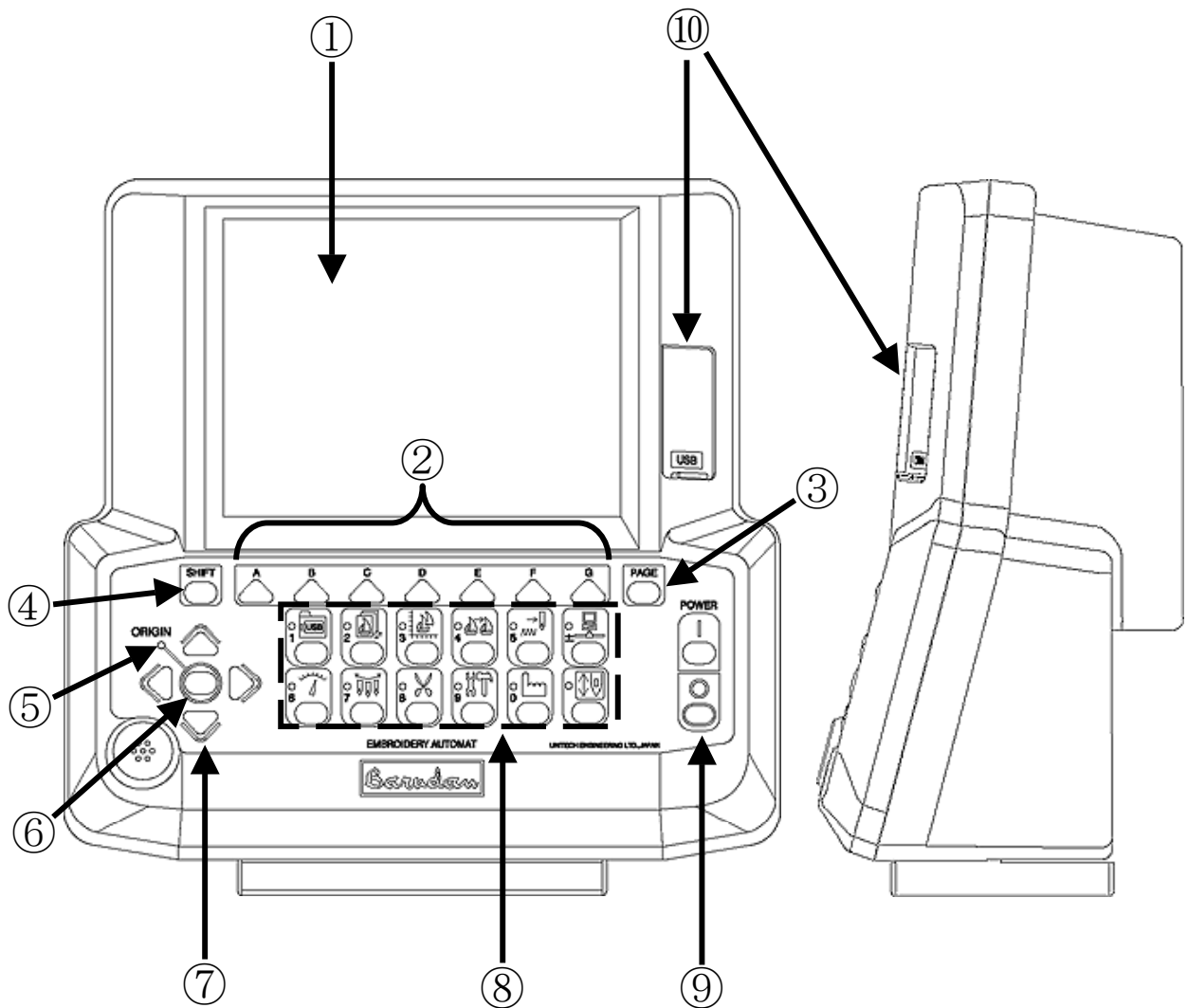
The machine can be turned OFF in the middle of a design. When powered back On, the machine resumes in the same position where the embroidery was stopped, even if the pantograph was moved when the machine was powered off.

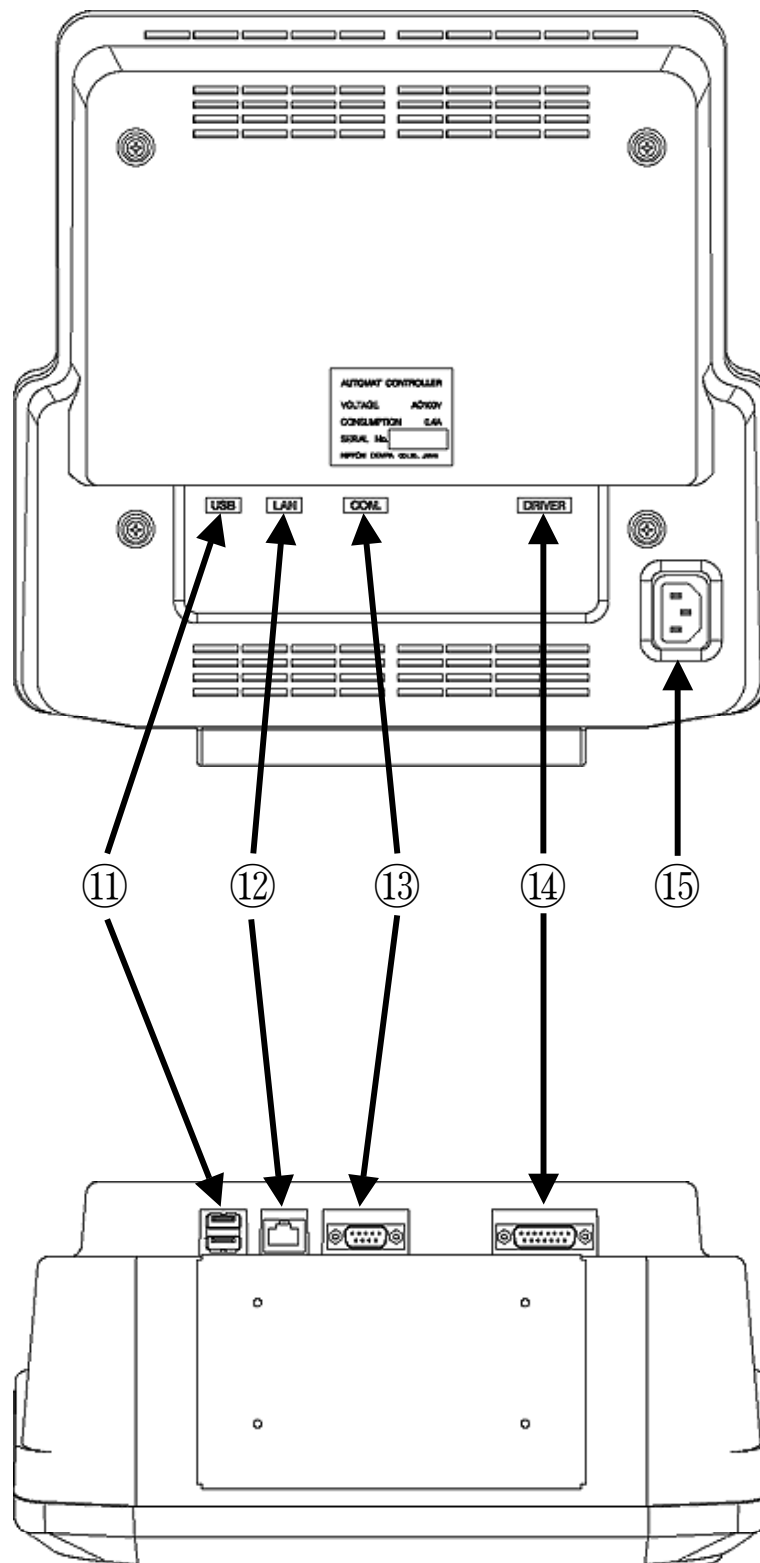
Chapter 3 Before Use

This chapter contains information on the following.

1. Appearance and Components
2. Panel Switches
3. Powering the Machine On / Off
4. Origin Set
5. Screen Structure
6. Information Screen
7. Design List Display Settings
8. Stand-By and Drive Mode
9. Switching Screens
10. Numeric Entry Dialogue Box
11. Character Entry Dialogue Box
12. Confirmation Message
13. Error Messages

1. Appearance and Components





1. LCD Display

Shows machine status, icons, and design information.

2. Icon key – A, B, C, D, E, F, and G-keys

Operation buttons assigned to functions displayed on screen above by icons.

3. Page key

Switches display screens. *Refer to *9. Switching Screens*.

4. Shift Key

Switches screen for more function options

5. Origin LED

When lit, the pantograph is located at the origin.

Blinks when the Jog Keys are assigned to other functions.

6. Origin key

Moves the Pantograph to the origin.

When the pantograph is located at origin, it moves the pantograph to the previous position, the position of the last stitch while the machine was in Drive mode.

7. Jog Keys

Moves the Pantograph. Single stroke gives 0.1mm movement. Holding the button gives continuous movement and the speed of the pantograph gradually increases. It is also used to move the cursor for selecting items from a list.

8. Panel Keys

All operations start from selecting one of the Panel Keys.

When entering a number, these keys become a numeric key pad.

*Refer to *2. Panel Switches* for more details.

9. Power ON/OFF Keys

Turns the machine ON and OFF.

10. USB (Port 1)

This is for a USB connection. It is used for uploading and downloading design data and also for updating the System software.

11. USB (Port 2)

This is a secondary USB connection. It is used for uploading and downloading design data and also for updating the System software.

12. LAN

This is for a LAN connection, for connecting the machine to a machine network. Optional Networking software is required to use this connection.

13. COM

This is for a COM connection for downloading designs from a PC to the machine. This operation requires PC software that can transfer designs by COM connection.

14. DRIVER

Connector to connect the Automat to the X-Series Driver Unit.

15. AC100V

Power inlet for AC100V

2. Panel Switches



Design Loading/Downloading Key

Loads and downloads designs from the USB port etc.
Numeric Key: 1



Design Memory Key

Manages designs in memory.
Numeric Key: 2



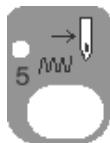
Design Edit Key

Edits and copies designs.
Numeric Key: 3



Color Change Key

Lists the color change codes for designs in memory and allows them to be changed.
Numeric Key: 4



Float Key

Moves the pantograph without stitching (standard and high speed modes)
Numeric Key: 5



Network Key

Reads Design data from the server, along with other network options.
Numeric Key: \pm (plus or minus)



Speed Key

Varies the machine speed.
Numeric Key: 6



Needle Change Key

Manually changes the needle (Color).
Numeric Key: 7



Trimming Key

Manually trims the thread.
Numeric Key: 8



Preference Key

Used for preference settings for the Automat.
Numeric Key: 9



Manual Key

Shows manual operation and parameter setting functions.

Numeric Key: **0**



Drive Key

Switches to and from stand-by and drive state modes.

3. Powering the Machine On / Off

Powering On

1. Turn the **POWER SOURCE** switch on the Driver box to the ON position.
2. Press the ON button on the Automat. The machine beeps loudly indicating it was powered on and the Origin Set screen will display.

Powering OFF

1. Press the OFF button on the Automat.
2. Turn the **POWER SOURCE** switch on the Driver box to the Off position.
CAUTION! It is best to unplug the machine when the machine is shut down at the end of the day to avoid the possibility of electrical surges.


4. Origin Set

After powering the machine on, you will need to set the origin.

1. Turn the **POWER SOURCE** switch on the Driver box to the ON position.
2. Press the ON button on the Automat.

After the beep, the following Origin Set screen will display.

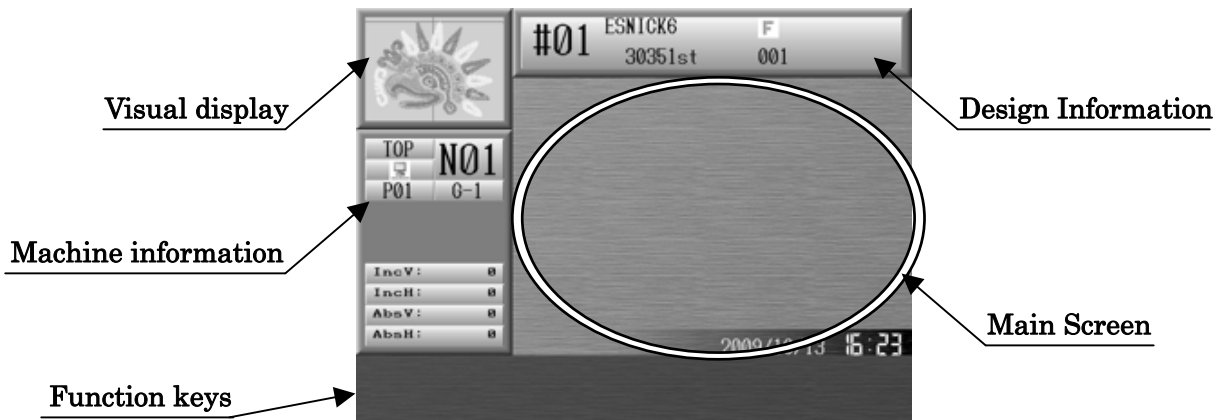


3. Press **G** below the  icon, the machine will seek its origin.

*Once the origin is set, the basic screen displays.

5. Screen Structure

Here is the basic screen structure of the XS Automat.



Main screen.

Date and time are shown at the bottom right corner.

Start Screen is blank after first turning on the machine.

Visual display

Shows the selected design.

Design Information screen

Shows the information of the selected design.

*Refer to 6. *Information Screen* for more details.

Machine Information screen

Shows the information of machine condition for the selected design.

*Refer to 6. *Information Screen* for more details.

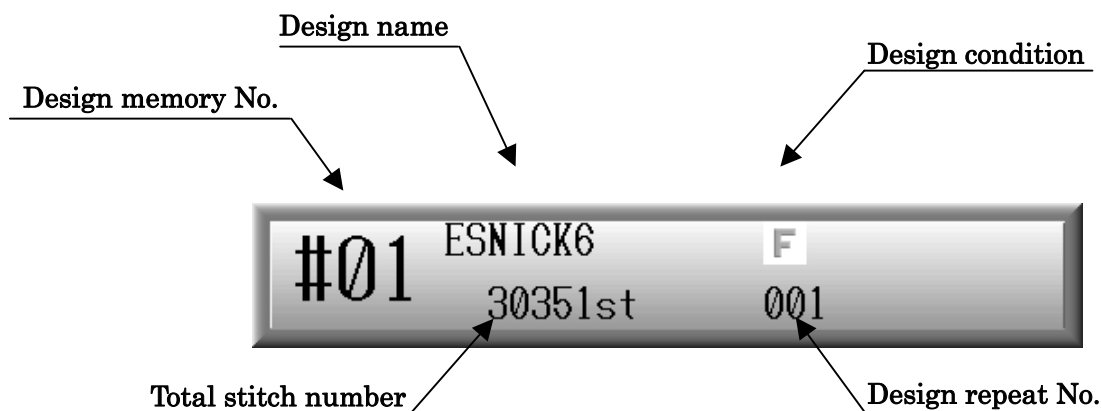
Function keys

All the Icon functions for the A to G key that apply will be shown here.

6. Information Screen

6-1. Design Information screen

Shows the information of the design selected.



Design memory No.

Shows the number of the design memory location.

Design name

Shows the name of the design.

Total stitch number

Shows the total stitch number of the design selected.

Design condition

Shows one of the icons shown below to indicate special conditions of the design.



: This is shown when MC #3 is changed. *1



: These are shown when MC #6 is changed. *1



: These are shown when MC #13 is changed. *1



: This is shown when the design was downloaded from the network. *2



: This is shown when the design was edited by DSP. *3

Design repeat No.

Shows how many times this design has been sewn.

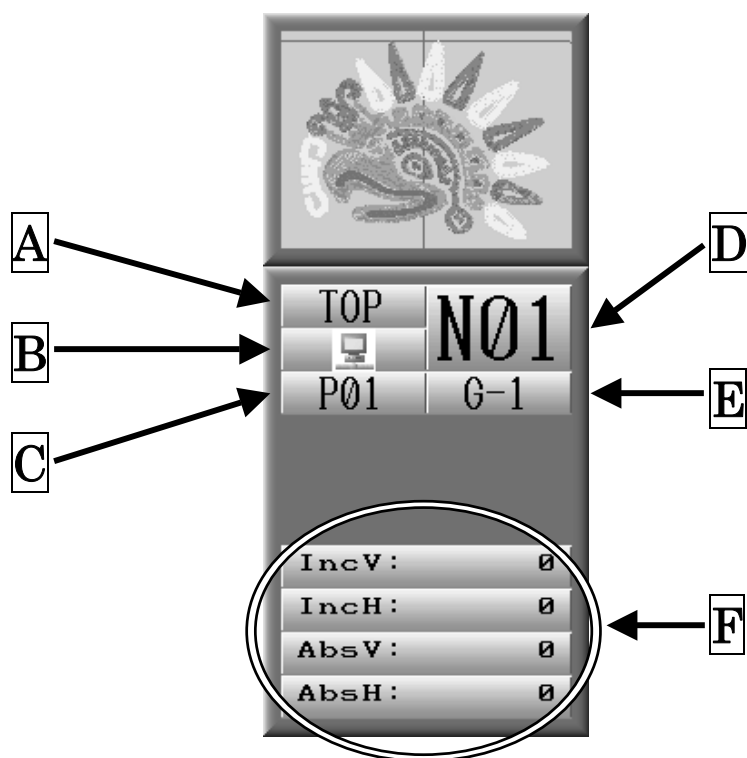
*1: Refer to *Chapter 7 2. Program List*

*2: Refer to *Chapter 9 6. and 7. Downloading.*


*3: Refer to *Chapter 10 4. DSP. (Design Stitch Processor)*


6-2. Machine Information screen

Shows the condition of the machine.



A : Shows **TOP** when the main shaft is at the correct stop position.

B : Shows  when the network is connected.

Shows  when the network is disconnected.

C : The height of the presser foot (Optional device)

D : The current number of the selected needle

E : The number of the group registered (When WS system is active)

F Shows the traveling distance of the pantograph frame.

Inc : The increment traveling distance the from last movement or stitch made.

Abs : The absolute traveling distance from the Start point to the current point.

7. Design List Display Settings

Settings for the Design list display.

*Memory design list and USB design list are individual settings.

1. Press either one of the **Design Memory key**  **2**, **Design Edit key**  **3**, or **Design**

Loading/Downloading key  **1**.


2. Press the **Shift key**.

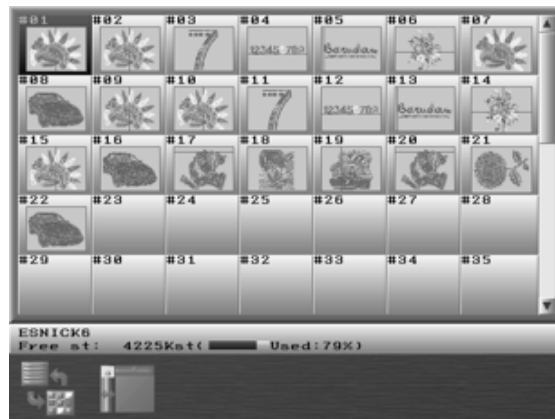


Press **Shift key** again to go back to the previous screen.

3. Press the **A-key**,  to switch the Design list display to Design name list display.



4. Press the **B-key**,  to show or hide the information screen.



***B-key**,  will not be shown in the **Design Loading/Downloading key**, .

Press either one of the **Design Memory key** , **Design Edit key** , or **Design**

Loading/Downloading key  to go back to the Start screen.

8. Stand-By and Drive Mode

The XS Automat has 2 different modes, Stand-By mode and Drive mode.

1. Stand-By Mode: The machine is turned on and idle but NOT in Drive mode.

This is the mode where sewing preparation takes place.

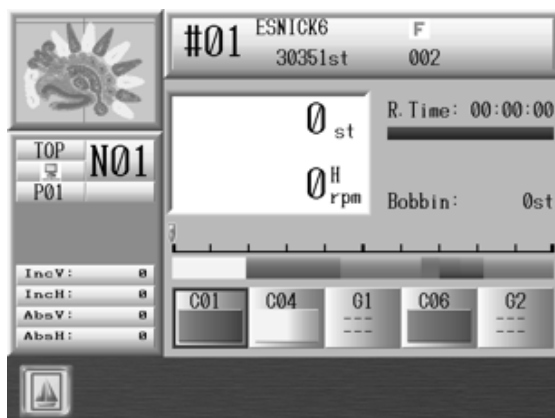
In this mode, design data can be selected and loaded.

Stand-By Mode screen



2. Drive mode: A design is chosen and it is ready to sew.

Typical appearance of the Drive mode

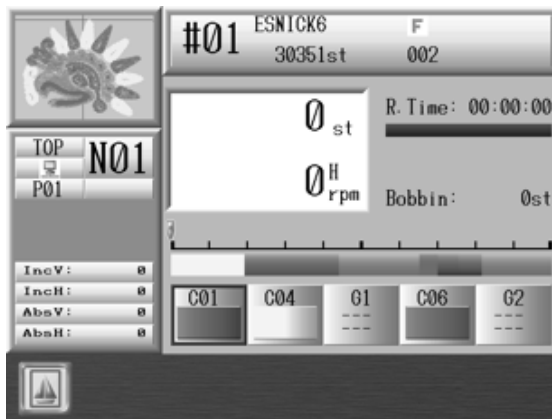


9. Switching Screens

9-1. Switching

By pressing the Page key during the Drive mode, the display changes to the extension screens, 1 and 2 as shown below. *Refer to *Chapter 8. 2. Drive Mode*.

Basic screen

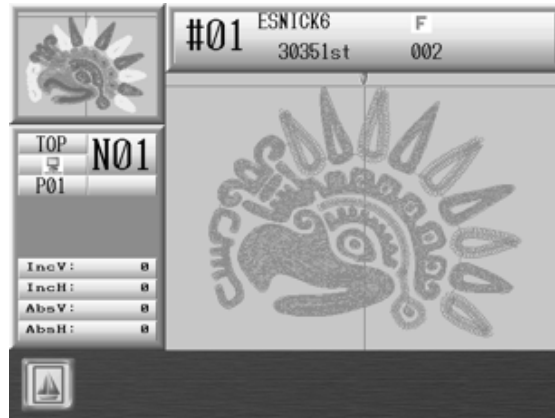


Extension screen

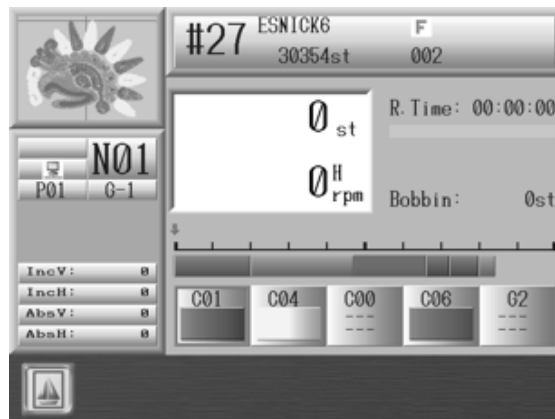


9-2. Extension screens

1. Press the Page key once and it will switch from the basic screen to the following Extension screen.



2. Press the Page key again to go back to the basic screen.

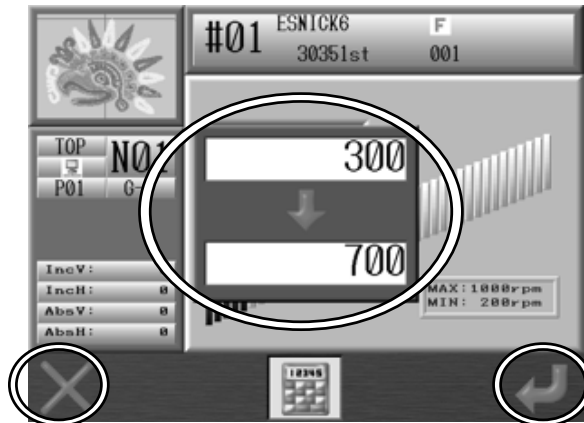


10. Numeric Entry Dialogue Box

When changing values, the **Numeric Entry Dialogue Box** displays.

Press the  icon.

By using the panel keys on the Automat as Numeric keys, you can enter a new value.




The Upper box with the value 300 is the current value in the system.

The Lower box with the value 700 is the value that is being entered.


*The screen above is the Speed setting screen.

1. Use the Automat Panel keys as Numeric keys to enter values.

For number references, see *2. Panel Switches*.

2. Press the **A-key**,  to delete the last digit (backspace).

3. Press the **G-key**,  to enter a new value.

4. Press the **D-key**,  to close the Numeric Entry Dialogue Box without saving a new value.

11. Character Entry Dialogue Box






When changing design names or needing to type words, press



the **Character Entry Dialogue Box** displays.

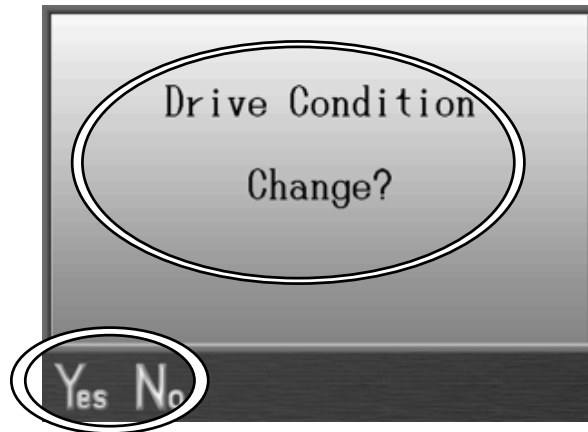


*The screen below is for changing design names.

1. Select a character using the Jog keys.
2. Press **A**,  to delete the last character (backspace).
Press **B**,  or the Origin Key, to enter a character.
Press **E**,  to delete all characters.
3. Press **G**,  to save the name that was entered.
4. Press **C**,  to close the Character Entry Dialogue Box without saving the name.



12. Confirmation Message

When changing each settings, or before initializing something, the following confirmation message displays to confirm if you are really willing to proceed.



The confirmation message shows the setting you're about to do.

* The message above is shown when changing a Machine Drive Condition.

1. Press the **A-key**,  to precede making changes.
2. Press the **B-key**,  to cancel changes and go back to the Start screen.


13. Error Messages

When errors occur during Machine or Automat operations, an error message will display.



In the Error message box, the Error number and Icon are shown.

*Refer to *Chapter 13. 3. Error Messages* for more details on the error numbers.

Press the **G-key**,  to close the error message.

Chapter 4 Manual Operations


This chapter contains information on the manual operations of the machine.

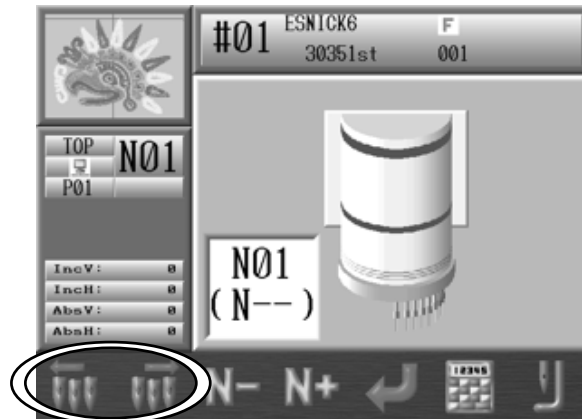
1. Color (Needle) Change
2. Presser Foot Height Adjustment.
3. Trimmer
4. Thread Clamp
5. Appliqué
6. Change Frame
7. Bobbin Counter
8. Main Motor Brake
9. Lubrication
10. Holding the Needle at Bottom Dead Bottom Center
11. Manual Roll to Roll Feature
12. Laser Pointer

1. Color Change


1-1. Manual Color Change


Instructions for changing a color (needle) manually

1. Press the **Needle Change Key** , and the following Color Change screen will display.



2. Change the needle number.

Press the **A-key**, , to go to the next smaller needle number.


Press the **B-key**, , to go to the next larger needle number.

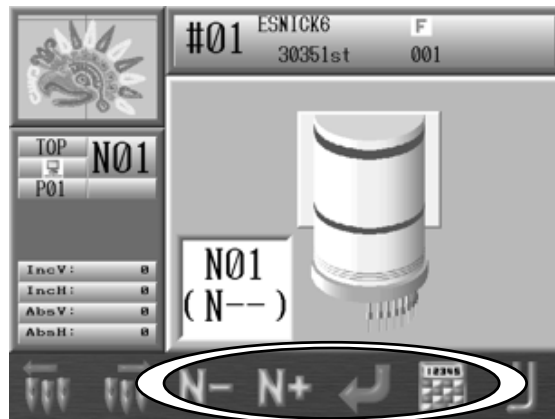
Press the **Needle Change Key**  again to go back to the Start screen.

Note: When the machine is first powered on, the machine must be oriented to the correct stop position to make a needle change. In this case, after following the steps above, the D14 message will display, prompting you to press the start switch to execute the needle change.


1-2. Direct Needle


Instructions for selecting a specific needle

1. Press the **Needle Change Key**  and the following Color Change screen will display.




2. The needle number in the box shown in parenthesis, is the new needle number you want to change to directly.

Press the **C-key**  to select the next smaller needle number.

Press the **D-key**  to select the next larger needle number.

Press the **E-key**  to change needle.



3. The needle number can be changed by using the Numeric Entry Dialogue.

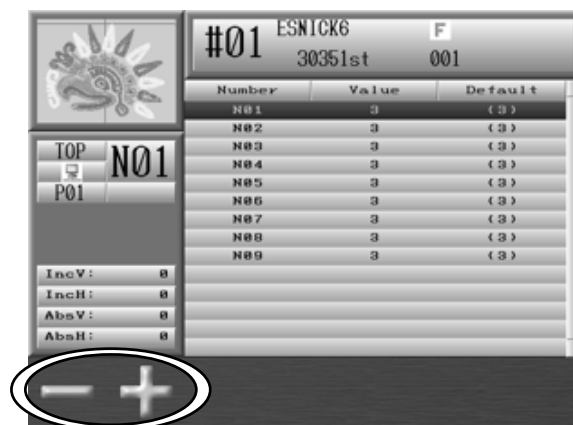
Press the **F-key**  to show the Numeric Entry Dialogue.



Note: When the machine is first powered on, the machine must be oriented to the correct stop position to make a needle change. In this case, after following the steps above, the D14 message will display, prompting you to press the start switch to execute the needle change.

2. Presser Foot Height Adjustment (Optional Device)

This feature is only for machines, which have the Presser Foot Height Adjustment option.

1. Press the **Needle Change key**  and the Color Change screen will display.
2. Press the **G-key** below the  icon and the screen for adjusting the Presser Foot Height will appear.




3. Select the needle number to adjust by using the Jog Keys.
4. Press the **A-key**  to select the next smaller height value.
Press the **B-key**  to select the next larger height value.

3. Trimmer

3-1. Trimming the Top Thread and Bobbin Thread

Instructions for trimming the top thread and bobbin thread manually

1. Press the **Trimming Key** .

2. The D14 Start Switch message appears.

Push the **Start Switch** to execute the trimming.





To cancel trimming and go back to the Start screen, press the **Trimming Key**



*The On/Off switch on each tension assembly (Head Switch) can also activate the trimming. Turn the Head Switch Off then On and the Green LED on the Tension Assembly will blink. Push the Start switch to execute the trimmer.
(The Green LED on the tension assembly must be blinking, when you push start)

3-2. Bobbin Thread Trimming

Instructions for trimming the bobbin thread manually


1. Press the **Trimming Key**  and the D14 Start Switch message appears.
2. Press the **A-key** below the  icon to trim the Bobbin thread.

*While Automending or stitch back without trimming, the bobbin thread may break. In order to avoid this, we suggest Bobbin thread trimming before automending or stitching back.



Trimmer cleaning mode

Press the **B-key**  to clean the trimmer.

Press the **B-key**  again to exit the Trimmer cleaning mode.

*There are some models that do not have the trimmer cleaning mode. For those models that do, we strongly recommend cleaning the trimmer regularly using the cleaning mode.

4. Thread Clamp


Instructions for releasing the thread clamp for easy threading

1. Press the **Manual Key** .

2. Manual Operation screen displays.





3. Press the **A-key** below the  icon to open or close the clamp


Press the **Manual Key**  again to go back to the Start screen.

5. Appliqué

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

1. Press the **Manual Key**  and open the Manual operation screen.
2. Press the **B-key** below the  icon and the following screen displays, indicating to push the Start switch to execute. Push the **Start Switch**.





Press the **B-key** below the  icon again to cancel and go back to the Manual operation screen.


3. Manually move the needle bar closer to the fabric.
- *Repeat steps 1 to 3 to retrieve the needle bar.

6. Change Frame

Change frame moves the pantograph forward to allow framing or positioning of an appliqué. This movement, called frame offset, is automatically set at the pattern height. A different frame offset distance can be set for each pattern in the Program Parameters.

1. Press the **Manual Key**  to open the Manual operation screen.
2. Press the **C-key** below the  icon.
3. The following D14 message appears, indicating to use the Start switch to execute.
Push the **Start Switch** and the pantograph will move forward, by the height of the pattern, unless a different value was set in the program options.



Press the **C-key** below the  icon to cancel and go back to the Manual operation screen.

4. Once the frame has been changed or the appliqué fabric placed, press the **Start Switch** to return the pantograph to its original position.

7. Bobbin Counter

The Bobbin Counter stops the machine and trims the bobbins, when a preset number of stitches are sewn.


By setting the number of stitches where a particular design normally runs out of bobbin, the bobbins can be replaced, avoiding missed stitches in the final sew out piece.

When the machine stops for the bobbin counter, it shows the Bobbin counter message below and the Green LED on the Tension assembly is lit. By pushing the Start Switch, the counter is automatically reset.

Set the counter to 0 to cancel the Bobbin Counter feature.

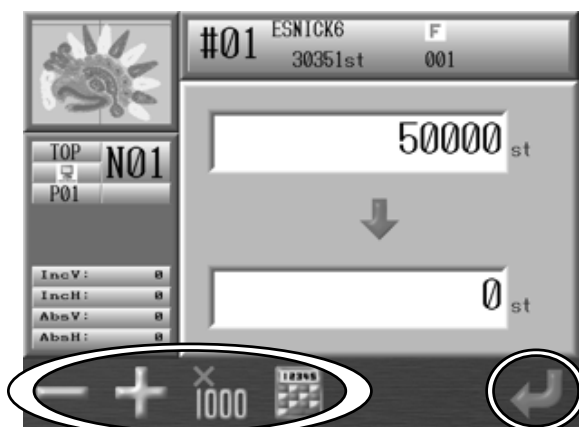
***Bobbin Counter setting can only be done by 100 stitches.**

(For example, if you set a value 250, the counter stops at 300 stitches.)

1. Press the **Manual Key**  to open the Manual operation screen.

2. Press the **D-key**, .

3. The following **Bobbin Counter screen** displays.



The number on top is the default number.

The number below is the count number.

The default number is the count number previously set.

4. Set the default value using the keys below.



(A-key) : The default value decreases by 100 stitches.



(B-key) : The default value increases by 100 stitches.



(C-key) : Press this button with above.

The default value decreases or increases by 1,000 stitches.



(D-key) : Show the Numeric Entry Dialogue.

Referring the *Chapter 3 10. Numeric Entry Dialogue Box* and enter the value..

5. Press the **G-key**,





to enter and apply the value you chose.

8. Main Motor Brake

This feature is only for the machines, which have a main motor brake.

The main shaft of the machine cannot be rotated while the brake is active. The following instructions explain how to release or activate the brake on the motor for maintenance reasons.

1. Press the **Manual Key**  to open the Manual operation screen.

2. Press the **G-key** below the  icon.

3. Press the **D-key** below the  icon to release or activate the brake.



9. Lubrication (Machine Maintenance)

NOTE! It is important to clean the machine before oiling. Keep all areas of the machine clean of built-up lint and dust. (Lubrication is required on the hook assembly and sewing head.)

Different parts of the machine requires different types of lubricants and different lubrication frequencies and it is very important to follow these instructions in order to keep the machine running properly.

Bobbin Case Maintenance

In a normal production setting, the bobbin case should be cleaned **every four 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 case will need to be replaced.

Cleaning the Bobbin case

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

Hook Assembly Maintenance

The hook assembly should be cleaned every four hours of normal machine operation. 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.

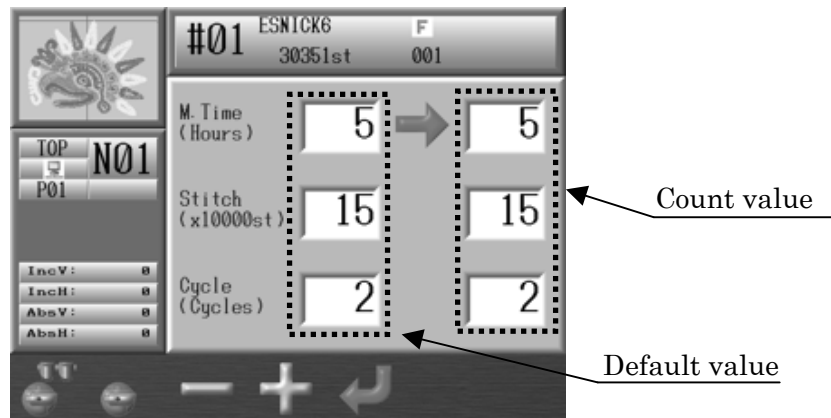
**It is best to oil at the end of the day, when the machine will be idle so any excess oil can drip off the assembly.*

Oiling the Hook Assembly


1. With all lint and dust removed from the hook assembly, place one 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.


9-1. Lubrication Menu


1. Press the **Manual Key**  to open the Manual operation screen.
2. Press the **G-key** below the  icon.
3. Press the **B-key** below the  icon and the Lubrication Menu displays.

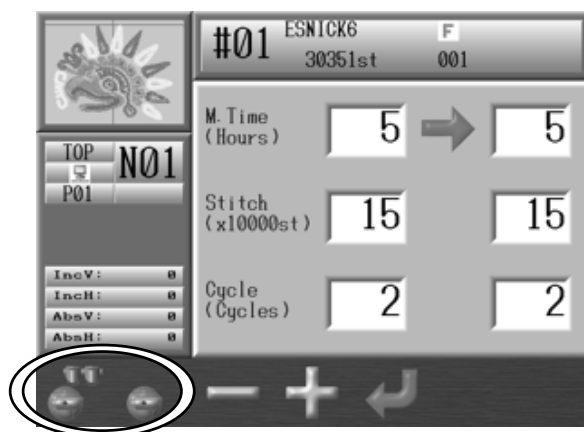



9-2. Manual Lubrication (Optional Lubrication Device installed)


1. Press the **Manual Key**  to open the Manual operation screen.

2. Press the **G-key** below the  icon.

3. Press the **B-key** below the  icon and the Lubrication Menu displays.



4. To lubricate the sewing heads and hook assemblies, press and hold the **A-key** below the  icon until the Automat makes a beep sound.

To lubricate just the hook assemblies, press the **B-key** below the  icon until the Automat makes a beep sound and starts lubrication.


9-3. Automatic Lubrication (Optional Lubrication Device installed)


Instructions for setting the frequency of the automatic lubrication


The frequency can be set by time and stitch count. When either the time or stitch counter, counts down to 0, this starts the lubrication and then resets the counter automatically.

When the lubrication starts both the time and stitch counter are reset.

When the value in the cycle column is 0, the automatic lubrication is turned Off.

1. Press the **Manual Key**  to open the Manual operation screen.

2. Press the **G-key** below the  icon.

3. Press the **B-key** below the  icon and the Lubrication Menu displays.

Use the Jog keys to select an item to change.



4. To change a value,




Press the **C-key** below the  icon for smaller numbers.


Press the **D-key** below the  icon for larger numbers.

5. Press the **E-key** below the  icon to save the new value.

9-4. Lubrication Alert

A Lubrication Alert can be set to notify when the machine needs to be oiled manually. When the machine reaches the time or stitch count set, the machine automatically stops and the Automat displays a lubrication alert message.


1. Press the **Manual Key**  to open the Manual operation screen.
2. Press the **G-key** below the  icon.
3. Press the **B-key** below the  icon for the Lubrication Menu displays.


Use the Jog keys to select an item to change.
4. Set the Default value of the Cycle to -1.
5. Press the **E-key** below the  icon to enter the new value.

9-5. Lubrication Setting Column

Item	Function	Range	Default
M. Time (Machine running time)	The time before the lubrication	1-100 Hours	5
Stitch (Stitch count)	The stitch count before the lubrication	1-100 10000 stitches	15 10000 stitches
Cycle (Frequency)	<p>The frequency of the lubrication to the sewing head.</p> <p>0: Automatic lubrication inactive and the lubrication requirement message will NOT appear.)</p> <p>-1: Automatic lubrication inactive but shows the lubrication requirement message.</p> <p>1-10: The frequency of the lubrication to the sewing bed before a lubrication to the sewing head is executed.</p> <p>(Example) A setting of 5, lubricates the sewing bed 5 times before lubricating the sewing head one time.</p>	<p>—1-10 Cycles</p>	<p>2 Cycles</p>


When a manual lubrication is executed, the time and stitch counters are reset.


*After the  manual feature is executed, the time, stitch counter, and cycle are reset.

*After the  manual feature is executed, the time and stitch counter are reset.

10. Holding the Needle at the Dead Bottom Center

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

1. Press the **Manual Key**  and open the Manual operation screen.

2. Press the **C-key** below the  icon.

3. The following D14 Start Switch message appears. Push the **Start Switch** to execute the needle down function.






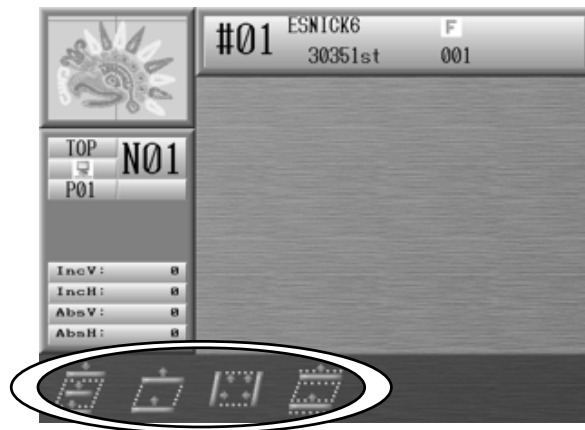
Press the **C-key** below the  icon again to cancel.

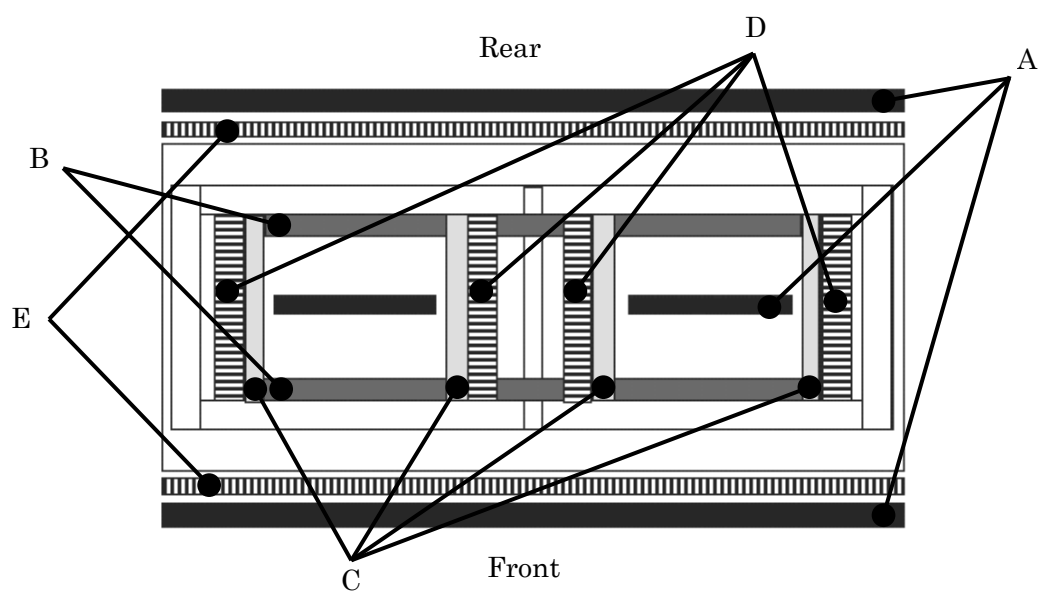
4. The machine stops as the needle penetrates the fabric.
5. Repeat operations 1 to 3 to return to the normal stop position.




11. Manual Roll-to-Roll Feature



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

1. Press the **Manual Key**  to open the Manual operation screen.
2. Press the **G-key** below the  icon.
3. Press the **C-key** below the  icon.
4. The icons to operate the fabric clamp display as shown below.
*Refer to the clamp operations functions on the next page before using them.





-  A : Clamp by needle
-  B : Front and Back
-  C : Right and Left

-  D : Right and Left
-  E : Support Clamp
- * A to E represents clamps.



Clamp A Close / Open



Clamp B and E Close / Open



Clamp C and D Close / Open



Clamp E Close / Open

12. Laser Pointer

This function is only available on the machines with a laser pointer.

Laser pointer irradiates the needle drop point.

1. Press the **Manual Key**



2. Press the **G-key**,



3. Press the **A-key**



to ON or OFF the Laser Pointer.

Chapter 5 Loading / Saving Designs

This chapter explains how to load designs into machine memory.

1. Before Loading / Downloading Designs
2. Before Using a USB Flash Drive
3. Loading Designs from a USB Flash Drive
4. Saving Designs to a USB Flash Drive
5. USB Administration
6. ABC Drive
7. Loading Through the COM port
8. Saving Through the COM port

1. Before Loading / Downloading Designs

These instructions explain how to use the Design Loading Key and are not necessarily repeated over and over again in the following chapters of Loading /Download Designs. So please refer to these instructions for details using this key.

1-1. Selecting a device to load or download designs


1. Press the **Design Loading/Downloading Key** .

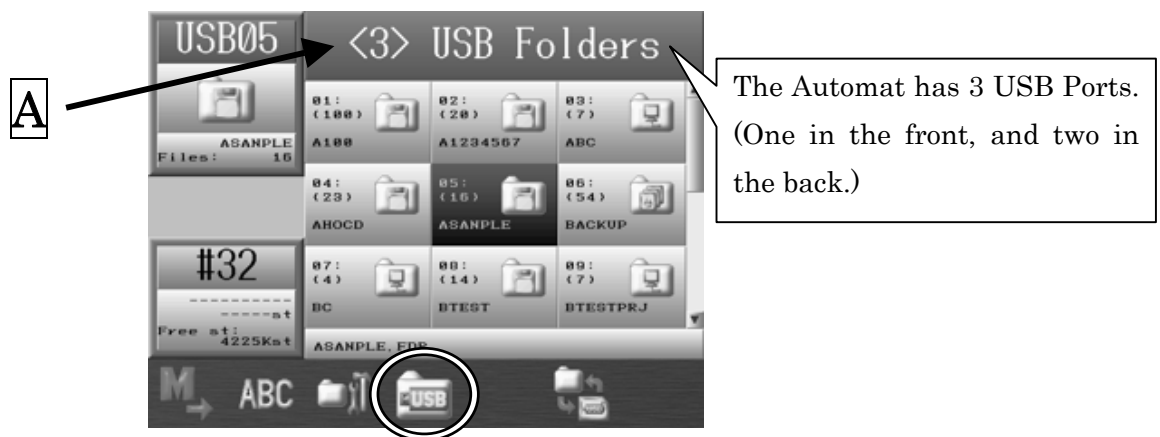
2. Press the **B-key** and select the device to load or download designs from the Design Loading / Downloading screen.



*The icon shown above the B-key is the icon for the device that will be selected when you press the B-key. The device that is currently selected is shown on the left side of the information window.

3. When the USB icon is selected, press the **D-Key** to cycle through the 3 USB Ports available on the Automat.



* If no USB device is installed on the selected port, an A38 message displays. In this case, Press the **G-key**  to clear the A38 message.




A: As shown, the 3rd USB port is selected.

1-2. Pause / Cancel

The Pause / Cancel function shows up in the following chapters of loading and saving designs. This function is not specifically called out in these chapters, so please refer to these instructions for using this feature.

1. Press the **B-key**,  to pause.
2. While pausing, press the **A-key**,  to stop loading/downloading.

Press the **B-key**,  to start loading/downloading.



*If the design being downloaded via a USB port has less than 50,000 stitches, the “Pause” to stop or “Abort” while downloading, is not available. Downloading is too quick for pausing.

2. Before Using a USB Flash Drive

1. Outline

The USB Flash Drive can be used for not only saving data but also for the following:

1. Storing Design Files

- Save / load design files in FDR format (.U01).
- Save / load design files in the Network format (.PRJ). *1
- Store design files in TFD format (.DST and .DSB). *2
- Bitmap image for each design file and image can be viewed on computers.
- Memory Back-up of all design files stored in the machine.

2. System Software Update

Software can be updated using a USB Flash Drive.

3. Editing

The design files in the USB Flash Drive can be edited on computers.

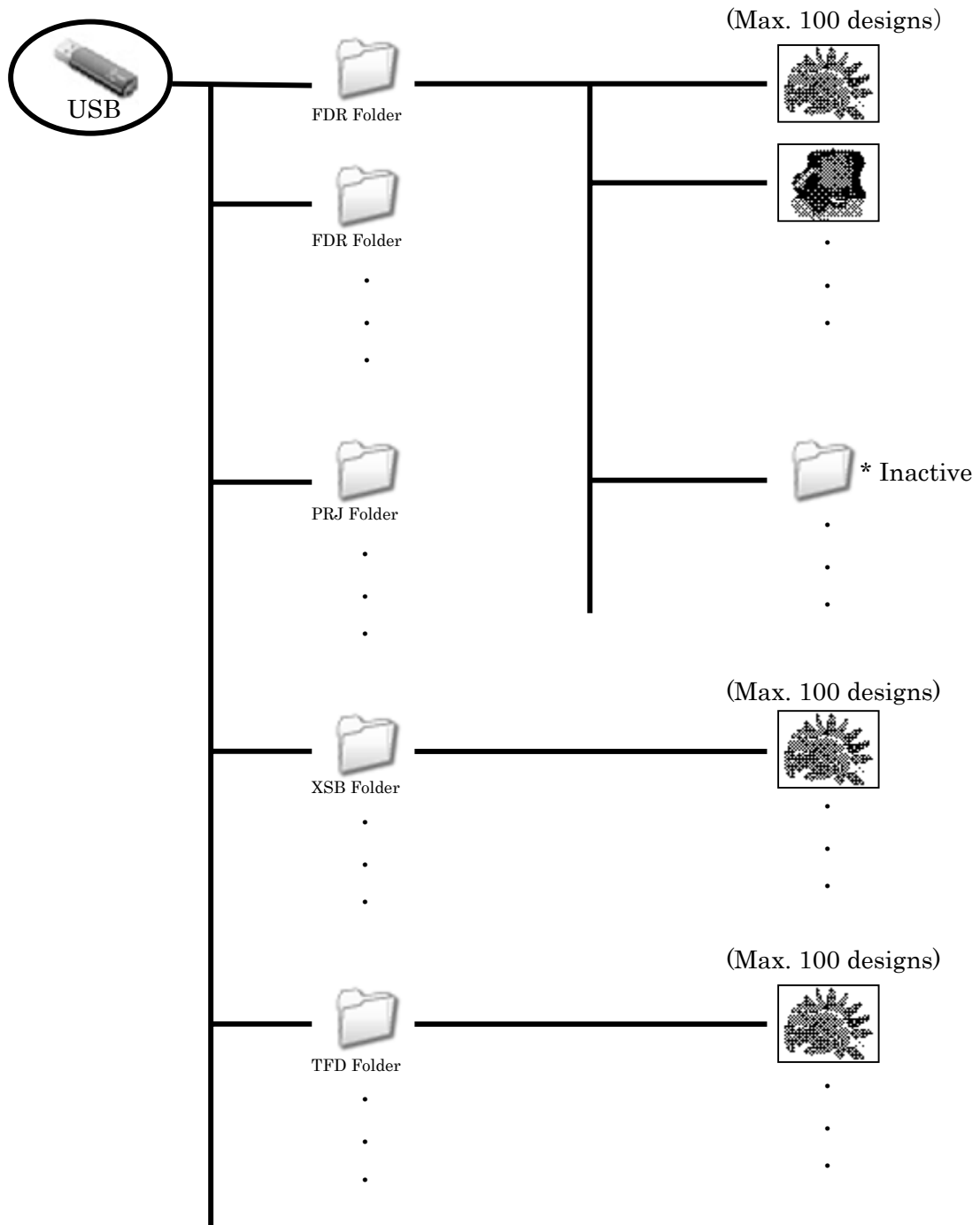
*Designs in PRJ format can be edited using LEM Server software.

*1. PRJ format consists of a design file, Program parameters and a Bitmap Image file.

*2. The Automat cannot save the TFD format file to the USB Flash Drive. Use a computer to save TFD format files on the USB Flash Drive.

2. USB Flash Drive Basics


The USB Flash Drive needs to have specific folders to store files.




* Folders within folders are Inactive. You maybe able to see these folders on a PC, but they will be unavailable and not shown on the machine Automat.

Folders are divided into the following 4 types.


1) FDR Folder

- This folder is shown as  on the Automat.
- Stores design data in FDR format (.U01)
- 100 designs can be saved in a FDR folder.


2) PRJ Folder

- This folder is shown as  on the Automat.
- Stores design data in Network/ PRF format.
- 100 designs can be saved in a PRJ folder.

3) XSB Folder

- This folder is shown as  on the Automat.
- Backs up all the designs in memory in the Automat.
- Merging is not available.

4) TFD Folder

- This folder is shown as  on the Automat
- Stores design data in TFD format (.DST and .DSB)
- This file cannot be created on the Automat.

*When you make a folder on a USB Flash Drive, make sure the folder has one of the following format file extensions:

Example)	ABC. fdr	(FDR folder)
	ABC. prj	(PRJ folder)
	ABC. xsb	(XSB folder)
	ABC. tfd	(TFD folder)

**NOTE: Do not edit the "System" folder in the USB Flash Drive. It may damage the system software.*

3. Loading Designs from a USB Flash Drive

Instructions for loading a design from a USB Flash Drive to the XS Automat.

3-1. Loading a New Design

1. Press the **Design Loading/Downloading Key**



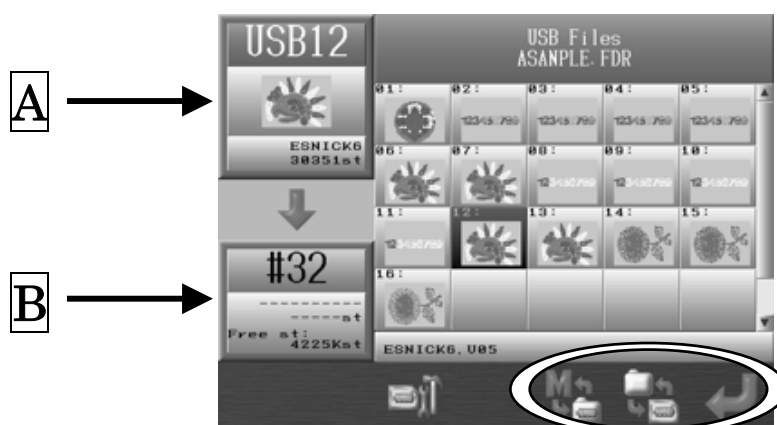
2. Check that the USB Flash Drive is selected. Press the D-key is to access the other USB ports if necessary (There are 3 USB ports available).

**Refer to 1. Before Loading/Downloading Designs.*

3. The Design Loading/Downloading screen will appear.



4. Select the folder that has the design you want to load to the Automat.
5. Press the **Origin key**, or the **F-key**,



A Shows the design information of the selected design on the USB device.


B Shows the design information and data capacity of the selected memory location.

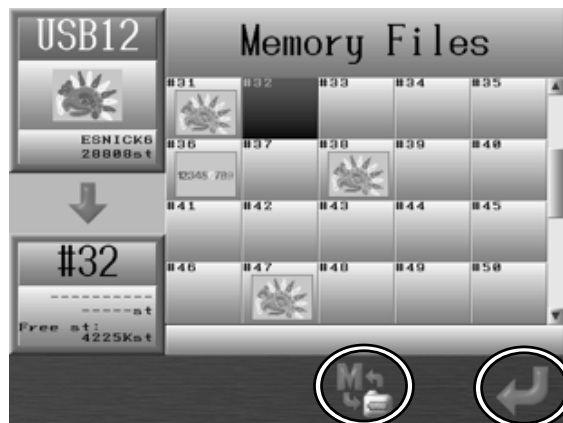
Press the **F-key**,

6. Use the **Jog Keys** to select the design you want to load.

*If you want to select several designs for downloading, see the following procedure:

1. Select a design and press ORIGIN key. After that an (*) is shown beside the design to indicate it's been chosen.
 2. Choose more designs and press the ORIGIN key to mark them.
 3. If you want to cancel a chosen design with an (*), select the design again and press the ORIGIN key to remove it.
7. You can save the selected design into a specific memory location. If you do not need to, the next empty memory location will be automatically selected for you. In this case please jump to item 10.


8. Press the **E-key**,  and the Memory files list displays.



*If you need to get back to the Design Folder List, press the **E-key**  again.

9. Use the **Jog keys** to select a memory file location to load the design into.

*If several designs have been selected using the ORIGIN key, you cannot assign specific pattern locations to load into. In this case, the designs will be automatically saved into the next available empty memory locations.

10. Press the **G-key**,  to load the Design(s) into memory. The display will go back to the start screen after downloading.

3-2. Adding a Design

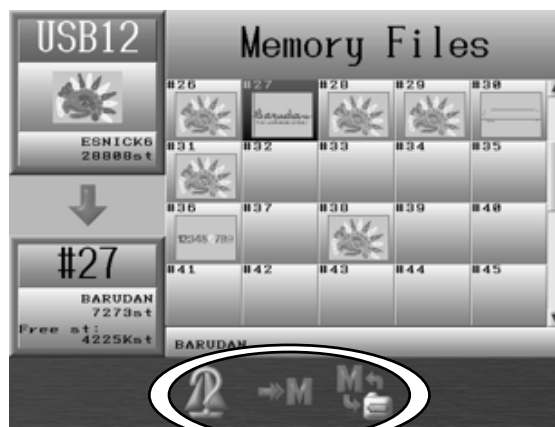
1. Press the **Design Loading/Downloading Key**



2. Use the **Jog keys** and select the folder that has the design you want to load.
3. Press the **Origin key** or the **F-key**, to display the list of designs in the folder.



4. Use the **Jog keys** and select the Design you want to load.
5. Press the **E-key**, to display the design data list in Memory.



6. Use the Jog keys and select the design you want add to.

To show the design information, press the **C-key**, .

*The design information shown is the same as what shows for Memory designs. Refer to *Chapter 6 2. Design Information* for more details.

7. If you've selected a memory location with a design already in it, the icon will be shown above the **D-key**.

8. Press the **D-key**, to confirm adding the new design to the design in memory.

9. Press the **G-key**, to start loading.

3-3. Loading a Back-up Design Folder

This function restores all the designs as they were, when the XSB memory backup folder was saved.

Important Notice:

When this function is executed, all designs (in the memory) will be overwritten by the backup memory.

1. Press the **Design Loading/Downloading Key**






2. Use the Jog keys and select the XSB Back-up folder that you want to restore.



3. Press the **G-key**



4. Press the **A-key**,  to start loading the Back-up folder designs.

Press the **B-key**  or the **G-key**  to cancel the loading and go back to the Design Loading screen.

3-4. Displaying Design Information

1. Press the **Design Loading/Downloading Key**



2. Use the **Jog keys** and select the folder that has the design you want to show the design information.

3. Press the **Origin key** or the **F-key**,



to show the list of designs in the folder.



4. Use the **Jog keys** and select the design you want to show the design information.

5. Press the **C-key**,



to show the USB Design Administration screen.



6. Press the **B-key**,



to show the design information.

Press the **B-key**,



again to go back to the USB Design Administration screen.

Press the **C-key**,



again to go back to the Design List.


4. Saving Designs to a USB Flash Drive

Instructions for storing designs from a BEXS Automat to an USB Flash Drive


4-1. Saving Designs

1. Press the **Design Loading/Downloading Key**




2. Press the **A-key**,  to display the Memory to USB Flash Drive downloading screen.




To go back to the Design Loading screen, press the **A-key**,  again.


3. Use the **Jog keys** and select a folder on the USB Flash Drive you want to save to.

Press the **Origin key** or the **F-key**,  to display the designs in the folder.

4. Press the **E-key**,  to show the Memory design list.




To display the design information, press the **C-key**, .

To go back to the USB Downloading screen, press the **E-key**, .

5. Use the **Jog keys** and select a design in memory to download to the USB Flash Drive.

*If you want to select several designs for downloading, see the following procedure:

1. Select a design and press ORIGIN key. After that an (*) is shown beside the design to indicate it's been chosen.
2. Choose more designs and press the ORIGIN key to mark them.
3. If you want to cancel a chosen design with an (*), select the design again and press the ORIGIN key to remove it


6. Press the **G-key**,  to save them to the USB Flash Drive.

4-2. Back-up the designs in memory

Backs up all the designs in memory.

1. Press the **Design Loading/Downloading Key**



2. Press the **A-key**,  to display the Memory to USB Flash Drive downloading screen.

3. Use the **Jog keys** and select an empty XSB folder you want use for a Back-up.



*If there is no XSB folder, create one. *See chapter 5.5-1 Creating a folder.*



4. Press the **G-key** .



5. Press the **A-key**,  to start the Back-up.


Press the **B-key**  or the **G-key**  to cancel the Back-up and go back to the USB Downloading screen.

5. USB Administration


Administration instructions for USB Flash Drives on the BEXS Automat

5-1. Creating a Folder


Instructions for creating folders on a USB Flash Drive

1. Press the **Design Loading/Downloading Key** .

The Design Loading/Downloading screen will display.

2. Press the **C-key** below the  icon and the USB Administration screen displays.



To go back to the Design Loading screen, press the **C-key**,  again.

3. Select the folder type that you want to create from the folders icons circled **A**.




(E-key) : for creating a FDR folder.



(F-key) : for creating a PRJ folder.



(G-key) : for creating a XSB folder.

4. Press the **A-key**,  and the Character Entry Dialogue box will appear.

Enter a folder name referring to *Chapter 3. 11. Character Entry Menu*.

5-2. Deleting Folders

Instructions for deleting folders on the USB Flash Drive

1. Press the **Design Loading/Downloading** key



The Design Loading/Downloading screen will display.



2. Use the **Jog keys** and select the folder that you want to delete.

3. Press the **C-key**,  to view the USB Flash Drive Administration screen.

4. Press the **B-key**,  and the following confirmation screen will appear.



5. Press the **F-key**,  to execute deleting.



6. Press the **B-key**,  or the **G-key**  to cancel the deletion and go back to the USB Flash Drive Administration screen.

5-3. Deleting designs on a USB Flash Drive


Instructions for deleting designs in design folders on a USB Flash Drive

1. Press the **Design Loading/Downloading Key** .


The Design Loading/Downloading screen will display.

2. Use the **Jog keys** and select the folder that has the design you want to delete.
3. Press the **F-key**,  to see in the folder.
4. Press the **C-key**,  and the USB Design Administration screen will appear.




To go back to the Design Loading screen, press the **C-key** .



5. Use the **Jog keys** and select the design to delete.
*If you want to select several designs for deleting, see the following procedure:
 1. Select a design and press ORIGIN key. After that an (*) is shown beside the design to indicate it's been chosen.
 2. Choose more designs and press the ORIGIN key to mark them.
 3. If you want to cancel a chosen design with an (*), select the design again and press the ORIGIN key to remove it

6. Press the **A-key**,  and the following confirmation dialogue box will appear.



7. Press the **F-key**,  to proceed and delete the selected design(s).

Press the **E-key**,  and the **F-key**,  to delete all the designs in the folder.


Press the **A-key**,  or the **G-key**,  to cancel deleting and go back to the USB Design Administration screen.

5-4. Changing a Folder Name

1. Press the **Design Loading/Downloading** key



The Design Loading/Downloading screen will display.

2. Use the **Jog keys** and select the folder that you want to change the name.
3. Press the **C-key**,  and the USB Administration screen will display.



4. Press the **SHIFT-key**.



To go back to the USB Administration screen, press the **SHIFT-key** again.

5. Press the **C-key**,  to display the Character Entry dialogue.

Refer to *Chapter 3 11. Character Entry Dialogue* and enter the folder name.

6. ABC Drive

ABC Drive is a function to automatically load a design into memory using the COM port. A memory location is selected for ABC mode and it's the only memory location to be sewn in this mode. After sewing this design in this memory, you take the machine out of Drive mode. This action automatically downloads the next design from the COM port and overwrites the design in memory with the new one. Please refer to 7. Design Loading from COM port for more info on COM settings.

*ABC Drive function setting cannot be changed while the machine is in Drive mode. You have to get out of Drive mode, to cancel ABC Drive and return back to regular operation.

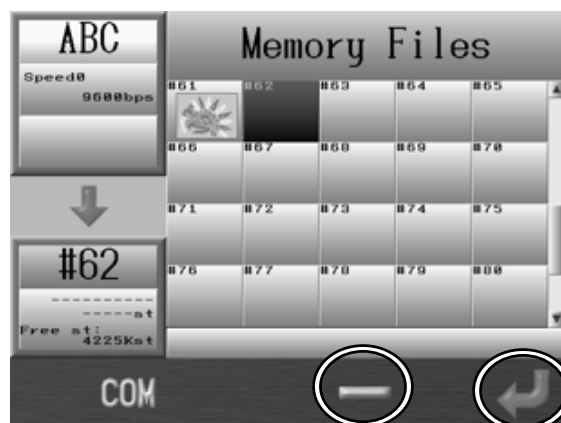
1. Press the **Design Loading/Downloading** key,



2. ABC Mode. Press the B-key to change the machine to ABC Drive Mode.


*Refer to 1. Before Using Design Loading / Downloading.

3. The Memory Design List will display.




4. Use the **Jog keys** to select a memory location to use for ABC mode.

*If you select a memory location that already has a design in it, the design will be overwritten.

The **E-key**  is for changing the loading speed.

*Refer to 7-1. Loading a New Design for details on changing speeds.

5. Press the **G-key**,  to set the ABC Drive function.

*While in ABC Drive mode, no other sewing operations or memory locations are available for use.

6. When the Automat is taken out of Drive mode, it will receive the next ABC drive design from the COM port, and overwrite the current design in memory.

*ABC Drive can only be used with U-code designs. The design name read into memory will show "ABC_data".

7. Loading through the COM port

A COM connector is located on the back of the BEXS Automat. Designs can be loaded from a device connected to the COM port. Devices using RS-232C can be connected and used.

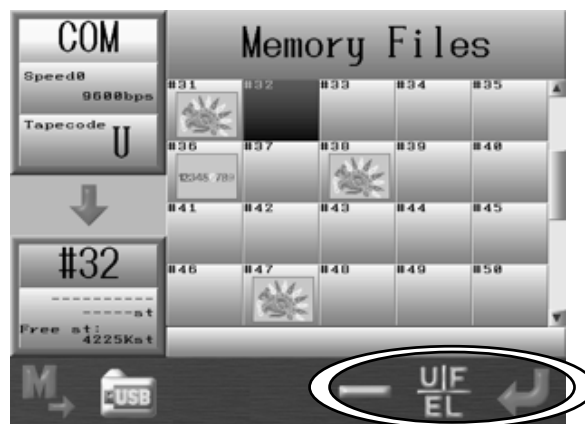
**Note: Please use a (null modem) crossover cable for the connection.*

7-1. Loading a New Design through the COM port.

1. Press the **Design Loading/Downloading key**,




2. COM Mode. Press the B-key to change the machine to COM Mode, if not already selected *Refer to 1. Before Loading/Downloading Designs.
3. The Memory design list will display.




4. Use the **Jog keys** to select an empty Memory location.


*If there are no empty memory locations, you will need to delete some designs from memory.


Refer to Chapter 6 5. Deleting Designs from Memory.

*If you select a Memory location that already has a design, the Enter key,  will not appear.


5. Press the **F-key**,  if needed, to change Tape Codes.

*There are 3 types of Tape code: U / F / EL

The Code changes each time you press the **F-key**,  from U→F→EL→U.

6. Changing loading speed (BAUD rate), if needed. Press and hold the **E-key**,  and

the icon changes to a , to allow you to change the loading speed.

7. Press the **E-key**,  to change the loading speed.

8. Press the **G-key**,  to ready the machine for the download.

9. Prepare the device or software program that has the design you want to download, and send the design.

*The following Loading speeds (BAUD rates) can be set.


Number	Speed (bps)
0	9600
1	19200
2	38400
3	57600
4	115200

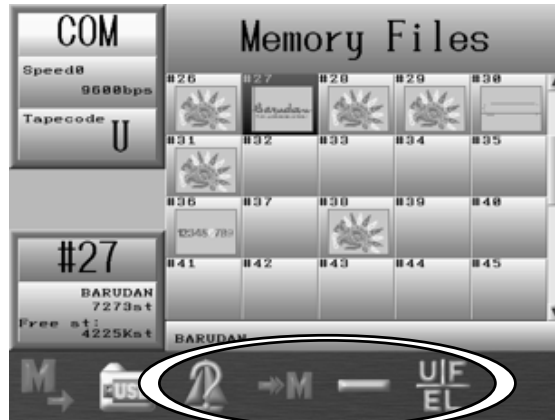
7-2. Adding a Design through the COM port.


1. Press the **Design Loading/Downloading** key,





2. Use the Jog keys and select a design in Memory to add the design to.

3. If the selected Memory location has a design loaded in it, the  icon will show above the **D-key**.




Press the **C-key**,  to show the Design information.


*Refer to Chapter 6 2. Design Information.

4. Press the **D-key**,  and the design becomes ready to load.
5. Press the **F-key**,  to select a different Tape code, if needed.

*Refer to 7-1. Loading a New Design for more details.

The **E-key**  is for changing the loading speed.

*Refer to 7-1. Loading a New Design for details on changing speeds.

6. Press the **G-key**,  to ready the machine for the download.
7. Have the connected device ready and send the design.

8. Saving a Design through the COM port.

A COM connector is located on the back of the BEXS Automat. Designs can be loaded from a device connected to the COM port. Devices using RS-232C can be connected and used.

**Note: Please use a (null modem) crossover cable for the connection.*

1. Press the **Design Loading/Downloading key**,



2. Press the **A-key**,



3. Use the **Jog keys** to select a design in memory you want to upload.

Press the **C-key**



to display the design information.

**Refer to Chapter6 2. Design Information for details.*

4. Press the **F-key**



if needed, to change the Tape code.

**Refer to 7-1. Loading a New Design for details.*

The **E-key**



is for changing the loading speed.

**Refer to 7-1. Loading a New Design for details on changing speeds.*

5. Have the connected device ready to receive the design.

6. Press the **G-key**,



to start uploading the design to the connected device.

Chapter 6 Memory Designs

This chapter contains information on the followings.

1. Selecting a Design
2. Design Information
3. Changing Design Names
4. Production Counts
5. Deleting Designs from Memory
6. Changing Color Codes of a Design
7. Outline Stitching
8. Thread Consumption

1. Selecting a Design

Instructions for selecting a design to embroider from Machine Design Memory



* Designs cannot be edited while in Drive mode.

1. Press the **Design Memory Key**  or **Design Edit key** .
2. Design data for all the memory locations displays.



3. Choose a design to embroider from the design data list.

Note: Pressing the Origin key will move the frame to the last sewn start position.

Press  or  again to go back to the Start screen.


2. Design Information

Instructions for viewing design information

1. Press the **Design Memory Key**

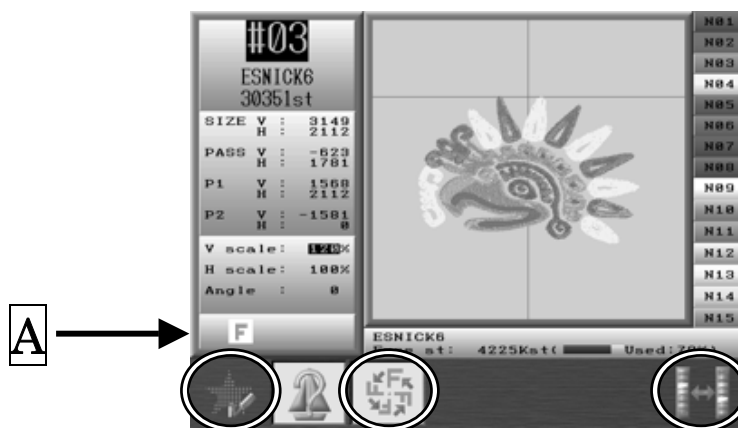



Design data for all the memory locations displays.

2. Select a design to view and press the **B-key** below the  icon.

3. The design information of the selected design will appear.

*The design shown will reflect any program changes.



Press the **B-key**  again to go back to the Design data list.

The design information screen has the following contents.

Design No. : Memory location of the design

Design Name : Name of the design

Stitch Count : Total stitch count of the design

SIZE : Distance between the overall dimensions of the design measured in tenths of millimeters.

PASS : Distance between the start and end points, shown as horizontal and vertical values, measured in tenths of millimeters.


P 1 : Distance from the start point to the bottom left corner of the design, measured in tenths of millimeters.


P 2 : Distance between the start point and the top right corner of the pattern measured in tenths of millimeters.


V scale : "V scale" of the Program Settings.


H scale : "H scale" of the Program Settings.

Angle : "Angle" of the Program Settings.

 : Shows one of the icons shown below to indicate special conditions of the design.

4. Press the **A-key** below the  icon to show the Needle drop points of the selected design.

Press the **A-key** below the  icon again to go back to the previous display.

5. Press the **C-key** below the  icon to show the design overview of before and after of the Program changes.

* When the Program has not been changed, it is not displayed.

6. Press the **G-key** below the  icon to change the design color.


3. Changing Design Names

Instructions for changing design names

1. Press the **Design Memory Key**



Design data for all the memory locations displays.

2. Select the design to change the name and press the **C-key** below the  icon.



3. A Character Entry dialogue box will appear.
*Refer to *Chapter 3. 11. Character Entry Dialogue Box* and enter a design name.


4. Production Counts

Instructions for displaying Production counts for the design selected

1. Press the **Design Memory Key**



Design data for all the memory locations displays.


2. To view the production counts of all the designs press the **D-key** below the  icon.


3. Design No, Design name, Stitch count, and Production quantities are shown in the list.




	Name	Stitches	Prod#
#01:	ESNICK6	0st	0
#02:	C4	0st	0
#03:	777	0st	0
#04:	A1234567	0st	0
#05:	BARUDAN	0st	0
#06:	HANA	0st	0
#07:	ESNICK6	0st	0
#08:	CAR	0st	0
#09:	ESNICK6	0st	0
#10:	C4	0st	0
#11:	777	0st	0
#12:	A1234567	0st	0



ESNICK6
Total prod#: 0


Press the **D-key** below the  icon to go back to the Memory design list.

4. Press the **F-key** below the  icon to reset the stitch and piece counts for the selected design. The screen below will appear to confirm if it is okay to reset.





Press the **A-key** below the  icon to reset.

Press the **B-key** below the  or  icon to cancel the reset.

5. To reset the stitch counts of all designs, press the **G-key** below the  icon.

6. A screen to confirm if it is okay to reset will appear.

Press the **A-key** below the  icon to confirm and reset.

Press the **B-key** below the  icon or **G-key** below the  icon to cancel.

5. Deleting Designs from Memory

Instructions on how to delete a design from Memory

1. Press the **Design Memory Key**







Design data for all the memory locations displays.

2. Select a design to delete with the Jog keys and press the **A-key** below the  icon.



3. Press the **F-key** below the  icon to delete the selected design.

Press the **E-key** below the  icon and **F-key** below the  icon to delete the all design.

Press the **G-key** below the  icon or **A-key** below the  icon to cancel and go back to the Memory design list.

6. Changing Color Codes of a Design

Instructions on how to change color codes

6-1. List display and making changes

1. Press the **Design Edit** key



2. Select the design that you want to see the **Color codes** and press the **C-key** below the



icon.



3. The list of the Color change function codes will appear as shown below.

The list displays the total color change functions.






4. Use the **Jog keys** to select a code.

Note: You can insert a code at the start of design, by selecting “0000-Start” in the list, and pressing and holding the Origin key. Afterwards, you can program this code.


5. Press the **A-key** below the  icon or **B-key** below the  icon to change the Color change function code. The new Changed code will be shown in black.

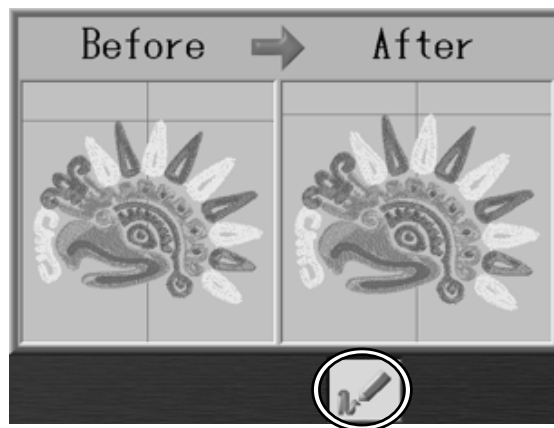
For machines with special devices (Loop/Cord/Sequin etc...)


Press **C-key** below the  icon and Sub-function is now available to change.


Use **A-key** below the  icon or **B-key** below the  icon to change the code.

*Refer to *Chapter 13. 2. Sub-Function Codes* for Sub-Function.

6. Press the **E-key** below the  icon to preview the Before and After changes.



Press the **E-key** below the  icon again to go back to the Color change function list.

7. Press the **G-key** below the  icon to start initializing the Color change function codes.

Press the **Design Edit key**  again to go back to the Start screen.

*When there are any changes made, a confirmation screen displays to confirm the changes. *Refer to *Chapter 3. 12. Confirmation Message* for more details.

6-2. List display and making changes

Batch changing for Color Change Functions

1. Press the **Design Edit key**



2. Select the design that you want to see the **Color codes** and press the **C-key** below the



icon to show the Color change function list.

3. Press the **D-key** below the





icon to show the Batch changing screen of Color change functions.





- Press the **E-key** below the






icon to preview the Before and After changes.

4. Use the Jog keys to select a function code in the list to change.
5. Press the **A-key** below the  icon or **B-key** below the  icon to change the **After** function code. Note: All **Before** Codes in design will be changed to the **After** codes when finished.

6. Press **D-key** below the  icon or **E-key** below the  icon to go back to the Color change function Batch changing screen.



Press **F-key** below the  icon to show the design preview of both before and after changing the Sub-functions.

7. Press the **A-key** below the  icon or **B-key** below the  icon to change the **After** Sub-function code.

Press the **Design Edit Key**  to go back to the Start screen.

7. Outline Stitching

Instructions for creating outline stitching data for designs

This feature has 2 useful purposes.

- When used with a boring needle for sewing, the outline stitch can be used to cut a hole in a piece of stable hooped material. Afterwards, a garment can be held to the hooped material by adhesive, and sewn thru the hole.
- The outline stitch can also be used as guideline for cutting out the embroidery with scissors after it's been sewn, such as sewing patches or appliqués.

1. Press the **Design Edit Key**



2. Press the **G-key** below the



icon.



3. Press the **B-key** below the



icon and the Outline Stitching setting screen will

appear.



Memory : Sets the Memory location where the outline stitching design is saved

Space : Sets the space around the design to the outline

Pitch : Set the stitch length for the running stitches used in the design


Start color : Sets the needle number for sewing.

Style : Sets the form of the outline

0: Outline data is made according to the actual border of the design.

1: Outline data is made to form the shortest distance around the border of the design.

4. Use the **Jog keys** to select a value to change.

5. Press the **A-key** below the  icon for a larger number.

Press the **B-key** below the  icon for a smaller number.

6. Press the **G-key** below the  icon to create an outline stitching design.

8. Thread Consumption

Instructions for thread consumption simulation

1. Press the **Design Memory Key**,



2. Press the **E-key** below the



icon and the Thread consumption screen appears.

Function	Value	Unit
N01	4.86M	1042st
N02	3.27M	1456st
N03	26.70M	12044st
N04	13.61M	5876st
N05	3.59M	1577st
N06	16.15M	7428st
N07	-----M	-----st
N08	-----M	-----st
N09	-----M	-----st

Simulates thread consumption for each needle.

Press the **E-key** below the



icon to go back to the Memory design data list.

3. Press the **A-key** below the



icon to change the result shown in meters or inches.

4. Press the **C-key** below the



icon and the Thread consumption settings display.

Function	Value	Default
01:Thickness	0	(0)
02:Back thread rate	50%	(50)
03:Needle height	0	(0)
04:Adjusting Value	100%	(100)

Press the **C-key** below the



icon to go back to the Thread consumption screen.

5. Select the item that you want to change the value.

6. Press the **A-key** below the  icon to decrease the value.

Press the **B-key** below the  icon to increase the value.

When there are any changes made, a confirmation screen appears.

*Refer to *Chapter 3. 12. Confirmation Message*.

Item	Function	Range	Default
Thickness	Thickness of the fabric measured in millimeters.	0.0~9.9mm	0.0mm
Back Thread Rate	Ratio of the Bobbin thread to Top thread in Satin stitches.	0~100%	50%
Needle Height	Needle height adjustment for chenille machines in millimeters.	0~2.0mm	0mm
Adjusting Value	Calibration ratio of thread consumption.	50~200%	100%

Chapter 7 Programs

This chapter contains the instructions on Program parameters.

1. Changing Program Settings
2. Program List
3. Setting the Sub-Soft Limit
4. Matrix Embroidery Set Up (Design Repeats)
5. Automatic Matrix Embroidery Set Up

1. Changing Program Settings

Instructions for changing Program settings for a selected design

*Program settings cannot be changed while in Drive mode.

1. Press the **Design Edit Key**,



2. Select a design and press the **B-key** below the



icon.

3. Program list of the selected design displays.



4. Select the item you want to change with the Jog keys.

5. Press the **A-key** below the



icon for smaller numbers.

Press the **B-key** below the



icon for larger numbers.

Note: Press the **D-key** below the




icon to change values using the Numeric Entry

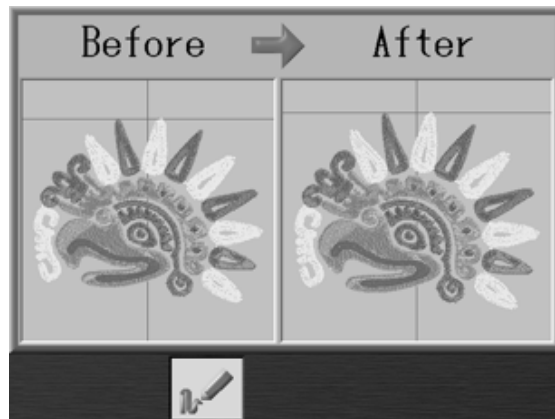
Menu. *Refer to *Chapter 3 10. Numeric Entry Dialogue Box*.


Note: To initialize Program settings, press the **G-key** below the



icon.

6. Press the **C-key** below the  icon to show the design preview of before and after changes.






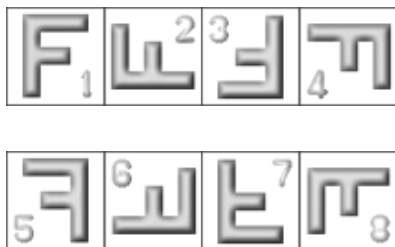






Press the **C-key** below the  again to go back to the Program list.









Press the **Design Edit Key**,  again to go back to the Start screen.







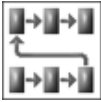
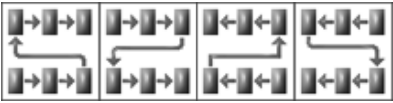
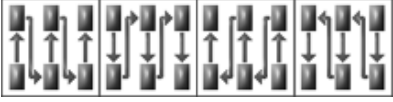

7. When there are any changes made, a confirmation screen appears.

*Please refer to *Chapter 3 12. Confirmation Message*.

2. Program List

No. & Icon	Parameter	Function	Default Value	Range of Values
1 	V scale Width Scale	Scales the pattern size between 50% and 200% of its original size.	100	50% ~200%
2 	H scale Height Scale			
3 	ROT pattern	<p>Rotates pattern counterclockwise, in 90 degrees increments. Settings 5-8 add mirror imaging to the rotation.</p> 	1	1 : 0° 2 : 90° 3 : 180° 4 : 270° 5 : 0° 6 : 90° 7 : 180° 8 : 270°
4 	Angle	Rotates pattern counterclockwise, in 1° increments.	0	0 ~89°
5 	Origin	When On, automatically returns the pantograph to the pattern origin, when sewing has been completed.	1	1: ON 2: OFF
6 	Socks	<p>Used for the sock frame attachment. Automatically sews two repetitions of a pattern, by manually setting two origin points for the same pattern. To set the 2 origins:</p> <ol style="list-style-type: none"> 1. Move the frame to where the second item is to be sewn, and then Press the Drive key to enter Drive. 2. Then move the frame to where the first item is to be sewn, and press the start bar to sew. <p>0 = Off 1 = On - Normal setup 2 = On – Second repetition mirrored 3 = On - Second repetition rotated 180°</p>	0	0 : Off 1 : Normal setup  2 : Mirror  3 : Rotation 

No. & Icon	Parameter	Function	Default Value	Range of Values
7 	Appliqué	Moves the pantograph forward for easy placement of appliqué fabric. The default movement is 1-1/2 times the height of the pattern. A new value can be programmed in the A. Offset parameter.	0	0: On 1: Off
8 	A H Offset	Sets the amount of distance in the H and V direction that the pantograph will move when Appliqué is on. If set at 0, the pantograph moves forward 1-1/2 times the height of the pattern.	0	-3000mm ~3000mm
9 	A V Offset			
10 	Frame	Automatically moves the pantograph forward at the end of the pattern, by the height of the pattern, unless a new value is programmed in F. Offset parameter.	0	0: On 1: Off
11 	F H Offset	Sets the amount of distance in the H and V direction that the pantograph moves when Frame is on. If set at 0, the pantograph moves forward by the height of the pattern.	0	-3000mm ~3000mm
12 	F V Offset			
13 	Cap Frame	Sets the machine up for Cap frame embroidery, by slowing down the maximum sewing speed and speed table settings.	0	0: Off 1: Cap Frame 2: Option 1 3: Option 2
14 	Frame Type	Able to set frame preference for the use of sub-soft limits. 0-off. 3 different Frames sizes are programmable.	0	0 ~3

No. & Icon	Parameter	Function	Default Value	Range of Values
15 	Repeat	Sets the number of times a pattern will be repeated. Set at 201, the pattern will sew an infinite number of repeats.	1	1 ~201 (201: infinite)
16 	Matrix	Pattern arrangement controlling the number of times a pattern repeats vertically and horizontally.	0	0 : OFF 1 : ON
17 	V Repeat	When using Matrix, the number of patterns in the V and H directions. Maximum number of patterns (V and H repeat) in a Matrix is 400.	1	1 ~400 Total of repetition (V+H) =400
18 	H Repeat			
19 	V Space	Space between patterns in the left to right direction.	0	-1000mm ~1000mm
20 	H Space	Space between patterns in the front to back direction.		
21 	Start Dir	<p>Sets the direction the matrix will be sewn.</p>  <p>0 1 2 3</p>  <p>4 5 6 7</p>	0	0~7
22 	Swing Type	Increases/decreases the width of Satin stitches sewn, according to the value set in Machine Conditions parameter #14 Swing.	0	0 : V and H 1 : V(X) only 2 : H(Y) only

3. Setting the Sub-Soft Limit

The machine software allows 3 embroidery areas to be programmed to limit the movement of the Pantograph. This feature is called the Sub-Soft Limit.

Program the lower left corner (P1) and the upper right corner (P2) for each area.

The pantograph movement will be limited to the rectangular area created by these 2 corners.

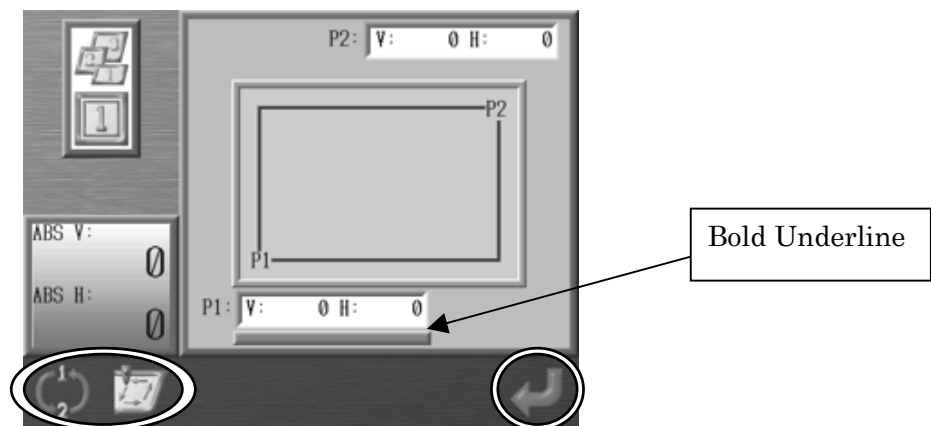
**Programming the 2 corners is done by moving the pantograph using the Jog keys.*

**The area for the Sub-Soft Limit cannot be larger than the Soft Limit Area set in the Machine Condition Parameters (MC).*


1. Press the **Design Edit Key**,  and select a design and press the **B-key** below the



2. Use the **Jog keys** and select item **14 Frame Type**.
3. It is inactive when it's set at 0. *The value can be changed from 1 to 3.
4. Press the **Origin key** to open the Setting screen.



5. Program 1. Use the Jog keys and move the Pantograph to find the lower left corner of the area. *When the P1 (V, H display) value is selected, it will have a Bold Underline under it as shown above.

If P1 is not selected, press  to change it to P1. Press this key to toggle back and forth between the P1 and P2 settings.


6. Press the **G-key** below the  icon to enter the position as P1.


The screen automatically toggles to the P2 setting for you to program it.

*P2 (V, H display) should have a Bold Underline under it.

7. Program 2.

Move the Pantograph to find the upper right corner of the area (P2).

8. Press the **G-key** below the  icon to enter position P2.

9. Press the **B-key** below the  icon to trace the area to see if the settings are correct.


4. Matrix Embroidery Set Up (Design Repeats)

This feature automatically repeats the design in the Embroidery area. The layout is calculated from the distance between the centers of the pattern and the quantity entered.

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

1. Press the **Design Edit Key**,




2. Select a design and press the **B-key** below the  icon.

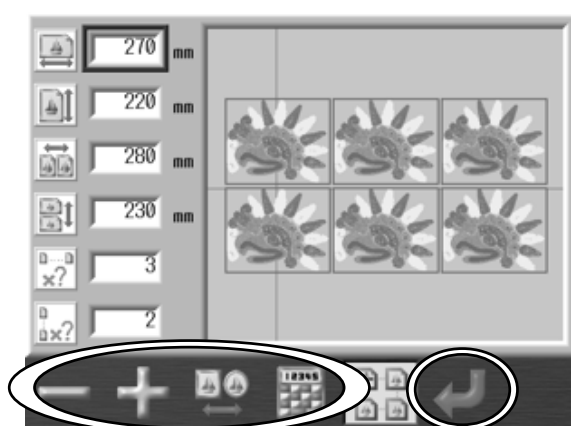
3. Use the **Jog keys** and select item 16, Matrix.


4. Set the value to 1.

5. Press and hold the **Origin key** to save the change.



6. Press the **E-key** below the  icon and the Matrix embroidery Design Repeats Set up screen displays.



Press the **E-key** below the  icon when finished to go back to the Program list.

7. Use the up and down Jog keys to select the item you want to change.



: Sets the border width around the pattern in millimeters.



: Sets the border height around the pattern in millimeters.



: Sets the distance between patterns in the V(X) direction in millimeters.

*The distance is measured from the center of the patterns (start point).



: Sets the distance between patterns in the H (Y) direction in millimeters.


* The distance is measured from the center of the patterns (start point).




: Sets the pattern repetition in the V(X) direction.




: Sets the pattern repetition in the H(Y) direction.


8. Press the **A-key** below the  icon for smaller number.

Press the **B-key** below the  icon for larger number.

Note: Press the **D-key** below the  icon to change values using the Numeric Entry

Menu. *Refer to *Chapter 3 10. Numeric Entry Dialogue Box*.

9. Press the **C-key** below the  icon to set the border shape. (Square or circle)

10. Press the **F-key** below the  icon to set the new values and view the changes made.

Note: The following Program parameters are automatically set with this feature.

#17: V repeat

#18: H repeat

#19: V space

#20: H space


5. Automatic Matrix Embroidery Set Up

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

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

1. Press the **Design Edit Key**,




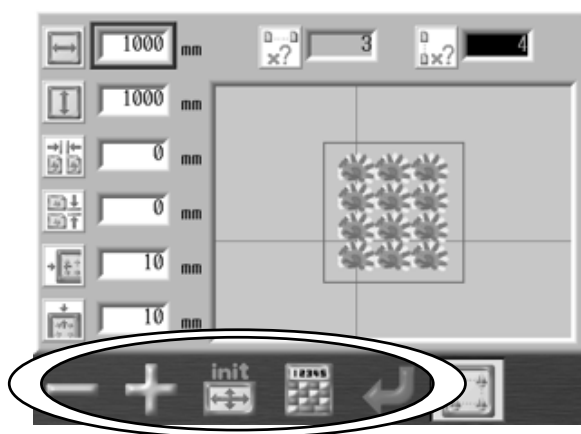
2. Select a design and press the **B-key** below the  icon.


3. Use the **Jog keys** and to select item 16, Matrix.

4. Set the value to 1.

5. Press and hold the **Origin key** to save the change.

6. Press the **F-key** below the  icon to view the Automatic Matrix Embroidery Setup screen.



Press the **F-key** below the  icon when finished to go back to the Program list.

7. Use the up and down Jog keys to select the item to change.



: Sets the V direction area of the Frame size in millimeters.

*The default value is the Frame limit settings, as set in MC.



: Sets the H direction area of the Frame size in millimeters.

*The default value is the Frame limit settings, as set in MC.



: Sets the distance between designs in the V(X) direction in millimeters.



: Sets the distance between designs in the H(Y) direction in millimeters.




: Sets the inside margin of the frame in the V(X) direction in millimeters.



: Sets the inside margin of the frame in the H(Y) direction in millimeters.

8. Press the **A-key** below the  icon for smaller numbers.

Press the **B-key** below the  icon for larger numbers.

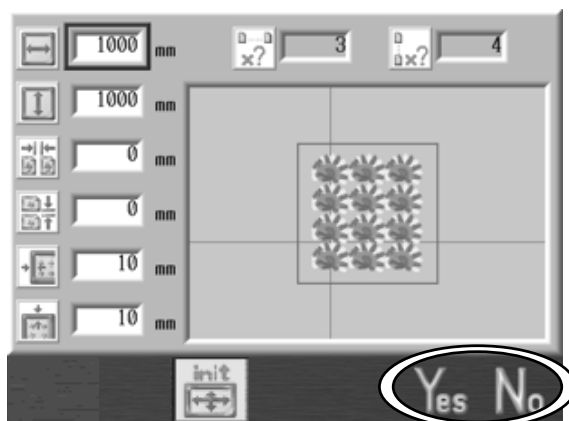
Note: Press the **D-key** below the  to change values using the Numeric Entry Menu.


*Refer to *Chapter 3 10. Numeric Entry Dialogue Box*.



Note: To initialize embroidery area to MC default settings, Press the **C-key** below the



. The following window appears to confirm the initializing.



Press the **F-key** below the  icon to accept.

Press the **G-key** below the  icon or **C-key** below the  icon to cancel.

Note: The following Program parameters are automatically set with this feature.

#17: V repeat

#18: H repeat

#19: V space

#20: H space.

Chapter 8 Embroidery

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)
8. Color Change Code (Teaching)
9. Function Codes
10. Stitch Back
11. Automending
12. Stand-By Mode (Resume)

1. Start Point

Instructions on registering the design start point.

Each design can have its own start point.

1. Select a design from the Memory. Use the **Jog keys** and move the pantograph to the location where you want to start the design.
2. Press the **Drive key** to put the machine in Drive mode. The start point is now registered for the design. Refer to *2. Drive Mode* in this chapter for more information.

*Designs just loaded into memory do not have Start Points, until entered into Drive.

3. Press the **Origin Key** to move the Pantograph to the Start Point already registered.

*In the Stand-By state, the Pantograph can move to the Start Point of any selected design in memory, by pressing the Origin Key.

*If a design has just been loaded, and never entered into Drive mode, the Pantograph moves to the machine's origin when the Origin Key is pressed.

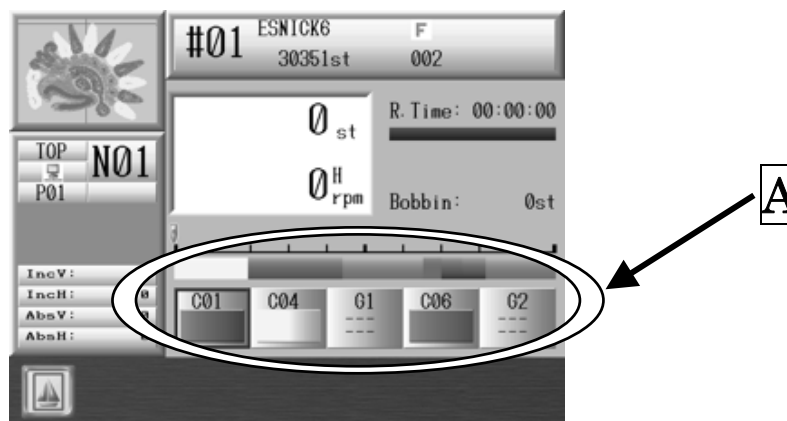
2. Drive Mode

Instructions for putting the machine in Drive mode

The machine can only sew when the machine is in Drive mode.

1. Press the **Drive Key** .

2. The following Drive mode screen appears. *The screen color changes.



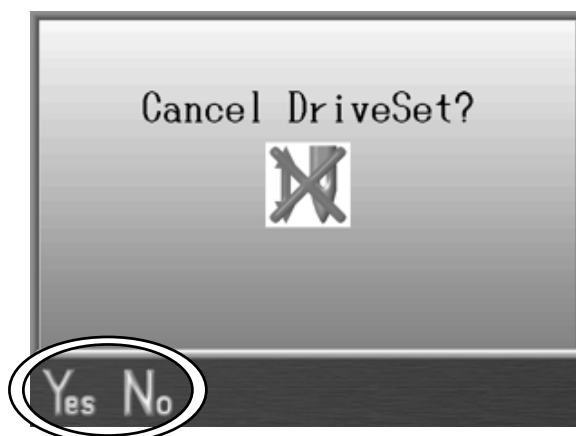
R.Time : Estimated remaining time to the end of sewing


Bobbin : Remaining stitch count for Bobbin counter


A shows the Color Change Function Codes.

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

4. Press the **Drive key**  and the following message appears.



5. Press the **A-key** below the  icon to put the machine in Stand-By mode.

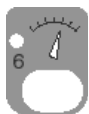
Press the **B-key** below the  icon to cancel and leave in Drive Mode.

3. Speed

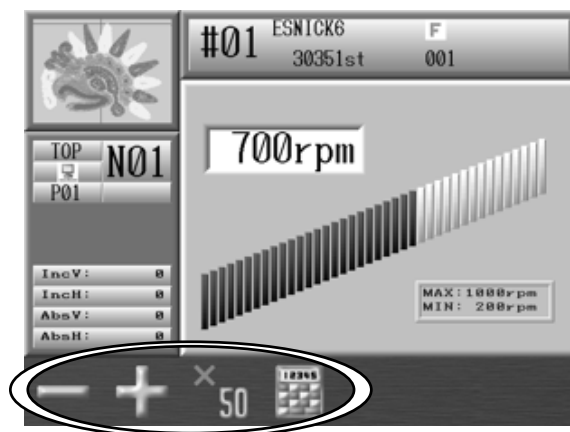
Instructions on changing the machine speed

The sewing speed can also be changed while the machine is sewing.


1. Press the **Speed key**





2. Speed Menu appears.



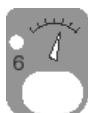
3. Press the **A-key** below the  icon to reduce the speed by 10 rpm.

Press the **B-key** below the  icon to increase the speed by 10 rpm.

If you press and hold the **C-key** below the  icon and then press the **A** or **B** key, the speed increases by **50 rpm**.

Note: Press the **D-key** below the  icon to change the speed using the Numeric Entry Menu. *Refer to *Chapter 3 10. Numeric Entry Dialogue Box* and enter the speed.

4. Press the **Speed key**



*The display will automatically go back to the Start Menu if no keys are touched for several seconds.

4. Trace

4-1. Perimeter trace

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

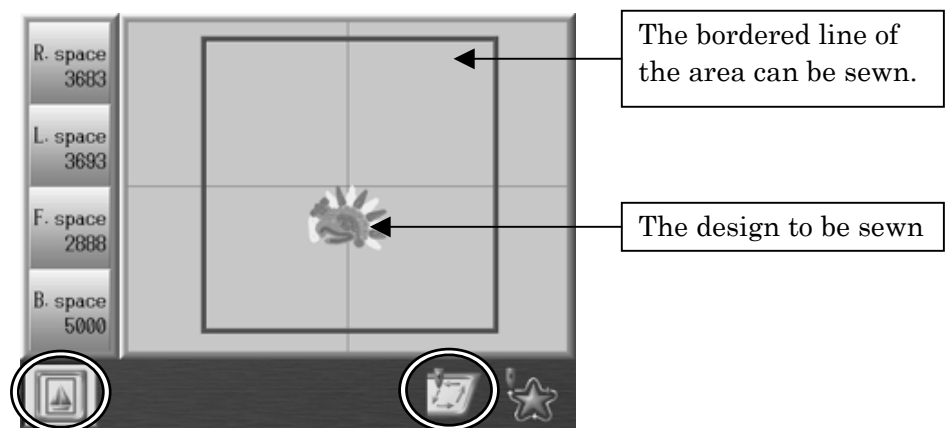
**The 4-corner trace takes into consideration any of the Program parameters that may have been altered.*

The Pantograph make a 4 corner trace of the design to ensure proper placement of the Pantograph. This feature is only available in Drive mode and SHOULD be done before sewing.

1. Press the **Drive Key**  and open the Drive Mode Screen.

2. Press the **A-key** below the  icon.

3. The Trace screen appears.




Following information are shown on this page:

R.space: Distance from the design to the right end of the frame

L.space: Distance from the design to the left end of the frame


F.space: Distance from the design to the front end of the frame

B.space: Distance from the design to the back end of the frame

Press the **A-key** below the  icon again to go back to the Drive Mode screen.

4. The design moves as the Pantograph moves with the Jog keys.

The borderline is normally shown in Blue. However, as the design gets closer to the line, it turns to yellow, then red.

5. Press the **F-key** below the  icon to start the Perimeter trace.

*If the design interferes with the border, the machine makes a beep sound and stops the trace in that direction. Relocate or resize the design so it fits in the border.

4-2. Outline Trace

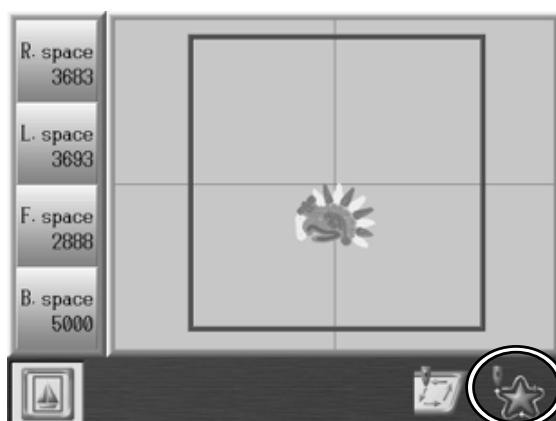
**Be sure the Frame limit parameters in the MC (Machine Condition) are correctly set before using this feature.*

The Pantograph traces the outline of the design to be sewn 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 reflects the Program parameters that have been changed.

1. Press the **Drive Key** and open the Drive Mode Screen.



2. Press the **A-key** below the icon.



3. Press the **G-key** below the icon to start the Outline trace.

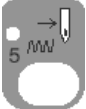


*If the design does not fit within the border, the machine makes a beep sound and stops the trace in that direction

5. Float

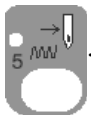
Float moves the Pantograph through the design without sewing.

*This function is only available in Drive Mode.

1. Press the **Float key**  and the Float screen appears.



2. Push the Start switch to start Float.
3. To end the Float, stop the machine with the Stop switch and then press the **Float key**,

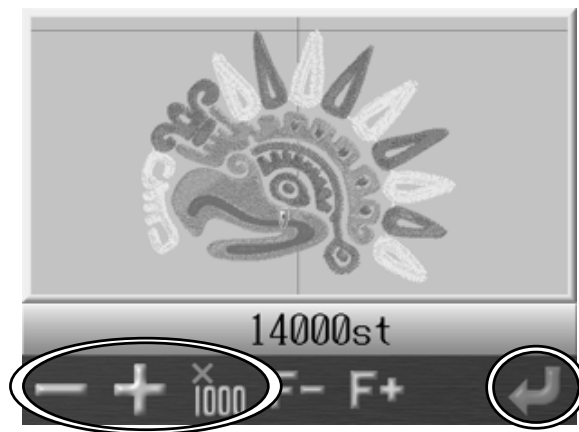



6. High Speed Float (By Stitch Count)

Instructions on floating to a specific stitch count

*This function is only available when operating Float in Drive mode.


1. Press the **Float key**  and the Float screen appears.




2. Press the **A-key** below the  icon for a smaller stitch number.

Press the **B-key** below the  icon for a larger stitch number.

*If you press and hold the (**A** or **B**) keys, the stitch number decreases/increases by 20 stitches.

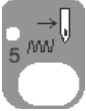
*If you press and hold the **C-key** below the  icon and then press the (**A** or **B**)-key, the stitch number decreases/increases by 1000 stitches.

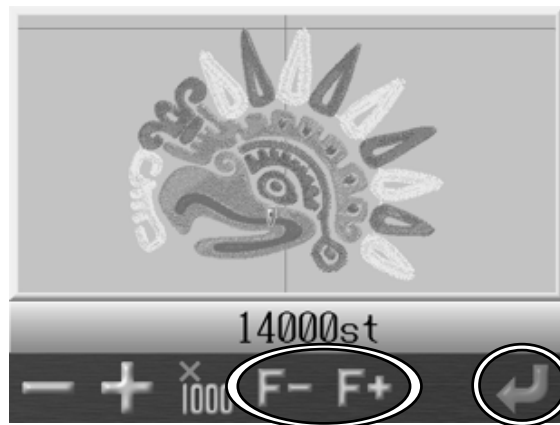
3. Press the **G-key** below the  icon and the Pantograph will go to the position of the stitch number selected.




7. High Speed Float (By Color Change)

Instructions on floating to a specific color change in the design data

*This function is only available when operating Float in Drive mode.


1. Press the **Float key**  and the Float screen appears.



2. Press the **D-key** below the  icon to find the previous color changes.
Press the **E-key** below the  icon to find the following color changes.
3. Press the **G-key** below the  icon to move the Pantograph to the chosen color change position.

8. Color Code Change (Teaching)

Instructions on changing the color sequence while sewing

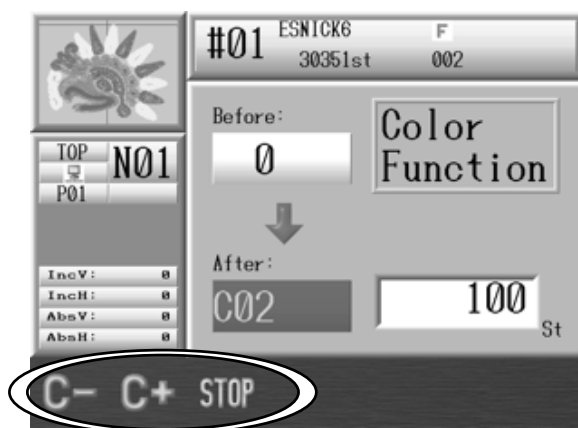
1. Press the **Drive Key**  and the Drive mode screen appears.



2. Press the **Color Change key** .

3. Push the Start Switch.

4. The sewing stops at the stitch count where the Color Codes or the Stop Codes are set in the pattern.


5. The controller shows the current code assigned.



6. Press the **A-key** below the  icon, or **B-key** below the  to change the Color code.

Press the **C-key** below the  icon to convert the code to a Stop code.



7. Push the Start switch to resume sewing with the new code.

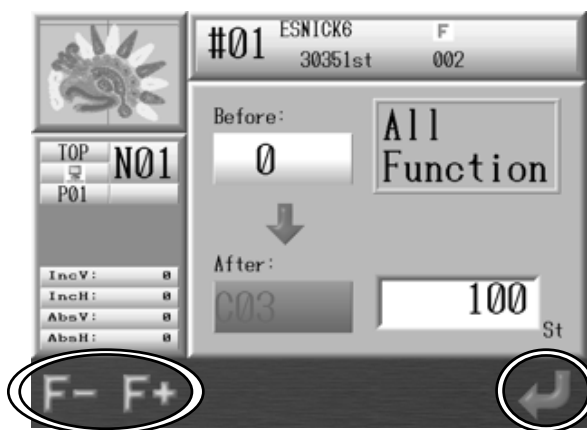
8. Stop the machine and press the **Color Change key**  to exit the teaching mode.




9. Function Codes


Instructions on changing all function codes while the machine is sewing

Use this feature with the High Speed Float (By Stitch Count) to change the Function code of the desired stitch. *Refer to *Chapter 13 1. Function Codes* for the details of the Function codes.

1. Press the **Drive Key**  and the Drive mode screen appears.
2. Float to the desired stitch number you want to insert or change a function code on.
3. Press and hold the **Color Change key**  for 2 short beeps.
4. The Function Code screen appears.



5. Press the **A-key** below the  icon or **B-key** below the  icon to change the Function code.
6. Press the **G-key** below the  icon to update the Memory with the new Function Code.

Press the **Color Change key**  again to finish.

10. Stitch Back

Instructions on backing up the machine to repair a missed stitch

1. If sewing, stop the machine with the Stop switch.
2. Push and hold the Stop switch to start the stitch back.
3. If you Stitch back past 30 stitches, the machine will continue to stitch back if you release the Stop switch. Use the Start switch in this case, to stop the Stitch back.
4. After stitching back to the desired position, push the Start switch to sew over the backed up stitches.

11. Automending

Automending is the Stitch back feature for one or more appointed sewing heads. In other words, not all the sewing heads, like the Stitch back feature.

Press and hold the Automending switch on the Tension Box for the appointed head, while the machine is stopped. The Pantograph will back up stitch by stitch, until the Automending button is released. The appointed sewing head or heads that have the Automending feature active, will have the Red LED on the Tension Box lit.

Use the Start switch to sew over the backed up stitching on the appointed sewing head(s) only.

1. Stop the machine with the Stop switch.
2. Press and hold the Automending switch on the Tension Box on the sewing head or heads that need stitches repaired and sewn over. Release the Automending switch as the Pantograph reaches the desired stitch position.
3. Push the start switch to start sewing automend stitches on the appointed head(s).
4. MC (Machine Condition) settings for Automending
 - #12 : Overlap – Overlap stitches after Automending, Default : 4
 - #13 : Auto Start – The automatic start after Automending, Default : Inactive

The Auto start option determines whether the machine stops after Automending or not.


When it stops: The machine stops where the Automending ends and Stitches back automatically as set by the Overlap parameter.

When it continues: The machine continues sewing and engages all of the sewing heads at the end of Automending.

* To Automend back on many stitches or to Automend on more than one head, press the Automend button on the appointed head(s) so the Red LED is lit on that head. Then press and hold the Stop switch to back up stitch by stitch. Backing up past 30 stitches will continue to back up when the stop switch is released. Press the start switch to stop backing up.

12. Stand-By Mode (Resume)

When the power to the machine is cut while in Drive mode, the machine can resume sewing in the position where it had left off. This is called Stand-By.

1. Turn ON the power to the machine.
2. Press the **G-key** below the  icon to search the Origin.



3. The Stand-By screen appears.



Press the **F-key** below the  icon to continue sewing.

Press the **G-key** below the  icon to exit Stand-By.

Chapter 9 Network

This chapter contains information on use the Network program.

1. Before Using the Network System
2. Registering the Operator Code
3. Break Call
4. Operator Call
5. Time-Out
6. Downloading Designs (Direct Downloading)
7. Downloading Designs (Scheduled Downloading)

1. Before Using the Network System

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

*Refer to *LEM Server Instruction Manual* for the Server side operation.

1. Introduction

- The server can send designs to designated machine.
- Operators can download designs from the server.
- The machine can update the designs to the server.
- The Network system automatically recovers the connections between the server and your machines.

2. Operations

The network has 2 major functions.

Logging machine status



Uploading /Downloading designs



3. File formats for the network system

The files downloaded from the server are converted into PRJ file. *1

4. To use the network system, following things will be required.

- BEXS Automat

[Barudan Options]

- Barudan LEM Server software

[The items to be prepared by Users]

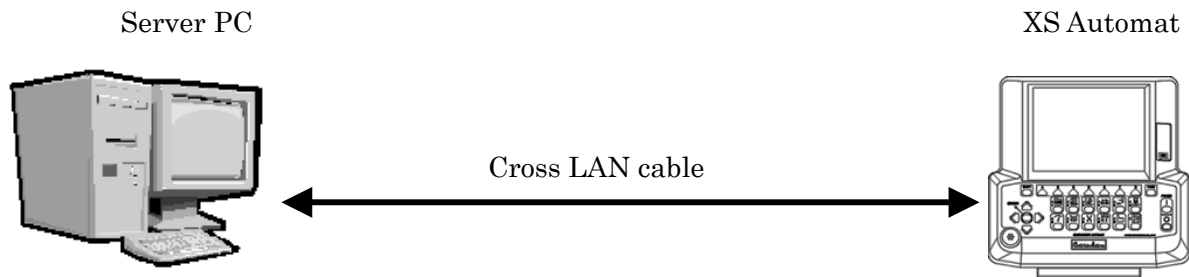
- Personal Computer with Windows 2000, Windows 2003, Windows XP or Windows Vista with a LAN connections. *Refer to *LEM-Server Instruction Manuals* for details.
- LAN cables *2
- HUB *3

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

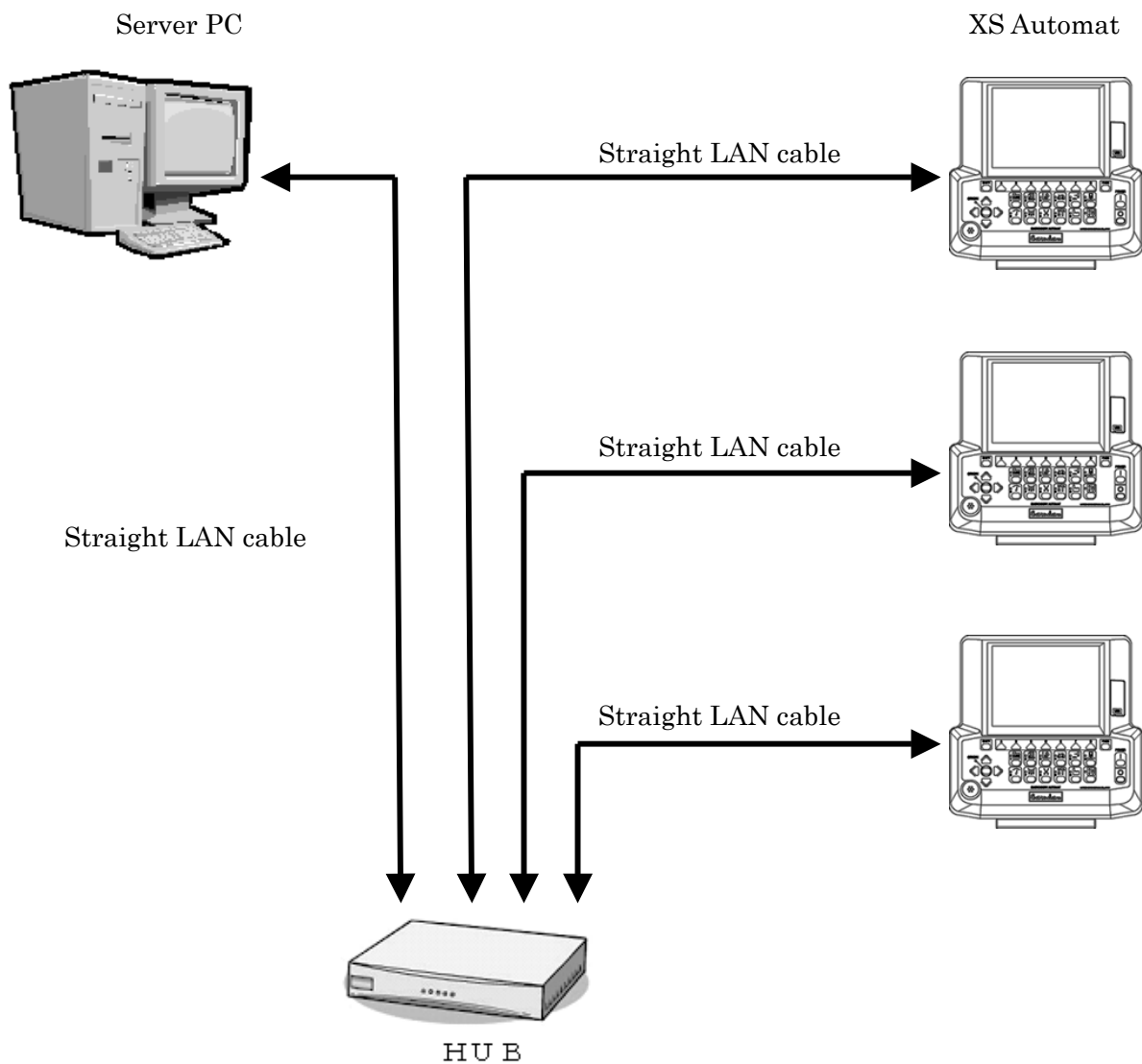
*2: The LAN cable may vary up to the connection schematic.

*3: A HUB will be required when connecting more than 2 machines to a server PC.

Example 1: One server PC and one Barudan XS series embroidery machine
(Using a Cross LAN cable.)



Example 2: One server PC and multiple Barudan XR series embroidery machines
(Using a straight LAN cable.)



2. Registering the Operator Code

Instructions for registering the operator code with the Automat

*Refer to the *LEM –Server Instruction manuals* for its operation.


2-1 Reporting the Operator Code

Reporting the current operator to the server.


1. Press the **Network key** .


2. Network screen displays.



3. Press  to view the Operator Code list.





Press the **B-key** below the  icon again to go back to the Network screen.

4. Choose an Operator Code.
5. Press the **G-key** below the  icon to send the operator code to the Server.


Press the **Network key**  again to go back to the Start screen.

2-2. Entering a new Operator Code

Instructions on entering a new operator code or changing one with the Automat

1. Press the **Network key** . When the Network screen displays, press  to view the Operator Code list.

2. Use the **Jog keys** and select the operator code to register or change.

3. Press the **D-key** below the  icon.



4. Character entry dialogue box appears.

refer to *Chapter 3 11. Character Entry Dialogue Box*.

*An operator code can have a maximum of 8 characters.

3. Break Call

Instructions on how an operator reports that they are on break and that the machine is not sewing. *Refer to *LEM-Server Instruction Manual* for its operation.

1. Press the **Network key**  to open the Network screen.
2. Press the **C-key** below the  icon to start Break. Break message appears.



3. Press the **C-key** below the  icon again to quit Break.

4. Operator Call

Instructions on placing a call to the server

*Refer to the *LEM-Server Instruction Manuals* for its operations.

1. Press the **Network key** to open the Network screen.




2. Press the **D-key** below the  icon to call the server.

5. Time-Out

Instructions on reporting that the machine is not in production

*Refer to the *LEM-Server Instruction Manuals* for its operation.


1. Press the **Network key**  to open the Network screen.

2. Press the **G-key** below the  icon.



3. Press the **A-key** below the  icon to report the Time-Out. The screen color changes.

*While in Time Out mode, you have to press and hold the Start switch on the machine if you want to sew something in this mode.

4. Press  again to report that the machine is ready for production.

(The screen color changes back.)

6. Downloading Designs (Direct Downloading)

Instructions on downloading designs that are saved on the server


Designs that will be downloaded need to be stored in the correct folders before downloading.

Set the Network server application to **Direct Download Mode** beforehand.

*Refer to the *LEM-Server Instruction Manuals* for its operation.


6-1. Searching a Design by its Name and Download


1. Press the **Network key**  to open the Network screen.

2. Press the **A-key** below the  icon.

3. The **Direct Download screen** displays.



Press the **A-key** below the  icon again to go back to the **Network screen**.

4. Press . Character Entry Menu appears.

*Refer to *Chapter 3 11. Character Entry Dialogue Box* for entering the design name to be downloaded.

5. Press the **G-key** below the  icon to start downloading.

The following information screen will be shown during downloading.





- A** The name of the design and total stitch number
- Width Width of the design
- Height Height length of the design
- Pass Distance between the start and end points, shown as horizontal and vertical values, measured in tenths of millimeters.
- P 1 Distance between the start point and bottom left corner of the pattern, measured in tenths of millimeters.
- P 2 Distance between the start point and top right corner of the pattern, measured in tenths of millimeters.
- B** The status time bar of the design being downloaded

6. When the download finishes, the screen will go back to the **Start screen** with the design selected on the screen.

6-2. Downloading from the Download History

1. Press the **Network key**  to open the Network screen.


2. Press the **A-key** below the  icon.

3. Press the **E-key** below the  icon.

4. **Download History** displays.



5. Use the Jog keys and select the design to download from the history list in the **Main menu**.

6. Press the **G-key** below the  icon to go back to the **Direct downloading screen** with the selected design.

7. Press the **G-key** below the  icon to start downloading.


7. Downloading Designs (Schedule Downloading)

Instructions on downloading scheduled designs registered on the server.


Set the Network server application to **Scheduled Download Mode** beforehand.

*Refer to the *LEM-Server Instruction Manuals* for its operation.


1. Press the **Network key**  to open the Network screen.

2. Press the **A-key** below the  icon. **Schedule Downloading screen** displays.



3. Use the Jog keys and select the design, then press the **C-key** below the  icon to show the design data information of the selected design. Refer to 6-1. *Searching a Design* by its Name and Download for details.



4. Press the **C-key** below the  icon to go back to the Schedule download screen.

5. Press the **G-key** below the  icon to start downloading.

*You can only download the first design in the list. You cannot download the other numbered designs in the list.

6. When the downloading finishes, the screen goes back to the Start Menu but the downloaded design still remains selected.

Chapter 10 Editing Memory Designs

This chapter contains information about editing designs.


1. Color Change Function Codes
2. All Function Codes
3. Running Stitch Additions
4. DSP (Design Stitch Processor)

1. Color Change Function Codes

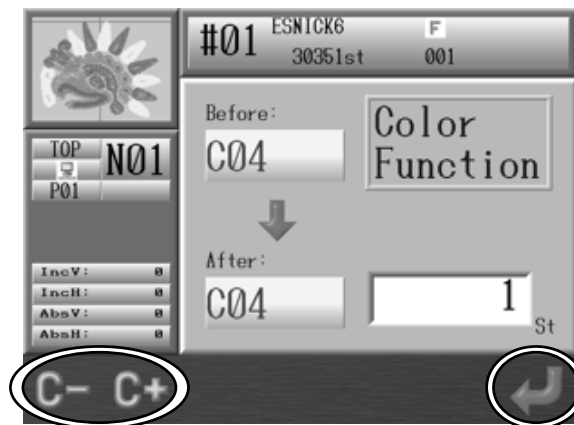
Instructions for searching and changing a color change function of the memory design selected.



This operation is not available in Drive mode, and it only applies to Color Change function codes.


*Please refer to *Chapter 13 1. Function Codes* for information on color change function codes.

1. Press the **Color change key**  in the Main keys.

2. **Color change function screen** displays.



3. Press the **A-key** below the  icon or **B-key** below the  icon to change the Color change function code.

4. Press the **G-key** below the  icon to save the change and go to the next color change function code in the design.


*An A24 message appears after the last color code in the design is found. Press the **G-key**

below the  icon to exit.

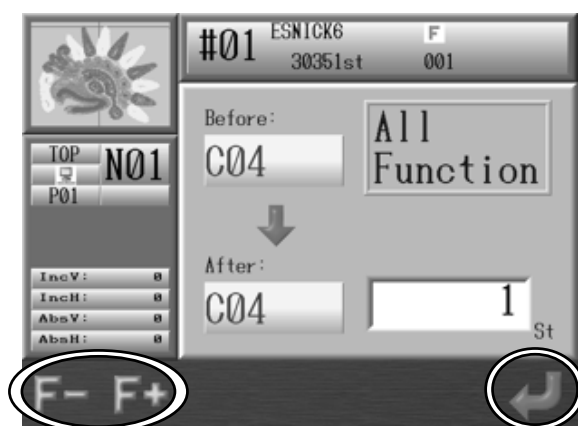
Press the **Color Change key**  again to go back to the Start Menu.



2. All Function Codes


Instructions for searching and changing **All** function codes in the memory design selected. **This operation is not available in Drive mode.** *Please refer to *Chapter 13 1. Function Codes* for information on function codes.

1. Press and hold the **Color Change key**  until it beeps.

2. The function code change screen appears for the selected Memory design.



3. Press the **A-key** below the  icon or **B-key** below the  icon to change the function code.

4. Press the **G-key** below the  icon to save the change and search for the next function code in the design.

* An A24 message appears after the last color code in the design is found. Press the **G-key**

below the  icon to exit.

Press the **Color Change key**  again to go back to the Start Menu.

3. Running Stitch Additions

Instructions for adding running stitches in a design


This function is not available during Drive mode.

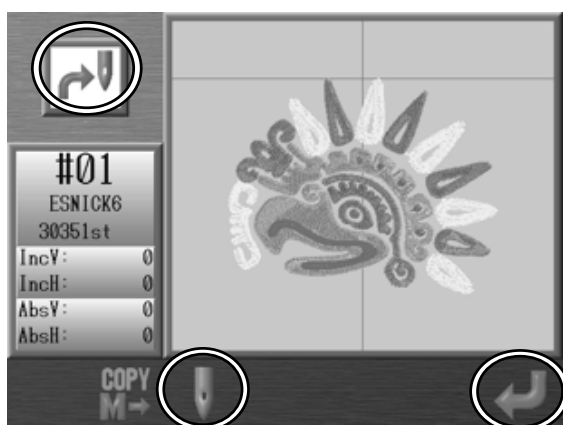
3-1. Adding running stitches using the Jog keys

Using the Jog keys adds running stitches, and at the same time, moves the pantograph.

1. Press the **Design Edit key**



2. Press the **A-key** below the  icon to open the Running stitch addition menu.



3. Press the **C-key** to change the mode of adding Jumps or Needle drops.

You can see what mode you are in by looking at the Icon in the top left corner of the display. The screen above shows the mode to add needle drops.




: Mode to add jumps



: Mode to add needle drops

4. Use the **Jog keys** to move the cursor to the point where you want to make an addition.

5. Press the **G-key** below the 

data.



Press the **Design Edit key**




again to go back to the Start Menu.

3-2. Design Additions


Instructions for combining 2 designs together into one memory location. Both designs must be in memory, and you import one of the designs into the other design location.


1. Press the **Design Edit key**  and then, press the **A-key** below the  icon to open the Running stitch addition menu.

2. Press the **B-key** below the  icon to import another design into the selected design.

*There needs to be more than 1 design saved in Memory to use this function.



Press the **B-key** below the  icon to go back to the Design Addition Menu.

3. Use the **Jog keys** to select another design that you want to add to the selected design.
4. Press the **G-key** below the  icon to start importing the design.

*If the importing design had been resized or rotated, it will import the data with these changes.

*Stitch addition and Design addition will be saved into memory after the last stitch in the selected design.

4. DSP (Design Stitch Processor)

4-1. Changing DSP

Instructions for making the selected design larger or smaller without changing the density of the design. Also, the Maximum stitch length, Satin and Tatami spacing, and Running stitch length can be changed.

1. Press the **Design Edit** key



2. Press the **G-key** below the



icon.

3. Press the **A-key** below the



icon and the DSP design list displays.



4. Use the **Jog keys** and select the item that you want to change values.

The value can be reduced/decreased by the



or



icons.

Note: Press the **C-key** below the



icon to change values using the Numeric Entry

menu. *Refer to *Chapter 3 10. Numeric Entry Dialogue Box*.


5. Press the **D-key** below the




icon to see the Memory design list.

6. Use the **Jog Keys** and choose a memory location to create the new DSP design in.

*If the memory location you chose already has a design in it, the old design will be overwritten.

7. After changing the values, press the **G-key** below the  icon to save the new design.




8. If you want to pause saving, press the **B-key** below the  icon.


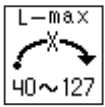



To cancel saving: Press the **A-key** below the  icon.

To continue saving: Press the **B-key** below the  icon.

*If the saving process was cancelled in the middle of saving, the incomplete design will be saved in Memory.

Press the **Design Edit Key**  again to go back to the Start screen.

4-2. Stitch Processor List

No. (Icon)	Item	Function	Range	Default
1 	Scale (Size)	Changes the design scale larger or smaller.	50~200%	100%
2 	MAX length	Sets the longest stitch length in the design. Use this setting to shorten the longest stitches in the design.	40~127	127
3 	SATIN space	Sets the Spacing of the Satin and Tatami stitches. Larger number: Stitches are less dense Smaller number: Stitches are denser	70~130%	100%
4 	TATAMI space			
5 	LINE pitch	Sets the length of running stitches. Larger number: Stitch length is longer Smaller number: Stitch length is smaller	70~130%	100%

Chapter 11 Preference

This chapter contains the following information.

1. Changing Machine Conditions (MC)
2. MC List
3. Sequin Adjusting Mode
4. Setting the Screen Color
5. Setting the Design Color
6. Network
7. Date Setting
8. Software Version

1. Changing Machine Conditions (MC)


Instructions on how to change the Machine Condition

1. Press the **Preference key**



2. Preferences setting screen below displays with various options.




3. Press the **A-key** below the  icon. The Machine conditions displays MC set up screen.



4. Use the **Jog keys** and select the parameter to change from MC setting list.

5. Press the **A-key** below the  icon for smaller number.


Press the **B-key** below the  icon for larger number.

Press the **E-key** below the  icon. Numeric Entry dialogue box appears.

Refer to Chapter 3 10. *Numeric Entry Dialogue Box* and enter the value.






6. Press the **G-key** below the  icon. Confirmation dialogue displays.


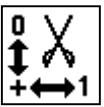
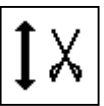
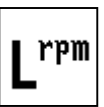

*Refer to Chapter 3 12. *Confirmation Message*.




7. After making changes, press the **Preference key**  again.



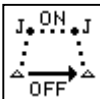

8. If there had been any changes made, confirmation screen appears.




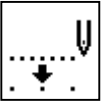
2. MC List

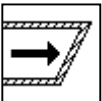
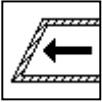
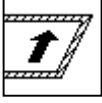




Icons	Parameter	Function/Action	Range Of Values	Default Value
1 	Borer 1	Switches off the thread break detector of a needle fitted with a boring device. Enter the number of the needle that has the borer. Set to 0 if a boring device is not in use.	0 – 15 [Needles]	0
2 	Trim Jumps	Controls the number of jump stitches above with the thread trimmer will cut the thread. If set at 3, when the M/C reads three or more consecutive jump stitches, it will stop and trim the thread. If set at 0, the thread will not be trimmed at any jump stitch.	0 – 9 [Stitches]	2
3 	Lock Stitch	<p>On starting up after a trim, the machine does lock stitches in the following methods:</p> <p>1,11 = Split stitch – splits first stitch into two stitches.</p> <p>*2,12 = Small triangle–sews a small triangle.</p> <p>*3,13 = Back stitch = splits first stitch into two stitches then backs over the same two stitches.</p> <p>Settings 11 –13 should be used if stitches less than 0.5 mm are needed at the start sewing.</p> <p>4 = to start sewing as the stitching data indicates (It doesn't lock stitches after a trim. (For DS, V1.70 R03~))</p> <p>14 = to start sewing where trimming was executed and sew as the data (It doesn't lock stitches after a trim. (For DS V1.70 R03~))</p>	1 - 4 and 11-14	1
4 	Clamp Type	<p>1 = Double clamp action (recommended for thick fabric): The clamp opens (at 295 degrees, it depends on Clamp Off Angle of MSU1) at first stitch before the needle penetrates garment and closes at dead bottom (0 degree).</p> <p>2 = Single Clamp action (recommended for thin fabric): The clamp opens at second stitch when sewing starts.</p> <p>3 = Clamp and fork action (recommended when a shorter tail is required at the start of sewing): The clamp opens at first stitch before the needle penetrates the garment.</p>	1 - 3	1
5 	Slow up Count	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.	3 – 15 [Stitches]	3

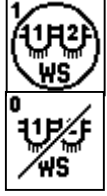





Icon	Parameter	Function/Action	Range Of Value	Default Value
6 	Trim Type	0 = Trimmers OFF 1 = Pantograph moves 0.4 mm to the left before needle penetrates and thread is trimmed. 2 = Pantograph moves backwards, then needle penetrates and the thread is trimmed. 3 = Same as 1, but slider pulls thread before trimming. 11 = The remnant of the upper thread under the fabric (at the start sewing/after trimming) will be shorter than normal length. Setting 11 opens the Thread clamps after the trim cycle to release the top thread tension on the check springs.	0 – 11	1
7 	Trim Dir	Sets the direction the pantograph moves after a thread trim. 0 = Moves in the H direction towards machine origin. 1 = Moves in the V direction towards machine origin.	0 - 1	0
8 	Trim Vector	Determines the distance in (0.1mm) that the pantograph moves before a trim. The function only activates when M/C is equipped with MK-6 trimming device.	0 – 50 [0.1 mm]	15
9 	Low Speed	Selects the speed at which the Low Speed function will operate. Determines the slow speed for precise stitches such as appliqué embroidery. Low speed function code needs to be inserted into design data in order to activate this parameter. M/C sews at slow speed after m/c reads low speed function code. A high-speed function code needs to be inserted and read to go back to normal sewing speed.	200 to max. speed [rpm]	450
10 	Jump Divide	Selects maximum stitch length that the m/c sews in a single head revolution. A stitch longer than the programmed values is divided into two stitches. E.g. if set at 80 (8mm), when the m/c encounters a stitch 10mm long, it will divide it into two stitches. *Move-offs may occur when 15 & 20 head m/c are sewing long stitch as on caps with cap frames due to the weight of the frames. In that case, the problem may be corrected by lowering the value (try 40 - 70). *If different m/c /fabric/design with various stitch lengths cause unexpected speed changes while sewing, this value can be changed to fix the problem (try 40 - 70). *Needle breaks while sewing hard, overlapping fabric with long stitches may be corrected by lowering the value (try 40 - 70).	30 – 127 [0.1 mm]	127









Icon	Parameter	Function/Action	Range Of Value	Default Value
11 	Stitch Back	<p>Controls number of stitches m/c will automatically back up at a thread break. If the function is off, m/c will not back up at a thread break. Otherwise, m/c backs up the number of stitches entered in this parameter. E.g., set at 4, the m/c automatically backs up four stitches after a thread break.</p> <p>*This function is ignored for Chenille/Lock stitch machines</p>	0 – 7 [stitch]	4
12 	Overlap	<p>Designates the number of stitches to overlap when automending. When embroidering towards the point of reversal, the other heads start working a few stitches before the point of reversal. *If beginning of sewing after automending stitches (with trimming) shows the bobbin on the top side, these extra stitches may cover the bobbin. *If the head misses a few stitches after automending stitches (with trimming), these extra stitches may cover the blank spot.</p> <p>*When MC#13 Auto Start value is 0, the m/c does not stop after automending stitches. Therefore, this function will not be activated.</p> <p>*This function is ignored with Chenille/Lock Stitch machines/Sequin Device running (code "S1")</p>	0 – 7 [stitch]	4
13 	Auto Start	<p>If On, during automend, the m/c automatically starts all heads without the operator moving the Start/Stop bar when it has sewn the total number of stitches to mend.</p> <p>0 = On, Automatically starts after Automend only. 1 = Off 2 = Automatically starts after Automend and Appliqué (Appliqué must be turned on in program). 3 = Automatically starts after Appliqué only (Appliqué must be turned on in Program).</p> <p>*M/C always stops after automending if manual trimming has been done right before automending, regardless of setting.</p>	0 – 3	1



Icon	Parameter	Function/Action	Range Of Value	Default Value
14 	Swing	<p>The distance in tenths of millimeters that is added or subtracted from the length of a stitch. This added or subtracted length is only applied to stitches that have a change in direction from the previous stitch. Therefore, this parameter has the effect of increasing/decreasing the width of a satin stitch, like typical lettering. This parameter has also effects the width of a tatami stitch.</p> <p>E.g.. If set to 1 (0.1mm/one each side), the width of a satin stitch expanded to 0.2mm wider than before.</p> <p><i>Note: If you want to add/subtract the length of stitch one direction only, sets at 1 or 2, “#22 Swing Type” in Program as follows.</i></p> <p><i>0 = Increase/decrease width in both directions.</i></p> <p><i>1 =Increase/decrease width in the Vertical direction only.</i></p> <p><i>2 = Increase/decrease width in the Horizontal direction only.</i></p>	-15 - +15 [0.1mm]	0
15 	Frame Start	<p>Determines when panto. starts to move in relation to the needle (degree wheel setting).</p> <p>*Parameter changes may improve thread break problems and stitch quality.</p> <p>Refer: If set to 70, the Pantograph starts moving at 70 degrees after the needle penetrated (at 300 degrees).</p>	45- 135 [degree]	70
16 	SF (Spectacle Frame) (Optional Frame being used in the USA)	<p>Sets the m/c up for a spectacle frame allowing you to execute pantograph movements exactly as programmed.</p> <p>0 = condenses the programmed pantograph movement (Jump stitches).</p> <p>1 = M/C moves per actual programmed pantograph movements. *Perimeter trace, Origin key, Frame (#10 in program), Seeking origin movement when the m/c powered On, are all disabled with setting when set to 1. (DS V1.40 R00 ~)</p> <p>2 = M/C moves per actual programmed pantograph movements.</p> <p>*Set to 1 to avoid hitting the pressure foot when using spectacle or sock frames.</p>	0 - 2	0
17 	Needle Down	<p>Determines if the needle is lowered after a thread break for easier threading.</p>	0 - 1	1

Icon	Parameter	Function/Action	Range Of Value	Default Value
18 	Appliqué	Sets pressure foot height when the Appliqué command is executed. Parameter is set in degrees, referring to the pressure foot height as shown on the degree wheel. *This method may be used for verification of start position.	60 – 120 [degree]	80
19 	T - Break	The m/c is designed to stop automatically when top thread is broken. Normal value is 3, meaning the m/c requires three consecutive thread break detections before stopping. *If the m/c does not stop even though a thread break occurs, changing the value to 2 may correct the problem. *If the m/c stops without a thread break, changing the value to 4 or 5 may correct the problem.	1 – 9 [stitch]	3
20 	0 admit	Determines the number of 0 data stitches allowed when the pattern is read into memory. 0 = deletes all 0 data, letting none into the pattern in memory. Setting at 1 allows one 0 data stitch, etc. up to 8. 9 = Allows all 0 data stitches into memory. *All 0 data stitches will be deleted automatically after thread is trimmed, even if set to 9.	0 - 9	0
21 	Combine Data	Determines the smallest stitch length allowed when pattern is read into memory. Stitches smaller than allowed length are combined into larger stitches. E.g.. 0 = No allowance 1 = less than 0.1mm stitches are combined into larger stitches. 2 = less than 0.2mm stitches are combined into larger stitches. 5 = less than 0.5mm stitches are combined into larger stitches. * Less than 0.4mm stitches will be combined into larger stitches automatically after the thread is trimmed.	0 - 9	0

Icon	Parameter	Function/Action	Range Of Value	Default Value
22 	Right Limit	Sets right soft limit – allowable distance pantograph can move to the right of the mechanical origin.	0 – 3200 [mm]	500
23 	Left Limit	Sets left soft limit – allowable distance pantograph can move to the left of the mechanical origin.	0 – 3200 [mm]	500
24 	Back Limit	Sets back soft limit – allowable distance pantograph can move to the front of the mechanical origin	0 – 3200 [mm]	500
25 	Front Limit	Sets front soft limit – allowable distance pantograph can move to the back of the mechanical origin	0 – 3200 [mm]	500
26 	LCD Mode	Not Used	-----	-----
27 	LCD Bright	Sets the color mode of the LCD screen.	1: dark 2: normal 3: bright	2
28 	Roll to Roll	<p>Sets the Roll-to-Roll function active. 0 = Roll to Roll not used 1 = Manual Roll to Roll ON/ Roll to Roll m/c</p> <p>* 1: Activated on stitch with a SE function code, the needle will remain down in the fabric (D32 Icon will also be displayed). Panto clips should be released and then press the start bar, the pantograph will move back to the start origin. Or move the panto to the position as set by values in F.offset (Program).</p> <p>* For roll to roll m/c, set to 1 and set Roll to Roll type (MSU2) to 1 (for normal roll fabric) or 2 (for thinner roll fabric).</p>	0 - 1	0


Icon	Parameter	Function/Action	Range Of Value	Default Value
29 	WS System	Sets WS System Active. 0 : OFF 1 : ON	0 - 1	0
30 	Clamp Frame	Not Used	-----	-----
31 	Warm Up Speed	Not Used	-----	-----
32 	Warm Up End	Not Used	-----	-----
33 	Frame Option	Sets the gain parameter automatically 0: Portal Frame 1: Spider Frame 2: One Touch Frame Note: *This function can only be activated with m/c equipped with AC Servo Motors for V/H axis. *Parameter used if m/c encounters distortion problem while running when using one of the inner frames listed due to pantograph load. *Set to 1 and press the DRIVE button, rewrites AC servo motor parameter to G3 from G2 automatically. *Set to 2, and press the DRIVE button, rewrites AC servo motor parameter to G4 from G2 automatically.	0 - 2	0
34 	Sequin size L1	Sets the Sequin Size Change on Left side	0-50	0


Icon	Parameter	Function/Action	Range Of Value	Default Value
35 	Sequin size R1	Sets the Sequin Size Change on Right side	0-50	0
36 	Network Type	Not Used	-----	-----
37 	Marker Type	<p>Laser Marker operation</p> <p>1: Turns ON when the machine is not sewing. 2: Turns On only in “Drive mode” and not sewing. 3: Same as above item 1 + it resets to ON when the machine is powered ON. 4: Same as above item 2 + it resets to ON when the machine is powered ON.</p> <p>This feature is for DT/VT only.</p>	1-4	1
38 	Borer 2	Switches off the thread break detector of a needle fitted with a boring device. Enter the number of the needle that has the borer. Set to 0 if a boring device is not in use.	0 – 15 [Needles]	0
39 	Borer 3	Switches off the thread break detector of a needle fitted with a boring device. Enter the number of the needle that has the borer. Set to 0 if a boring device is not in use.	0 – 15 [Needles]	0
40 	Sequin size L2	Sets the Sequin Size Change on Left side	0-50	0
41 	Sequin size R2	Sets the Sequin Size Change on Right side	0-50	0
42 	Marker Type	<p>Presser foot function control</p> <p>0: Not used. 1: Changes Presser foot height by the Needle number. 2: Changes the Presser foot height by the PR function code in the color change F-list.</p>	0-2	0

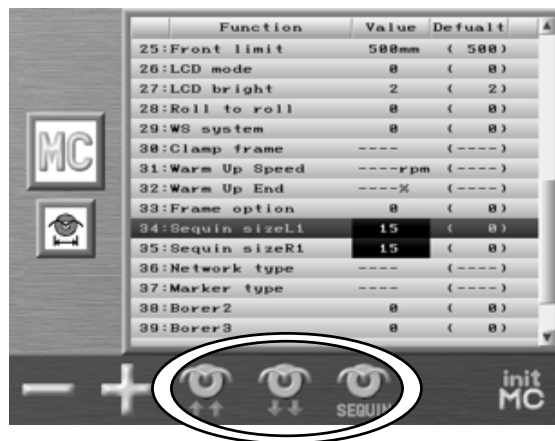
43		Rotary Sequin	<p>Rotary sequin control</p> <p>0: The last number of needle is available for the sequin device</p> <p>1: All needles are available for the sequin device.</p> <p>Parts needs to be changed to sequin parts on using needle number.</p>	0-1	0
44		Special MC	<p>This is used to change the Parameters of SMC, SMSU</p> <p>(For Chenille machine only)</p>	-----	-----

3. Sequin Adjusting Mode

Instructions on the Sequin devices and adjusting mode operations


1. Press the **Preference key** . Preferences setting screen below displays with

various options. Press the **A-key** below the  icon. The Machine conditions displays MC set up screen.



2. Go to MC setting list and select either 34: Sequin size L1 or 35: Sequin size R1, then press the Origin key to have the machine on the Sequin Adjusting mode.
(This function cannot be selected when Sequin device is not connected.)

3. Press the **C-key** below the  icon to feed a Sequin on all heads.

4. Press the **D-key** below the  icon to feed back a Sequin on all heads.

5. Press the **E-key** below the  icon to do adjustment of each head.

4. Setting the Screen Color

Instructions on setting the screen color

4-1. Setting by RGB Color number

1. Press the **Preference key**,



. Preference setting screen below displays with various options.

2. Press the **C-key** below the Main icon of



. Following screen color changing setting menu displays.



3. Set the colors by moving the color scroll bars on the color lines with numbers.

Here, you can create an original color by mixing these 3 colors.

Main Window : Screen color for the main window

Sub Window : Screen color for the information window

Sub Info : Inner window color for the information window

Drive Set : Screen color during Drive set

Drive Info : Inner window color of the information window during Drive set


Float : Screen color during Float

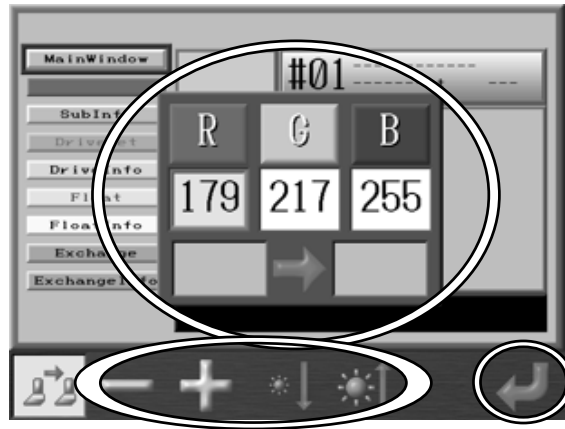
Float Info : Inner window color of the Information window during Float

Exchange : Screen color during changing frames

Exchange Info : Inner window color of the information window during changing frames


4. Use the Jog keys and select the item that you want to change the color.

5. Press the **A-key** below the Main icon of , or the **Origin key**. Following dialogue box appears.





The color details will be shown in RGB.

Left shows the color before the change and right shows the color after the change.

Press the **A-key** below the Main icon of  to cancel the changes and close the dialogue box.


6. Use the Jog keys and enter the value that you want to change to from RGB.


Press the **B-key** below the Main icon of  for smaller value.

Press the **C-key** below the Main icon of  for larger value.

Press the **D-key** below the Main icon of  to reduce all RGB value together.


Press the **E-key** below the Main icon of  to increase all RGB value together.

7. Press the **G-key** below the Main icon of  to save the changes.

8. Press the **F-key** below the Main icon of  to change the all colors to default.

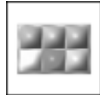
4-2. Easy Settings

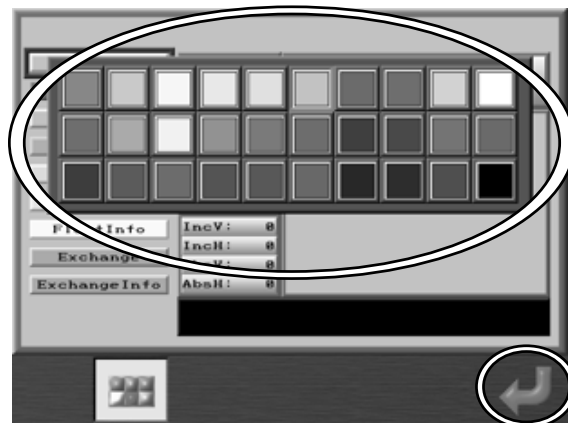
Instructions on selecting a design color from the color list


1. Press the **Preference key**, . Preference setting screen below displays with various options.

2. Press the **C-key** below the Main icon of  to view the Screen Color setting screen.

3. Use the Jog keys and choose the number to change the color.

4. Press the **B-key** below the Main icon of . Following dialogue appears.



Press the **B-key** below the Main icon of  to close the dialogue without saving changes.

5. Use the **Jog keys** and select the color.

6. Press the **G-key** below the Main icon of . It shows the design color.

5. Setting the Design Color

5-1. Instructions on setting the design color by the value

Colors can be changed by changing the value of **R** (red), **G** (green) and **B** (blue).

1. Press the **Preference key**,



. Preference setting screen below displays with

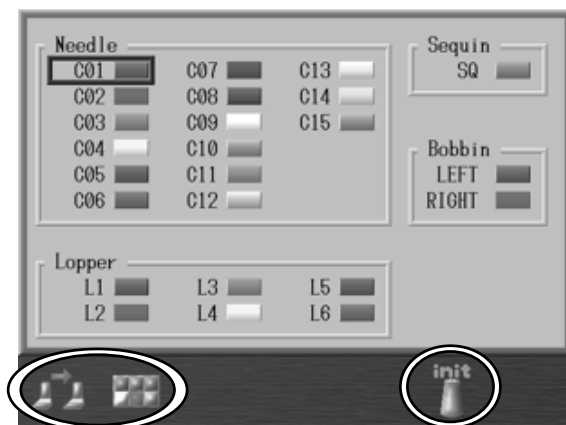
various options.

2. Press the **D-key** below the Main icon of



. Design color setting screen will

display.



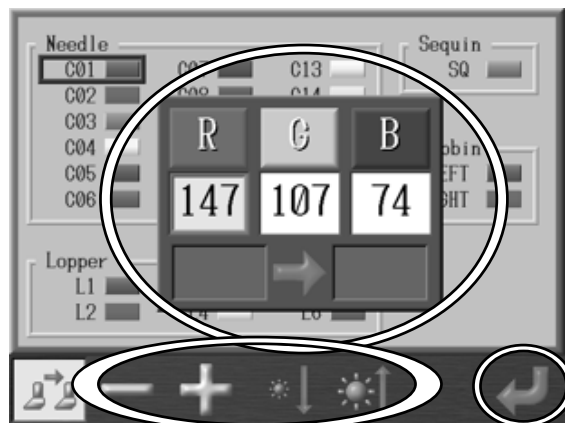
3. Use the Jog keys and select the number that you want to change the color.

4. Press the **A-key** below the Main icon of




or the **Origin key**. Following dialogue

box appears.





The color details will be shown in RGB.


Left shows the color before the change and right shows the color after the change.


Press the **A-key** below the Main icon of  to cancel the changes and close the dialogue box.


5. Use the Jog keys and enter the value that you want to change to from RGB.


Press the **B-key** below the Main icon of  for smaller value.

Press the **C-key** below the Main icon of  for larger value.

Press the **D-key** below the Main icon of  to reduce all RGB value together.


Press the **E-key** below the Main icon of  to increase all RGB value together.


6. Press the **G-key** below the Main icon of  to save the changes.

7. Press and hold the **F-key** below the Main icon of  to change the all colors to default.


5-2. Easy Settings

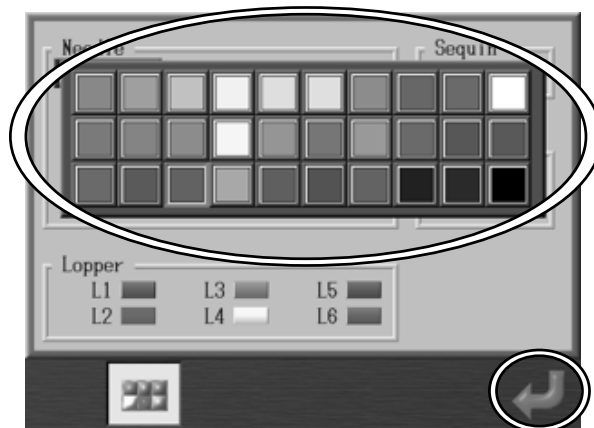
Instructions on selecting a design color from the color list


1. Press the **Preference** key, . Preference setting screen below displays with various options.

2. Press the **D-key** below the Main icon of  to view the Design Color setting screen.

3. Use the Jog keys and choose the number to change the color.

4. Press the **B-key** below the Main icon of . Following dialogue appears.



Press the **B-key** below the Main icon of  to close the dialogue without saving changes.


5. Use the **Jog** keys and select the color.

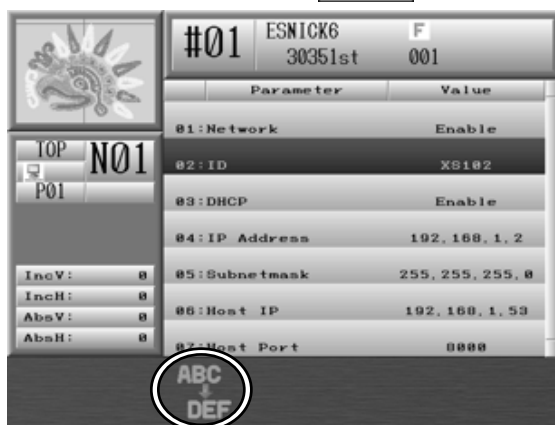
6. Press the **G-key** below the Main icon of . It shows the design color.

6. Network

Instructions on setting Network configurations


1. Press the **Preference key**, . Preferences setting screen displays.

2. Press the **E-key** below the Main icon of  to display the Network Menu.



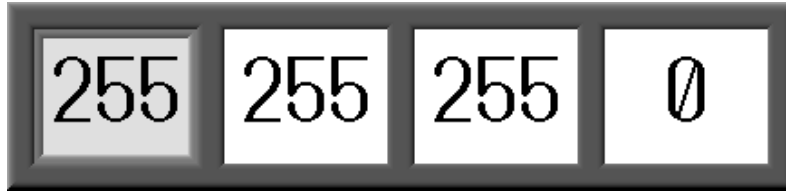
3. Select the item that you want to change from the Network setting item list.

Network : Input the “1”
ID : Set up desired automat ID name
IP Address : Set up IP address of the machine
Subnet mask : Leave as it – standard fixed value
Host IP : Set up IP address of the server
Host Port : Input the Port of the server


4. Press the **C-key** below the Main icon of .


Dialogue boxes to change each function's value appears.

5. When changing IP Address, following dialogue appears.



- Use the left and right Jog keys to select the item to change the value.
- Use the top and bottom Jog keys to change the value.

Press the **C-key** below the Main icon of  again to cancel the changes and go back to the Network setting menu.


6. Press the **G-key** below the Main icon of  to save the new value.

Refer to *Chapter 3 10. Numeric Entry Dialogue Box* and *Chapter 3 11. Character Entry Dialogue Box*.

7. Date Setting



Instructions on setting the Automat date and time

1. Press the **Preference key**, . Preferences setting screen displays.

2. Press the **F-key** below the Main icon of . Date setting menu appears.




3. Select the item, year, month, date, hour and minute.


Press the **A-key** below the Main icon of , or **B-key** below , to change the value.


Press the **G-key** below the Main icon of  to save the changes.

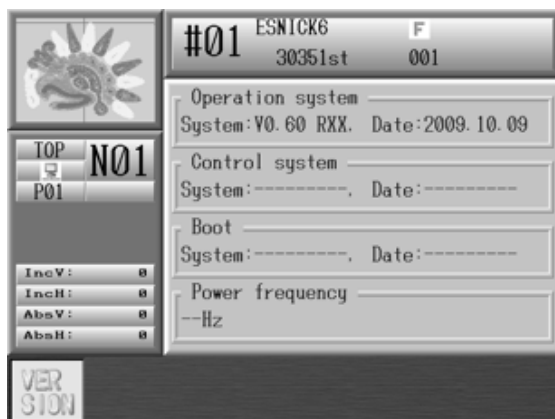
8. Software Version

Instructions on seeing BEXS software version

1. Press the **Preference key**, . Preferences setting screen below displays with various options.

2. Press the **G-key** below the Main icon of .

3. Press the **A-key** below the Main icon of . Following screen that shows the system version displays.



Operation system : Shows Version within operation
Control system : Shows Version with machine drive
Boot : Shows Version with boot ROM
Power Frequency : Shows power source frequency

Press the **A-key** below the Main icon of  to go back to the Preference setting screen.

Chapter 12 System

This chapter contains instructions on System programs.

1. System Structuring
2. Updating System software
3. Initializing Memory

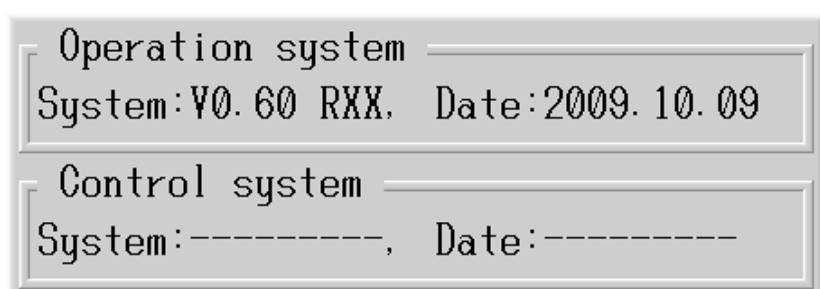
1. System Structuring

BEXS is composed of 2 system programs.

Each system needs to be updated when there are updated versions.

To check the software version loaded on the machine, see the Version information screen.

*Refer to *Chapter 11 8. Software Version*.



Operating system: Linux

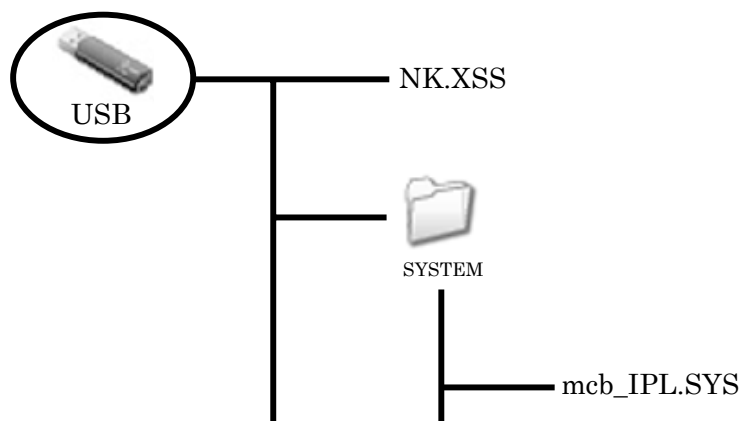
System Update File: NK.XSS

Control System is for Machine operating system (MC board)

System Update File: mcb_IPL.SYS *Save this file in the SYSTEM Folder

*Refer to *2. System Software Update* for System updating.

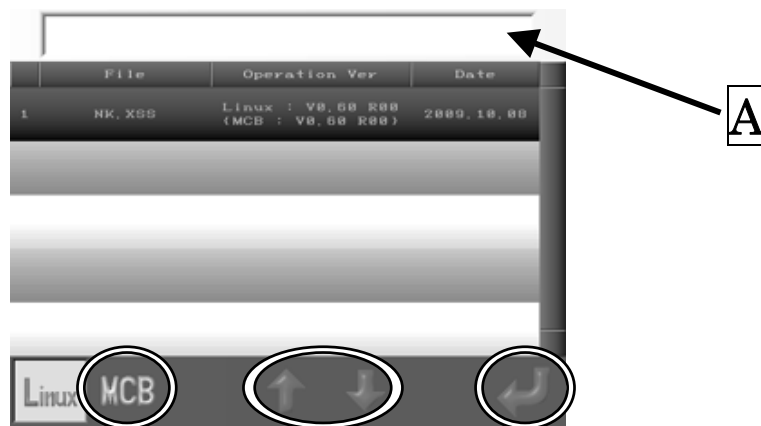
Save each system file in the appropriate folder in your USB as follows.



2. System Software Update

Instructions for updating the system software on the machine

1. Turn **Off** the power.
2. Insert the USB Flash Drive that contains the Software update.
3. While the machine is **Off**, press and hold the **Origin** key.
4. Press and hold the **ORIGIN** key until it makes an intermittent beeping sound.
5. The System Update screen displays.



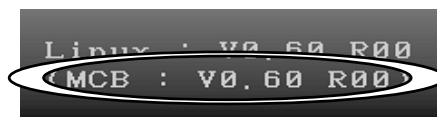
File names, System software version, date are shown.


In the A, the status of the system displays.

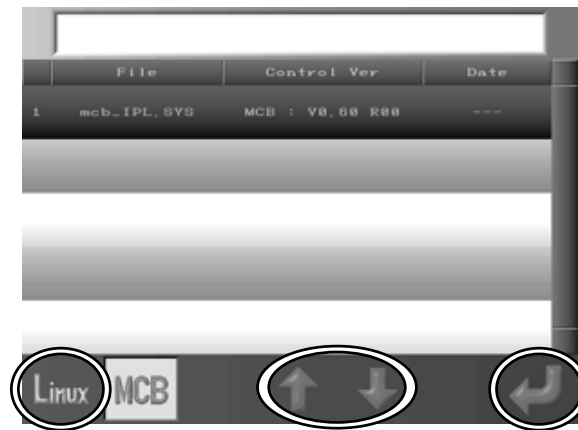
*Below shows how the Operation System version will be shown.


Update the shown version control system software in the parenthesis as well.



The machine may not operate properly with wrong version system software.



6. Press the **B-key** below the  icon to display the Control System Update screen.



7. Press the **A-key** below the  icon to display the Operation System Update screen.

8. Use the **D-key** below the  icon and the **E-key** below the  icon and select the System to update.

9. Select the System software that you want to update, and press and hold the **G-key**,



to update the system software. The System starts updating.

10. When the process is complete, turn Off the power and restart.


3. Initializing Memory

Instructions to initialize the machines memory.

*Be sure to back up the data before the initialization.

1. Turn **Off** the power.
2. Press and hold the **Origin key** and **Jog Up key** and turn **ON** the machine.
3. After a while, it becomes a screen like the figure below.



4. Press the **A-key** below the  icon.
5. The icon of "Yes" is displayed on the screen.
Press and hold the "Yes"-key to start the initialization.
If you want to cancel initialization, turn off the power.
6. The following message is displayed.
"Please Wait for Origin LED to blink."
7. Turn off the power after confirming Origin LED blinked, and turn on the power again.

Chapter 13. Appendix

This chapter contains the following reference information.

1. Function Codes
2. Sub-Function Codes
3. Error Messages

1. Function Codes

No.	Code	Function
0	0	Normal Stitch
1	JP	Jump Stitch
2	L	Low Speed
3	LJ	Low Speed Jump
4	H	High Speed
5	HJ	High Speed Jump
6	T1	Top Thread Trimming
7	T2	Bobbin Threading
19	G1	Group 1
20	G2	Group 2
23	SE	Sub End
32	C00	Stop
33	C01	Needle Bar 1
34	C02	Needle Bar 2
35	C03	Needle Bar 3
36	C04	Needle Bar 4
37	C05	Needle Bar 5
38	C06	Needle Bar 6
39	C07	Needle Bar 7
40	C08	Needle Bar 8
41	C09	Needle Bar 9
42	C10	Needle Bar 10
43	C11	Needle Bar 11
44	C12	Needle Bar 12
45	C13	Needle Bar 13
46	C14	Needle Bar 14
47	C15	Needle Bar 15

* 1
↓

No.	Code	Function
64	S0	Sequin OFF
65	S1	Sequin ON
67	SJ	Sequin Jump
68	CC	Chain Stitch
69	CL	Loop Stitch
70	PR	Presser foot height
71	SPL	Normal Embroidery
72	ST1	Taping & Cording Embroidery (R)
73	ST2	Taping & Cording Embroidery (L)
74	SZ1	Zigzag Embroidery (L)
75	SZ2	Zigzag Embroidery (R)
76	SC1	Coiling Embroidery (L)
77	SC2	Coiling Embroidery (R)
78	LN	Nipple Movement
79	LZ	Zigzag Movement
80	HSP	Head Selection Pattern

* 1 After G 1 : Group 1 is called Color Change Function.






2. Sub-Function Codes









No.	Codes	Function		Sub Function Sewing Pattern 1	Sub Function Sewing Pattern 2
68	CC	Chenille	Chain stitch	Looper (L)	Needle Height (H)
69	CL		Loop stitch	“—”, 1~6	“—”, 1~10
70	PR	Presser foot height		Height adjustment (P) “—”, 1~10	“— — —”
71	SPL	HL	Normal embroidery	“— — —”	“— — —”
72	ST1		Taping & Cording embroidery (R)	Normal / Blind (P) “—”, 1~2	“— — —”
73	ST2		Taping & Cording embroidery (L)		
74	SZ1		Zigzag embroidery (L)	Pattern (P)	“— — —”
75	SZ2		Zigzag embroidery (R)	“—”, 1~6	
76	SC1		Coiling embroidery (L)	4 Levels/(L/R) (P) “—”, 1~8	“— — —”
77	SC2		Coiling embroidery (R)		
78	LN		Nipple Movement	Lower Dead Point (B) “— —”, 1~10	Stroke (S) “— —”, 1~10
79	LZ		Zigzag movement	Width (S) “— —”, 1~15	“— — —”
80	HSP	Head Selection Pattern		Pattern (P) “— —”, 1~50	“— — —”








* “—” and “— —” remain the same.





* “— — —” is not in use.







3. Error Messages









Message (Code)	Description	Trouble shooting
A01 	No or Low Battery Voltage Error	If machine has been powered off for a long period time, or a replacement CPU board was installed, battery maybe low and need recharged. Leave machine on for 24 hours to recharge battery. If battery doesn't recharge, call tech support for info on replacement.
A05 	Wrong Tape Code or BAUD Rate Error	1. When sending a design via cable from a PC to the machine, the tape code setting on the PC must match the setting set on the machine in "IN COM" mode, otherwise you'll get this error. Barudan = U code Tajima = EL code ZSK = F code Make sure the PC transfer machine setting matches the Machine "In COM" tape setting. 2. Also check that the BAUD rate setting on the machine matches the BAUD output from the PC software program. They must match or you'll get this error. Call tech or software support to help diagnose.
A07 	IC Memory Error	EPROM writing error. Problem with CPU/Control board. Call Tech Support.
A08 	Memory is Full or Design Memory Read Error	1. Check to see if the memory is full first. Delete some designs if full. 2. This could also be a problem reading a design into memory. Try renaming the problem design, or try reading another design that's verified good. 3. If no designs will read into memory, may need to reformat the internal CF memory card. Call tech support.
A11 	No PC or Peripheral Device Connected Error	This error occurs when sending a design to the machine from a PC with a COM/Serial cable, and the cable is disconnected or broken. Check the cable connections first. Next try rebooting the computer and the machine and try again. If the COM connection has never worked before and you're setting this up for the first time, then the PC program settings or cable connections are suspect. Call tech or software support to help diagnose.








Message (Code)	Description	Trouble shooting
A20 	Memory Slot Empty	This is not an error. It's a message that the memory slot you've selected is empty and you cannot make any changes to it.
A21 	All Memory Slots are Empty	This is not an error. It's a message indicating that all the memory locations are empty. Load at least one design into memory to make this message go away
A24 	No More Color Change Codes Found	This message occurs when teaching colors in a design, and you've reached the last color change in the design, and no more color changes are found.
A26 	Sock Frame Origin Not Set	The sock frame parameter in "Program" menu, requires that you set the first sock frame origin while the machine is out of Drive mode. Then set the machine in Drive mode, and move the pantograph to origin of the second sock frame. If you do not move the panto to the second sock frame after putting into Drive, you'll get this error.
A27 	No more Function Codes Found	This message occurs when searching or programming function codes in a design, and you've reached the last function code.
A28 	Calculating Please wait	This is a message that the machine is busy. Wait till the message disappears before pressing any buttons.
A29 	Memory is Full	This is a message that all the memory locations are full. Delete some designs in order to load more in.
A34 	Too Many Color Changes in Design	The maximum amount of color changes is 400. The 401 st and more will be deleted from the design.










Message (Code)	Description	Trouble shooting
A35 	Spectacle Frame Error	Spectacle Frame is a special parameter in MC parameters. When Spectacle Frame is turned On, some machine operations are prohibited to protect the machine. This is the error message given when an operation is prohibited. If a spectacle frame is not being used, turn this feature Off.
A36 	Appliqué Error	When manual Appliqué feature is activated, you cannot use the origin key. This is to prevent bending the presser foot. Turn manual appliqué feature Off to use the origin key.
A37 	USB Memory Device is Full	Delete some designs off of the USB Memory Device.
A38 	No USB Memory Device Inserted	<ol style="list-style-type: none"> 1. Check that the USB Memory Device is inserted correctly. If inserted OK and still getting error, check Automat connector and/or try another USB memory device. 2. If still a problem, check the internal CF memory card and/or connection board. Make sure they are not damaged or came loose.
A39 	USB Read/Write Error	Retry using the USB memory or try another USB memory device.
A40 	Network Error	This error occurs when using Barudan's DFS (Design File Server) or LEM Networking Software to connect to the machine. It means the machine is disconnected from the network. Check that the cable from the PC to this machine is connected properly and not damaged. If OK, close the DFS or LEM software and reopen and retry. If still a problem. Reboot the computer and the machine to see if it corrects the network error. If the problem is intermittent, try re-routing the cable away from other electrical power cables or try a shorter cable.
A41 	Design Data Reading Error	This error occurs when reading design data that is made with a format problem or with wrong design information header. Try reformatting the bad design with digitizing/editing software or read another good design.







Message (Code)	Description	Trouble shooting
D01 	Needle Bar Not Locked	Color Change Lock sensor is not engaged or not working properly. Manually rotate the Color change assembly so the sensor plate engages the Lock sensor and retry. If still a problem look to see if the Sensor LED is working. If the Color Change assembly is in a bind or jammed, do not force. See Error D05 for possible binds.
D03 	Color Change Lock Error	Color Change Lock sensor is not engaged or not working properly. Manually rotate the Color change assembly so the sensor plate engages the Lock sensor and retry. If still a problem look to see if the Sensor LED is working. If the Color Change assembly is in a bind or jammed, do not force. See Error D05 for possible binds.
D04 	Color Change Needle Sensor Error	Needle Select Board in Color Change Assembly has a sensor for each needle. One sensor at a time should always be engaged and On. First manually rotate the Color change assembly to see if it clears up the problem. Do not force if color change is in a bind. See Error D05 for possible binds. If no binds and still getting this error, check the Needle select board to see if the sensor plate is bent or if any of the sensors are broken. Replace the Needle select board.
D05 	Color Change Error	<p>Machine had an error trying to make a color change. Manually rotate the color change assembly to see if there are any binds in the color change movement. Possible Binds.</p> <ol style="list-style-type: none"> 1. One or more of the thread keep solenoids is stuck or out of position causing it to jam a head from moving. 2. One or more of the Jump solenoids is not engaging 3. One or more take up levers are broken. 4. Sewing head side cover is interfering with head movement. 5. The Degree wheel is the wrong position. <p>Correct any of these conditions before continuing. May need to power down and back On to reset the machine, afterwards.</p>

Message (Code)	Description	Trouble shooting
D06 	Main Motor Trip Error	Try to restart the machine. If still getting error, turn Off and try rotating sewing head by hand and check for binds (To rotate the sewing head, remove the main drive pulley cover to get to the degree wheel and turn the degree wheel). See D07 trouble shooting for possible binds.
D07 	Main Motor Overload Error	Turn Off machine and rotate sewing head by hand and check for bind (To rotate the sewing head, remove the main drive pulley cover to get to the degree wheel and turn the degree wheel). If binding, take off the throat plate and check for thread wrapped around back of the sewing hook or sewing hook area. Try oiling the machine to see if it's easier to rotate. If you cannot find bind, call tech support for help.
D08 	Frame Limit Error	Message that the pantograph is beyond one of the soft limits as set in the MC parameters. Re-center the origin of design so it traces inside the limits without getting this error. Call tech support if soft limits need to be reset or changed in MC parameters.
D09 	Start/Stop Switch Error	This error means there is a problem with either the start or stop switch being stuck on. Check switches and wiring.
D11 	Rotary Encoder Error	Problem with encoder. Call tech support.
D12 	Trimmer Slider Error	Trimmer slider is stuck in down position or caught on un-trimmed thread. If caught on un-trimmed thread, break thread by hand and pull about 2 inches (50mm) of thread before letting the trimmer slider pull thread up into the thread catch. If machine continues to have D12 errors because it's not trimming, check and adjust the trimmers. Replace blades and wave washer if necessary. If D12 is happening because slider is sticking, check slider operation by hand and clean or repair as necessary for smooth operation.

Message (Code)	Description	Trouble shooting
D13 	No further Stitch Back or Automending due to 1600 stitch limit	Message that machine cannot stitch back or automend any further due to 1600 Stitch limit. If needing to stitch back/automend further, use float operation, and float back where needed. See operation manual for Float instructions.
D14 	Push Start Button	Message that start button needs to be pushed to continue operation.
D16 	Bobbin Break	(Optional Bobbin sensor equipped) Message that machine stopped due to bobbin thread break. Fix or replace bobbin thread.
D19 	Stopped for Stop Code	Message that machine stopped due to stop code in design.
D20 	End of Automending	Message that machine stopped due to Automend operation finished.
D21 	Stopped by Stop Switch	Message that machine was stopped by the stop switch
D22 	Trimmer Motor Error	<p>Trimmer motor is jammed or not stopping in the correct position.</p> <p>You must turn machine Off to reset this error.</p> <p>Check the trimmer blade adjustment.</p> <p>Birdnesting of thread will knock trimmers out of adjustment when trying to trim. Remove any excess thread from under throat plate and reset trimmer blade if needed.</p>
D23 	Stopped for Appliqué	Message that machine stopped due to stop code in design and Appliqué program feature is turned On.

Message (Code)	Description	Trouble shooting
D25 	Stopped for Thread Break	<p>Message that machine stopped due to thread break. Fix thread break and continue. If thread is not broke (false thread break) check that thread is wrapped around the thread detect wheel on the tension assembly.</p> <p>If false thread breaks occur on small stitches try increasing MC parameter #19, T-Break to a higher value.</p>
D26 	Pulse Motor Circuit Overheat	<p>Message that the machine stopped because the pulse motor drive (pantograph) circuitry has over heated. Power off the machine to let it cool down.</p> <p>Check and clean the fan and fan opening to make sure lint or other debris is not blocking them. Afterwards, power back On, and check that the fan is working. If fan works and still getting D26 error, call tech support.</p>
D27 	Stopped for Temporary Repair Stop	<p>Message that a temporary stop code was inserted in the design on the last run.</p>
D28 	No further Stitch Back or Automending due to Color Change	<p>This is a message saying you cannot back up any further unless you do a manual trim. Do a manual trim.</p>
D29 	Servo Driver Error	<p>Something jammed the pantograph while sewing, or there is a problem with the Servo electronics. Power off machine and make sure pantograph is not jammed by trying to move by hand. Remove any binds before powering on again. If no binds, power back On and see if it's OK. If still a problem, call tech support.</p>
D30 	Head/Duct Board Switch Error	<p>More than 2 switches on the Head/Duct board are ON. Please check and make sure switches are set properly. Check ribbon cable from head switch boards to head duct boards. An unplugged or damaged cable from one board will cause this error.</p>
D31 	Driver Box/Board Communication Error	<p>Problem with Automat recognizing that the Driver board is connected. Check cables from Automat to Driver board. Call tech support.</p>

Message (Code)	Description	Trouble shooting
D32 	Stopped for Sub End Code	Message that Roll to Roll feature is turned On, and machine stopped due to Sub End code in design data.
D33 	Power Interrupt Error	A power interruption to the machine has occurred. Power down the machine, then back On to re-set. If you continue to get this error, check for electrical power problems to machine. Try another known good power outlet, or another circuit that's not being used by other equipment.
D34 	Stopped by Light Curtain	Optional light curtain activated. Something is blocking the light beam or light beam is not working properly. Check light curtain.
D35 	Lubrication Error	Optional Device. Check Lubrication device.
D36 	Stopped for Bobbin Counter	When Bobbin counter feature is activated, machine stops, trims the bobbin and gives this message to let you know why it stopped. Change your bobbin, and start machine to reset.
D37 	Sequin Device Error	Check that Sequin Driver box is turned on. Call tech support
D38 	Chenille Driver Error	Turn off the machine and reboot. Make sure the Chenille Driver box is turned On. If the same error message displays again, check the wiring to the Needle Bar rotation motor. Otherwise motor may be faulty or jammed. Call Tech support.
D39 	Looper Motor Error	Turn off the machine and reboot. If still a problem, turn the Looper motor shaft manually until the (top) shaft sensor turns On and retry. Call Tech support for more help.
D40 	Chenille Thread Clamp Motor Error	Turn off the machine and reboot. If still a problem, turn the tension release motor shaft manually until the shaft sensor turns On and retry. Call Tech support for more help.

Message (Code)	Description	Trouble shooting
D41 	Chenille Needle Height Error	This error occurs when the needle bar height or cancel position is wrong. Turn off the machine and reboot. If still a problem, turn off the machine. Then manually rotate the (needle bar) leveling shaft on the problem head and see if the needle bar drive levers inside move smoothly and freely and not in a bind. Fix and correct any binds in the levers before turning the machine on again. Then, rotate the shaft to the lower position and see if the LED for Needle height origin sensor lights when engaged. Call Tech support for further help.
D42 	Chenille Error	This Chenille error occurs when there's a problem other than D38 to D41. Its' most likely a stepper driver board problem in the Chenille Drive box. Call tech support for help.
D43 	Presser Set Error	Call Tech support.
D44 	Lock Stitch Zig-Zag Driver	Call Tech support.
D45 	Lock Stitch Zig-Zag Tension	Call Tech support.
D46 	Lock Stitch Zig-Zag Error	Call Tech support.

Embroidery Machine

BEXR

BEXS

BEXY

series

Mechanical Guide

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Barudan

Chapter 1 Machine Basics

Machine Installation

Normally, your machine is installed by a technician. Instructions are provided if the machine ever needs to be moved. Check that you have all accessories from the installation kit:

- **Leveling Bolts**
Arm type machine: four (4) leveling feet, ten/twelve (10/12) leveling bolts for the twelve and fifteen head machines.
Bridge type machine: five (5) leveling pads.
- **Light Fixture** Already assembled above the sewing area. The 110V machines have a separate power cord for the Lamp Assembly. Therefore, they need to be plugged into a separate outlet. *Do not plug into the outlet on the front of the Driver Box.*
- **Felt Pads** (one per needle per sewing head) If necessary, place a Felt Pad on each of the Spool Pins located on the Thread Stand before threading.

Verifying Machine Outlet Voltage

1. Check the installation site outlet voltage.

The voltage should be 100V to 240V or 200V to 260V. If in doubt regarding voltage, have a qualified electrician check it.

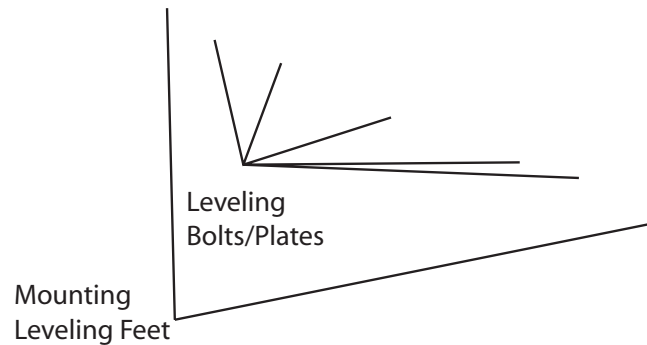
NOTE: The machine can be configured to operate from 100V-240V or 200V-260V depending on the machine model.

Call Technical Support for instructions.

2. Check that the outlet is grounded.
3. Plug the machine power cord into a wall outlet and verify voltage on the Driver box power strip.
4. Check voltage at the outlet on the front of the Driver box. It should be between 108V-112V. Voltage can range from 90V to 132V (-10% to +10%) coming into the machine for 110V/1P power. Voltage can range from 180V-264V coming into the machine for 220V/3P power

Leveling an Arm Type Machine

1. Mount the four (4) leveling feet, one on each corner of the machine frame. Use a manual or hydraulic jack capable of lifting the weight of the machine to raise it. Place the machine on the floor and level the machine at the four corners first. Leave at least 2 feet of open floor space around the machine.

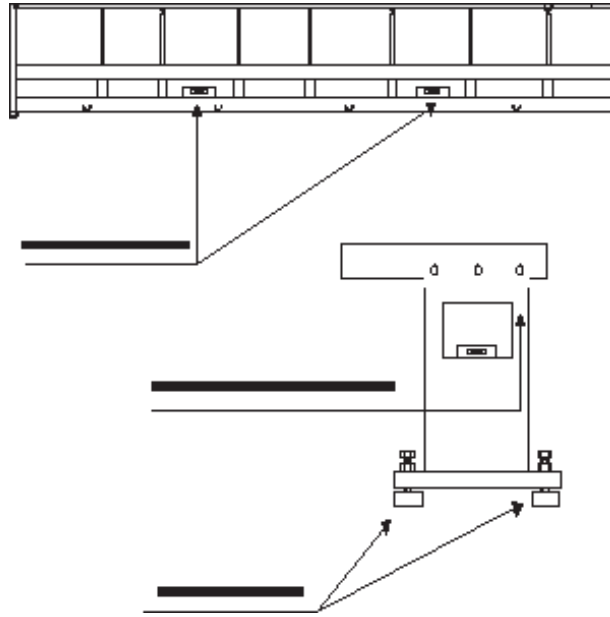


CAUTION! Be alert to the dangers of lifting the machine.

NOTE: The level and lifting device (jack) are not included in the installation kit.

2. Install the adjusting bolts in the appropriate slots so that the head of the bolt is on the bottom. Screw (1) Nut onto the bolt so that it's under the slot. Place (1) washer on top of the nut under the slot. Repeat with another nut and washer, above the slot. The leveling plate should be on the floor, under the leveling bolt. Adjust so they support the machine without lifting it. See the illustration above.

CAUTION: Use a bubble-level on the machine frame to properly level the machine.



Important Safety Instructions

When using an embroidery machine, basic safety precautions should always be followed. This machine is intended for commercial use.

Read all instructions before using this machine.

Save these instructions.

Danger

To reduce the risk of electric shock:

- An embroidery machine should never be left unattended when plugged in.
- Always power off and unplug this embroidery machine from the electric outlet immediately before cleaning.
- Always turn off the Automat and Driver Box when not in use for long periods of time.

Warning

To reduce the risk of burns, fire, electric shock, or injury to persons:

- Do not allow to be used as a toy. Close attention is necessary when this embroidery machine is used by, or near children.
- Use this embroidery machine only for its intended use as described in this manual.
- Use only attachments recommended by the manufacturer, as contained in this manual.
- Never operate this embroidery machine if it has a damaged cord or plug, if it is not working properly, if it has been damaged or is wet. Contact Barudan America technical support.
- Never operate the embroidery machine with any air openings blocked. Keep ventilation openings of the machine free from the accumulation of lint, dust, and loose cloth.
- Never drop or insert any object into any opening.
- Do not use outdoors.
- Do not operate where aerosol (spray) products are being used or where oxygen is being administered.
- To disconnect, turn all controls to the off position, then remove the plug from the outlet.
- Do not unplug by pulling on the cord. To unplug, grasp the plug, not the cord.
- Keep fingers away from all moving parts. Special care is required around the sewing machine needles.
- Always use the proper needle plate. The wrong plate can cause the needle to break.
- Do not use bent needles.
- Do not pull or push fabric while stitching. It may deflect the needle, causing it to break.
- Switch the sewing machine off when making any adjustments in the needle area, such as threading the needle, changing a needle, replacing the bobbin, changing the presser foot, or the like.
- Always unplug the machine from the electrical outlet when removing covers, lubricating or when making any other user servicing adjustments mentioned in the instruction manual.

- Connect this embroidery machine to a properly grounded outlet only. See Grounding Instructions.
- Always unplug before relamping. Replace bulb with same type rated Watts.
- Keep fingers away from moving parts, especially the area near trimmer blades.

Grounding Instructions

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.

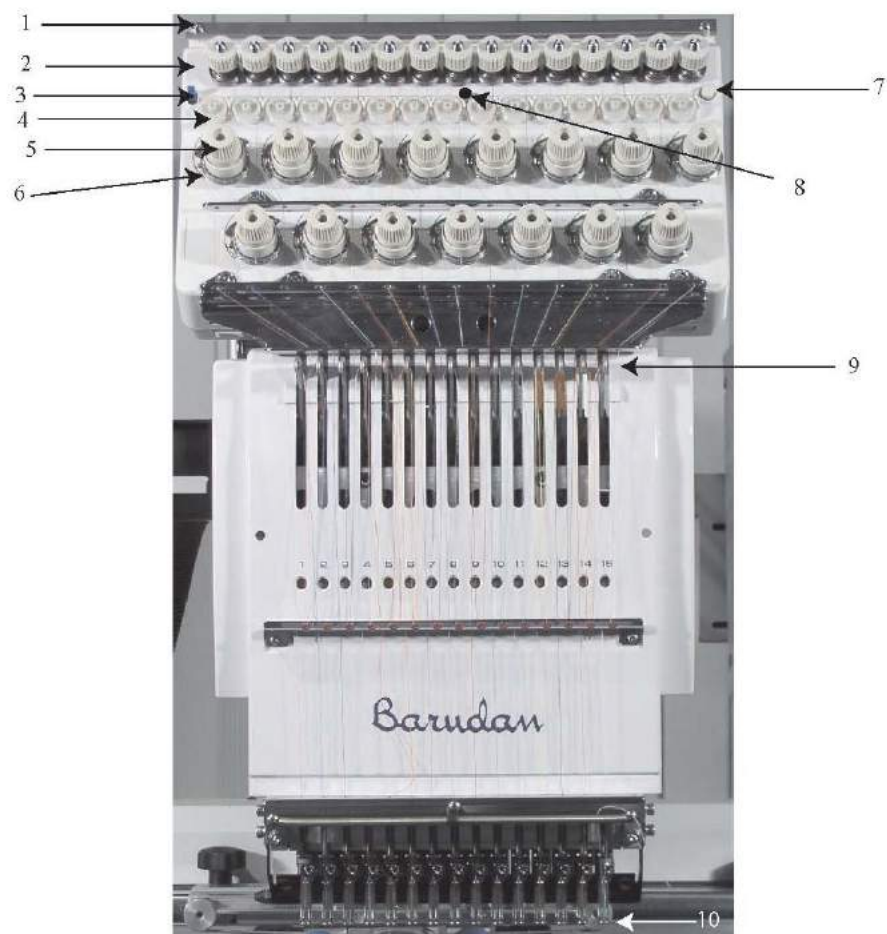
DANGER! Improper connection of the equipment-grounding conductor can result in a risk of electric shock. The conductor with insulation having an outer surface that is green, with or without yellow stripes, is the equipment-grounding conductor. Do not connect the equipment-grounding conductor to a live terminal if the cord needs to be repaired or replaced.

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.

220V 3 Phase

This product is for use on a circuit having a nominal rating more than 120V and is factory-equipped with a specific electric cord and plug. No adapter should be used with this product. If the product must be reconnected for use on a different type of electric circuit, the reconnection should be made by qualified service personnel; and after the reconnection, the product should comply with all local codes and ordinances.

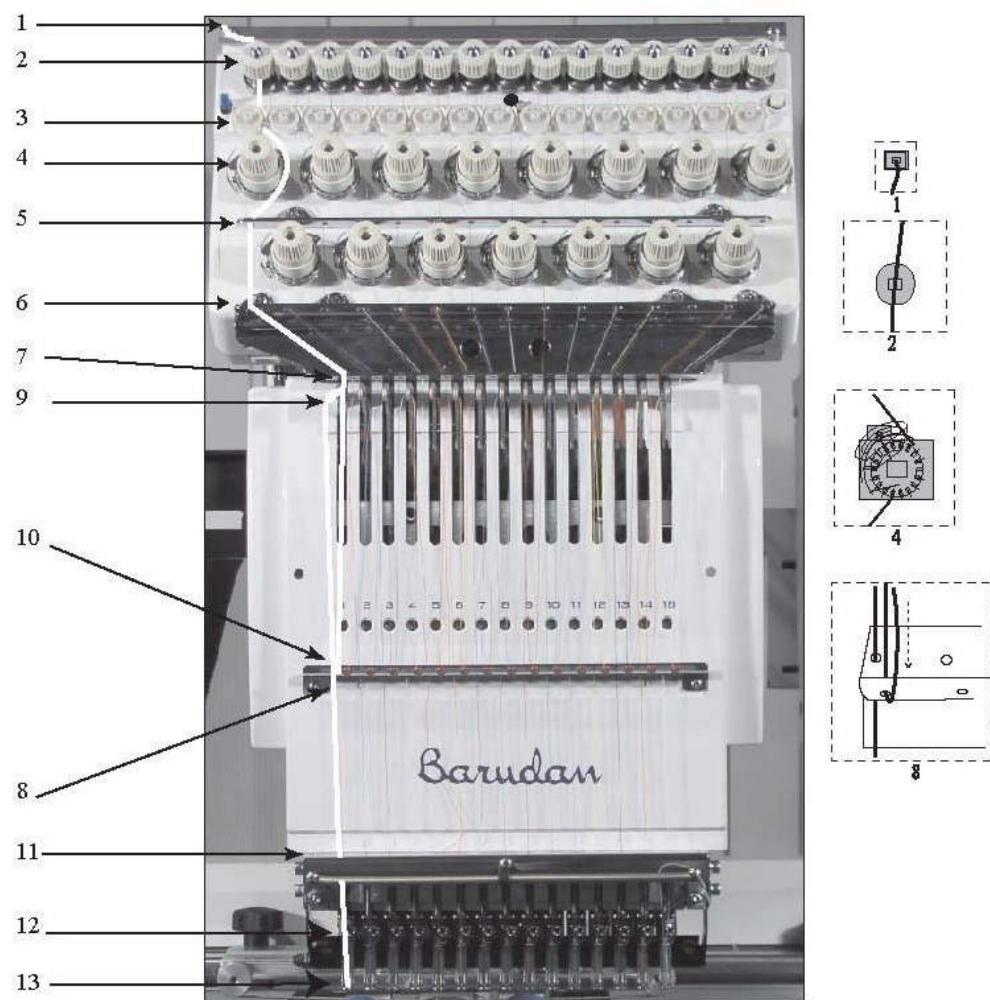
NOTE: If there is doubt as to whether an outlet box is properly grounded, consult a qualified electrician.



Sewing Head Components

There are several types of Barudan sewing heads, i.e. Y7, Y9, Z9, Z15. However, basic components are the same for each.

1. **Thread Guide Felt Pad Cover** - Holds thread in place to prevent tangling and keep thread clean.
2. **Pretensioners** - Adjust and control the top thread tension for each of the needles.
3. **Head Control Switch** - Enables/disables thread break detection on each head and cancels the head, so that it does not sew.
4. **Thread Break Detector Wheel** - When a problem occurs with the thread, the thread detection LED blinks red.
5. **Top Thread Tensioners** - Adjust the top thread tension for each of the needles.
6. **Take-Up Spring** - Helps form stitches.
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, and slider error problem by fast blinking 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.



Threading 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. Blow the thread through the tube 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 re-thread a sewing head, follow these steps which correspond to the diagram on the facing page.

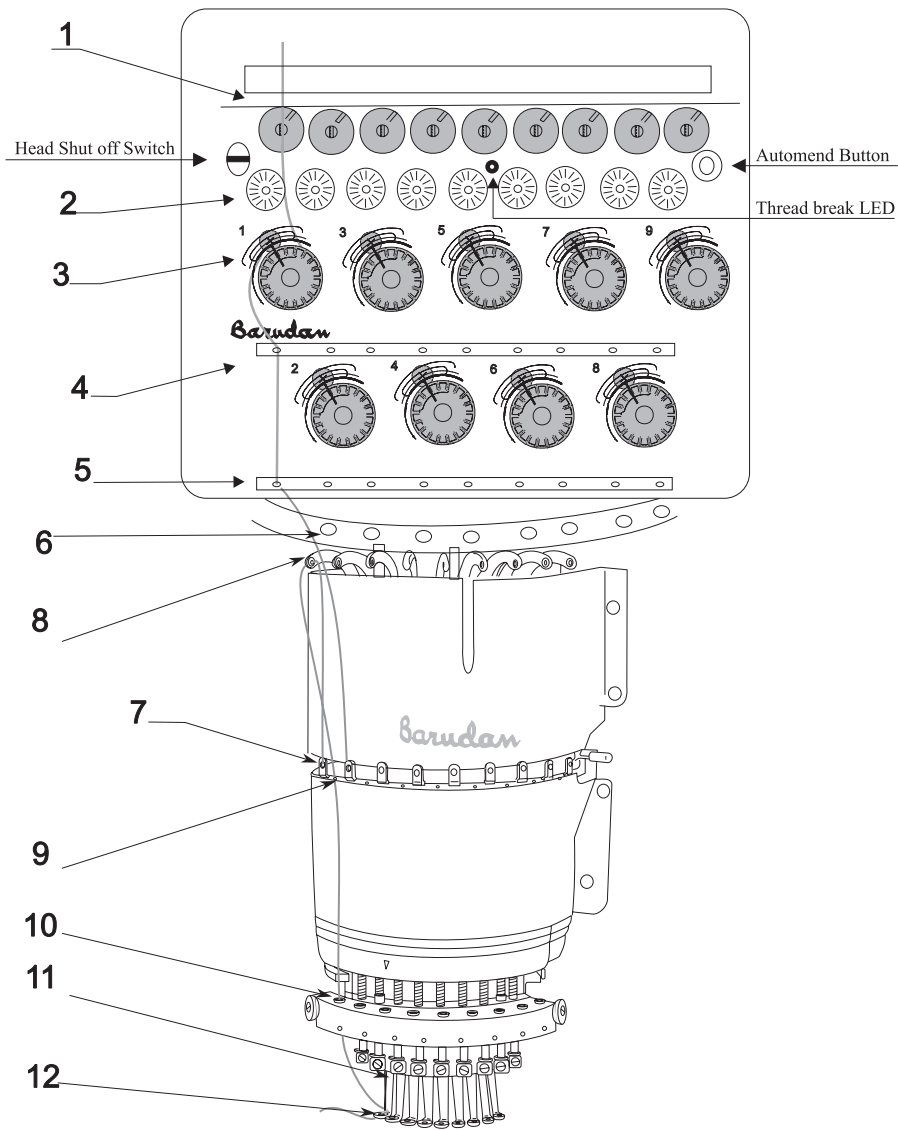
Threading a Z15 Head

Refer to Diagram on the previous page.

Preparation for threading the sewing head:

- Remove the felt pad covering the first thread guide.
 - Double up the end of the thread and twist.
 - Before placing cones of thread on thread stand, notice that each tube is numbered according to needle.
 - Place a circular felt pad and cone of thread on each spindle of the thread stand.
 - Insert the twisted end of thread in the end of the tube.
1. Using canned or compressed air, blow air into the tube and release the thread. The thread will immediately blow through the tube and out the first guide.
 2. Snap the thread into the slotted post of first tensioner (from right to left).
 3. Take the thread from the right to left of the detector wheel and wrap it clockwise one time around the wheel..
 4. Pull the thread to the right of the tensioner assembly and wrap it clockwise one and one-half times between the nylon 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.**
5. Thread through the top thread guide.
 6. Thread through the next guide.
 7. Thread through the third guide.
 8. Pass the thread to the right of the take up lever, then through the next thread guide from back to front.
 9. Thread the eyelet in the take-up lever from right to left.
 10. Thread through the next thread guide.

11. Reach underneath the thread keep apron and push the thread keep pin forward, so the thread can go through the hole, then pass the thread through the last eyelet.
12. Optionally, 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.
13. Thread the eye of the needle from front to back and pass the thread through the large hole in the presser foot.
 - After all needles have been threaded, replace the felt pad to avoid kinks and loops in the thread.



Threading a Y9 Head with Rotary Thread Break Sensors

1. Take the thread through the slotted post of first tensioner.
2. Take the thread to the right side of the sensor wheel and wrap clockwise one turn.
3. Pull the thread to the right of the tensioner assembly and wrap it clockwise one and one-half times around the metal wheel 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.

4. Thread through the top thread guide.
5. Thread through the next guide.
6. Thread through the next guide.
7. Pass the thread to the right of the take up lever, then through the next thread guide from back to front.
8. Thread the eyelet in the take-up lever from right to left.
9. Thread through the next thread guide.
10. Reach underneath the apron and push the thread keep pin forward, so the thread can go through the hole, then pass the thread through the last eyelet.
11. Optionally, thread the small pigtail that circles the needle (Fig. 1) 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.
12. Thread the eye of the needle from front to back and pass the thread through the large hole in the presser foot.

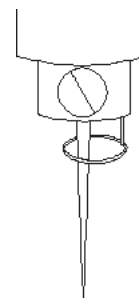
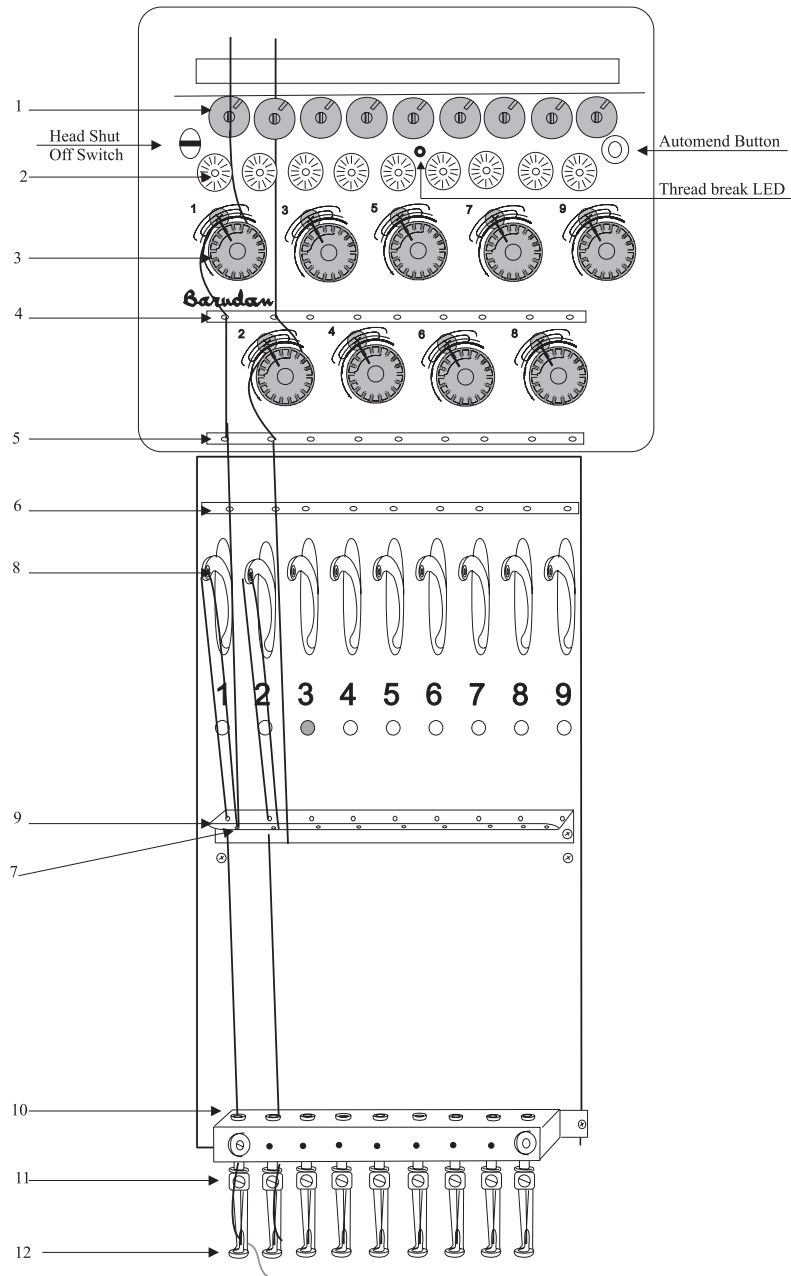


Fig. 1



Threading the Z9 Head with Rotary Thread Break Sensors

1. Take the thread through the slotted post of first tensioner.
2. Take the thread to the right side of the sensor wheel and wrap clockwise one turn.
3. Pull the thread to the right of the tensioner assembly and wrap it clockwise one and one-half times around the metal wheel 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.

4. Thread through the top thread guide.
5. Thread through the next guide.
6. Thread through the next guide
7. Pass the thread to the right of the take up lever, then through the next thread guide from back to front.
8. Thread the eyelet in the take-up lever from right to left.
9. Thread through the next thread guide.
10. Reach underneath the apron and push the thread keep pin forward, so the thread can go through the hole, then pass the thread through the last eyelet.
11. Optionally, 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. See Fig. 1
12. Thread the eye of the needle from front to back and pass the thread through the large hole in the presser foot.

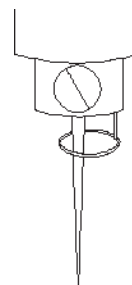
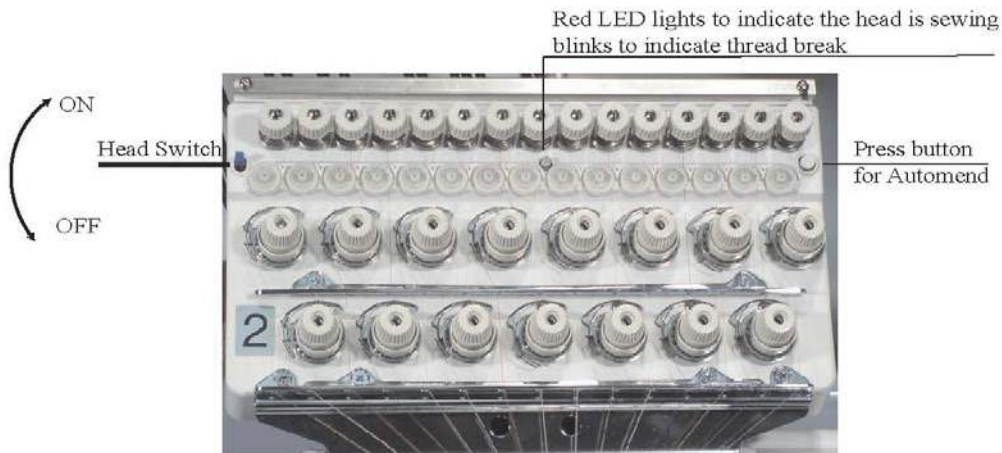


Fig. 1

Sewing Head Controls

When using the machine, you may need control over whether thread breaks are detected and which heads will sew.



Thread Break Detection

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. (For Z head machines, this switch also cancels the sewing head.)

Rotary Wheels

The thread is wrapped around the rotary wheel. As the machine sews the wheel spins. When the wheel stops spinning it is an indication of a thread break, causing the LED on the sewing head to flash red, indicating a thread break. The sewing head will stop and the pantograph will automatically move back a few stitches. If you need to back up farther in the pattern, see [Repairing Missed Stitches](#).

Disengaging a Sewing Head

A head can be shut off when it is not needed. For Z head machines, while the machine is stopped, turn off the thread break switch by placing it in the down position; to restart the head place the thread break switch in the up position.

For Y head machines see the instructions on the next page.

Barudan

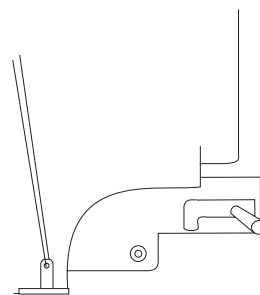
Disengaging a Sewing Head

1. Press the **Stop button** to stop the machine from sewing.

CAUTION! A sewing head must never be turned off while the machine is sewing.

2. Switch off the appropriate **thread break switch**. This will cancel the thread break detection on this head.
3. Engage the **head shut-off pin** to prevent the needles from moving up and down. Pull the pin forward.

NOTE: It is best to do a manual thread cut before disengaging a head so that when it is restarted, the needle does not become unthreaded.



Head Shut Off Switch

Restarting a Sewing Head

1. Press the **Stop button** to stop the machine from sewing.

CAUTION! A sewing head must never be turned back on while the machine is sewing.

2. Move the **thread break switch** to the on position.
3. Disengage the **head shut-off pin** to release the needle. Move the pin to the back. The red LED on the front of the sewing head will be lighted during sewing.

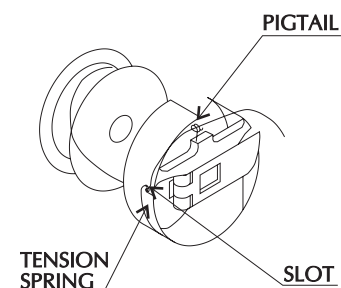
When a head is turned back on, it will begin to sew and its thread keep solenoid will be released when the Start button is pressed to begin sewing again. If the other heads were not sewing, and their thread keep solenoid clamps were activated, the head that was just turned on will also have its thread keep solenoid clamp activated.

NOTE: To prevent the active needle of a head that has been turned back on from becoming unthreaded, you should hold on to the end of the thread while pressing the Start button to resume sewing.

Replacing Bobbins

The machine is shipped to you with bobbins in place, ready to sew. Follow these steps when you need to replace 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. Pull the bobbin case latch toward you, and the case will slide out of the hook assembly.
 - On a cylinder bed machine, first open the hinged sewing hook cover to expose the bobbin case.

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.
5. Close the sewing hook cover.

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 you left hanging is on top.
3. Release the latch and press the bobbin case into position until you hear a distinct “click”. If a 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

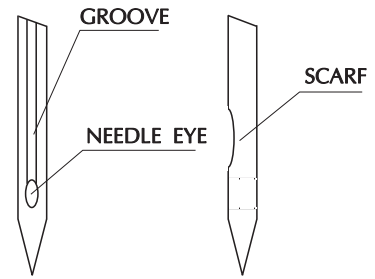
Carries the top thread through the fabric and into the Hook Assembly.

Scarf

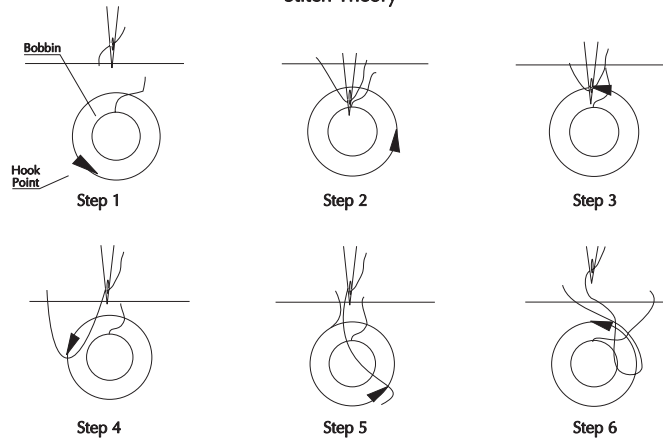
Small notch, or cutout, on the back of the needle that provides the clearance needed for the hook point to pass without striking the needle during stitch formation. When installed, the scarf should always be facing towards the back of the machine.

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. When installed, the Groove should always be facing towards the front of the machine.



Stitch Theory



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

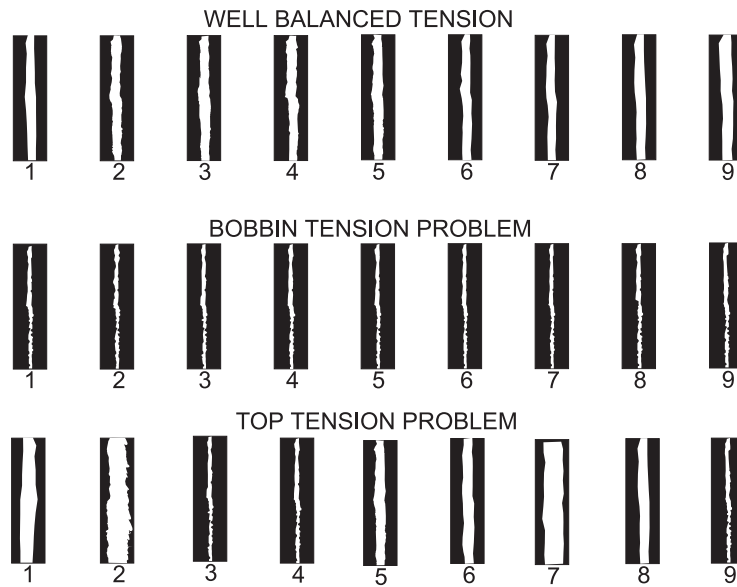
Top Thread Tensions

Tension is the tautness of the thread as stitches are formed. There are two tensions to be considered when making adjustments. The top thread, is controlled by the top tension (small pretensioner, large top tensioner); 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.

An excellent way to test the tensions is by using an **H** or **I** test.

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. Barudan supplies several sew test designs on a CF card for new machines.



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 shows little 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.

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 you are using, to allow a smooth flow of thread to the top tensioners. The pretensioners should only need adjustment when you change from a light weight thread to a heavier weight, or vice versa, and to tighten top thread when looping.



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 tension knob counterclockwise.
2. If the thread flows too freely, increase the pressure on the spring that holds the disk down by turning the tension knob clockwise.

The top tensioners controls 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 garment, possibly both. The monogram will look rough, and will not lie smoothly on the fabric. The bobbin tension on the back side of the garment will look very narrow.

You may find it necessary to adjust the top tension to compensate for variances in material or thread. Generally when you are 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 tension knob on the top tension assembly is marked with a + and -, with an arrow between them. Turn the top tension knob **clockwise**, toward the + **sign**, to **tighten** the top thread tension.
2. Turn the top tension knob **counterclockwise**, toward the - **sign**, to **loosen** the top thread tension.

Checking the Top Tension

1. Make sure that the take-up lever is at its highest position.
2. Pull thread slowly, through the eye of the needle. You should feel some resistance, but not so much that the thread feels as if it will break.

Adjusting the Bobbin Tension

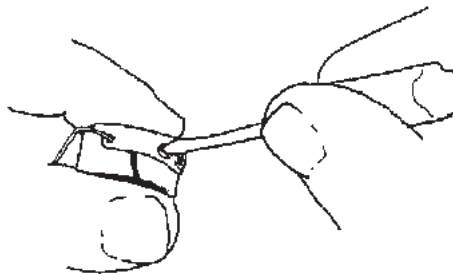
The bobbin tension is set by adjusting the larger screw on the bottom of the bobbin case. To test the tension, insert a bobbin in the case and slowly pull the end of the thread. The thread should unwind slowly and smoothly out of the bobbin case, yielding a slight resistance. Experience will help you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

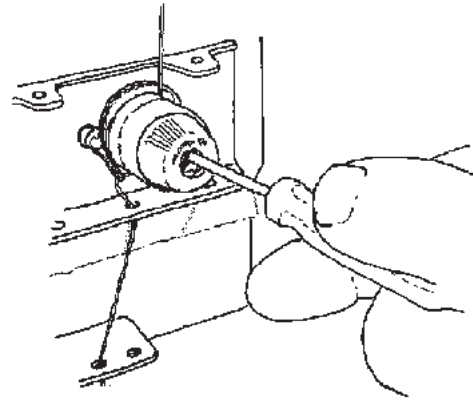
You may find it necessary to adjust the tension take-up spring when you switch to very thin or very thick fabric. To sew on thinner fabric, lighten the tension on the take-up spring. To sew on thicker fabric, tighten the tension. Follow the steps listed below for adjusting the take-up spring tension.

False Thread Break Detection

There may be a time when you notice that the machine is constantly detecting 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. **Loosen** the take-up spring by inserting a screwdriver into the post and turn **counterclockwise**, until the take-up spring has moved off of the detection bracket.. Then, turn the screwdriver clockwise until the take-up spring touches the detection bracket. Turn approximately $\frac{1}{4}$ of a turn more so that the slot in the post is at approximately 11:00.



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.

Positioning the Design on the Garment

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, these measurements should be scaled down.

EMBROIDERY PLACEMENT GUIDELINES	
WASH CLOTHS	1-1/2" above hem or 1" above border
HAND TOWELS	2" above hem or 1-1/2" above border
BATH TOWELS	4" above hem or 2" above border
SHEETS	The bottom of the monogram should be centered about 2" above the wide hem line on the top side of the sheet.
PILLOW CASES	The monogram should be centered between the edge of the open end and the stitching on the hem or the border pattern.
SHIRT POCKETS	1/4" to 1/2" down from the pocket edge and centered between seams
SHIRT CUFFS	1-3/8 " toward the button hole (from center) and 1/4" above the top stitching at edge
TIES	2" to 2-1/2" up from the tip or 9" to 11" up from the tip when worn with a vest
GOLF SWEATERS, SHIRTS	7-1/2" to 9" down from the left shoulder seam and 4" to 6" over from center
LADIES SWEATERS	3-1/2" to 4-1/2" down from the collar and centered on front
ROBES, BLOUSES	4" to 6" down from left shoulder seam and 3" to 5" over from center
SATIN JACKETS	Left breast area: 3-1/2" to 4" over from center edge and 6" to 8" down from the shoulder seam Jacket back: placement depends on pattern size/jacket size but can be centered anywhere from 6" to 9" down from collar seam.
FUR COATS	Lining: right side at waist level

Millimeter Conversion Chart

The chart below will help you convert fractional inches to millimeters.

FRACTIONAL INCH	MILLIMETER EQUIVALENT
1/16	1.5875
1/8	3.175
3/16	4.7625
1/4	6.3500
5/16	7.9375
3/8	9.525
1/2	12.700
5/8	15.875
3/4	19.050
7/8	22.2250
1	25.400

Backing Materials

The use of backing materials and/or toppings will enhance your 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 light-weight tearaway to heavy-weight 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 light-weight 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 dealing with an open weave fabric that you don't want to move or gather, using spray adhesive on the backing will help keep the two together, adding stability.

Softouch

Softouch is a woven backing material made of 100% non-shrinkable polyester. Softouch backing is used with many knits and stretch fabrics. These materials cannot be pulled tightly in a hoop by themselves because they will stretch out of shape. Softouch is used to add stability to the garment while it is being sewn. Without Softouch backing, knits will not hold the stitching and can even be forced down into the hole in the throat plate.

To use Softouch backing, cut a piece slightly larger than the hoop you are using and place it underneath the area of the garment that is going to be monogrammed. Hoop the garment as usual, using the backing material as though it were part of the garment. Make sure that the garment is as smooth and snug as possible in the hoop. You may wish to use a dissipating bonding adhesive spray to bond the backing to the garment for better stability.

Cut away the excess backing after embroidering, leaving a small margin around the embroidery. Do not cut the backing between letters and designs. Leaving it in place gives added stability to the embroidery after laundering.

Softouch can also be used with thinner woven fabrics to give better clarity and detail to intricately embroidered designs.

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, woven cotton buckram; and 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.

Nylon Backing

Nylon backing is used with many knits and stretch fabrics. Use nylon as a substitute for Softouch if the design is not worn against the skin. Hooping procedures for nylon are identical to those for Softouch backing.

Backing Paper

Backing paper is used beneath fabrics with a looped or rough texture, e.g., towels or canvas, and with garments that have a rubber lining, e.g., rain slickers or waterproof bags. This allows the hooped garment to move smoothly while sewing, decreasing the chance of dragging. The backing paper is not put in the hoop with the material, but is placed under the hoop, between the garment and the sewing surface. When the embroidery is finished the paper can be pulled away.

CAUTION! Backing paper has a tendency to shred during sewing. Small pieces of paper can get caught in the hook and jam the machine. Be sure to clean away all excess pieces of paper that may be left after embroidering.

Water Soluble Topping

Water soluble plastic foil 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 outside the design.
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.

NOTE: Embroidery should not be left damp or wet longer than a few minutes.

Needle Types

The type of needle you use is determined by the type of fabric you are embroidering.

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.
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Ball Point	Ball point needles deflect and slip between the threads of the fabric. They are best suited to fine knits and wovens, which have a tendency to snag or run.
Sharp Point	Sharp point needles have a cutting edge to penetrate non-woven materials. They are used only for leather and similar materials.

Needle Insertion

When you receive the machine, all needles should already be in place. However, you will, from time to time, need to change a needle.

Replacing a Needle

1. Turn off the main power to the machine.
2. Loosen the needle clamp screw, located on the bottom of the needle bar and remove the needle. Use the small, yellow handled flat blade screwdriver provided in the accessory tool box.
3. 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.
4. Tighten the needle clamp screw while holding the needle in place to secure the needle.

Needles/Backing Chart

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

NEEDLES/BACKING CHART				
FABRIC	NEEDLE SIZE/TYPE	BACKING	TOPPING	COMMENTS
Canvas	80/12SP or NP	1T	No	Hoop tightly to keep canvas from slipping in hoop.
Coated/ Waterproof Fabric	80/12 SP, BP, Teflon	1T	No	Heavyweight fabrics may not require any backing.
Corduroy	80/12SP or NP	1T	Yes	A higher stitch density, as well as topping, may be necessary to prevent stitches from sinking into the wale.
Cotton Sheeting	70/10 to 80/12SP or NP	1T	No	High density or very detailed patterns may require more backing.
Denim	80/12SP or NP	1T	Optional	Reduce speed if needle begins to heat up or if thread breaks occur.
Dress Shirt (Woven)	70/10 to 80/12BP	1T	Optional	Topping recommended for highly detailed patterns or pique knits.
Golf Shirt (Cotton/ Poly Knit)	70/10 to 80/12BP	1C	Optional	Topping recommended for highly detailed patterns or pique knits.
Golf Shirt (100% Cotton)	70/10 to 80/12BP	2C or 3T	Optional	Topping recommended for highly detailed patterns or pique knits.
Leather	70/10 to 80/12SP	1T	No	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.
Lingerie or Silk	70/10 BP or NP	2T	Yes	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.

NEEDLES/BACKING CHART				
FABRIC	NEEDLE SIZE/TYPE	BACKING	TOPPING	COMMENTS
Lycra® or Spandex®	70/10 to 80/12BP	1C	Optional	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.
Nylon Wind-breaker	70/10 to 80/12BP or NP	None	No	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.
Satin Jacket	70/10 to 80/12BP or NP	0 or 1	No	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.
Sweater Knit	70/10 to 80/12BP	1 or 2C	Yes	Tightly woven knits may need just one layer of backing. Widewale 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.
Sweatshirt	70/10 to 80/12BP	1 or 2C	Optional	Highly detailed patterns may require 2 layers of backing.
Terrycloth	80/12SP or NP	1T	Yes	Plastic wrap is preferred because it prevents the terry loops from poking up through the stitching after repeated washings.
Vinyl	80/12NP	1T	No	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.
BP = Ball Point NP = Normal Point SP = Sharp 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.

- You should have both soft-bristle and stiff-bristle brushes and a shop vac 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.
- Periodically vacuum the vents of the driver box. Do not use compressed air to blow the vents clean, as this will force debris into the driver box.

A maintenance log, attached to the machine, is recommended. Keep a chart of the maintenance/oiling schedule, performed on the machine.

Bobbin Case Maintenance

In a normal production setting, the bobbin case should be cleaned **every 4 - 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 case will need to be replaced.

Cleaning the Bobbin Case

1. When the case is removed for cleaning, check the shaft for wear.
2. Brush lint and dust out of the case with a small soft-bristle brush.
3. Replace the bobbin in the case and test the tension, as detailed on page 1-22.

Hook Assembly Maintenance

The hook assembly should be **cleaned every 4 - 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.

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. Refer to the appropriate diagram/chart for the type of sewing head on your machine.

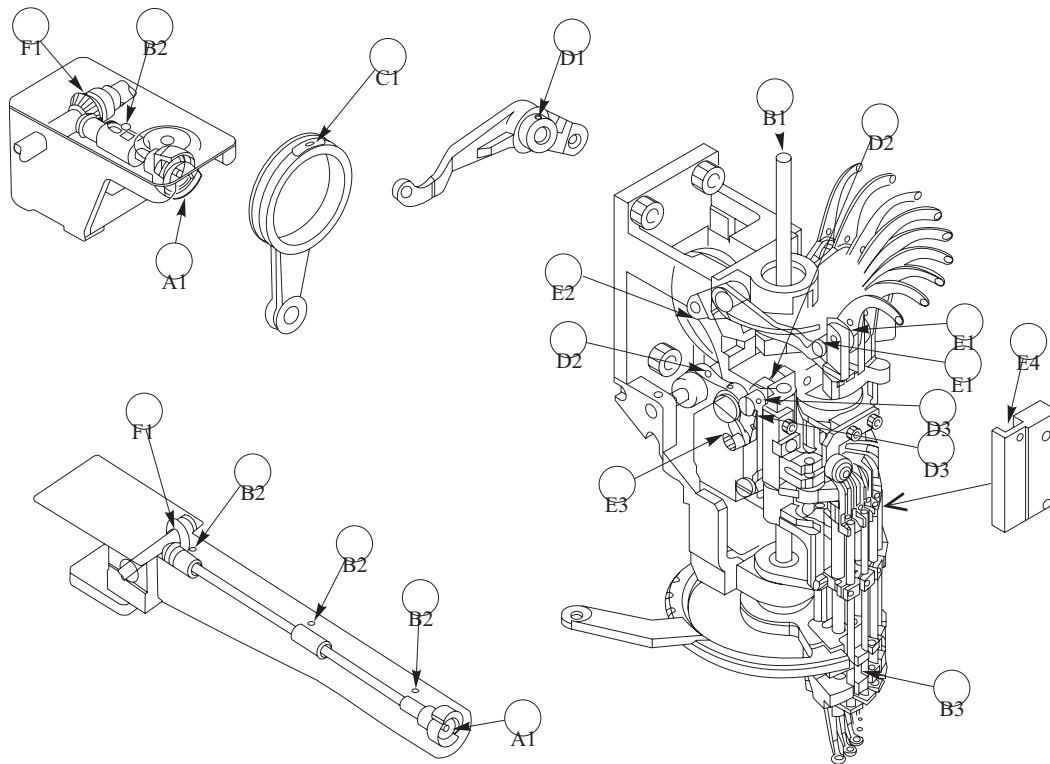
**The machine should always be turned off before it is oiled.
Oiling procedures are based on an 8-hour workday.**

**Barudan America supplies machine oil and bearing oil with all new machines.
Lithium Grease Spray has to be purchased by the customer.**

Y Type Head

The head cover on a Y head machine has a small removable door that lets you oil many head components without removing the entire cover.

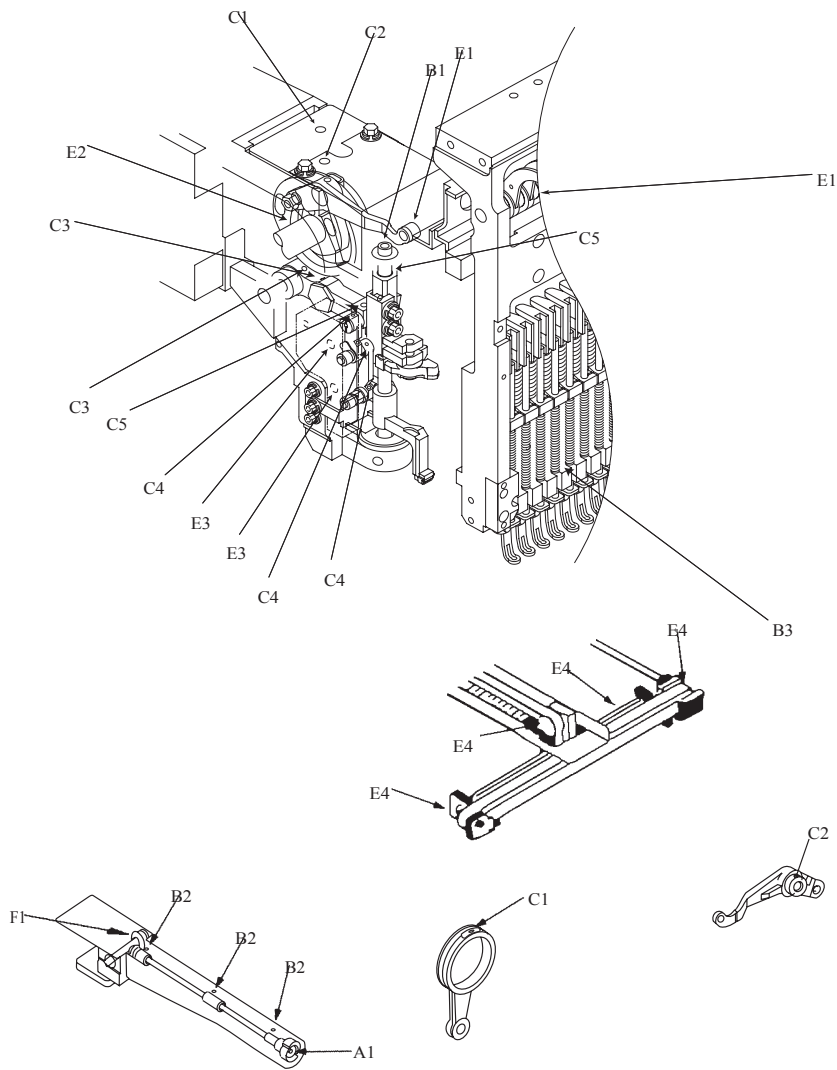
**THE MACHINE SHOULD ALWAYS BE TURNED OFF BEFORE IT IS OILED.
OILING PROCEDURES ARE BASED ON AN 8 HOUR WORKDAY.**



Y TYPE HEAD OILING			
PART IDENTIFICATION		LUBRICANT	FREQUENCY
Rotating Hook	A1	Barudan machine oil Clear (mineral) oil for sewing machinery	Every 4 to 6 hours
Drive Shaft	B1	Barudan machine oil Clear (mineral) oil for sewing machinery *Wipe lightly with cotton swab saturated in oil.	Once a week
Hook Shaft Bushing	B2		
*Needle Bars/Turret Plate Oil Pad	B3		
Needle Bar Crank Rod	C1	Bearing oil	Once a week
Take-up Drive Lever	D1	Bearing Oil	Once a month
Needle Bar Drive Lever	D2		
Needle Bar Drive Link	D3		
Take-Up Lever	E1	Lithium grease spray	Every 3 months
Take-Up Lever Cam	E2		
Presser Foot Cam	E3		
Guide Plate	E4		
Lower Connecting Gear	F1	Wheel bearing grease	Every 6 months
H/V Linear Bearing Rails (not shown)		Clean and oil with 30 wt. engine/machine oil	Every 3 months

Z Type Head

THE MACHINE SHOULD ALWAYS BE TURNED OFF BEFORE IT IS OILED. OILING PROCEDURES ARE BASED ON AN 8 HOUR WORKDAY.



BEVS/VY Oiling Diagram

Z TYPE HEAD Oiling Chart			
PART IDENTIFICATION		LUBRICANT	FREQUENCY
Rotating Hook	A1	Barudan machine oil Clear (mineral) oil for sewing machinery	Every 4 to 6 hours
Drive Shaft	B1	Barudan machine oil Clear (mineral) oil for sewing machinery	Once a week
Hook Shaft Bushings (3)	B2		
*Needle Bars/Turret Plate Oil Pad	B3	Barudan machine oil Clear (mineral) oil for sewing machinery *Wipe lightly with cotton swab saturated in oil.	Once a month
Needle Bar Crank Rod	C1	Bearing oil	Once a week
Take-Up Drive Lever	C2		
Needle Bar Drive Lever (2)	C3		
Needle Bar Drive Links (3)	C4		
Needle Bar Driving Link	C5		
Needle Bar Driving Block	C6	Bearing oil	Once a month
Take-Up Lever	E1	Lithium grease spray	Every 3 months
Take-Up Lever Cam Groove	E2		
Presser Foot Cam (2)	E3		
H/V Linear Bearing Rails	E4	Lithium grease spray	Every 3 months
Pantograph Guide Shaft (not pictured, only on 2-8 head models)			
Color Change Cam Groove (not pictured)			
Lower Connecting Gear	F1	Wheel bearing grease	Every 3 months

Chapter 3 Troubleshooting

Quick Fixes

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

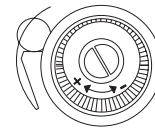
PROBLEM	CAUSE	SOLUTION
Fabric Puckering	Garment hooped too loosely	Rehoop the garment, making sure it is taut.
	No backing	Backing helps stabilize most fabrics - use the appropriate backing for the application.
	Improper use of backing	Backing should be hooped along with the garment. If more stability is needed, backing or topping should be bonded to the garment.
	Improper tension	Adjust the tensions so that only one third bobbin thread shows on the underside of the embroidery.
Machine Stops, Thread Not Broken	Sewing head is turned off, but thread break indicator switch is on	When heads are not in use, make sure the thread break indicator switch is off.
	Improper threading	Make sure thread goes through the eyelet's directly below the tension knobs, the take-up lever eyelet and the take-up spring.
	Faulty take-up spring	Make sure the take-up spring is bouncing freely. If the problem continues, replace it.
	Faulty ON/OFF switch	Call Technical Support.
	Faulty PCB Board (Thread Break Indicator Board)	Call Technical Support.
Needle Breaks	Needle inserted improperly	Make sure the needle is inserted all the way into the needle bar and the long groove is in the front. Make sure the needle clamp screw is tight.
	Flow of thread is obstructed	Check the top 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.
	Needle too close to hook	Hook needs to be re-timed.
	Needle hits hoop	Make sure hoop is big enough for work being done.
	Needle is bent	Replace needle.

PROBLEM	CAUSE	SOLUTION
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 needle plate.		
Stitches Are Not Being Formed	Bobbin is empty	Replace with full bobbin.
	Not enough bobbin thread pulled out of bobbin case	There should be at least three (3) inches of thread hanging from the bobbin case when it is replaced.
	Needle inserted improperly	Make sure the needle is inserted all the way into the needle bar and the long groove is in front. Make sure the needle clamp screw is tight.
	Timing is off	Re-time the hook.
	Broken hook point	Replace the entire hook assembly.
	Thread is not threaded through the take-up lever.	Check all threading points to make sure none have been missed.
Thread "Birdnests" Under Needle Plate Area	Improper threading	Check all threading points to make sure none have been missed.
	Hooped too loosely	Fabric must be hooped securely, with proper backing.
	Lack of lubrication in hook assembly. Even if you oil the machine every day, this can happen when you run the machine especially long and hard.	Place one drop of oil in hook assembly oiling point.
	Using a fill stitch on very small areas	Change to a satin stitch.
	Tension problems	Adjust the tension. Remove the bobbin case and check the tension.
	Faulty take-up spring	Replace the take-up spring.
	Dull needle	Replace the needle.
	Needle is too large, making hole in fabric	Change to a smaller needle.
Thread Breaks	Flow of top thread is obstructed	Check the top tension, if it is too tight, see if the thread is caught on the tension disks, thread stand or thread spool pin and make sure it is not looped around the take-up spring.

PROBLEM	CAUSE	SOLUTION
Thread Breaks cont'd	Machine running too fast for the particular application	Reduce speed.
	Burr on bobbin case	Buff burr with emery and crocus cloth (available at hardware stores) or replace bobbin case.
	Burr or excessive wear on hook	Hooks are not always repairable and buffing the hook may alter the timing. Replace the entire hook assembly.
	Scratches, needle marks or burrs on needle plate top, hole, and underside	Polish flat surfaces with fine emery, then crocus cloth. Polish hole with emery or crocus cord.
	Burr on front edge of hook	Polish with emery or crocus cloth. Clean after polishing and re-oil it.
Undetected Thread Breaks	Sensors are not detecting thread breaks.	The machine may be set for a boring device in MC Parameter 1. Check to make sure that the Borer parameter is at Ø.
False Thread Break	Sensor wheels are not spinning.	Make sure that the thread is wrapped around the sensor wheel. If so, try more tension on top tensioner, ¼ to ½ turn.
Thread Break Is Frayed	Burr on eye of needle	Replace the needle.
	Eye of needle becomes worn (especially when using metallic thread)	Replace the needle. Try an oversized needle with metallic thread.
	Thread guides are worn or burred (especially when using metallic thread)	Polish guides lightly with crocus cord or replace if badly worn. For a temporary solution, apply clear nail polish over the worn spot.
	Eye of needle too small	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.
Thread Frays and Breaks	Weak spot or knots in thread (this will show up as either a fray or a clean break)	This will show up as an infrequent break, if so, replace the thread.
Thread Looping	The take-up spring adjustment is incorrect.	Increase the take-up spring tension slightly to eliminate looping on the top of embroidery.

Take-Up Spring Replacement

After repeated adjustments, the take-up spring may begin to show wear. You may notice that adjusting the take-up spring no longer corrects tension problems. In this case, you need to replace the take-up spring.



Complete Tension Assembly

Replacing the Take-Up Spring

1. Remove the outer tension knob, turning it counter clockwise until it comes off the tension assembly.
2. Remove the ratchet washer from the tension assembly post.
3. Remove the Tension Spring Cover, including the tension spring that rests inside it.
4. Remove the outer white felt disk, then the Rotary Disk wheel.
5. Remove the inner white felt disk.
6. Remove the green felt disk.
7. Remove the white plastic isolation plate. You may need to carefully pull up on it from behind with the blade of a flat screwdriver.
Notice the position of the take-up spring in reference to the assembly post. There is a groove in bottom of the post where the spring locks in place.
8. Remove the worn take-up spring.
9. Insert the new spring, placing it in the same position as the old one. Make sure the new spring rests against the take-up spring bracket.
10. Replace the white plastic isolation plate with the flat side facing you. Make sure it is firmly seated on top of the Take-Up Spring Bracket (it will partially cover the post) so the take-up spring cannot go around the post. The white plastic Isolation Plate traps the spring in place.
11. Replace the green felt disc.
12. Replace the inner white felt disk.
13. Replace the Rotary Disk Wheel, then the outer white felt disk.
14. Replace the Tension Spring Cover, including the Tension spring inside it.

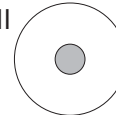
Outer Tension Knob



Ratchet Washer



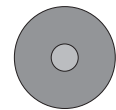
Tension Spring Cover with Spring



White Plastic Isolation Plate

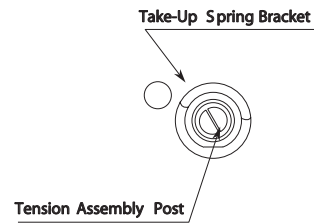


Take-Up Spring



Green Felt Disc

15. Replace the Ratchet Washer.
16. Replace the Tension knob, turning it clockwise until it is ½ way turned down onto the tension assembly post.
17. Adjust the new Take-Up Spring as instructed on page 1-24 of the Mechanical Guide.



Hook Timing

Hook timing is probably the most misunderstood aspect of embroidery machine mechanics. It has nothing to do with the type of fabric, tension or synchronization of the heads on a multihead machine.

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

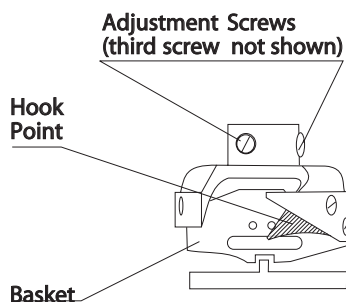
1. Leave the needle and bobbin threaded and remove the needle plate.
2. For easier access to timing, set the machine to the last needle.
3. Locate the Main Drive Pulley with degree indicator.

NOTE: The main drive pulley on an arm type machine is driven by the main motor drive belt. Remove the cover to access it.

The main drive pulley on a bridge machine is located on the side of the machine opposite the automat under a metal cover.

Always rotate the main drive pulley in the direction that rotates the hook counterclockwise.

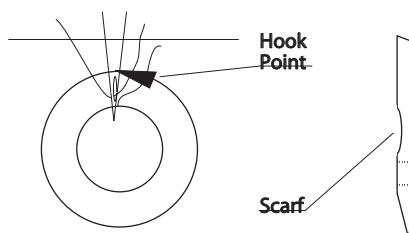
4. Rotate the Main Drive Pulley to where the indicator points to 24 degrees (Arm type heads) 25 degrees (Bridge type heads). The point of the hook should be directly behind the scarf of the needle and above the needle eye.
5. Check the hook-to-needle clearance. There should be approximately $\frac{1}{2}$ of a needle's 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 covers.



Hook Assembly

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 base of the hook. This will allow you to advance or retard the hook.
3. Locate the main drive pulley with degree indicator.
4. Rotate the main drive pulley to where the indicator points to the necessary degree. The point of the hook should be directly behind the scarf of the needle and above the needle eye.
5. Check the hook-to-needle clearance. There should be approximately $\frac{1}{2}$ a needle's 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. Adjust the Position Finger Bracket (see the next page).
 - An H or I test is an excellent manner of testing the hook timing adjustments. Sew out these letters (one for each needle) and check for any irregularities in the sewing and stitch quality. Thread breaks, needle breaks or skipped stitches can occur when the hook is not properly timed.



Position Finger Bracket 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. A 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 Position Finger moves out of adjustment. When correct, the Position Finger notch, the protruding part, lines up centered with the hook assembly shaft.

Adjusting the Position Finger Bracket

1. After adjusting the hook timing, leave the Needle Plate off.
2. Rotate the Main Drive Pulley 0 degrees.
3. Loosen the set screw slightly, taking care to use the correct size screwdriver since the screw is very flat and easily stripped. You can also use a hex wrench for newer models.
4. Carefully move the position finger, centering the notch to the needle. To make sure you are looking at the needle straight on, use the lubrication hole, behind the Needle Plate, as a reference. Visually line up the needle with this hole, then adjust the position finger. Allow enough clearance between the basket opening and the notch of the Position Finger.
5. Carefully retighten the screw.



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