Please read this manual before using the machine.
Please keep this manual within easy reach for quick reference.
Thank you very much for buying a BROTHER sewing machine. Before using your new machine, please read the safety instructions below and the explanations given in the instruction manual.

With industrial sewing machines, it is normal to carry out work while positioned directly in front of moving parts such as the needle and thread take-up lever, and consequently there is always a danger of injury that can be caused by these parts. Follow the instructions from training personnel and instructors regarding safe and correct operation before operating the machine so that you will know how to use it correctly.
SAFETY INSTRUCTIONS

[1] Safety indications and their meanings
This instruction manual and the indications and symbols that are used on the machine itself are provided in order to ensure safe operation of this machine and to prevent accidents and injury to yourself or other people.
The meanings of these indications and symbols are given below.

Indications

| ![Symbol] | WARNING | The instructions which follow this term indicate situations where failure to follow the instructions could result in death or serious injury. |
| ![Symbol] | CAUTION | The instructions which follow this term indicate situations where failure to follow the instructions may result in minor or moderate injury. |

Symbols

- ![Symbol] ・・・・・・ This symbol (△) indicates something that you should be careful of. The picture inside the triangle indicates the nature of the caution that must be taken.
  (For example, the symbol at left means “beware of injury”.)

- ![Symbol] ・・・・・・ This symbol (○) indicates something that you must not do.

- ![Symbol] ・・・・・・ This symbol (●) indicates something that you must do. The picture inside the circle indicates the nature of the thing that must be done.
  (For example, the symbol at left means “you must make the ground connection”.)
# Notes on safety

## WARNING

### Basic precautions

- Do not disassemble or modify the programmer, otherwise it may cause fire or electric shocks or problems with correct operation.
- Ask the place of purchase or a qualified technician to carry out any internal inspections, adjustments or repairs that may be required. (Any problems with correct operation that occur as a result of the customer attempting to disassemble or modify the programmer will not be covered by the warranty.)
- The bag that the programmer came in should be kept out of the reach of children or disposed of safely. Young children may risk suffocation if they place it over their head while playing with it.
- Do not handle the programmer or connector for the sewing machine or the AC adapter with wet hands, otherwise it may cause electric shocks.
- If the programmer is subjected to a strong force such as by being dropped or stepped on, it may become damaged.
- If you continue to use the programmer while it is damaged, it may result in fire or electric shocks. If the programmer becomes damaged, immediately disconnect it from the sewing machine (or disconnect the AC adapter from the wall outlet) and contact the place of purchase or a qualified technician.
- Do not insert objects such as screwdrivers into the AC adapter jack or the memory media slot, otherwise it may cause fire or electric shocks or problems with correct operation.
- Do not handle the AC adapter plug of the programmer, otherwise it may cause electric shocks or problems with correct operation.
- Disconnect the AC adapter from the wall outlet before disconnecting the AC adapter plug from the programmer, otherwise it may cause electric shocks or problems with correct operation.

### Installation

- Do not use any AC adapter other than the one from Brother, otherwise it may cause fire or electric shocks or problems with correct operation.
- When using the AC adapter, do not use any voltage other than the specified voltage, otherwise it may cause fire or electric shocks or problems with correct operation.
- Do not damage or process the connection cable for the sewing machine or the AC adapter cable, or place heavy objects such as furniture on top of them or bend or pull them with excessive force, otherwise it may cause fire or electric shocks or problems with correct operation.
- Be sure to use an AC adapter that complies with the safety standards in the country of use, otherwise it may cause fire or electric shocks or problems with correct operation.

### During use

- If a foreign object gets inside the programmer, immediately disconnect it from the sewing machine (or disconnect the AC adapter from the wall outlet) and contact the place of purchase or a qualified technician. If you continue to use the programmer while there is a foreign object inside it, may result in fire or electric shocks or problems with correct operation.
- Do not allow water or oil to get onto the programmer, otherwise it may cause fire or electric shocks or problems with correct operation.
- If any liquids get onto the programmer, immediately disconnect it from the sewing machine (or disconnect the AC adapter from the contact the place of purchase or a qualified wall outlet) and technician.
- Do not use the programmer if a problem is noticed such as smoke or a bad odor coming from the programmer, otherwise it may cause fire or electric shocks or problems with correct operation.
- Immediately disconnect the programmer from the sewing machine (or disconnect the AC adapter from the wall outlet) and contact the place of purchase or a qualified technician. (The programmer must never be repaired by the customer, as it can be extremely dangerous to do so.)
- Do not insert objects such as screwdrivers into the SD card slot or the USB flash memory port, otherwise it may cause fire or electric shocks or problems with correct operation.
<table>
<thead>
<tr>
<th><strong>CAUTION</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environmental requirements</strong></td>
</tr>
<tr>
<td>!</td>
</tr>
<tr>
<td>!</td>
</tr>
<tr>
<td>!</td>
</tr>
<tr>
<td>!</td>
</tr>
<tr>
<td>!</td>
</tr>
<tr>
<td>!</td>
</tr>
<tr>
<td><strong>Installation</strong></td>
</tr>
<tr>
<td>!</td>
</tr>
<tr>
<td>!</td>
</tr>
<tr>
<td>!</td>
</tr>
<tr>
<td>!</td>
</tr>
<tr>
<td><strong>During use</strong></td>
</tr>
<tr>
<td>!</td>
</tr>
<tr>
<td>!</td>
</tr>
<tr>
<td>!</td>
</tr>
</tbody>
</table>
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BAS H series, Programmer
Chapter 1
Read Me
This document is organized as follows.

**Chapter 1 Read Me**
Describes general precautions.

**Chapter 2 Setting Up Your Programmer**
Describes how to set up your programmer and its basic operations.

**Chapter 3 Programming with Icons (PROGRAM)**
Describes how to create programs with icons.

**Chapter 4 Extended Option Output (PROGRAM)**
Describes how to set the extended option output.

**Chapter 5 File Manager Functions**
Describes how to check, copy, move, and change program data.

**Chapter 6 Setting Functions**
Describes how to display program of the sewing machine.

**Additional Information**
Chapter 2
Setting Up Your Programmer
### Part names and functions

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Power indicator</td>
<td>Illuminates when the power is turned on.</td>
</tr>
<tr>
<td>(2) Caution indicator</td>
<td>Illuminates when an error occurs.</td>
</tr>
<tr>
<td>(3) LCD/touch panel</td>
<td>This displays messages and touch keys (icons).</td>
</tr>
<tr>
<td>(4) HOME key</td>
<td>This key is used to return to the home screen. At the home screen, hold down (for 2 seconds or more) to switch to sleep mode*.</td>
</tr>
<tr>
<td>(5) BACK key</td>
<td>This key is used for operations such as returning to the previous step and canceling settings.</td>
</tr>
<tr>
<td>(6) ENTER key</td>
<td>This key is used for operations such as confirming settings.</td>
</tr>
<tr>
<td>(7) JOG key</td>
<td>This key is used when programming sewing data.</td>
</tr>
<tr>
<td>(8) SD card slot</td>
<td>Insert an SD card.</td>
</tr>
<tr>
<td>(9) USB port × 2</td>
<td>Connect a device such as a USB flash memory.</td>
</tr>
<tr>
<td>(10) AC adapter jack</td>
<td>Connect an AC adapter.</td>
</tr>
</tbody>
</table>

* The screen will turn off and the sewing machine cannot be operated. Press the home key once more to cancel sleep mode.
CHAPTER 2 SETTING UP YOUR PROGRAMMER

Features

Stitch length
Can be set in the range 0.05 to 12.7 mm

Stitch count
The maximum stitch count per data is 20,000. (The sewing machine can hold 999 patterns, and the storage media can hold as many patterns as the upper limit of the media's storage capacity allows. However, if there are some patterns which have a large number of stitches in each program, the number of patterns which can be stored may be less.)

Basic operation

**WARNING**

- Do not handle the programmer or connector for the sewing machine or the AC adapter with wet hands, otherwise it may cause electric shocks.
- Do not insert objects such as screwdrivers into the AC adapter jack or the memory media slot, otherwise it may cause fire or electric shocks or problems with correct operation.
- Do not use any AC adapter other than the one from Brother, otherwise it may cause fire or electric shocks or problems with correct operation.
- Disconnect the AC adapter from the wall outlet before disconnecting the AC adapter plug from the programmer, otherwise it may cause electric shocks or problems with correct operation.
- Do not damage or process the connection cable for the sewing machine or the AC adapter cable, or place heavy objects such as furniture on top of them or bend or pull them with excessive force, otherwise it may cause fire or electric shocks or problems with correct operation.
- Do not use the programmer if a problem is noticed such as smoke or a bad odor coming from the programmer, otherwise it may cause fire or electric shocks or problems with correct operation.
- Immediately disconnect the programmer from the sewing machine (or disconnect the AC adapter from the wall outlet) and contact the place of purchase or a qualified technician. If you continue to use the programmer while there is a foreign object inside it, may result in fire or electric shocks or problems with correct operation.

**CAUTION**

- Do not place the programmer on unstable surfaces such as unsteady tables or high shelves, otherwise it may tip over or fall down and cause injury.
- Do not place heavy objects on top of the programmer, otherwise it may become unbalanced and tip over or fall down and cause injury.
- Turn off the power switch before connecting and disconnecting the connector for the sewing machine, otherwise it may damage the programmer and the control box.
- Be sure to disconnect the connector for the sewing machine when using the AC adapter, otherwise it may cause problems with correct operation of the programmer.
Connecting the programmer to the sewing machine

This section describes how to connect the programmer to the sewing machine. Check that the sewing machine is off before connecting the cable.

< Connecting to BAS-311HN, 326H, 341H and 342H >
Connect to the connector on the right side of the control box.

Fasten the screws securely.

<BAS-311HN, BAS-326H>  <BAS-341H, BAS-342H>
Turning the power on

1. Switch on the sewing machine.

Turning the power off

1. Write the program of the programmer to a medium.
   "Saving programs that you have created" (Refer to page 21 in Chapter 3.)

2. Press the foot switch pedal to raise the work clamp.

3. Switch off the sewing machine.
When using the programmer alone

**WARNING**

Be sure to use an AC adapter that complies with the safety standards in the country of use. Otherwise, it may cause fire or electric shocks or problems with correct operation.

Purchase an AC adaptor conforming to the specifications below.

**OUTPUT**: 24 VDC, 0.5A

**Polarity**:

![Diagram of AC adapter with specifications](image)

**Precautions on disassembly, assembly, and part replacement**

**WARNING**

Do not disassemble or modify the programmer, otherwise it may cause fire or electric shocks or problems with correct operation.

Ask the place of purchase or a qualified technician to carry out any internal inspections, adjustments or repairs that may be required.

(Any problems with correct operation that occur as a result of the customer attempting to disassemble or modify the programmer will not be covered by the warranty.)

- For preventing the internal wiring from being damaged, considerable care must be taken when assembling and disassembling the case.
- For preventing the internal wiring from getting caught in the case or other parts, care must be taken when assembling the case.
- Be sure to use a torque of 0.5 N/m when tightening screws.
  Using excessive torque may damage the case.
Handling media

**WARNING**

Do not insert objects such as screwdrivers into the SD card slot or the USB flash memory port, otherwise it may cause fire or electric shocks or problems with correct operation.

### Using SD cards and USB flash memory

#### Configuration of SD card and USB flash memory folders

<table>
<thead>
<tr>
<th>Data type</th>
<th>Folder name</th>
<th>File name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control program</td>
<td>¥BROTHER¥ISM¥ISMSYS¥</td>
<td>ISM19MN.BVP, ISM21MN.BVP (Main control program)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ISM19MT.BVP (Motor control program)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ISM23PL..BVP (Panel control program)</td>
</tr>
<tr>
<td>Sewing data</td>
<td>¥BROTHER¥ISM¥ISMDH**¥</td>
<td>ISMS0***.SEW</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ISMS0***.EMB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* &quot;***&quot; represents the value for memory switch No. 752. If you would like to keep additional sewing data for different sewing machines on a single SD card, change the folder name.</td>
</tr>
<tr>
<td>Memory switch</td>
<td>Same as above</td>
<td>memorysw.db</td>
</tr>
<tr>
<td>Parameter</td>
<td>Same as above</td>
<td>userparam.db</td>
</tr>
<tr>
<td>Cycle program</td>
<td>Same as above</td>
<td>ISMCYC**.SEW</td>
</tr>
<tr>
<td></td>
<td></td>
<td>* &quot;***&quot; represents the sewing data number.</td>
</tr>
<tr>
<td>Extended option</td>
<td>Same as above</td>
<td>ISMSEQ**.SEQ</td>
</tr>
<tr>
<td>programs</td>
<td></td>
<td>* &quot;***&quot; represents the sewing data number.</td>
</tr>
<tr>
<td>Error log</td>
<td>¥BROTHER¥ISM¥ISMSMLDT¥</td>
<td>Stores the files which relate to error logs.</td>
</tr>
</tbody>
</table>

#### Notes on handling SD cards and USB flash memory

- Do not insert any objects into the card slot and the USB flash memory port other than SD cards or USB flash memory. If this is not observed, damage to the product may occur.
- Do not remove the power plug or insert or remove an SD card or USB flash memory while data reading or writing operations are in progress, otherwise the data may become corrupted or the SD card or USB flash memory may become damaged.
- If the data cannot be recognized, return the data to the device which recorded it or some other similar device to check if the SD card or USB flash memory is damaged or not.
- The data on the SD card or USB flash memory may become lost or corrupted due to some malfunction or accident. It is recommended that you make backups of important data.

* Company names and product names appearing in this manual are trademarks or registered trademarks of the respective owners.
* This product is compatible with media that has been formatted using the FAT16/32 method. Media that has been formatted using other formatting methods cannot be used.
CHAPTER 2 SETTING UP YOUR PROGRAMMER

■ Inserting SD cards and USB flash memory

1. Open the media slot cover.

2. Insert the SD card or USB flash memory into the SD card slot or USB flash memory port of the programmer.

The programmer is compatible with the following SD cards and USB flash memories.

<table>
<thead>
<tr>
<th>Type</th>
<th>Setting location</th>
</tr>
</thead>
<tbody>
<tr>
<td>•SD cards (maximum capacity 2 GB)</td>
<td>3594B</td>
</tr>
<tr>
<td>•SDHC cards (maximum capacity 32 GB)</td>
<td>3660B</td>
</tr>
<tr>
<td>•USB flash memory (maximum capacity 32 GB)</td>
<td>3597B</td>
</tr>
</tbody>
</table>

■ When removing SD cards and USB flash memory

Check that reading or writing has finished, and then simply remove the storage device.

If the programmer is connected to a PC, first wait until the SD card or the USB flash memory is no longer being accessed by the PC, and then remove the SD card or USB flash memory.
Chapter 3
Programming with Icons
CHAPTER 3 PROGRAMMING WITH ICONS

**Foreword**

While being operated by the programmer, a number of icons are displayed on the screen which illustrate its operations and functions. This chapter describes the procedure for programming with icons.

**Keys to be used**

Below is an explanation of the keys which are used when programming.

- Press this to move the cursor around within the preview, etc.
- Press this to return to the Home screen.
- Press this to return to the previous step.
- Press this to confirm outlines and settings.
About the programming screen

At the Home screen, touch \( \text{programming} \) to display the programming screen.

- **Sewing**
- **Programming**
- **File Manager**
- **Settings**

- Shows an image of the program.
- Shows the difference between the current cursor position and the position at the previous step.
- Shows the current number of needle positions and the total number of stitches.
- Use to display and change program zoom ratio and zoom position.
- Shows the size of the program.
- Use to redo and restore programs.
- Used to delete all programs and to save and load programs.
- Switches the mode.
- Shows icons which can be used in the various modes.
- Sets the values used by the various functions.
Description of icons

Programming

- Creating a line
- Creating a curve
- Creating an arc
- Creating a rectangle
- Creating a circle of the specified radius (clockwise or counterclockwise)
- Creating a circle of the specified diameter (clockwise or counterclockwise)
- Creating a circle by specifying three points
- Creating a semicircle
- Creating an ellipse
- Creating needle drop data
- Creating feed data
- Creating basting data
- Specifying the sewing start point

Editing programs

- Deleting an outline
- Moving an outline
- Copying an outline
CHAPTER 3 PROGRAMMING WITH ICONS

Rotating an outline

Moving an outline symmetrically

Copying an outline symmetrically

Moving an outline by an offset

Copying an outline by an offset

Resizing an outline

Changing the line type of an outline

Adding and deleting backtrack stitches for an outline

Switching the sewing start and end points for outlines

Changing the connection method for an outline

Combining outlines

Changing the sewing order for an outline

Deleting an outline component point

Moving an outline component point

Adding an outline component point

Changing curve shapes

Changing the attributes of outline component points

Separating an outline at a component point
CHAPTER 3 PROGRAMMING WITH ICONS

Deleting a sewing point

Moving a sewing point

Adding a sewing point

Editing sewing points

Changing the attributes of sewing points

Separating an outline at a sewing point

Setting bar tacking at a sewing point

Adding and deleting codes at sewing points

 Editing end codes

Checking programs

Moving backward one stitch at a time

Moving forward one stitch at a time

Moving to the start position

Measuring distances

Buttons for running external functions

Creating a new file

Deleting all changes to the program being edited

Saving

Saving with a different filename
### Opening a file

### Other

- ![Undo](image) **Undoing changes**
- ![Redo](image) **Redoing changes**
The procedure for programming with icons is as follows.

1. Displaying the programming screen

At the Home screen, touch \( \text{Programming} \).

The programming screen will be displayed.

If you press \( \text{Yes} \) when the following message is displayed, the sewing machine will operate and programs can then be created.

Programm

Are you sure you want to move the feed mechanism of the sewing machine in conjunction with the cursor on the screen? If you press the \( \text{No} \) key, and then you can program without operating the sewing machine.

Yes No

Furthermore, if you press \( \text{No} \) at the above screen, the model selection screen (shown below) will be displayed, so select the applicable model and then touch \( \text{OK} \). At this time, you can create programs without operating the sewing machine.

Touch \( \text{Cancel} \) to return to the Home screen.

If the following message is displayed, press \( \text{Yes} \) to start again from the program which was not saved when operation was last stopped. In addition, press \( \text{No} \) to start creating a new program.
2. Starting program creation

Touch \( \text{\textbullet} \).

3. Set the sewing start position.

Touch \( \text{\textbullet} \).

Use the jog key to move the cursor in the \( + \) direction.

Once you have set the sewing start position, press \( \text{\textbullet} \).

4. Creating program

Select the desired icon from the icons in the top-right corner of the screen, and then create a program for the design you would like to sew. The programs you create are enabled until you delete them.

For detailed explanations on creating programs, refer to "Creating programs" (page 24) and "Programming example" (page 53).
5. Inputting an end code

Once you have finished creating the program, edit the end code that controls the sewing machine operation. The following six end codes from 111 to 116 are available, each of which carries out machine operations as shown in the table below.

When creating programs, an end point (normal) is set at the sewing end point.

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>111</td>
<td>Normal</td>
</tr>
<tr>
<td>112</td>
<td>Fixes the sewing speed at 1200 sti/min or lower</td>
</tr>
<tr>
<td>113</td>
<td>Carrying out no thread wiping</td>
</tr>
<tr>
<td>114</td>
<td>Fixes the sewing speed at 1200 sti/min or lower and no thread wiping is carried out</td>
</tr>
<tr>
<td>115</td>
<td>Carrying out no thread trimming</td>
</tr>
<tr>
<td>116</td>
<td>Fixes the sewing speed at 1500 sti/min or lower</td>
</tr>
</tbody>
</table>

1. Touch 📚.

2. Touch 🖼️.

3. Touch the end code that you would like to set, and then change the code.

- 111: Normal
- 112: Under 1200 sti/min
- 113: Disable Wiper
- 114: Disable Wiper, Under 1200 sti/min
- 115: Disable Trimming
- 116: Under 1500 sti/min
6. Saving the created program

For details on the operation method, refer to "File Manager Functions" (page 112).

1. Touch  

[When saving a new program]

2. Touch the Program No. field to display the numeric keypad screen, and then touch the keys to enter the program number.

3. Touch the Comment field to display the keyboard screen, and then touch the keys to enter a comment.

4. When you touch  on the numeric keypad screen or the keyboard screen, the file will be saved in the panel internal memory and the display will return to the programming screen. Touch  to return to the programming screen without saving the file.

[When overwriting an existing program number]

2. The program saving dialog screen will be displayed, so touch  to overwrite the existing file.

Touch  to return to the programming screen.
7. Saving programs with a different name

1. Touch \( \text{\textligature{\text{Program}}} \) to display the numeric keypad screen, and then touch the keys to enter the program number.

2. Touch the Program No. field to display the numeric keypad screen, and then touch the keys to enter the program number.

3. Touch the Comment field to display the keyboard screen, and then touch the keys to enter a comment.

4. When you touch \( \text{\textligature{\text{Program}}} \) on the numeric keypad screen or the keyboard screen, the file will be saved in the panel internal memory and the display will return to the programming screen. Touch \( \text{\textligature{\text{Cancel}}} \) to return to the programming screen without saving the file.

8. Ending programming

1. Press \( \text{\textligature{\text{Home}}} \) at the programming screen. (The display will return to the Home screen.)

2. If a program is currently being created, the following dialog screen will be displayed. Touch \( \text{\textligature{\text{Yes}}} \) to discard the program which has been completed and end programming.

   Touch \( \text{\textligature{\text{No}}} \) to return to the programming screen.
9. Loading programs which have already been created

For details on the operation method, refer to "File Manager Functions" (page 112).

1. Touch 💾.

If there is a program which is currently being created, the following dialog screen will be displayed. Select either "Overwrite current data", "Append to the current data" or "Append to the current data (Split Auto Insert)", and then touch OK. Refer to the following for details on each selection item.

<table>
<thead>
<tr>
<th>Selection item</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overwrite current data</td>
<td>Discard the data which is currently being created, and display the data which has been loaded.</td>
</tr>
<tr>
<td>Append to the current data</td>
<td>The data is connected via feeding to the end of the program which is currently being edited.</td>
</tr>
<tr>
<td>Append to the current data (Split Auto Insert)</td>
<td>The data is connected via feeding to the end of the program which is currently being edited, and a code (split) is inserted at the beginning of the loaded data.</td>
</tr>
</tbody>
</table>

2. Touch 📑 to select the media to load the file from, and then navigate to the folder to load the file from.

3. Select the file to be loaded from the file list, and then touch OK.

4. The details of the file which have been loaded will appear in the programming screen.
10. Deleting programs

1. Touch \[\text{ }\].

2. The program which is currently being edited will be deleted and the display will return to the initial status.

Creating programs

This section describes icons used for creating and editing program and how to use them.
* For details about operations, refer to "Programming example" (page 53).
* For details on the setting method for zigzag stitches, refer to "Zigzag stitch" (page 61).
* In the program, ● indicates the sewing start point and × indicates the sewing end point.

Creating a line

1. Touch \[\text{ }\].

2. Touch \[\text{ }\].

3. Make the settings for each item.
   * Refer to "Setting parameters" (page 29) for details on the setting method.

4. Use the jog key to move the cursor \[\text{ +}\] to the next point, and then press \[\text{ }\].

5. Repeat step 4 until the shape you would like to sew has been created. Move the cursor \[\text{ +}\] to the end point, and then press \[\text{ }\] twice.
   * You can connect straight lines, curves and arcs together.

Creating a curve

1. Touch \[\text{ }\].

2. Touch \[\text{ }\].

3. Make the settings for each item.
   * Refer to "Setting parameters" (page 29) for details on the setting method.

4. Use the jog key to move the cursor \[\text{ +}\] to the next point, and then press \[\text{ }\].

5. Repeat step 4 until the shape you would like to sew has been created. Move the cursor \[\text{ +}\] to the end point, and then press \[\text{ }\] twice.
Creating an arc

1. Touch ✂.

2. Touch ✂.

3. Make the settings for each item.
   * Refer to "Setting parameters" (page 29) for details on the setting method.

4. Use the jog key to move the cursor + to the second point, and then press ✽.

5. Use the jog key to move the cursor + to the third point, and then press ✽.
   * If you would like to create more than three points for the arc, you can continue entering more points.

Creating a rectangle

1. Touch ✂.

2. Touch ✂.

3. Make the settings for each item.
   * Refer to "Setting parameters" (page 29) for details on the setting method.

4. Use the jog key to move the cursor + to the second point, and then press ✽.

   Second point  Start point

5. Use the jog key to set the rectangle shape.

   To create the rectangle shape, move the cursor + from the single side which was created in step 4 to the desired position for the rectangle, and then press ✽.

   Second point  Start point
Creating a circle

The following three options are available for creating a circle.

- Specify a radius to create a circle (clockwise or counterclockwise)
- Specify a diameter to create a circle (clockwise or counterclockwise)

1. Touch 📊.

   ■ If 🔫 is selected

2. Touch 🔫 or ⬇.

3. Make the settings for each item.
   * Refer to "Setting parameters" (page 29) for details on the setting method.

   ■ If 🔫 is selected

2. Touch 🔫.

3. Make the settings for each item.
   * Refer to "Setting parameters" (page 29) for details on the setting method.

4. Use the jog key to move the cursor ➕ to the second point, and then press ⬇.

5. Use the jog key to move the cursor ➕ to the third point, and then press ⬇.
Creating a semicircle

1. Touch 🔁.
2. Touch 🔄.
3. Make the settings for each item.
   * Refer to "Setting parameters" (page 29) for details on the setting method.
4. Use the jog key to move the cursor ➡ to the point which you would like to set, and then press 🏷.

Creating an ellipse

1. Touch 🔁.
2. Touch 🔄.
3. Make the settings for each item.
   * Refer to "Setting parameters" (page 29) for details on the setting method.
4. Use the jog key to move the cursor ➡ to the second point on the long axis (short axis), and then press 🏷.
   Second point ➡ Start point
5. Use the jog key to move the cursor ➡ to the position for the short axis (long axis), and then press 🏷.
   ➡ Start point
Creating needle drop data

Create needle drop data for the current needle position.

1. Touch \( \text{needle drop} \).
2. Touch \( \text{needle drop} \).
3. Make the settings for each item.
   * Refer to "Setting parameters" (page 29) for details on the setting method.
4. Use the jog key to move the cursor \( \uparrow \) to the point where you would like to set the needle down position, and then press \( \downarrow \).
   To change the maximum pitch, carry out the same procedure as in step 3 to change the setting.
5. Repeat step 4 until the needle drop position can be set.
   Move the cursor \( \uparrow \) to the end point, and then press \( \downarrow \) twice.

Creating feed data

Create (feed) data to move the needle to the next position without needle drop at the current position.

1. Touch \( \text{feed} \).
2. Touch \( \text{feed} \).
3. Make the settings for each item.
   * Refer to "Setting parameters" (page 29) for details on the setting method.
4. Use the jog key to move the cursor \( \uparrow \) to the point where you would like to set the feed, and then press \( \downarrow \) twice.

Creating basting data

Create basting data.

1. Touch \( \text{basting} \).
2. Touch \( \text{basting} \).
3. Make the settings for each item.
   * Refer to "Setting parameters" (page 29) for details on the setting method.
4. Use the jog key to move the cursor \( \uparrow \) to the point where you would like to set basting, and then press \( \downarrow \).
5. Repeat step 4 until the basting position can be set.
   Move the cursor \( \uparrow \) to the end point, and then press \( \downarrow \) twice.
**Setting parameters**

**Operation method**
Parameters are displayed in a list at the right edge of the screen, so touch ▼ ▲ to make the settings.

**Details of parameter settings**

<table>
<thead>
<tr>
<th>Icon</th>
<th>Parameter</th>
<th>Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>Method for Appending *1</td>
<td>Insert, Append to beginning, Append to end</td>
</tr>
<tr>
<td>+</td>
<td>Method for moving cursor</td>
<td>Move freely, Snap to needle point</td>
</tr>
<tr>
<td>⬇️</td>
<td>Rotation direction *2</td>
<td>Clockwise, Counterclockwise</td>
</tr>
<tr>
<td>🔫</td>
<td>Line type</td>
<td>Running, V Zigzag, N Zigzag</td>
</tr>
<tr>
<td>⬇️</td>
<td>Running pitch *3</td>
<td>0.3 - 12.7 mm</td>
</tr>
<tr>
<td>🔫</td>
<td>Zigzag pitch *4</td>
<td>0.1 - 25.5 mm</td>
</tr>
<tr>
<td>🔫</td>
<td>Zigzag left width *4</td>
<td>0.0 - 25.5 mm</td>
</tr>
<tr>
<td>🔫</td>
<td>Zigzag right width *4</td>
<td></td>
</tr>
<tr>
<td>🔫</td>
<td>Number of zigzag stitches *4</td>
<td>2 - 4 stitches</td>
</tr>
<tr>
<td>⬅️</td>
<td>Running generation mode *3</td>
<td>Equal Pitch, Prioritize Pitch</td>
</tr>
<tr>
<td>🔫</td>
<td>Backtack entry mode</td>
<td>No Back Tack, V Back, N Back, Overlap *6</td>
</tr>
<tr>
<td>🔫</td>
<td>Backtack exit mode</td>
<td></td>
</tr>
<tr>
<td>🔫</td>
<td>Backtack Entry Number of Stitches *5</td>
<td>0 - 9 stitches</td>
</tr>
<tr>
<td>🔫</td>
<td>Backtack Exit Number of Stitches *5</td>
<td></td>
</tr>
<tr>
<td>🔫</td>
<td>Maximum Pitch *7</td>
<td>0.3 - 12.7 mm</td>
</tr>
<tr>
<td>🔫</td>
<td>Split Auto Insert *8</td>
<td>None, Split w/Needle Up</td>
</tr>
<tr>
<td>🔫</td>
<td>Outline connection</td>
<td>Feed, Running, Stitch, Baste</td>
</tr>
</tbody>
</table>

*1  When adding an existing pattern, you can select the method for appending the program (Insert, Append to end, Append to beginning).

*2  This can only be set when drawing a circle (radius), circle (diameter), semicircle or ellipse.

*3  This can only be set when the line type is set to "Running".
CHAPTER 3 PROGRAMMING WITH ICONS

*4 This can only be set when the line type is set to "V Zigzag" or "N Zigzag".
*5 This can only be set when backtack start mode (backtack end mode) is set to a setting other than "No back Tack".
*6 This can only be set when drawing a rectangle, circle (radius), circle (diameter), circle (3 points) or ellipse.
*7 This can only be set when creating needle drop data.
*8 This can only be set when creating feed data or basting data.

■ Parameter setting examples

Example 1: To create sewing points which are as even as possible without exceeding the specified pitch: Set the running generation mode to "Equal Pitch".

Example 2: To connect the end point of the previous outline and the start point of the current outline by feeding: Set the outline connection to "Feed".
Editing programs (Editing outlines)

The procedure for editing programs using icons is as follows.

Deleting an outline

1. Touch .

2. Touch .

3. Use to position the cursor at the outline which you would like to delete.

4. When you press the key once, the outline will change to red lines and it will be selected.

   When you press the key once, the selected outline will be unselected.

5. If there is more than one outline that you would like to delete, repeat steps 3 and 4.

   * To select all outlines
   Hold down to select all outlines.

   * To unselect all outlines
   Hold down to unselect all selected outlines.

6. Press .

Moving an outline

1. Touch .

2. Touch .

3. Use to position the cursor at the outline which you would like to move.

4. When you press the key once, the outline will change to red lines and it will be selected.

   When you press the key once, the selected outline will be unselected.

5. If there is more than one outline that you would like to move, repeat steps 3 and 4.

   * To select all outlines
   Hold down to select all outlines.

   * To unselect all outlines
   Hold down to unselect all selected outlines.

6. Press .

7. Touch to set the method for moving the cursor (Move freely, Snap to needle point).

8. Use the jog key to move the cursor to the place where you would like to move the outline.

**Copying an outline**

1. Touch 👇.

2. Touch 🡫.

3. Use 👈➡️ to position the cursor 🍀 at the outline which you would like to copy.

4. When you press the △ key once, the outline will change to red lines and it will be selected.

   When you press the ▼ key once, the selected outline will be unselected.

5. If there is more than one outline that you would like to copy, repeat steps 3 and 4.
   * To select all outlines
     Hold down △ to select all outlines.
   * To unselect all outlines
     Hold down ▼ to unselect all selected outlines.

6. Press 🍀.

7. Touch 👈➡️ to set the method for moving the cursor (Move freely, Snap to needle point).

8. Use the jog key to move the cursor 🍀 to the place where you would like to copy the outline.


**Rotating an outline**

1. Touch 👇.

2. Touch 🡫.

3. Use 👈➡️ to position the cursor 🍀 at the outline which you would like to rotate.

4. When you press the △ key once, the outline will change to red lines and it will be selected.

   When you press the ▼ key once, the selected outline will be unselected.

5. If there is more than one outline that you would like to rotate, repeat steps 3 and 4.
   * To select all outlines
     Hold down △ to select all outlines.
   * To unselect all outlines
     Hold down ▼ to unselect all selected outlines.

6. Touch 👈➡️ to set the rotation angle, rotation center point and method for moving the cursor (Move freely, Snap to needle point).

7. Press 🍀.

   * If the rotation center was set to "Specified point" in step 6, you can use the jog key to move the cursor 🍀 so that the current cursor position rotates around the center.
     In this case, after moving the cursor 🍀, press 🍀 once more. In addition, each time you change the rotation angle, the preview is displayed after the outline is rotated.

   * Rotation center ... Origin, Center of Mask, Mask top edge, Mask bottom edge, Mask top-left, Mask bottom-left, Mask top-right, Mask bottom-right, Specified point
   * The method for moving the cursor is set only when the rotation center point is set to "Specified point".
Moving an outline symmetrically

1. Touch \[ \text{symmetry mode} \]

2. Touch \[ \text{symmetry mode} \]

3. Use \[ \text{symmetry mode} \] to position the cursor \[ \text{symmetry mode} \] at the outline which you would like to move symmetrically.

4. When you press the \[ \text{symmetry mode} \] key once, the outline will change to red lines and it will be selected.

When you press the \[ \text{symmetry mode} \] key once, the selected outline will be unselected.

5. If there is more than one outline that you would like to move symmetrically, repeat steps 3 and 4.

* To select all outlines
  Hold down \[ \text{symmetry mode} \] to select all outlines.

* To unselect all outlines
  Hold down \[ \text{symmetry mode} \] to unselect all selected outlines.

6. Touch \[ \text{symmetry mode} \] to set the symmetry mode and method for moving the cursor (Move freely, Snap to needle point).

7. Press \[ \text{symmetry mode} \].

Copying an outline symmetrically

1. Touch \[ \text{symmetry mode} \]

2. Touch \[ \text{symmetry mode} \]

3. Use \[ \text{symmetry mode} \] to position the cursor \[ \text{symmetry mode} \] at the outline which you would like to copy symmetrically.

4. When you press the \[ \text{symmetry mode} \] key once, the outline will change to red lines and it will be selected.

When you press the \[ \text{symmetry mode} \] key once, the selected outline will be unselected.

5. If there is more than one outline that you would like to copy symmetrically, repeat steps 3 and 4.

* To select all outlines
  Hold down \[ \text{symmetry mode} \] to select all outlines.

* To unselect all outlines
  Hold down \[ \text{symmetry mode} \] to unselect all selected outlines.
6. Touch ▼ ▲ to set the symmetry mode and method for moving the cursor (Move freely, Snap to needle point)

* Symmetry mode
  ... X-axis, Y-axis, Center of Mask (horizontal), Center of Mask (vertical), Mask top edge, Mask bottom edge, Mask left edge, Mask right edge, Specified axis

* The method for moving the cursor is set only when the symmetry mode is set to "Specified axis".

7. Press ◀️.

* If the symmetry mode was set to "Specified axis" in step 6, you can use the jog key to move the cursor ◀️ so that the current cursor position moves symmetrically around the center.

In this case, after moving the cursor ◀️, press ◀️ once more. When this is done, each time you change the cursor position, the preview is displayed after the cursor is moved.
Moving an outline by an offset

1. Touch ✍️.

2. Touch ⬅️.

3. Use ⬅️ to position the cursor ➕ at the outline which you would like to move by an offset.

4. When you press the ▲ key once, the outline will change to red lines and it will be selected.

When you press the ▼ key once, the selected outline will be unselected.

* Outlines which consist of stitches/feeding/basting and outlines which have been loaded from *.SEW files cannot be moved by an offset.

5. If there is more than one outline that you would like to move by an offset, repeat steps 3 and 4.

* To select all outlines
  Hold down ▲ to select all outlines.

* To unselect all outlines
  Hold down ▼ to unselect all selected outlines.

6. Touch ⬅️ ➕ to set the offset direction (Inside/Left Side, Outside/Right Side) and the offset width.

7. Press .

Copying an outline by an offset

1. Touch ✍️.

2. Touch ⬅️.

3. Use ⬅️ to position the cursor ➕ at the outline which you would like to copy by an offset.

4. When you press the ▲ key once, the outline will change to red lines and it will be selected.

When you press the ▼ key once, the selected outline will be unselected.

* Outlines which consist of stitches/feeding/basting and outlines which have been loaded from *.SEW files cannot be copied by an offset.

5. If there is more than one outline that you would like to copy by an offset, repeat steps 3 and 4.

* To select all outlines
  Hold down ▲ to select all outlines.

* To unselect all outlines
  Hold down ▼ to unselect all selected outlines.

6. Touch ⬅️ ➕ to set the offset direction (Inside/Left Side, Outside/Right Side), the offset width, the number of offset copies (1 to 99) and the offset creation method (Same Direction, Return, Return + stitch connection).

7. Press .
Resizing an outline

1. Touch \[\text{Resize outline}\].

2. Touch \[\text{Select/deselect outline}\].

3. Use \[\text{cursor control keys}\] to position the cursor \(\uparrow\) at the outline which you would like to resize.

4. When you press the \[\text{cursor control keys}\] once, the outline will change to red lines and it will be selected.

   When you press the \[\text{cursor control keys}\] once, the selected outline will be unselected.

5. If there is more than one outline that you would like to resize, repeat steps 3 and 4.
   
   * To select all outlines
     Hold down \[\text{cursor control keys}\] to select all outlines.
   
   * To unselect all outlines
     Hold down \[\text{cursor control keys}\] to unselect all selected outlines.

6. Touch \[\text{cursor control keys}\] to set the X ratio, Y ratio, resize center, hold element (stitch number or sewing pitch) and method for moving the cursor (Move freely, Snap to needle point).

[Diagram showing cursor control keys and resize options]

* Resize center ... Origin, Center of Mask, Mask top edge, Mask bottom edge, Mask top-left, Mask bottom-left, Mask top-right, Mask bottom-right, Specified point

* The method for moving the cursor is set only when the resize center is set to "Specified point".

7. Press \[\text{ok}\].

   * If the resize center was set to "Specified point" in step 6, you can use the jog key to move the cursor \(\uparrow\) so that the outline is resized with the current cursor position as the resize center.

   In this case, after moving the cursor \(\uparrow\), press \[\text{ok}\] once more. In addition, each time you change the X ratio or Y ratio, the preview is displayed after the outline is resized.

   * Outlines which consist of stitches/feeding/basting and outlines which have been loaded from *.SEW files normally have "Keep Number of Stitches" as their hold element.
### Changing the Line Type of an Outline

1. Touch 

![Line Type Icon]

2. Touch 

![Line Type Icon]

3. Use 

![Cursor Position Icon]

to position the cursor at the outline which you would like to change the line type for.

4. When you press the key once, the outline will change to red lines and it will be selected.

When you press the key once, the selected outline will be unselected.

5. If there is more than one outline that you would like to change the line type for, repeat steps 3 and 4.

* To select all outlines
  Hold down 
  to select all outlines.

* To unselect all outlines
  Hold down 
  to unselect all selected outlines.

6. Touch 

![Running, V Zigzag, N Zigzag, Keep Current Shape, Equal Pitch, Prioritize Pitch]

Line type

Sewing pitch

Running generation mode

* For details on the setting method for zigzag stitches, refer to "Zigzag stitch" (page 61).

* Outlines which consist of stitches/feeding/basting and outlines which have been loaded from *.SEW files cannot have their line types changed.

7. Press .

### Adding and Deleting Backtack Stitches for an Outline

1. Touch 

![Stitch Type Icon]

2. Touch 

![Stitch Type Icon]

3. Use 

![Cursor Position Icon]

to position the cursor at the outline which you would like to add or delete backtacking for.

4. When you press the key once, the outline will change to red lines and it will be selected.

When you press the key once, the selected outline will be unselected.

5. If there is more than one outline that you would like to add or delete backtacking for, repeat steps 3 and 4.

* To select all outlines
  Hold down 
  to select all outlines.

* To unselect all outlines
  Hold down 
  to unselect all selected outlines.

6. Touch 

![Backtack Type Icon]

**Backtack type (start position)**

**Number of backtack stitches (start position)**

**Backtack type (end position)**

**Number of backtack stitches (end position)**

* Backtack stitch type ...
  No Back Tack, V Back, N Back, Overlap

* The "Overlap" setting can only be set for closed outlines (circles specified by radius, circles specified by diameter, circles specified by three points, ellipses, rectangles, etc.).

7. Press .
Switching the sewing start and end points for outlines

1. Touch 🔄.

2. Touch 🔄.

3. Use ⬅️➡️ to position the cursor 🔱 at the outline which you would like to switch the outline start point or end point for.

4. When you press the ⬆️ key once, the outline will change to red lines and it will be selected. When you press the ⬇️ key once, the selected outline will be unselected.

5. If there is more than one outline that you would like to switch the start point or end point for, repeat steps 3 and 4.
   * To select all outlines
     Hold down ⬆️ to select all outlines.
   * To unselect all outlines
     Hold down ⬇️ to unselect all selected outlines.

6. Press 🔄.
   * When multiple continuous outlines are selected, the orders are also switched.

Example: When outlines 1, 2, 3 and 4 have been created, and you select outlines 1, 2 and 4 (red lines) and switch the start and end points:

Changing the connection method for outlines

1. Touch 🔄.

2. Touch 🔄.

3. Use ⬅️➡️ to position the cursor 🔱 at the outline which you would like to change the outline connection method for.

4. When you press the ⬆️ key once, the outline will change to red lines and it will be selected. When you press the ⬇️ key once, the selected outline will be unselected.

5. If there is more than one outline that you would like to change the outline connection method for, repeat steps 3 and 4.
   * To select all outlines
     Hold down ⬆️ to select all outlines.
   * To unselect all outlines
     Hold down ⬇️ to unselect all selected outlines.

6. Touch ⬅️ ➤️ to set the outline connection method (Stitch, Feed, Running, Baste).
   * If "Stitch" is set as the outline connection method:
     If the maximum pitch of the stitches exceeds 12.7 mm, use the "Feed" setting to connect.
   * If "Running" is set as the outline connection method:
     The outline is connected by a straight line at the current outline running pitch.

7. Press 🔄.
   * The end point of the previous outline and the start point of the current outline are connected.
Combining outlines

1. Touch .

2. Touch .

3. Use to position the cursor at an outline which you would like to combine.

4. When you press the key once, the outline will change to red lines and it will be selected.

When you press the key once, the selected outline will be unselected.

5. If there is more than one outline that you would like to combine, repeat steps 3 and 4.

   * To select all outlines
   Hold down to select all outlines.

   * To unselect all outlines
   Hold down to unselect all selected outlines.

6. Press .

   * The following outlines cannot be combined.
   - Closed outlines (circles specified by radius, circles specified by diameter, circles specified by three points, ellipses, rectangles, etc.)
   - Outlines which consist of stitches/feeding/basting and other types of outlines

   * If only one outline is selected, it will become a closed outline.

   <Example>

   Changing the sewing order for an outline

1. Touch .

2. Touch .

3. Use to position the cursor at the outline which you would like to change the outline sewing order for.

4. When you press the key once, the outline will change to red lines and it will be selected.

When you press the key once, the selected outline will be unselected.

5. If there is more than one outline that you would like to change the outline sewing order for, repeat steps 3 and 4.

   * To select all outlines
   Hold down to select all outlines.

   * To unselect all outlines
   Hold down to unselect all selected outlines.

6. Touch to set the sewing order (Move Forward, Move Back, Move to start, Move to end).

7. Press .
This section describes the icons which are used when editing outline component points and how to use them.

* You cannot edit the outline component points for outlines which have been loaded from *.SEW files.

Deleting an outline component point

1. Touch \( \mathbb{V} \).

2. Touch \( \mathbb{V} \).

3. Touch \( \llbracket \mathbb{V} \rrbracket \) to set the selection method.

Selecting continuous component points for editing

4. Touch \( \llbracket \mathbb{V} \rrbracket \) to set the selection method to "Range select".

5. Use \( \mathbb{V} \) to move the cursor \( \mathbb{V} \) to the start point for the range that you would like to select.

* You can move the cursor continuously by holding down the key.

6. Press \( \mathbb{V} \).

7. Use \( \mathbb{V} \) to move the cursor \( \mathbb{V} \) to the end point of the range that you would like to select. The component points will change to red, and the points from the start point to the end point will be selected.

* You can move the cursor continuously by holding down the key.

8. Press \( \mathbb{V} \).

Manually selecting component points for editing

4. Touch \( \llbracket \mathbb{V} \rrbracket \) to set the selection method to "Manual select".

5. Use \( \llbracket \mathbb{V} \rrbracket \) to move the cursor \( \mathbb{V} \) to the component point that you would like to delete.

* You can move the cursor continuously by holding down the key.

6. When you press the \( \Delta \) key once, the component point will change to red and it will be selected. When you press the \( \nabla \) key once, the selected component point will be unselected.

7. If there is more than one component point that you would like to delete, repeat steps 5 and 6.

* To select all outlines

   Hold down \( \Delta \) to select all component points in an outline.

* To unselect all outlines

   Hold down \( \nabla \) to unselect all selected component points.

8. Press \( \mathbb{V} \).
CHAPTER 3 PROGRAMMING WITH ICONS

Moving an outline component point

1. Touch the icon.

2. Touch the icon.

3. Touch the icon to set the selection method (Manual select, Range select) and method for moving the cursor (Move freely, Snap to needle point).

   * If the method for moving the cursor is set to "Move freely", the cursor can be moved to any desired position.
   * If the method for moving the cursor is set to "Snap to needle point", the cursor will move to the sewing point.

■ Selecting continuous component points for editing

4. Touch the icon to set the selection method to "Range select".

5. Use the icon to move the cursor to the start point for the range that you would like to select.

   * You can move the cursor continuously by holding down the key.

6. Press the icon.

7. Use the icon to move the cursor to the end point of the range that you would like to select. The component points will change to red, and the points from the start point to the end point will be selected.

   * You can move the cursor continuously by holding down the key.

8. Press the icon once, and then use the jog key to move the cursor to the place where you would like to move the component point.

9. Press the icon.

■ Manually selecting component points for editing

4. Touch the icon to set the selection method to "Manual select".

5. Use the icon to move the cursor to the component point that you would like to move.

   * You can move the cursor continuously by holding down the key.

6. When you press the icon once, the component point will change to red and it will be selected.

   When you press the icon once, the selected component point will be unselected.

7. If there is more than one component point that you would like to move, repeat steps 5 and 6.

   * To select all outlines
     Hold down the icon to select all component points in an outline.

   * To unselect all outlines
     Hold down the icon to unselect all selected component points.

8. Press the icon once, and then use the jog key to move the cursor to the place where you would like to move the component point.

9. Press the icon.

■ Selection method

<table>
<thead>
<tr>
<th>Selection method</th>
<th>Method for moving the cursor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual select</td>
<td>Move freely</td>
</tr>
<tr>
<td>Range select</td>
<td>Move freely</td>
</tr>
</tbody>
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Selection method

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</tr>
<tr>
<td>Range select</td>
<td>Move freely</td>
</tr>
</tbody>
</table>
### Adding an outline component point

1. Touch 🖍.

2. Touch ✅.

3. Use ⬅️ to move the cursor ✅ to the component point where you would like to add a component point.
   
   * You can move the cursor continuously by holding down the key.

4. Press 📊.
   
   * The component point will be automatically added between the selected component point and the next component point.

   * You cannot add component points for circles (circles specified by radius, circles specified by diameter, circles specified by three points) and ellipses.

### Changing curve shapes

1. Touch 🖍.

2. Touch 🚧.

3. Use ⬅️ to move the cursor ✅ to the component point in the curve that you would like to edit.
   
   * You can move the cursor continuously by holding down the key.

4. Press 📊.
   
   * You can only change the current component point if it and the component points immediately before and after it are part of a curve.

5. Use the jog key to edit the curve.
   
   * To rotate the curve clockwise
     
     Hold down ⬆️ to rotate the curve clockwise.
   
   * To rotate the curve counterclockwise
     
     Hold down ⬇️ to rotate the curve counterclockwise.

6. Press 📊.
### Changing the attributes of outline component points

1. Touch \[ \text{Moving tool} \].

2. Touch \[ \text{Attribute select tool} \].

3. Use \[ \text{Cursor tool} \] to move the cursor to the component point that you would like to change the attributes for.
   
   * You can move the cursor continuously by holding down the key.

4. Touch \[ \text{Attribute select tool} \] to select the attribute (Straight line, Curve) to change. The attribute of the component point will then be changed.

   * You cannot change the attributes for component points in circles (circles specified by radius, circles specified by diameter, circles specified by three points) and ellipses.
   * It is possible to change arcs into straight lines or curves, but straight lines and curves cannot be changed into arcs.

### Separating an outline at a component point

1. Touch \[ \text{Moving tool} \].

2. Touch \[ \text{Select tool} \].

3. Use \[ \text{Cursor tool} \] to move the cursor to the component point in the outline where you would like to separate the outline.
   
   * You can move the cursor continuously by holding down the key.

4. Press \[ \text{Select tool} \].

   * Circles (circles specified by radius, circles specified by diameter, circles specified by three points), ellipses and outlines which consist of stitches/feeding/basting cannot be separated.
   * The outline will be separate at the position of the selected component point.

Example: To separate outline 1 at component point A

Select component point A  
Outline will separate into 1' and 2' at component point A

Start point  
Outline 1  
End point  
Start point  
1'  
2'
CHAPTER 3 PROGRAMMING WITH ICONS

Editing programs (Editing sewing points)

This section describes the icons which are used when editing sewing points and how to use them.

 ance: Delete a Sewing Point

1. Touch .

2. Touch .

3. Touch , , to set the skipping units (1, 10, 50, 100, 500, 1000, 5000), code display switching (Hide code, Show code) and the selection method.

■ Selecting Continuous Sewing Points for Editing

4. Touch , , to set the selection method to "Range select".

5. Use , , to move the cursor to the start point for the range that you would like to select.

* You can move the cursor according to the skipping units.
* You can move the cursor continuously by holding down the key.

6. Press .

7. Use , , to move the cursor to the end point of the range that you would like to select. The sewing points will change to red, and the points from the start point to the end point will be selected.

* You can move the cursor according to the skipping units.
* You can move the cursor continuously by holding down the key.

8. Press .

■ Manually Selecting Sewing Points for Editing

4. Touch , , to set the selection method to "Manual select".

5. Use , , to move the cursor to the sewing point that you would like to delete.

* You can move the cursor according to the skipping units.
* You can move the cursor continuously by holding down the key.

6. When you press the key once, the sewing point will change to red and it will be selected.

When you press the key once, the selected sewing point will be unselected.

7. If there is more than one sewing point that you would like to delete, repeat steps 5 and 6.

* To select all outlines
   Hold down to select all sewing points in an outline.
* To unselect all outlines
   Hold down to unselect all selected sewing points.

8. Press .
Moving a sewing point

1. Touch [ ].

2. Touch [ ].

3. Touch [ [ ] to set the skipping units (1, 10, 50, 100, 500, 1000, 5000), code display switching (Hide code, Show code) and method for moving the cursor (Move freely, Snap to needle point).

   * If the method for moving the cursor is set to “Move freely”, the cursor can be moved to any desired position.
   * If the method for moving the cursor is set to “Snap to needle point”, the cursor will move to the sewing point.

   "Selecting continuous sewing points for editing"

4. Touch [ [ ] to set the selection method to “Range select”.

5. Use [ [ ] to move the cursor to the start point for the range that you would like to select.

   * You can move the cursor according to the skipping units.
   * You can move the cursor continuously by holding down the key.

6. Press [ ].

7. Use [ [ ] to move the cursor to the end point of the range that you would like to select. The sewing points will change to red, and the points from the start point to the end point will be selected.

   * You can move the cursor according to the skipping units.
   * You can move the cursor continuously by holding down the key.

8. Press [ ] once, and then use the jog key to move the cursor to the place where you would like to move the component point.

9. Press [ ].

   "Manually selecting component points for editing"

4. Touch [ [ ] to set the selection method to "Manual select".

5. Use [ [ ] to move the cursor to the sewing point that you would like to move.

   * You can move the cursor according to the skipping units.
   * You can move the cursor continuously by holding down the key.

6. When you press the [ ] key once, the sewing point will change to red and it will be selected.

    When you press the [ ] key once, the selected sewing point will be unselected.

7. If there is more than one sewing point that you would like to move, repeat steps 5 and 6.

    * To select all outlines
      Hold down [ ] to select all sewing points in an outline.
    * To unselect all outlines
      Hold down [ ] to unselect all selected sewing points.

8. Press [ ] once, and then use the jog key to move the cursor to the place where you would like to move the component point.

9. Press [ ].

   "Skipping units"

   Skipping units
   --

   Code display switching
   --

   Selection method
   --

   Method for moving the cursor
   --

   "Code display switching"

   Skipping units
   --

   Code display switching
   --

   Selection method
   --

   Method for moving the cursor
   --

   "Selection method"

   Skipping units
   --

   Code display switching
   --

   Selection method
   --

   Method for moving the cursor
   --

   "Method for moving the cursor"

   Skipping units
   --

   Code display switching
   --

   Selection method
   --

   Method for moving the cursor
   --
### Adding a sewing point

1. Touch `(touch)`.

2. Touch `+`.

3. Touch `↑` to set the skipping units (1, 10, 50, 100, 500, 1000, 5000), code display switching (Hide code, Show code), sewing point method for appending (Add Manually, Add Automatically) and method for moving the cursor (Move freely, Snap to needle point).

   * The method for moving the cursor is only displayed when the sewing point method for appending is set to "Add Manually".

4. Touch `→` to set the sewing point method for appending to "Add Automatically".

5. Use `+` to move the cursor `+` to the sewing point where you would like to add a sewing point.

   * You can move the cursor according to the skipping units.
   * You can move the cursor continuously by holding down the key.

6. Press `→`.

   * The sewing point will be automatically added between the selected sewing point and the next sewing point.

### Adding sewing points manually

4. Touch `→` to set the sewing point method for appending to "Add Manually".

5. Use `→` to move the cursor `+` to the sewing point where you would like to add a sewing point.

   * You can move the cursor according to the skipping units.
   * You can move the cursor continuously by holding down the key.

6. Press `→` once, and then use the jog key to move the cursor `+` to the place where you would like to add the sewing point.

   * If the method for moving the cursor is set to "Move freely", the cursor can be moved to any desired position.
   * If the method for moving the cursor is set to "Snap to needle point", the cursor will move to the sewing point.

7. Press `→`.

   * The sewing point will be added in between the selected sewing point and the next sewing point at the position where the cursor was moved to in step 6.
Changing the attributes of sewing points

1. Touch .

2. Touch .

3. Touch to set the skipping units (1, 10, 50, 100, 500, 1000, 5000) and code display switching (Hide code, Show code).

4. Use to move the cursor to the sewing point that you would like to change the attributes for.
   * You can move the cursor according to the skipping units.
   * You can move the cursor continuously by holding down the key.

5. Touch to select the attribute to change (Stitch, Feed, Baste). The attribute of the sewing point will then be changed.

   * When switching from "Feed" to "Stitch" or from "Baste" to "Stitch", the sewing pitch must be 12.7 mm or less for both X and Y. If the setting is outside the range, the buzzer will sound twice and processing will stop.

Separating an outline at a sewing point

* When separating outlines at sewing points when the outlines contain component point data, the component point data will be lost.

1. Touch .

2. Touch .

3. Touch to set the skipping units (1, 10, 50, 100, 500, 1000, 5000) and code display switching (Hide code, Show code).

4. Use to move the cursor to the sewing point in the outline where you would like to separate the outline.
   * You can move the cursor continuously by holding down the key.

5. Press .
CHAPTER 3 PROGRAMMING WITH ICONS

--- Setting bar tacking at a sewing point

1. Touch 

2. Touch 

3. Touch 

4. Use 

5. Touch 

--- Adding and deleting codes at sewing points

1. Touch 

2. Touch 

3. Use 

4. Touch the place where you would like to add or delete a code. The code will be added or deleted.

* Depending on the type of code, the selection of codes for adding and deleting may take place in the screen destination.

To return to the previous screen, touch 

* Refer to "List of code settings" (page 50) for a list of the codes which can be set.
5. If you touch the icons at the top of the screen, you can check the setting details for the codes.

* Sewing points which have a code set will change to green.

**Editing end codes**

1. Touch  

2. Touch  

3. Touch the end code that you would like to change.

The end code for the final sewing point will be changed.

- 111: Normal
- 112: Under 1200st/min
- 113: Disable Wiper
- 114: Disable Wiper, Under 1200st/min
- 115: Disable Trimming
- 116: Under 1500st/min

* For details on the codes that can be set, refer to "5. Editing end codes" in the programming procedures (page 20).
## List of code settings

<table>
<thead>
<tr>
<th>Name</th>
<th>Setting value</th>
<th>Icons*2</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split</td>
<td>Needle Up/Needle Down</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermittent presser foot height</td>
<td>-10.0 - 10.0mm (Setting units: 0.1mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thread tension</td>
<td>0 - 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sewing speed</td>
<td>200 - 2800sti/min (Setting units: 100 sti/min) (The maximum sewing speed is limited to the above setting or less)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low-speed</td>
<td>0: Low-speed cancel</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: Limits the maximum sewing speed to 1200 sti/min or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2: Limits the maximum sewing speed to 800 sti/min or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3: Limits the maximum sewing speed to 600 sti/min or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4: Limits the maximum sewing speed to 400 sti/min or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option output 1</td>
<td>ON/OFF *1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option output 2</td>
<td>ON/OFF *1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option output 3</td>
<td>ON/OFF *1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Option No.</td>
<td>1 - 20</td>
<td></td>
<td>* Up to five can be set for each sewing point.</td>
</tr>
<tr>
<td>Sewing machine stop</td>
<td>Paused/Not Paused</td>
<td></td>
<td>* When the feed has been set, the end point of the stitch is set automatically.</td>
</tr>
<tr>
<td>Thread trimming</td>
<td>Enabled/Disabled</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1 On when selected, off when not selected.

*2 When code display is set to "Show code" during sewing editing or checking, the icons are displayed in the top-left of the screen.

The icons are always displayed during code setting.
Checking programs

This section describes the icons which are used when checking programs and how to use them.

### Checking each stitch

1. Touch ![](image1).

2. Touch ![](image2) to set the skipping units (1, 10, 50, 100, 500, 1000, 5000) and code display switching (Hide code, Show code).

   * Refer to the "List of code settings" (page 50) for a list of the codes which are displayed when code display switching is set to "Show code".

3. Touch ![](image3) or ![](image4). (Or, operation is also possible using ![](image5).)

   * To move backward
     Touch ![](image6), or use ![](image7).
     Hold down ![](image8) or ![](image9). The cursor \( \uparrow \) will move back by the skipping units while the key is being pressed.

   * To move forward
     Touch ![](image10), or use ![](image11).
     Hold down ![](image12) or ![](image13). The cursor \( \downarrow \) will move forward by the skipping units while the key is being pressed.

### Moving to the start position

1. Touch ![](image14).

2. Touch ![](image15).
   The feed will return to the sewing start position.
Measuring distances

1. Touch  

2. Touch  

3. Touch  to set the method for moving the cursor (Move freely, Snap to needle point).

4. Use the jog key to move the cursor  to the start point that you would like to measure.

5. Press  

6. Use the jog key to move the cursor  to the position that you would like to measure.
   * The distance between the measurement start position and the current cursor position is displayed as  and  .
   * The line linking the measurement start position and the current cursor position is displayed.
Programming example

This section describes how to create a program, using an actual program as an example.

- Programming for each stitch: Page 53
- Pattern with lines: Page 54
- Pattern with curves: Page 55
- Double stitch and multiple stitch: Page 56
- Continuous sewing with the work clamp in position after thread trimming/feed: Page 57
- Basting: Page 58
- Symmetrical pattern: Page 59
- Programming while entering splits in different patterns: Page 60
- Zigzag stitch: Page 61

* For function and operating information about each icon, refer to "Programming" (page 24).
* In the programming example, point A in the illustration is the first stitch.

Programming for each stitch

The following describes how to perform programming for each stitch according to the pattern sheet.

1. Carry out steps 1 to 3 in "Programming procedure" (page 19).
2. Touch .
3. Touch .
4. Use the jog key to move the cursor to B.
5. Press .
6. Repeat steps 4 and 5 to move the cursor to C.
7. Press .
8. Carry out steps 5 and after in "Programming procedure" (page 20).
This section describes how to program shapes which include straight lines, using an actual program as an example.

1. Carry out steps 1 to 3 in "Programming procedure" (page 19).

2. Touch \[\text{Pattern with lines}\].

3. Touch \[\text{Pattern with lines}\].

4. Use the jog key to move the cursor \[\text{Pattern with lines}\] to B.

5. Press \[\text{Pattern with lines}\].

6. Carry out the same operation in steps 4 and 5 for C, D and E.

7. Press \[\text{Pattern with lines}\].

8. Carry out steps 5 and after in "Programming procedure" (page 20).
Pattern with curves

This section describes how to program shapes which include curved lines, using an actual program as an example.

Be sure to press twice to make a split at corner points C or E. If a split is not made, the corner will be rounded.

When a split is made

When a split is not made

Making more intermediate points such as points B, D, F, G, and H creates smoother curves.

1. Carry out steps 1 to 3 in "Programming procedure" (page 19).
2. Touch .
3. Touch .
4. Use the jog key to move the cursor to B.
5. Press .
6. Repeat steps 4 and 5 to move the cursor to C.
7. Press twice to insert a split.
8. Move the cursor to E.
9. Press twice to insert a split.
10. Move the cursor to I.
12. Carry out steps 5 and after in "Programming procedure" (page 20).
Double stitch and multiple stitch

If you would like to program multiple lines at a constant width away from another line, you can create the lines using offset copying.

This section describes how to program double stitches on the left side of another line in the sewing direction, using an actual program as an example.

Be sure to press \( \leftrightarrow \) twice to make a split at a point B or E where the line changes to the curve.

Placing more intermediate points such as points C and D creates smoother curves.

1. Carry out steps 1 to 3 in "Programming procedure" (page 19).

2. Use the functions for creating straight or curved lines to create an outline from A to F.
   * Refer to "Pattern with lines" (page 54) or "Pattern with curves" (page 55).

3. Touch \( \text{Middle} \).

4. Touch \( \text{Middle} \).

5. Touch \( \leftarrow \rightarrow \) to set whether the double stitch will be created to the left or the right of the sewing direction.

   To create the line to the left of the sewing direction:

   \( \leftarrow \rightarrow \) \text{Inside/Left Side} \>

   To create the line to the right of the sewing direction:

   \( \leftarrow \rightarrow \) \text{Outside/Right Side} \>

6. Touch \( \leftarrow \rightarrow \) to set the sewing width and the number of copies.

   Example: To sew a double stitch at a sewing width of 3.0 mm, set the sewing width to "03.00mm" and the number of copies to "1".

   * To sew multiple stitches, set the number of copies to the number of additional lines to be sewn.

7. Touch \( \leftarrow \rightarrow \) to set the offset method (Same Direction, Return, Return + Stitch Connection).

   Example: To copy in the same direction as the sewing direction, set the offset creation method to "Same Direction".

8. Use the jog key to select the whole of the outline which was created in step 2.
   *The outline which is selected will be displayed in red.

9. Press \( \text{Start} \).

10. The selected outline will be copied in the specified sewing direction.

11. Carry out steps 5 and after in "Programming procedure" (page 20).
Continuous sewing with the work clamp in position after thread trimming (feed)

Set "feed" to continue sewing with the work clamp in position after thread trimming. The following describes how to program pattern 2 with a feed after pattern 1.

![Pattern Diagram]

1. Carry out steps 1 to 3 in "Programming procedure" (page 19).

2. Create the outline for pattern 1.
   * Refer to "Pattern with lines" (page 54).

3. Touch 📊.

4. Touch 📊.

5. Use the jog key to move the cursor 🔄 to C.

6. Press 🔄 twice.

7. Create the outline for pattern 2.
   * Refer to "Pattern with lines" (page 54).

8. Carry out steps 5 and after in "Programming procedure" (page 20).
Basting

The following describes how to program basting from point C to point F.

1. Carry out steps 1 to 3 in "Programming procedure" (page 19).
2. Use the function for creating straight lines to create an outline from A to C.
   * Refer to "Pattern with lines" (page 54).
3. Touch A
4. Touch B
5. Use the jog key to move the cursor + to D.
6. Press C
7. Repeat steps 5 and 6 to move the cursor + to F.
9. Repeat step 2 to create the outline from F to H.
   * Refer to "Pattern with lines" (page 54).
10. Carry out steps 5 and after in "Programming procedure" (page 20).
**Symmetrical pattern**

When programming a symmetrical pattern, program a target pattern and then select a symmetrical pattern type. This section describes how to program shapes which are symmetrical along the Y axis, using an actual program as an example.

![Symmetrical pattern diagram](image)

**Symmetrical pattern type**

- **Symmetrical to Y-axis**
  - Select "Symmetrical along Y axis".
  - **Center of mask (horizontal)**
    - Select "Center of Mask (Horizontal)".
  - **Top edge of mask**
    - Select "Mask top edge".
  - **Left edge of mask**
    - Select "Mask Left Edge".

- **Symmetrical to X-axis**
  - Select "Symmetrical along X axis".
  - **Center of mask (vertical)**
    - Select "Center of Mask (Vertical)".
  - **Bottom edge of mask**
    - Select "Mask bottom edge".
  - **Right edge of mask**
    - Select "Mask Right Edge".

1. Carry out steps 1 to 3 in "Programming procedure" (page 19).
2. Use the functions for creating feed data or curved lines to create an outline from A to B. Refer to "Programming for each stitch" (page 53) or "Pattern with curves" (page 55).
3. Touch .
4. Touch .
5. Touch to select the symmetry mode. In the example, "Symmetrical along Y axis" is selected.
6. Use the jog key to select the whole of the outline which was created in step 2.
   - * The outline which is selected will be displayed in red.
7. Press .
   - The selected outline will be copied symmetrically along the Y axis.
8. Carry out steps 5 and after in "Programming procedure" (page 20).
Programming while entering splits in different patterns

Multiple patterns are programmed splitting each pattern in sequence. The following describes how to program 3 patterns in sequence.

1. Carry out steps 1 to 3 in "Programming procedure" (page 19).
2. Create the outline for pattern 1.
   * Refer to "Pattern with lines" (page 54).
3. Touch \[ \]
4. Touch \[ \]
5. Touch \[ \] to set a split.
6. Use the jog key to move the cursor \( \) to B.
7. Press \( \) twice.
8. Create the outline for pattern 2.
   * Refer to "Pattern with lines" (page 54).
9. Carry out steps 3 to 5 once more.
10. Use the jog key to move the cursor \( \) to C.
11. Press \( \) twice.
12. Create the outline for pattern 3.
    * Refer to "Pattern with lines" (page 54).
13. Carry out steps 5 and after in "Programming procedure" (page 20).
**Zigzag stitch**

This section describes how to program a zigzag stitch which moves to the left and right while centered on the sewing start point (A), using an actual program as an example.

Two types of zigzag sewing can be selected: V-type zigzag and N-type zigzag. The left and right zigzag widths can also be set separately for each type. In addition, zigzag stitches with curved lines can also be programmed.

(A description of the programming method using V-type zigzag sewing is given as an example.)

1. Carry out steps 1 to 3 in "Programming procedure" (page 19).

2. Touch .

3. Touch .

* To program curved-line zigzag stitches, touch .

4. Touch to change to "V-type zigzag".

5. Set the running pitch and zigzag width for V-type zigzag stitches.

   Example: To set the running pitch to 3.0 mm: Touch to set the running pitch to "03.0mm".

6. Set the zigzag width (right) for V-type zigzag stitches.

   Example: To set the zigzag width (right) to 1.0 mm: Touch to set the zigzag width (right) to "01.0mm".

7. Set the zigzag width (left) for V-type zigzag stitches.

   Example: To set the zigzag width (left) to 1.0 mm: Touch to set the zigzag width (left) to "01.0mm".

8. Set the number of zigzags for V-type zigzag stitches.

   Example: To set the number of zigzag stitches to 2: Touch to set the number of zigzags to "2".

9. Use the jog key to move the cursor to B.


    * To program curved-line zigzag stitches, repeat this procedure.

11. Carry out steps 5 and after in "Programming procedure" (page 20).
This section describes the program modification methods using specific examples.

- Resizing a pattern: Page 63
- Modifying a part of pattern: Page 64
- Deleting the first stitch to change the sewing start point to the second stitch: Page 65
- Moving the sewing start point: Page 66
- Adding a new sewing start point before the first stitch: Page 67
- Adding an escape point before the sewing start point: Page 68
- Modifying a pattern by moving a component point: Page 69

- Modifying a pattern by adding a component point: Page 70
- Modifying a pattern by deleting a component point: Page 71
- Moving the pattern in parallel (when the first stitch is the sewing start point): Page 72
- Deleting a part of data during programming: Page 73
- Moving a part of a continuous program in parallel: Page 74
- Moving a part of a continuous program in parallel partially: Page 75
- Inserting a straight line into a pattern: Page 76 - 78
Resizing a pattern

The following describes how to resize a programmed pattern.

The reference point for resizing patterns is the center point for enlarging or reducing the pattern size.

1. Carry out step 8 in "Programming procedure" (page 22).

2. Touch  

3. Touch  

4. Use  to select the pattern which you would like to resize.

5. When you press the key once, the pattern will change to red lines and it will be selected.

6. Touch  and enter the resizing ratios for the X direction and Y direction.
   Example: To enlarge by 150%: Change the resize setting to "150.0%".

7. Touch  to set the resize center.
   Example: To resize centering on the origin: Set the resize center to "Origin".

8. Touch  to set the hold element.
   Example: To resize while maintaining the same number of stitches as in the original data: Set the hold element to "Keep Number of Stitches".

9. Press  

   The pattern will be resized.

* If the resize center was set to "Specified point" in step 7, you can use the jog key to move the cursor so that the outline can be resized with the current cursor position as the resize center.

   In this case, after moving the cursor, press once more.

   In addition, each time you change the resize ratio, the preview is displayed after the outline is resized.

10. Carry out steps 6 and 7 in "Programming procedure" (page 21, 22).
CHAPTER 3 PROGRAMMING WITH ICONS

Modifying a part of pattern

The part of the programmed pattern is changed.
The following describes how to modify 5, 6 and 7 to 5’, 6’ and 7’.

1. Carry out step 8 in "Programming procedure" (page 22).

2. Touch .

3. Touch to select "Range select".

4. Touch to select "Range select".

5. Use to move the cursor to 5.
   *You can move the cursor according to the skipping units.
   * You can move the cursor continuously by holding down the key.

6. Press .

7. Use to move the cursor to 7. Sewing points 5 to 7 will all now be selected.

8. Press .

9. Use the jog key to move the cursor to 5’, 6’ and 7’.

10. Press .

   The sewing points will move to the 5’, 6’ and 7’ positions.

11. Carry out steps 6 and 7 in "Programming procedure" (page 21, 22).
Deleting the first stitch to change the sewing start point to the second stitch

The following describes how to delete the sewing start point of a programmed pattern to make the second stitch as the sewing start point.

1. Carry out step 8 in "Programming procedure" (page 22).

2. Touch .

3. Touch .

4. Touch to select "Manual select".

5. Use to move the cursor to 1.

   * You can move the cursor according to the skipping units.

   * You can move the cursor continuously by holding down the key.

6. When you press the key once, the sewing point will change to red and it will be selected.

7. Press .

   The 1 at the white circle for the 1st stitch will be deleted, and the needle position for the sewing start point will move to the 2 for the 2nd stitch.

8. Carry out steps 6 and 7 in "Programming procedure" (page 21, 22).
Moving the sewing start point

The following describes how to move the sewing start point from 1 to 1'.

1. Carry out step 8 in "Programming procedure" (page 22).

2. Touch  

3. Touch  

4. Touch  

5. Use  

6. When you press the  key once, the sewing point will change to red and it will be selected.

7. Press  

8. Use the jog key to move the cursor  to 1'.

9. Press  

The 1 at the white circle for the 1st stitch will move, and the needle position for the sewing start point will move to 1'.

10. Carry out steps 6 and 7 in "Programming procedure" (page 21, 22).
Adding a new sewing start point before the first stitch

A point is added before the current sewing start point to make it as the sewing start point. The following describes how to change the sewing start point from 1 to 1'.

1. Carry out step 8 in "Programming procedure" (page 22).

2. Touch  .

3. Touch  .

4. Touch  to select "Add Automatically".

5. Use  to move the cursor  to 1.

6. Press  .
   *You can move the cursor according to the skipping units.
   * You can move the cursor continuously by holding down the key.

A sewing point will be added to the outline between sewing points 1 and 2.

7. Touch  .

8. Touch  to select "Manual select".

9. Use  to move the cursor  to 1.

10. When you press the  key once, the sewing point will change to red and it will be selected.

11. Press  .

12. Use the jog key to move the cursor  to 1'.

13. Press  .
   The 1 at the 1st stitch will move, and the needle position for the sewing start point will move to 1'.

14. Repeat steps 9 to 13 to move the sewing point which was added in step 6 to position 1.

15. Carry out steps 6 and 7 in "Programming procedure" (page 21, 22).
Adding an escape point before the sewing start point

The following describes how to set the escape point A before the sewing start point.

* The escape point is a provisional point provided to prevent the work clamp from interfering with the needle or the presser foot when the work clamp is lifted at the start point.

1. Carry out step 8 in "Programming procedure" (page 22).
2. Touch ✖.
3. Touch ➕.
4. Use the jog key to move the cursor ➕ to A.
5. Press ☎.

The sewing start point at position 1 will be moved to position A. By shifting the position of the sewing start point, the point can be used as an escape point.

6. Carry out steps 6 and 7 in "Programming procedure" (page 21, 22).
Modifying a pattern by moving a component point

This section describes how to change the outline component points in a pattern which has already been programmed.

This section describes how to modify a circle (A, B and C) so that it passes through the vertices of a triangle (D, E and F), using an actual program as an example.

1. Carry out step 8 in "Programming procedure" (page 22).
2. Touch \(\uparrow\).
3. Touch \(\downarrow\).
4. Touch \(\leftarrow\rightarrow\) to select "Manual select".
5. Use \(\uparrow\rightarrow\) to move the cursor \(\uparrow\) to A.
   * You can move the cursor continuously by holding down the key.
6. When you press the \(\uparrow\) key once, the component point will change to red and it will be selected.
7. Press \(\bigcirc\).
8. Use the jog key to move the cursor \(\uparrow\) to D.
9. Press \(\bigcirc\).
   Point A will move to position D.
10. Repeat steps 8 and 9 to move B to E and C to F.
11. Carry out steps 6 and 7 in "Programming procedure" (page 21, 22).
Modifying a pattern by adding a component point

This section describes how to add outline component points to a pattern which has already been programmed.
This section describes how to modify a pattern by adding component point A' and adjusting the positions of A and A', using an actual program as an example.

1. Carry out step 8 in "Programming procedure" (page 22).
2. Touch  
3. Touch  
4. Use  to move the cursor + to A.
5. Press  
   * You can move the cursor continuously by holding down the key.

A component point A' will be added to the outline between component points A and B.

6. Touch .
7. Touch  to select "Manual select".
8. Use  to move the cursor + to A.
   * You can move the cursor continuously by holding down the key.

9. When you press the  key once, the component point will change to red and it will be selected.
10. Press  .
11. Use the jog key to move the cursor + to A.
12. Press  .
13. Repeat steps 8 to 11 to move component point A' which was added in step 5.
14. Carry out steps 6 and 7 in "Programming procedure" (page 21, 22).
Modifying a pattern by deleting a component point

This section describes how to delete outline component points from a pattern which has already been programmed. This section describes how to modify a pattern by deleting component point D, using the following program as an example.

1. Carry out step 8 in "Programming procedure" (page 22).

2. Touch .

3. Touch .

4. Use to move the cursor to D.
   * You can move the cursor continuously by holding down the key.

5. When you press the key once, the component point will change to red and it will be selected.

6. Press .

   The selected component point will be deleted. The outline will be reconstructed so that the component points before and after the selected component point are joined together.

7. Carry out steps 6 and 7 in "Programming procedure" (page 21, 22).
Moving the pattern in parallel

The following describes how to move the pattern in parallel when the first stitch is the sewing start point.

1. Carry out step 8 in "Programming procedure" (page 22).

2. Touch 

3. Touch 

4. Use 🔄 to position the cursor 🦷 at the outline which you would like to edit.

5. When you press the △ key once, the outline will change to red lines and it will be selected.

6. Press 

7. Use the jog key to move the cursor 🦷 along the X-axis to position A.

8. Press 

   The 1st stitch will move to position A.

9. Carry out steps 6 and 7 in "Programming procedure" (page 21, 22).
Deleting a part of data during programming

The following describes how to delete 2 stitches (7 and 8) at point 8 and creating a new program.

1. Touch while programming.

2. Touch.

3. Touch to select "Manual select".

4. Use to move the cursor to 8.

5. When you press the key once, the sewing point will change to red and it will be selected.

6. Press.

   The sewing point at 8 will be deleted.

7. Repeat steps 4 to 6 to delete the sewing point at 7 also. The sewing point at 7 will be deleted and the cursor will move to 6.

8. Continue programming.
Moving a part of a continuous program in parallel

This section describes how to move part of a continuous program (patterns B and C) in parallel at the same time, using an actual program as an example.

1. Carry out step 8 in "Programming procedure" (page 22).
2. Touch .
3. Touch .
4. Use to position the cursor at the outline of pattern B.
5. When you press the key once, the outline will change to red lines and it will be selected.
6. Repeat steps 4 and 5 to select pattern C as well. Patterns B and C will now be selected.
7. Press .
8. Use the jog key to move the cursor to 2.
   Pattern B will move to 2, and the pattern C will move to 4 in the same way.
10. Carry out steps 6 and 7 in "Programming procedure" (page 21, 22).
Moving a part of a continuous program in parallel partially

Move a part of a continuous program in parallel to the position before the next feed is started. The following describes how to move only pattern B in parallel.

1. Carry out step 8 in "Programming procedure" (page 22).
2. Touch \[\text{Move Start Point}\].
3. Touch \[\text{Move End Point}\].
4. Use \[\text{Cursor Move}\] to position the cursor \[\text{△}\] at the outline of pattern B.
5. When you press the \[\text{△}\] key once, the outline will change to red lines and it will be selected.
6. Press \[\text{Start}\].
7. Use the jog key to move the cursor \[\text{△}\] to 2".
8. Press \[\text{Start}\].

Pattern B will move to 2".
9. Carry out steps 6 and 7 in "Programming procedure" (page 21, 22).

To set parallel movement in the middle of stitch data, touch \[\text{△}\], and then touch \[\text{△}\], select the sewing points to move in parallel, and then move the sewing points.
The sewing points which are moved are connected by feeding.
(In the example given below, 6-3 which are in between 2 and 4 are moved to 6"-3".)
Inserting a straight line into a pattern

This describes how to add a new pattern to an existing program or pattern which has already been created.  
* The procedure introduced here is the procedure when "Settings" -> "Programmer" -> "Consecutive Data Input" is set to "OFF".

1) When inserting a straight line before the selected pattern

1. Touch [ ].

2. Use [ ] to move the cursor [ ] to outline #2.

3. Touch [ ].

4. Touch [ ].

5. Touch [ ] [ ] to select "Insert".

6. Use the jog key to move the cursor to the position where you would like to insert the pattern.

7. Press [ ] to provisionally set the start point.

8. Use the jog key to move the cursor [ ] to the position for the end point of the new pattern to be created.

9. Press [ ] to provisionally set the sewing points.

* Repeat steps 8 and 9 until the shape of the pattern has been created.

10. Press [ ] to confirm the pattern.
2) When inserting a straight line after a selected component point
* The above operation is only enabled for straight lines, curves and arcs.

1. Touch \(\text{ }\)

2. Use \(\text{ }\) to move the cursor \(\text{ }\) to #2.
   * You can move the cursor continuously by holding down the key.

3. Touch \(\text{ }\)

4. Touch \(\text{ }\)

5. Touch \(\text{ }\) to select "Insert".

6. Use the jog key to move the cursor to the position where you would like to insert the pattern.

7. Press \(\text{ }\) to provisionally set the start point.

8. Use the jog key to move the cursor \(\text{ }\) to the end point.

9. Press \(\text{ }\) to confirm the pattern.
3) When inserting a line while drawing a circle

[Before inserting straight line]  [After inserting straight line]

1. Touch ↓↓↓↓.

2. Use ←→ to move the cursor → to C.
   * You can move the cursor continuously by holding down the key.

3. Touch ↓↓↓↓.

4. Touch \.

5. Touch ←→ to select "Insert".

6. Use the jog key to move the cursor to #1.

7. Press ← to provisionally set the start point.

8. Use the jog key to move the cursor → to the position for the end point of the new pattern to be created.

9. Press ← to provisionally set the sewing points.
   * Repeat steps 8 and 9 until the shape of the pattern has been created.

10. Press ← to confirm the pattern.
Chapter 4
Extended Option Output (PROGRAM)
**Function of the extended option output**

You can register programs to control various pressing motions and automatic stacking of sewn products in the sewing machine for any purpose.

* Programs from earlier models (BAS300E/F/G series) cannot be used by the BAS300H series.
* Operation for the extended option output is for the experienced. Since it includes complicated operations, you are recommended to receive training before using this function. For information on the training, contact an engineer who have received training or store where you purchased your sewing machine.

Only when 3 conditions, i.e. output conditions, enabling conditions and disabling conditions (three items for each), are established, the extended option output is executed.

The relationship between the output and the conditions is as follows:

```
Output condition 1
Output condition 2
Output condition 3

Enabling condition 1
Enabling condition 2
Enabling condition 3

Disabling condition 1
Disabling condition 2
Disabling condition 3
```

**Description of icons**

- Creates the content for extended option output.
- Deletes the extended option output program which is being edited.
- Saves the extended option output onto media.
- Saves the extended option output onto media with a different name.
- Reading the extended option output data saved in the media.
- Opens the setting screen.
- Loads extended option output programs from the sewing machine.
| | Sets the extended option output program which is being displayed into the sewing machine. |
| | Deletes extended option output programs from the sewing machine. |
CHAPTER 4 EXTENDED OPTION OUTPUT (PROGRAM)

Setting extended option output

Opening the extended option output setting screen

Follow the procedure given below to display the extended option output settings.

1. Touch on the programming screen.

2. A dialog box is displayed for you to select the type of file to create.

3. Select "New Extended Option Program", and then touch OK.

The extended option output settings will open.

Setting details of the extended option output

Specifying a value at the items below.

- **Extended option output No.**
  
  Use to specify a setting number from output numbers 1 to 20.
  
  * Refer to “Table of extended option output” (page 90).

- **Output conditions**
  
  Enter the extended option output conditions. You can enter up to three conditions: Off, On or Toggle.
  
  * Refer to “Table of extended option output” (page 90).

- **Timer 1**
  
  Set a time until the output is switched after the output condition is established.
  
  Set 0 or any value between 10 and 2550 ms by increments of 10 ms.

- **Timer 2**
  
  Set duration of the extended option output.
  
  Set 0 or any value between 10 and 2550 ms by increments of 10 ms.
  
  If you set 0, the switched output status is kept.

* To clear the setting value, unselect the condition check box and then select "Spare" in the screen.

* The setting details will be saved in the sewing machine (in the panel internal memory). Refer to "Applying extended option output to the sewing machine" on page 86.
CHAPTER 4 EXTENDED OPTION OUTPUT (PROGRAM)

Setting enabling conditions

The following conditions can be set.

- **Enabling conditions**
  - 3 conditions can be specified.
  - Refer to “Table of condition number” (page 87)

- **Disabling conditions**
  - Up to three disabling conditions can be entered.
  - Refer to “Table of condition number” (page 87).
  - If enabling conditions are not set, it is always in the enabled status.
  - To use the extended option output conditions without changing any, do not set any value as enabling conditions.
  - To clear the setting value, select "Spare" in the conditions screen.

Saving extended option output

The extended option output created by the programmer can be saved into the panel internal memory.

1. Touch .

   When saving a new program

   The save screen will open, so select the extended option output program number.

   ![Save Extended Option Program](image)

2. Touch .

   The extended option output will be saved and the display will return to the extended option output settings.

   - If you do not want to save the extended option output, touch to return to the extended option output settings.
   - Up to a maximum of 99 extended option outputs can be saved in the panel internal memory. In addition, the setting data can be written to storage media (SD card or USB flash memory).

   ![Save Program](image)

   Are you sure you want to overwrite the current file?

   Touch Yes to overwrite the existing file.
   Touch No to return to the extended option output settings.

   [When overwriting an existing program number]

   2. The program saving dialog screen will open, so touch Yes to overwrite the existing file.
   Touch No to return to the extended option output settings.
CHAPTER 4 EXTENDED OPTION OUTPUT (PROGRAM)

Saving with a different filename

The extended option output created by the programmer can be saved into the panel internal memory with a different name.

1. Touch \[
\text{Save Extended Option Program}
\]

The save screen will open, so enter an extended option output program number which is not yet being used.

2. Touch \[
\text{OK}
\]

The extended option output will be saved under the different name and the display will return to the extended option output settings.

If you would like to overwrite an existing program number, enter an existing extended option output program number at the save screen in step 1.

A saving confirmation dialog screen will be displayed, so touch \[
\text{Yes}
\] to overwrite the existing file. Touch \[
\text{No}
\] to return to the extended option output settings.
CHAPTER 4 EXTENDED OPTION OUTPUT (PROGRAM)

Loading extended option output which has been created

You can load extended option output from the media (panel internal memory, SD card or USB flash memory) where it has been stored.

1. Connect the media which contains the extended option output which you would like to load.
   * When loading a program which has been saved in the panel internal memory, this operation is not required.
2. Touch .
3. The File Manager will open, so select the media and destination which contain the extended option output which you would like to load.
4. Select the extended option output which you would like to load.
5. Touch .
   The extended option output will be loaded and the display will return to the extended option output settings. (This operation does not register the extended option output in the sewing machine's memory.)
   * If you do not want to load the extended option output, touch to return to the extended option output settings.
   * Refer to "Importing files from storage media into the panel internal memory" in "Chapter 5 - File Manager Functions" (page 122) for details on how to import extended option output into the sewing machine.
6. SEQ files which have been created by connecting the BPD3000 programmer to a BAS311G are given the filename "ISMSEQ00.SEQ". Because the "ISMSEQ00.SEQ" file cannot be read by the LCD panel, use a PC to change the name to "ISMSEQ01.SEQ" so that it can be read by the LCD panel.

Deleting extended option output

You can delete extended option output which is being edited.

1. Touch .
2. A confirmation screen will be displayed for you to confirm if it is okay to delete the contents which are being edited.
3. Touch .
   The contents which are currently being edited will be deleted, and the display will return to the extended option output settings.
   * To delete extended option output which has been saved in storage media (panel internal memory, SD card or USB flash memory), delete the extended option output file which is saved on the storage media while referring to "Deleting files and folders" in the File Manager Functions (page 117).
Applying extended option output to the sewing machine

This explains how to load and apply the extended option output to the sewing machine.

1. Save the extended option output or load extended option output that has already been created.

2. At the extended option setting screen, touch 

3. A confirmation screen will be displayed.

4. Touch Yes

5. The extended option output settings will be applied to the sewing machine.

Displaying extended option output

This explains how to display the extended option output which has been applied to the sewing machine.

1. At the extended option setting screen, touch 

2. A confirmation screen will be displayed.

3. Touch Yes

4. The extended option output setting screen will be refreshed.

Initializing extended option output

This explains how to initialize the extended option output which has been applied to the sewing machine.

1. At the extended option setting screen, touch 

2. A confirmation screen will be displayed for you to confirm if it is okay to initialize the content which has been applied.

3. Touch Yes

4. The extended option output which has been applied will be deleted from the sewing machine and the setting will be initialized.
The following shows the output condition numbers, enabling condition numbers and disabling condition numbers, and operations to establish them.

### Mode for operating the sewing machine

<table>
<thead>
<tr>
<th>Condition No.</th>
<th>Operation to establish the condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>After a feed is complete at the home position</td>
</tr>
<tr>
<td>2</td>
<td>After a feed is complete at the sewing start point (at escape point, if applicable)</td>
</tr>
<tr>
<td>3</td>
<td>Before sewing or a test feed starts from the sewing start point (or the escape point)</td>
</tr>
<tr>
<td>4</td>
<td>Before the upper shaft of the sewing machine starts rotating at the first stitch</td>
</tr>
<tr>
<td>5</td>
<td>Before a test feed starts at the first stitch</td>
</tr>
<tr>
<td>6</td>
<td>After sewing or a test is complete (before moving to the sewing start or escape point)</td>
</tr>
<tr>
<td>7</td>
<td>After an emergency stop is reset</td>
</tr>
<tr>
<td>8</td>
<td>After a step back starts</td>
</tr>
<tr>
<td>9</td>
<td>Before halfway sewing starts</td>
</tr>
<tr>
<td>10</td>
<td>After the lower shaft counter value changes from 1 to 0 and the lower thread replacement wait state starts.</td>
</tr>
<tr>
<td>11</td>
<td>After the lower thread replacement wait state ends</td>
</tr>
<tr>
<td>12</td>
<td>After a program starts</td>
</tr>
<tr>
<td>13</td>
<td>After a program ends</td>
</tr>
<tr>
<td>14</td>
<td>When trigger data is detected during sewing</td>
</tr>
<tr>
<td>15</td>
<td>After an emergency stop occurs</td>
</tr>
<tr>
<td>16</td>
<td>After a thread breakage is detected</td>
</tr>
<tr>
<td>17</td>
<td>After a program is changed</td>
</tr>
<tr>
<td>18</td>
<td>After the power switch is turned on</td>
</tr>
<tr>
<td>19</td>
<td>After a low air pressure error is detected</td>
</tr>
<tr>
<td>20</td>
<td>Before moving to the next start point on completion of sewing in the split mode</td>
</tr>
<tr>
<td>21</td>
<td>After moving to the next start point on completion of sewing in the split mode</td>
</tr>
</tbody>
</table>

### Standard input

<table>
<thead>
<tr>
<th>Condition No.</th>
<th>Operation to establish the condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>When the foot pedal is enabled (before the work clamp moves up or down)</td>
</tr>
<tr>
<td>26</td>
<td>When the start pedal is enabled (before starting operation)</td>
</tr>
</tbody>
</table>

### Standard output

<table>
<thead>
<tr>
<th>Condition No.</th>
<th>Operation to establish the condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>After the work clamp rises (after the right work clamp rises for the air type)</td>
</tr>
<tr>
<td>31</td>
<td>After the work clamp lowers</td>
</tr>
<tr>
<td>32</td>
<td>After the left work clamp rises (only for the air type)</td>
</tr>
<tr>
<td>33</td>
<td>After the left work clamp lowers (only for the air type)</td>
</tr>
<tr>
<td>34</td>
<td>After the intermittent work clamp rises</td>
</tr>
<tr>
<td>35</td>
<td>After the intermittent work clamp lowers</td>
</tr>
<tr>
<td>36</td>
<td>After the wiper output is turned off</td>
</tr>
<tr>
<td>37</td>
<td>After the thread breaking output is turned off</td>
</tr>
<tr>
<td>38</td>
<td>Before the work clamp rises</td>
</tr>
</tbody>
</table>
## External input of the extended option

<table>
<thead>
<tr>
<th>Condition No.</th>
<th>Operation to establish the condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>When extended option input 1 is turned on</td>
</tr>
<tr>
<td>41</td>
<td>When extended option input 1 is turned off</td>
</tr>
<tr>
<td>42</td>
<td>When extended option input 2 is turned on</td>
</tr>
<tr>
<td>43</td>
<td>When extended option input 2 is turned off</td>
</tr>
<tr>
<td>44</td>
<td>When extended option input 3 is turned on</td>
</tr>
<tr>
<td>45</td>
<td>When extended option input 3 is turned off</td>
</tr>
<tr>
<td>46</td>
<td>When extended option input 4 is turned on</td>
</tr>
<tr>
<td>47</td>
<td>When extended option input 4 is turned off</td>
</tr>
<tr>
<td>48</td>
<td>When extended option input 5 is turned on</td>
</tr>
<tr>
<td>49</td>
<td>When extended option input 5 is turned off</td>
</tr>
<tr>
<td>50</td>
<td>When extended option input 6 is turned on</td>
</tr>
<tr>
<td>51</td>
<td>When extended option input 6 is turned off</td>
</tr>
<tr>
<td>52</td>
<td>When extended option input 7 is turned on</td>
</tr>
<tr>
<td>53</td>
<td>When extended option input 7 is turned off</td>
</tr>
<tr>
<td>54</td>
<td>When extended option input 8 is turned on</td>
</tr>
<tr>
<td>55</td>
<td>When extended option input 8 is turned off</td>
</tr>
<tr>
<td>56</td>
<td>When extended option input 9 is turned on</td>
</tr>
<tr>
<td>57</td>
<td>When extended option input 9 is turned off</td>
</tr>
<tr>
<td>58</td>
<td>When extended option input 10 is turned on</td>
</tr>
<tr>
<td>59</td>
<td>When extended option input 10 is turned off</td>
</tr>
<tr>
<td>60</td>
<td>When extended option input 11 is turned on</td>
</tr>
<tr>
<td>61</td>
<td>When extended option input 11 is turned off</td>
</tr>
<tr>
<td>62</td>
<td>When extended option input 12 is turned on</td>
</tr>
<tr>
<td>63</td>
<td>When extended option input 12 is turned off</td>
</tr>
<tr>
<td>64</td>
<td>When extended option input 13 is turned on</td>
</tr>
<tr>
<td>65</td>
<td>When extended option input 13 is turned off</td>
</tr>
<tr>
<td>66</td>
<td>When extended option input 14 is turned on</td>
</tr>
<tr>
<td>67</td>
<td>When extended option input 14 is turned off</td>
</tr>
</tbody>
</table>

## Extended option output

<table>
<thead>
<tr>
<th>Condition No.</th>
<th>Operation to establish the condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>When extended option output 1 is turned on</td>
</tr>
<tr>
<td>71</td>
<td>When extended option output 1 is turned off</td>
</tr>
<tr>
<td>72</td>
<td>When extended option output 2 is turned on</td>
</tr>
<tr>
<td>73</td>
<td>When extended option output 2 is turned off</td>
</tr>
<tr>
<td>74</td>
<td>When extended option output 3 is turned on</td>
</tr>
<tr>
<td>75</td>
<td>When extended option output 3 is turned off</td>
</tr>
<tr>
<td>76</td>
<td>When extended option output 4 is turned on</td>
</tr>
<tr>
<td>77</td>
<td>When extended option output 4 is turned off</td>
</tr>
<tr>
<td>78</td>
<td>When extended option output 5 is turned on</td>
</tr>
<tr>
<td>79</td>
<td>When extended option output 5 is turned off</td>
</tr>
<tr>
<td>80</td>
<td>When extended option output 6 is turned on</td>
</tr>
<tr>
<td>81</td>
<td>When extended option output 6 is turned off</td>
</tr>
<tr>
<td>82</td>
<td>When extended option output 7 is turned on</td>
</tr>
<tr>
<td>83</td>
<td>When extended option output 7 is turned off</td>
</tr>
<tr>
<td>84</td>
<td>When extended option output 8 is turned on</td>
</tr>
<tr>
<td>85</td>
<td>When extended option output 8 is turned off</td>
</tr>
<tr>
<td>86</td>
<td>When extended option output 9 is turned on</td>
</tr>
<tr>
<td>87</td>
<td>When extended option output 9 is turned off</td>
</tr>
<tr>
<td>88</td>
<td>When extended option output 10 is turned on</td>
</tr>
<tr>
<td>89</td>
<td>When extended option output 10 is turned off</td>
</tr>
<tr>
<td>90</td>
<td>When extended option output 11 is turned on</td>
</tr>
<tr>
<td>91</td>
<td>When extended option output 11 is turned off</td>
</tr>
<tr>
<td>92</td>
<td>When extended option output 12 is turned on</td>
</tr>
<tr>
<td>93</td>
<td>When extended option output 12 is turned off</td>
</tr>
<tr>
<td>94</td>
<td>When extended option output 13 is turned on</td>
</tr>
<tr>
<td>95</td>
<td>When extended option output 13 is turned off</td>
</tr>
<tr>
<td>96</td>
<td>When extended option output 14 is turned on</td>
</tr>
<tr>
<td>97</td>
<td>When extended option output 14 is turned off</td>
</tr>
<tr>
<td>98</td>
<td>When extended option output 15 is turned on</td>
</tr>
<tr>
<td>99</td>
<td>When extended option output 15 is turned off</td>
</tr>
<tr>
<td>100</td>
<td>When extended option output 16 is turned on</td>
</tr>
<tr>
<td>101</td>
<td>When extended option output 16 is turned off</td>
</tr>
<tr>
<td>102</td>
<td>When extended option output 17 is turned on</td>
</tr>
<tr>
<td>103</td>
<td>When extended option output 17 is turned off</td>
</tr>
<tr>
<td>104</td>
<td>When extended option output 18 is turned on</td>
</tr>
<tr>
<td>105</td>
<td>When extended option output 18 is turned off</td>
</tr>
<tr>
<td>106</td>
<td>When extended option output 19 is turned on</td>
</tr>
<tr>
<td>107</td>
<td>When extended option output 19 is turned off</td>
</tr>
<tr>
<td>108</td>
<td>When extended option output 20 is turned on</td>
</tr>
<tr>
<td>109</td>
<td>When extended option output 20 is turned off</td>
</tr>
</tbody>
</table>
## Table of extended option input

<table>
<thead>
<tr>
<th>Extended option input No.</th>
<th>Combined input (conditions)¹¹</th>
<th>Name</th>
<th>Use condition</th>
<th>Connector <strong>²</strong></th>
<th>Pin No.</th>
<th>Connector No.</th>
<th>Signal</th>
<th>+24V</th>
<th>OV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EJECT RIGHT SENSOR</td>
<td></td>
<td>MEMORY</td>
<td>P10 (EXIN1)</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>EJECT LEFT SENSOR</td>
<td></td>
<td>SW560=1,2</td>
<td></td>
<td>5</td>
<td>6</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>RESET SW</td>
<td></td>
<td>MEMORY</td>
<td></td>
<td>8</td>
<td>9</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>SW650=2</td>
<td></td>
<td>11</td>
<td>12</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
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<td>14</td>
<td>15</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>PNo Input bit0</td>
<td></td>
<td>MEMORY</td>
<td>P11 (EXIN2)</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>PNo Input bit1</td>
<td></td>
<td>SW354=1,2</td>
<td></td>
<td>5</td>
<td>6</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>PNo Input bit2</td>
<td></td>
<td>MEMORY</td>
<td></td>
<td>8</td>
<td>9</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>PNo Input bit3</td>
<td></td>
<td>SW355=ON</td>
<td></td>
<td>11</td>
<td>12</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14</td>
<td>15</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Upper thread nipper F sensor</td>
<td></td>
<td>MEMORY</td>
<td>P34 (EXIN3)</td>
<td>2</td>
<td>5</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Upper thread nipper sensor</td>
<td></td>
<td>SW500=ON</td>
<td></td>
<td>3</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>AIR SW</td>
<td></td>
<td>MEMORY</td>
<td>P35 (EXOUT1)</td>
<td>12</td>
<td>11</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td>P8 (SENSOR1)</td>
<td>11</td>
<td>10</td>
<td>12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table of extended option output

<table>
<thead>
<tr>
<th>Extended option output No.</th>
<th>Name</th>
<th>Use condition</th>
<th>Pin No.</th>
<th>Connector</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2-STEP THREAD TENSION DEVICE</td>
<td>MEMORY SW564=ON</td>
<td>5</td>
<td>P35 (EXOUT1)</td>
<td>+24V</td>
</tr>
<tr>
<td>2</td>
<td>AIR WIPER</td>
<td>MEMORY SW557=2</td>
<td>6</td>
<td>P12 (AIR2)</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>AUTO EJECT</td>
<td>MEMORY SW560=1,2,3</td>
<td>7</td>
<td>P13 (AIR3)</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>RIGHT WORK CLAMP FLIP/FLOP</td>
<td>MEMORY SW505=1,2</td>
<td>1</td>
<td>P35 (EXOUT1)</td>
<td>+24V</td>
</tr>
<tr>
<td>5</td>
<td>LEFT WORK CLAMP FLIP/FLOP</td>
<td>MEMORY SW951=ON</td>
<td>1</td>
<td>P12 (AIR2)</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>PNo output bit0</td>
<td>MEMORY SW951=ON</td>
<td>3</td>
<td>P12 (AIR2)</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>PNo output bit1</td>
<td>MEMORY SW951=ON</td>
<td>4</td>
<td>P12 (AIR2)</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>PNo output bit2</td>
<td>MEMORY SW951=ON</td>
<td>5</td>
<td>P12 (AIR2)</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>PNo output bit3</td>
<td>MEMORY SW951=ON</td>
<td>6</td>
<td>P12 (AIR2)</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>SIGNAL TOWER GREEN</td>
<td>MEMORY SW559=ON</td>
<td>7</td>
<td>P12 (AIR2)</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>SIGNAL TOWER YELLOW</td>
<td>MEMORY SW559=ON</td>
<td>8</td>
<td>P12 (AIR2)</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>SIGNAL TOWER RED</td>
<td>MEMORY SW559=ON</td>
<td>9</td>
<td>P12 (AIR2)</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>NEEDLE COOLER</td>
<td>SW550=ON</td>
<td>8</td>
<td>P35 (EXOUT1)</td>
<td>+24V</td>
</tr>
<tr>
<td>14</td>
<td>Inner clamp device or lower thread detector</td>
<td>SW556=1,2,3</td>
<td>4</td>
<td>P35 (EXOUT1)</td>
<td>+24V</td>
</tr>
<tr>
<td>15</td>
<td>LCLAMP</td>
<td>When 2 stage work clamp is used</td>
<td>2</td>
<td>P13 (AIR3)</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>RCLAMP</td>
<td>For the air type</td>
<td>1</td>
<td>P13 (AIR3)</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>Pneumatic thread take-up</td>
<td>MEMORY SW575=ON</td>
<td>1</td>
<td>P13 (AIR3)</td>
<td>-</td>
</tr>
<tr>
<td>18</td>
<td>Pneumatic thread trimming</td>
<td>MEMORY SW164=ON</td>
<td>2</td>
<td>P13 (AIR3)</td>
<td>-</td>
</tr>
<tr>
<td>19</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>20</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*1 Use this output when an optional part is mounted.
   It is not available as the extended option I/O if conditions are established.

*2 Connector numbers and pin numbers on the control board in the control box.
Examples of the extended option output

To program the extended option output, prepare the timing chart. Then, set output conditions and enabling/disabling conditions based on the chart.

The following examples describe how to develop program setting values based on the timing chart.

* No explanation of the operation of the sewing machine is provided.

## Example 1

**Sequence 1 for stacker**

This sequence ejects material immediately after the work clamp rises on completion of sewing, and programs stacking operation.

<table>
<thead>
<tr>
<th>Option output 4</th>
<th>BAR1: For holding material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option output 5</td>
<td>BAR2: For moving material</td>
</tr>
<tr>
<td>Option output 6</td>
<td>AIR: For air blow</td>
</tr>
</tbody>
</table>

### Timing chart

1. **BAR1**
   - Timing: 1.2 sec
   - Timing:
     - Rising of work clamp when sewing has been completed

2. **BAR2**
   - Timing: 0.5 sec
   - Timing: 0.7 sec

3. **AIR**
   - Timing: 0.5 sec
   - Timing: 1.7 sec

### Program setting values

<table>
<thead>
<tr>
<th>Output No.</th>
<th>Operation setting</th>
<th>Output condition</th>
<th>Timer 1 [ms]</th>
<th>Timer 2 [ms]</th>
<th>Enabling conditions</th>
<th>Disabling conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>ON</td>
<td>30 Rising of work clamp</td>
<td>0</td>
<td>1200</td>
<td>6 End of sewing</td>
<td>81 Output 6 OFF</td>
</tr>
<tr>
<td>5</td>
<td>ON</td>
<td>76 Output 4 ON</td>
<td>500</td>
<td>700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>ON</td>
<td>76 Output 4 ON</td>
<td>500</td>
<td>1700</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Example 2

**Sequence 2 for stacker**

This sequence ejects material immediately after the work clamp rises on completion of sewing, and programs stacking operation.

<table>
<thead>
<tr>
<th>Option output 3</th>
<th>UP/DW: Rising/lowering for removing material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option output 4</td>
<td>MOVE: Movement for removing material</td>
</tr>
<tr>
<td>Option output 5</td>
<td>BAR1: For holding material</td>
</tr>
<tr>
<td>Option output 6</td>
<td>BAR2: For moving material</td>
</tr>
</tbody>
</table>

#### Timing chart

1. **UP/DW**
2. **MOVE**
3. **BAR1**
4. **BAR2**

5. **Trigger code detection during sewing**
6. **Movement of sewing start point after sewing ends**

#### Program setting values

<table>
<thead>
<tr>
<th>Output No.</th>
<th>Operation setting</th>
<th>Output condition</th>
<th>Timer 1 [ms]</th>
<th>Timer 2 [ms]</th>
<th>Enabling conditions</th>
<th>Disabling conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>ON</td>
<td>2</td>
<td>Movement of sewing start point</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>78</td>
<td>Output 5 ON</td>
<td>200</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>ON</td>
<td>14</td>
<td>Trigger detection</td>
<td>0</td>
<td>0</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>40</td>
<td>Input 1 ON</td>
<td>0</td>
<td>0</td>
<td>—</td>
</tr>
<tr>
<td>5</td>
<td>ON</td>
<td>42</td>
<td>Input 2 ON</td>
<td>0</td>
<td>0</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>81</td>
<td>Output 6 OFF</td>
<td>10</td>
<td>0</td>
<td>—</td>
</tr>
<tr>
<td>6</td>
<td>ON</td>
<td>75</td>
<td>Output 3 OFF</td>
<td>10</td>
<td>500</td>
<td>—</td>
</tr>
</tbody>
</table>
Example 3

Signals for external equipment
When connecting to the external sequence unit, this sequence programs operations to issue timing signals.

<table>
<thead>
<tr>
<th>Option output</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>READY: Ready-for-sewing signal</td>
</tr>
<tr>
<td>5</td>
<td>END: Sewing end signal</td>
</tr>
<tr>
<td>6</td>
<td>THBK: Thread breakage detection signal</td>
</tr>
</tbody>
</table>

Timing chart

Program setting values

<table>
<thead>
<tr>
<th>Output No.</th>
<th>Operation setting</th>
<th>Output condition</th>
<th>Timer 1 [ms]</th>
<th>Timer 2 [ms]</th>
<th>Enabling conditions</th>
<th>Disabling conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>ON</td>
<td>Movement of sewing start point</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>Sewing machine returns to home position</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Change of P. No.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>ON</td>
<td>Movement of sewing start point</td>
<td>0</td>
<td>100</td>
<td>6</td>
<td>End of sewing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sewing machine returns to home position</td>
</tr>
<tr>
<td>6</td>
<td>ON</td>
<td>Thread breakage detection</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>Start of step back</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Output 4 OFF</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Use of extended option output (Basics)

This section provides a comprehensive description of how to use the extended option output by providing a range of examples so that many users will be able to use it easily.

The examples show programs that can be tried and tested only with an air-type sewing machine.

Necessary items

- Air work clamp type sewing machine (an electromagnetic type is not applicable).
- The programmer
- Programming instruction manual (Refer to the instruction manual when a reference page is provided.)
- Sewing machine adjustment manual (Refer to the section on switching the memory switch.)

Simplified examples of the extended option output

Programming No. 1 to No. 20 is possible as option outputs; No. 15 is for the air valve output of the left work clamp and No. 16 is for the air valve output of the right work clamp. If outputs No. 15 and 16 are programmed as option output, the work clamp will not function as originally programmed, but will function as programmed as option output. The examples show how to program option outputs No. 15 and 16 to confirm their operation (acceptable if the left and right work clamps function as programmed).

Caution

- One example shows how to sew with the work clamp raised. Please be careful when attempting it.
- Be sure to remove the needle before confirming its operation.

Turning the output interlocking on and off corresponding to sewing machine operations

Create a program to automatically raise and lower the left work clamp (option output No. 15 ON and OFF) at the sewing start point.

1. Have the programmer at hand, and follow the instructions given in "Opening the extended option output setting screen" (refer to page 82) to display the output settings.

2. Referring to the table of sewing machine operation mode condition numbers (refer to page 87), set "ON when condition No. 2 (on completion of movement to the sewing start point) is established". Set Timer 2 to 1 sec. (1000 ms). On the setting screen, make the following settings.

   Select condition No. 2, and then touch OK.

   After the setting is input, the numeric value in the column of the extended option output setting screen will be refreshed, so that you can check if the value has been input correctly.

3. Touch .

4. Save the settings in the panel internal memory, and then touch OK.
5. Display the extended option output settings once more, and then touch \( \text{\text{ }} \) to apply the extended option output which was saved in step 5 to the sewing machine.

6. Read short sewing data of approximately 10 stitches. Set the memory switch No. 50 to 4 (the work clamp is not automatically raised when sewing is completed). Carry out sewing operation.
   Confirm that the left work clamp is in the raised position, that it stays in that position for one second, and then lowers whenever the needle returns to the sewing start point. If the left work clamp operates in this manner, it is operating in accordance with the program.

**Modifying programmed data**
Modify existing program data according to the procedure described in "Turning the output interlocking on and off corresponding to sewing machine operations".

1. Display the extended option output settings.

2. Touch \( \text{\text{ }} \)
   Load the programs which have already been written.

3. Display the output setting screen. Set Timer 1 to 0.5 sec. (500 ms) and Timer 2 to 0.5 sec. (500 ms).
   On the setting screen, make the following settings.

   ![Output Setting Screen]

   The existing "1000" setting for timer 2 will be refreshed and overwritten with "500".

4. Carry out steps 4 to 6 in "Turning the output interlocking on and off corresponding to sewing machine operations" to overwrite the extended option output.

5. Carry out sewing operation. Confirm that the time that elapses after the needle returns to the sewing start point until the left work clamp rises is longer (since the setting for Timer 1 has been changed from 0 to 0.5 sec.), and that the length of time the work clamp takes to rise is less (since the setting for Timer 2 has been changed from 1 to 0.5 sec.).
Individually programming on and off

In the examples of "Turning the output interlocking on and off corresponding to sewing machine operations" and "Modifying data you programmed once", a procedure was described outlining how to create a program to keep the output on state for a time set for Timer 2, and return it to the off state automatically.

In this example, create a program to automatically open the left work clamp at the sewing start point (option output No. 15 ON) and close it simultaneously when the machine starts. (option output NO. 15 OFF). Confirm that on and off output conditions are different.

1. Have the programmer at hand and display the output settings.

2. Referring to the table of sewing machine operation mode condition numbers (refer to page 87), set "ON when condition No. 2 is established (on completion of movement to the sewing start point)".

   On the setting screen, make the following settings:

   ![New Extended Option Program]

   3. Referring to the "Mode for operating the sewing machine" table of condition numbers (refer to page 87), set to "off when condition No. 3 (before sewing start) is established".

      Enter into the setting screen as shown below.

      ![New Extended Option Program]

     4. Touch to save the extended option output.

     5. Display the extended option output settings once more, and then touch to apply the extended option output which was saved in step 4 to the sewing machine.

     6. Carry out sewing operation. Confirm that the left work clamp rises after the needle returns to the sewing start point and it lowers when sewing begins.

        As shown in the above example, when Timer 2 is set to [0000], the on or off state will remain unchanged after the condition is established.
Using trigger data to turn the output on while sewing

In the "Individually programming on and off" example, No. 15 was programmed to turn on at the sewing start point. In this example, the setting is changed so that it turns on during sewing. Do not change the off setting at the sewing start which was set in the "Individually programming on and off" example.

1. Touch ＜＞.
   Load the programs which have already been written.

2. Referring to the table of sewing machine operation mode condition numbers (refer to page 87), set "ON when condition No. 14 (trigger data detection) is established". On the setting screen, overwrite the values as follows.

   ![Table of sewing machine operation mode condition numbers]

   Check that the data which was set in "Individually programming on and off" still remains.

3. Touch ＜＞ to overwrite the extended option output.

4. Display the extended option output settings once more.
   Touch ＜＞ to apply the extended option output which was overwritten in step 3 to the sewing machine.

5. Load the sewing program for editing, and add a code at the desired position. ("Adding and deleting codes at sewing points" in "Chapter 3 - Programming with icons" (page 48))
   At the code editing screen, specify "Not paused" for option output No. 15. Enter into the setting screen as follows.

   ![Setting screen for option output]

6. After adding the code, save the sewing program under a new program number.

7. Carry out sewing.
   Check that the left work clamp rises at the position where the code was added, and that it drops when sewing starts.
CHAPTER 4 EXTENDED OPTION OUTPUT (PROGRAM)

**Sequence output**

This assumes that the option output is for the stacker (a device that ejects material after sewing is complete). It creates an example of sequence output after the work clamp rises when sewing ends.

First, make the settings for option output No. 15 so that it turns on and off corresponding to the raising of the work clamp. Next, set No. 16 so that it turns on and off, and then add the condition at the end of sewing as explained in the section below.

1. Have the programmer at hand and display the output settings.

2. Referring to the table of condition numbers of the standard output (refer to page 87), set output condition No. 15 to "ON when condition No. 30 is established (after the work clamp rises)". Set Timer 2 to 1.2 sec. (1200 ms). Enter the following in the extended option output settings.

3. Referring to the table of condition numbers of the extended option output (refer to page 88), set the output condition for No. 16 to "condition No. 98 (when No. 15 is turned on)". Set Timer 1 to 0.5 sec. (500 ms) and Timer 2 to 0.7 sec. (700 ms).

On the setting screen, make the following settings.

4. Touch \( \text{ } \) to overwrite the extended option output.

5. Display the extended option output settings once more. Touch \( \text{ } \) to apply the extended option output which was overwritten in step 4 to the sewing machine.

6. Carry out sewing operation. Set the memory switch No. 50 to 3 (the work clamps are automatically raised when sewing is completed) to carry out sewing operation. Confirm that the left work clamp (No. 15) is turned on and right work clamp (No. 16) is turned on after a 0.5 sec. delay and both are turned off in 0.7 sec. corresponding with the raising of the work clamps (in this example, the right and left work clamps operate as option outputs). Depress the foot pedal to confirm that No. 15 and 16 are turned on and off. When restarting, confirm that the intermittent clamp is at the lowered position.

In sequence output mode (outputs are continuously turned on and off), it can be useful to specify the first output that turns on as the output condition for sewing machine operation. Then specify the moments when the first output turns on or off as the output condition for subsequent outputs.
Adding enabling (AND) conditions to the sequence output

In the example in the previous section, option outputs No. 15 and 16 are turned on and off even when you depress the foot pedal.

In this section, add enabling conditions to allow the output to be turned on and off only when sewing is finished.

1. Touch \[\text{Load programs}\].
   Load the programs which have already been written.

2. Referring to the "Mode for operating the sewing machine" table of condition numbers (refer to page 87), set the enabling condition for No. 15 to "Enable \(\text{OK}\) setting when condition No. 6 (after sewing ends) is established". Set it to "Disable \(\text{OK}\) setting (condition No. 101 in the "Table of condition number" on page 88) when output No. 16, which ends output of a continuous sequence is turned off".

3. Touch \[\text{Overwrite option output}\] to overwrite the extended option output.
   If an enabling condition has been set, the disabled status is the initial setting.

4. Display the extended option output once more, and then touch \[\text{Apply extended option output}\] to apply the extended option output which was overwritten in step 3 to the sewing machine.

5. Read sewing data to carry out sewing operation.
   Confirm that the left and right work clamps (option outputs No. 15 and 16) do not operate when the foot pedal is depressed, but they are turned on and off corresponding with the raising of the work clamps when sewing is completed. (Confirm that the intermittent clamp is at the lowered position. Depress the start switch.)
   If you set "enabling \(\text{OK}\)" as the enabling condition", you usually need to set "disabling \(\text{OK}\)" as well.
   In the above example, set an enabling (AND) condition at the first output No. which is to be turned on and off.
   Then, set the condition number for the last on or off for the sequence as the disabling condition.
   If you do not set any enabling conditions as in the previous examples, outputs are turned on and off according to the settings made on the output setting screen.
Use of extended option output (Application)

On the precondition that a checking board is created, this section describes how to create programs by providing some examples.

**Necessary items (other than for Basics)**

Checking board (refer to “Reference material” page 109.)

**Limitations of extended option output**

- Disabled when an output point count exceeds 20 (including the work clamp output).
- Disabled when an input point count exceeds 14.
- Input check during sewing machine operation is disabled. Therefore, on and off operation of the output detected by input from the foot switch pedal while sewing is not possible.
- Sequence output during sewing machine operation is disabled. On and off operation of the output by inputting trigger data out of sewing data is enabled. Temporarily pausing the sewing machine to run the extended option output by inputting trigger data is enabled. (Input and output are enabled in this case.)
- Disabled when many AND conditions are set. For example, operation by switching among multiple modes and inhibition of output by combining multiple inputs are disabled. Up to 2 input AND conditions can be set for each option output. Configuration of 3 input AND conditions is enabled by setting one output as a virtual output. (Refer to "Examples of option outputs" on page 94, 101.)
- Control of the incorporated stepper motor output by the extended option output is disabled.
Examples of option outputs (Application)

Automating the commencement of sewing

If you set memory switch No. 950 to ON, sewing automatically commences after turning on option output No. 1. Create a program to make the machine commence sewing after the work clamp lowers.

1. Change the memory switches to the following settings.
   No.50 = 4, No.57 = ON, No.950 = ON

2. Have the programmer at hand and display the output settings.
   If any extended option output exists which has already been registered, delete it first.

3. Referring to the "Standard output" table of condition numbers (refer to page 87), set the output condition for No. 1 to "on when condition No. 31 (after the work clamp lowers) is established", and set Timer 2 to 100 ms. Enter the following in the extended option output settings.

```
<table>
<thead>
<tr>
<th>Output No.</th>
<th>Off</th>
<th>On</th>
<th>Toggle</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>31</td>
<td></td>
<td>OK</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>OK</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>OK</td>
</tr>
<tr>
<td>1</td>
<td>0 ms</td>
<td>0 ms</td>
<td>0 ms</td>
<td>--</td>
</tr>
<tr>
<td>1</td>
<td>0 ms</td>
<td>100 ms</td>
<td>0 ms</td>
<td>--</td>
</tr>
</tbody>
</table>
```
4. Touch to write the extended option output.

5. Display the extended option output settings once more.
   Touch to apply the extended option output which was written in step 4 to the sewing machine.

6. Read the sewing data. Depress the start pedal. The sewing machine detects the home position and moves to the sewing start point. Though depressing the start pedal usually starts sewing operation, it will not when memory switch No. 950 is set to ON. Depress the foot pedal twice to raise and lower the work clamp. Confirm that sewing commences after the foot pedal has reached the lowered position.

### Controlling commencement of sewing by providing an input check to the automatic start function

Add option input No. 1 to the enabling conditions in the previous section.

1. Touch and load the programs which have already been written.

2. Display the enabling condition setting screen. Referring to the table of external input condition numbers (refer to page 88), set enabling condition No. 1 to “enabling when condition No. 40 (input 1 ON) is established”. Set “disabling when condition No. 41 (input 1 OFF) is established”.

3. Touch to overwrite the extended option output.

4. Display the extended option output once more, and then touch to apply the extended option output which was overwritten in step 3 to the sewing machine.

5. As an additional step 7 in "Automating the commencement of sewing", confirm also that sewing commences only when option input No. 1 is on.
   By carrying out sequence control of the raising and lowering of the work clamp using the option output as shown in the example above, you can configure the sewing machine so that material is automatically loaded before sewing.
Adding input check to carry out settings of 3-input AND conditions

This example adds "when option inputs No. 1 and 2 are on" to the enabling conditions in the previous example of "Controlling commencement of sewing by providing an input check to the automatic start function". "After the work clamp is lowered (condition No. 31)" has been set as the output condition. Accordingly, a total of 3-input AND conditions are set.

Up to 2-input AND conditions can be set for each option output. 3-input AND conditions are configured so that one output is set to be virtual output.

In this case, set option output No. 2 as virtual output.

1. Touch and load the programs which have already been written.

2. Display the extended option output settings.

Referring to the "Extended option output" table of condition numbers (refer to page 88), set the enabling condition for No. 1 to "Enable setting when condition No. 72 (output 2 on) is established". Set "Disable when condition No. 73 (output 2 off) is established".

3. Referring to the "External input of the extended option" table of condition numbers (refer to page 88), set the enabling condition for No. 2 to "Enable setting when condition No. 40 (input 1 on) is established". Enter into the setting screen as follows.
4. Referring to the "External input of the extended option" table of condition numbers (refer to page 88), set the output off condition for No. 2 to "off when condition No. 41 (input 1 off) is established". Enter into the setting screen as follows.

![New Extended Option Program](image)

5. Referring to the "External input of the extended option" table of condition numbers (refer to page 88), set the enabling condition for No. 2 to "Enable setting when condition No. 42 (input 2 on) is established". Set "Disable when condition No. 43 (input 2 off) is established".

![New Extended Option Program](image)

6. Touch to overwrite the extended option output.

7. Display the extended option output once more, and then touch to apply the extended option output which was overwritten in step 6 to the sewing machine.

8. Confirm that sewing commences as the work clamp lowers when both option inputs No. 1 and 2 are ON. In the example above, the output condition for virtual output No. 2 on is condition No. 40 (input 1 on). If input 1 is already on when the power is turned on, virtual output No. 2 will not turn on.
Temporary pause during sequence operation

Program Example 1 from the instruction manual. Confirm the option output during temporary pause.

1. Use [delete] to delete the registered extended option output.

2. Referring to Example 1 (Sequence 1 for the stacker) in the programmer instruction manual (refer to page 91), program outputs of No. 4, 5, and 6 and enabling conditions for No. 4.

3. When the program is working as intended, press the temporary pause switch during the sequence operation to cancel it.
   Operating temporary pause during sequence operation temporarily pauses the sequence. To complete the sequence, carry out a restore operation.

4. Add condition No. 15 (when the sewing machine enters the temporary pause state), as conditions for output No. 4, 5, and 6 OFF.
   If you press the temporary pause switch, the output is immediately turned off.
How to create programs

- **Selecting hardware on the output side**
  
  Use NPN open collector outputs.

  ![Circuit board diagram](image1)

  It is assumed that an optionally available air valve is used. In addition to a 24 V air valve, use a 24 VDC relay.

  ![Circuit board diagram](image2)

  Fuses are not incorporated into the output circuit. To prevent the circuit from being damaged if the output short-circuits, it is recommended that you mount an external fuse for each circuit.

- **Selecting hardware on the input side**

  - Use non-isolated IC inputs

    ![Circuit board diagram](image3)

    Example connection to a proximity sensor

  - In addition to using a contact switch or a 24 V sensor, use relays to isolate inputs.

    ![Circuit board diagram](image4)

  - Use relays for an electronic circuit with a min. application load of 5 V and 1 mA or less.
### Creating an I/O allocation table

Allocate the selected hardware to complete the table.

#### Table of option output

<table>
<thead>
<tr>
<th>Option output No.</th>
<th>Allocation</th>
<th>Connector No.</th>
<th>Pin No.</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>P35 (EXOUT1)</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>P12 (AIR2)</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td>3</td>
<td></td>
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<td>7</td>
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<td>4</td>
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<td></td>
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<tr>
<td>12</td>
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<td>P35 (EXOUT1)</td>
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<td>3</td>
<td>11</td>
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<td>2</td>
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</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>16</td>
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<td>P13 (AIR3)</td>
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</tr>
<tr>
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<td>4</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

#### Table of option input

<table>
<thead>
<tr>
<th>Option input No.</th>
<th>Allocation</th>
<th>Connector No.</th>
<th>Pin No.</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>P10 (EXIN1)</td>
<td>2</td>
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<td></td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>P34 (EXIN3)</td>
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<td>5</td>
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<td>12</td>
<td></td>
<td></td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>P35 (EXOUT1)</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>P8 (SENSOR1)</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>
CHAPTER 4 EXTENDED OPTION OUTPUT (PROGRAM)

Creating a timing chart and table of program setting values
Refer to three examples in pages 91 to 93.
1. Create a timing chart where on and off operations of input and output are shown in sequence of order of operation.
2. Tabulate the program setting values based on the timing chart and table of condition numbers (Refer to pages on 87).
3. Input values by using the programmer.

Use of extended option output (Reference material)

Appendix

Parts for the extended option

- P35 EXOUT1 connector
  For option outputs 1 to 3 and 12 to 16
  For option input 13
  12-pin connector of NH series from J.S.T. Mfg Co., Ltd.

- Housing for P12 AIR 2 connector
  For option output 4 to 11
  10-pin connector of NH series from J.S.T. Mfg Co., Ltd.

- Housing for P13 AIR 3 connector
  For option output 17 to 20
  5-pin connector of NH series from J.S.T. Mfg Co., Ltd.

Parts for the extended option input

- Housing and pin for P10 EXIN 1 connector
  Option input 1 to 5
  16-pin connector of PHD series from J.S.T. Mfg Co., Ltd.

- Housing and pin for P11 EXIN 2 connector
  Option input 6 to 10
  18-pin connector of PHD series from J.S.T. Mfg Co., Ltd.

- Housing and pin for P34 EXIN 3 connector
  Option input 11 to 12
  5-pin connector of PH series from J.S.T. Mfg Co., Ltd.

- Housing and pin for P8 SENSOR 1 connector
  Option input 14
  12-pin connector of PAD series from J.S.T. Mfg Co., Ltd.
Circuit diagram of the checking board

Option input 14 is a connector shared with the home position sensor signal. It is not used on the checking board.
Block diagram

Connector layout of the main circuit board
Chapter 5
File Manager Functions
Tasks that can be carried out using the File Manager

This chapter describes how to use the File Manager.

The File Manager can be used to carry out the following tasks for files which are saved in the panel internal memory or on storage media.

- Checking file information
- File operations such as loading, deleting and copying files and changing filenames
- Reading files from and writing files to storage media

Furthermore, the following file formats (extensions) can be handled by the programmer.

(Files other than those given below can be displayed and selected, but operations on these files are restricted to changing filenames, copying and moving.)

- emb: Sewing data
- sew: Sewing data, cycle programs and user parameters
- seq: Extended option settings
- jpg, png, bmp, gif: Image files

Description of icons

< File Manager screen >

Displays the folder path.

Touch these to change the media.

Touch this to change the folder.

These change the list display and carry out file operations.

The currently-selected media will be displayed.

This selects and unselects everything.

This displays detailed file information.

Program No.001
3.7 x 3.7 (mm) 3 stitches
206B
### Media selection, file selection, addresses, sorting

| ![Media selection](image1) | Selecting media for browsing  
| ![Media selection](image2) | (Panel internal memory, SD card, USB flash memory) |
| ![Media selection](image3) | Formatting media |
| ![Media selection](image4) | Changing media |
| ![Media selection](image5) | Moving to a higher folder |
| ![Media selection](image6) | Selecting/unselecting all items |

### Changing the display

- Switching to list display
- Switching to icon display

### File and folder operations

- Adding folders
- Editing filenames, folder names and comments
- Deleting files and folders
- Copying files and folders
- Cutting files and folders
- Pasting files and folders
### CHAPTER 5 FILE MANAGER FUNCTIONS

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Edit" /></td>
<td><strong>Editing files</strong></td>
</tr>
<tr>
<td><img src="image" alt="Multiple Select" /> <img src="image" alt="Single Select" /></td>
<td><strong>Switching between multiple select and single select mode</strong></td>
</tr>
<tr>
<td><img src="image" alt="Up" /></td>
<td><strong>Writing from the panel internal memory to other media (storage media)</strong></td>
</tr>
<tr>
<td><img src="image" alt="Down" /></td>
<td><strong>Reading from other media (storage media) to the panel internal memory</strong></td>
</tr>
</tbody>
</table>
Displaying file lists

Checking file information

This displays the details of files and folders which are stored on the various media (panel internal memory and storage media).

1. Connect the media containing the files which you would like to check to the programmer.
2. At the screen, touch to display the File Manager.
3. Touch the icon in the top-left corner of the screen to switch to the media which contains the files you would like to check.
4. Select the file you would like to check. The detailed file information will be displayed at the bottom of the screen.

Changing the content display method to list format or icon format

This switches the method used for displaying file contents.

1. At the screen, touch to display the File Manager.
2. Touch.
3. The file contents will be displayed in list format.
4. Touch.
5. The file contents will be displayed in icon format.
CHAPTER 5 FILE MANAGER FUNCTIONS

Sorting the display (applying sorting conditions)

You can sort the file content display according to a specified sort order.

1. At the home screen, touch the file manager icon to display the File Manager.

2. Touch the "Name", "Type" or "Date" tab at the top of the list.

3. The file contents will be sorted in ascending or descending order based on the item which you touched. (The order switches between ascending and descending each time you touch the same item.)
Deleting files and folders

This deletes files which are stored on the various media (panel internal memory and storage media). It is possible to select more than one file for deleting at the same time.

1. At the 📀 screen, touch 📄 to display the File Manager.

2. Select the file(s) or folder(s) which you would like to delete.
(To delete more than one file or folder, use multiple select mode to select the files or folders which you would like to delete.)

3. Touch 📄.

4. The delete confirmation dialog screen is displayed, so touch 🔄 Yes.

   Touch 🔄 No to return to the file list screen.

5. The selected file(s) or folder(s) will be deleted.
CHAPTER 5 FILE MANAGER FUNCTIONS

Copying files and folders

Files and folders which have been saved on media (panel internal memory and storage media) can be copied to the displayed folder. It is possible to select more than one file for copying at the same time.

1. At the screen, touch to display the File Manager.

2. Select the file(s) or folder(s) which you would like to copy.
   (To copy more than one file or folder, use multiple select mode to select the files or folders which you would like to copy.)

3. Touch ．

4. Navigate to the destination folder for copying.

5. Touch ．

* If the files or folders in the copy source and the copy destination are the same, the following dialog screen will be displayed.

   To overwrite, touch Yes ．
   Touch No to return to the file list screen.

6. The selected file(s) or folder(s) will be copied to the displayed folder.
Moving files and folders

Files and folders which have been saved on media (panel internal memory and storage media) can be moved to the displayed folder. It is possible to select more than one file for moving at the same time.

1. At the screen, touch to display the File Manager.

2. Select the file(s) or folder(s) which you would like to move.
   (To move more than one file or folder, use multiple select mode to select the files or folders which you would like to move.)

3. Touch .

4. Navigate to the destination folder for moving.

5. Touch .

6. The selected file(s) or folder(s) will be moved to the displayed folder.
CHAPTER 5 FILE MANAGER FUNCTIONS

Changing the names of files and folders

This changes the names of files and folders which are stored on the various media (panel internal memory and storage media).
Comments which are attached to files can be changed at the same time.

1. At the 🔄 screen, touch 🔄 to display the File Manager.
2. Select the file or folders which you would like to change the name of.
3. Touch 🔄.
4. The display will change to the filename/folder name editing screen so that you can edit the filename or folder name.
   * In the case of sewing data files, you can edit the comments at the same time.
5. Touch OK.
6. The filename, folder name and/or comment will be changed to the contents which were edited in step 4.
Creating folders

You can create new folders in the storage media.

1. At the screen, touch to display the File Manager.

2. Touch the icon in the top-left corner of the screen to switch to the storage media.

* When creating a folder on an SD card, select ; when creating a folder on a USB flash memory, select .

3. Navigate to the folder where you would like to create a new sub-folder.

4. Touch .

5. The display will change to the folder name entry screen, so that you can enter the name of the folder.

6. Touch .

7. The folder will be created.
Importing files from storage media into the panel internal memory

Files which have been saved on storage media can be imported into the panel internal memory. It is possible to select more than one file for importing at the same time.

1. Insert the storage media containing the file that you wish to import into the programmer.
2. At the  screen, touch to display the File Manager.
3. Touch the icon in the top-left of the screen to select the storage media which contains the file that you would like to import.

* To import a file from an SD card, select ; to import a file from a USB flash memory, select .
4. Touch the file which you would like to import in order to select it. (To import more than one file or folder, use multiple select mode to select the files or folders which you would like to import.)
5. Touch .
6. The selected file(s) will be imported into the panel internal memory.

Exporting files from the panel internal memory to storage media

Files which have been saved in the panel internal memory can be exported to storage media. It is possible to select more than one file for exporting at the same time.

1. Insert the storage media that you wish to use for exporting the file from the programmer.
2. At the  screen, touch to display the File Manager.
3. Touch the icon in the top-left corner of the screen to select the panel internal memory.
4. Touch the file which you would like to export in order to select it. (To export more than one file or folder, use multiple select mode to select the files or folders which you would like to export.)
5. Touch .
6. The selected file(s) will be exported to the storage media.
Formatting media

You can format media (panel internal memory or storage media) so that it can be used with the programmer.

1. At the screen, touch to display the File Manager.

2. Touch the icon in the top-left corner of the screen to select the media which you would like to format.

3. Touch the icon in the top-left corner of the screen once more, and then touch at the bottom of the list.

4. A screen asking you to confirm the formatting operation will be displayed.

   Touch Yes.

   Touch No to return to the file list screen.

5. The specified media will be formatted, and it can then be used.
Chapter 6
Setting Functions
CHAPTER 6 SETTING FUNCTIONS

Setting the programmer

You can change the settings which relate to programming functions. The changed settings will be applied when programming. The procedure for changing the programmer settings and the items which can be set are explained below.

1. At the screen, touch .
2. Touch to display the programmer settings.
3. Touch the setting value for the setting item which you would like to change, and then change the setting value.
   * Refer to the following table for the setting items.
4. Touch at the bottom of the screen to apply the changed settings.

<table>
<thead>
<tr>
<th>Setting item</th>
<th>Summary</th>
<th>Setting value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jog acceleration pattern</td>
<td>This changes the acceleration pattern for the jog key when it is held down.</td>
<td>1 - 5 Slow ... Fast</td>
</tr>
<tr>
<td>Continuous data input</td>
<td>ON: When entering data, it is automatically connected to the end point of the previous outline. OFF: When entering data, an outline start point is entered each time.</td>
<td>ON / OFF</td>
</tr>
<tr>
<td>X coordinate initial value (mm)</td>
<td>Changes the initial value for the cursor's X coordinate.</td>
<td>–999 - 999</td>
</tr>
<tr>
<td>Y coordinate initial value (mm)</td>
<td>Changes the initial value for the cursor's Y coordinate.</td>
<td>–999 - 999</td>
</tr>
</tbody>
</table>

Setting the display

You can change settings which relate to the display. After a setting is changed, it is applied once it is confirmed. The procedure for changing the display settings and the items which can be set are explained below.

1. At the screen, touch .
2. Use to display the display settings, and then touch the desired setting item.
3. Touch the setting value for the setting item which you would like to change, and then change the setting value.
   * Refer to the following table for the setting items.
4. Touch at the bottom of the screen to apply the changed settings.

<table>
<thead>
<tr>
<th>Setting item</th>
<th>Summary</th>
<th>Setting value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brightness</td>
<td>This changes the brightness of the LCD backlight.</td>
<td>1 - 6 Dark ... Bright</td>
</tr>
</tbody>
</table>
Setting the date and time

You can change settings which relate to the date and time.
After a setting is changed, it is applied once it is confirmed.
The procedure for changing the date and time settings and the items which can be set are explained below.

1. At the screen, touch.
2. Use to display the date and time settings, and then touch the desired setting item.
3. Touch the setting value for the setting item which you would like to change, and then change the setting value.
   * Refer to the following table for the setting items.
4. Touch at the bottom of the screen to apply the changed settings.

<table>
<thead>
<tr>
<th>Setting item</th>
<th>Summary</th>
<th>Setting value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time zone</td>
<td>This changes the time zone setting. * Refer to the &quot;List of time zone settings&quot; on the next page for the time zones which can be set.</td>
<td>Refer to the next page.</td>
</tr>
<tr>
<td>Year</td>
<td>This changes the year setting.</td>
<td>2015 - 2037</td>
</tr>
<tr>
<td>Month</td>
<td>This changes the month setting.</td>
<td>1 - 12</td>
</tr>
<tr>
<td>Day</td>
<td>This changes the day setting.</td>
<td>1 - 31</td>
</tr>
<tr>
<td>Hour</td>
<td>This changes the hour setting.</td>
<td>1 - 24</td>
</tr>
<tr>
<td>Minute</td>
<td>This changes the minute setting.</td>
<td>0 - 59</td>
</tr>
<tr>
<td>Date display format</td>
<td>This changes the date display format. Example: When set to YYYY/MM/DD , the date is displayed as &quot;2015/01/01&quot;.</td>
<td>YYYY/MM/DD DD/MM/YYYY MM/DD/YYYY</td>
</tr>
<tr>
<td>Time display format</td>
<td>This changes the time display format.</td>
<td>12 hours/24 hours</td>
</tr>
</tbody>
</table>
## List of time zone settings

<table>
<thead>
<tr>
<th>Choice</th>
<th>Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midway</td>
<td>Central African Time (Harare)</td>
</tr>
<tr>
<td>Honolulu</td>
<td>Baghdad</td>
</tr>
<tr>
<td>Anchorage</td>
<td>Moscow</td>
</tr>
<tr>
<td>American Pacific Time (Los Angeles)</td>
<td>Kuwait</td>
</tr>
<tr>
<td>American Pacific Time (Tijuana)</td>
<td>East Africa Time (Nairobi)</td>
</tr>
<tr>
<td>American Mountain Time (Phoenix)</td>
<td>Teheran</td>
</tr>
<tr>
<td>Chihuahua</td>
<td>Baku</td>
</tr>
<tr>
<td>American Mountain Time (Denver)</td>
<td>Tbilisi</td>
</tr>
<tr>
<td>American Central Time (Costa Rica)</td>
<td>Yerevan</td>
</tr>
<tr>
<td>American Central Time (Chicago)</td>
<td>Dubai</td>
</tr>
<tr>
<td>American Central Time (Mexico City)</td>
<td>Kabul</td>
</tr>
<tr>
<td>American Central Time (Regina)</td>
<td>Karachi</td>
</tr>
<tr>
<td>Bogota</td>
<td>Oral</td>
</tr>
<tr>
<td>American Eastern Time (New York)</td>
<td>Yekaterinburg</td>
</tr>
<tr>
<td>Caracas</td>
<td>Calcutta</td>
</tr>
<tr>
<td>Atlantic Time (Barbados)</td>
<td>Colombo</td>
</tr>
<tr>
<td>Halifax</td>
<td>Kathmandu</td>
</tr>
<tr>
<td>Amazon Time (Manaus)</td>
<td>Almaty</td>
</tr>
<tr>
<td>Chile/Santiago</td>
<td>Yangon</td>
</tr>
<tr>
<td>Newfoundland Standard Time (St. John's)</td>
<td>Krasnoyarsk</td>
</tr>
<tr>
<td>Brasilia Time (São Paulo)</td>
<td>Bangkok</td>
</tr>
<tr>
<td>Argentina Time</td>
<td>China Standard Time (Beijing)</td>
</tr>
<tr>
<td>Nuuk</td>
<td>Hong Kong</td>
</tr>
<tr>
<td>Montevideo</td>
<td>Irkutsk</td>
</tr>
<tr>
<td>South Georgia Islands</td>
<td>Kuala Lumpur</td>
</tr>
<tr>
<td>Azores Islands</td>
<td>Perth</td>
</tr>
<tr>
<td>Cabo Verde</td>
<td>Taipei</td>
</tr>
<tr>
<td>Casablanca</td>
<td>Seoul</td>
</tr>
<tr>
<td>Greenwich Mean Time</td>
<td>Japan Standard Time (Tokyo)</td>
</tr>
<tr>
<td>Greenwich Mean Time (London)</td>
<td>Yakutsk</td>
</tr>
<tr>
<td>Central European Standard Time (Amsterdam)</td>
<td>Adelaide</td>
</tr>
<tr>
<td>Central European Standard Time (Belgrade)</td>
<td>Darwin</td>
</tr>
<tr>
<td>Central European Standard Time (Brussels)</td>
<td>Brisbane</td>
</tr>
<tr>
<td>Central European Standard Time (Sarajevo)</td>
<td>Hobart</td>
</tr>
<tr>
<td>Windhoek</td>
<td>Sydney</td>
</tr>
<tr>
<td>West Africa Time (Brazzaville)</td>
<td>Vladivostok</td>
</tr>
<tr>
<td>Eastern European Standard Time (Amman)</td>
<td>Guam</td>
</tr>
<tr>
<td>Eastern European Standard Time (Athens)</td>
<td>Magadan</td>
</tr>
<tr>
<td>Eastern European Standard Time (Beirut)</td>
<td>New Zealand/Auckland</td>
</tr>
<tr>
<td>Eastern European Standard Time (Cairo)</td>
<td>Fiji</td>
</tr>
<tr>
<td>Eastern European Standard Time (Helsinki)</td>
<td>Majuro</td>
</tr>
<tr>
<td>Israel Standard Time (Jerusalem)</td>
<td>Tongatapu</td>
</tr>
<tr>
<td>Minsk</td>
<td></td>
</tr>
</tbody>
</table>
Setting the language

You can change settings which relate to the language.
After a setting is changed, it is applied once it is confirmed.
The procedure for changing the language is explained below.

1. At the  screen, touch  .
2. Use  to scroll the screen, and select "Language setting" from the list.
3. Touch the language which you would like to select.
   * Refer to the settings in the table below for the languages which can be selected.
4. Touch  at the bottom of the screen to apply the changed settings.

Setting the sound

You can change settings which relate to the sound.
After a setting is changed, it is applied once it is confirmed.
The procedure for changing the sound settings and the items which can be set are explained below.

1. At the  screen, touch  .
2. Use  to scroll the screen, and select "Sound setting" from the list.
3. Touch the setting value for the setting item which you would like to select, and then change the setting value.
   * Refer to the following table for the setting items.
4. Touch  at the bottom of the screen to apply the changed settings.

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Summary</th>
<th>Setting value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Button check sound volume</td>
<td>This changes the volume of the button check sound.</td>
<td>0 - 6 Low ... High</td>
</tr>
<tr>
<td>Error check sound volume</td>
<td>This changes the volume of the error check sound. Some fatal errors will generate a sound regardless of this setting.</td>
<td>0 - 6 Low ... High</td>
</tr>
</tbody>
</table>
Checking information

Viewing information

You can check information relating to the sewing machine and LCD panel. The steps required in order to check the information are explained below.

1. At the house screen, touch the setting icon.

2. Use the up and down arrows to scroll the screen, and select "Information" from the list.

3. Touch "Information".

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewing machine serial number</td>
<td>This displays the serial number of the sewing machine.</td>
</tr>
<tr>
<td>Main software version</td>
<td>This displays the version of the main sewing machine software.</td>
</tr>
<tr>
<td>Motor software version</td>
<td>This displays the version of the sewing machine motor software.</td>
</tr>
<tr>
<td>Panel software version</td>
<td>This displays the version of the LCD panel software.</td>
</tr>
<tr>
<td>Maintenance information list</td>
<td>This displays the maintenance information for the sewing machine.</td>
</tr>
<tr>
<td>Error log list</td>
<td>This displays the error information for the sewing machine.</td>
</tr>
</tbody>
</table>
CHAPTER 6 SETTING FUNCTIONS

Updating the software

The programmer can be used to update the software for the sewing machine.
The procedure for updating the sewing machine software is given below.

1. At the screen, touch .
2. Use to scroll the screen, and select "Software update" from the list.
3. Touch the item corresponding to the software which you would like to update.
   * Refer to the following table for the update items.

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel software</td>
<td>This lets you update the panel software.</td>
</tr>
<tr>
<td></td>
<td>* If the update file cannot be found, updating will not be possible.</td>
</tr>
<tr>
<td>Main software</td>
<td>This lets you update the main software.</td>
</tr>
<tr>
<td></td>
<td>* If the update file cannot be found, updating will not be possible.</td>
</tr>
<tr>
<td>Motor software</td>
<td>This lets you update the motor software.</td>
</tr>
<tr>
<td></td>
<td>* If the update file cannot be found, updating will not be possible.</td>
</tr>
</tbody>
</table>

Checking the software license

The programmer can be used to update the software for the software license.
The steps required in order to check the software license information are explained below.

1. At the screen, touch .
2. Use to scroll the screen, and select "Open source license" from the list.
3. Touch "Open source license".

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open source license</td>
<td>This displays the license for the open source software.</td>
</tr>
<tr>
<td></td>
<td>* If you touch &quot;Open source license&quot;, the license will be displayed.</td>
</tr>
</tbody>
</table>
The following shows available spare parts.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Part name</th>
</tr>
</thead>
<tbody>
<tr>
<td>SB6532001</td>
<td>FRONT COVER ASSY</td>
</tr>
<tr>
<td>SB6019001</td>
<td>PROGRAMMER MAIN PCB ASSY</td>
</tr>
<tr>
<td>SB6538001</td>
<td>EARTH PLATE</td>
</tr>
<tr>
<td>SB6539001</td>
<td>KEYBOARD</td>
</tr>
<tr>
<td>SB6540001</td>
<td>CURSOR KEY</td>
</tr>
<tr>
<td>SB6541001</td>
<td>PUSH KEY</td>
</tr>
<tr>
<td>Part Number</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>SB6525001</td>
<td>PROGRAMMER KEY PCB ASSY</td>
</tr>
<tr>
<td>SB6472001</td>
<td>MN-KEY HARNESS</td>
</tr>
<tr>
<td>SB6542001</td>
<td>REAR COVER ASSY</td>
</tr>
<tr>
<td>SB6551001</td>
<td>REAR COVER CAP</td>
</tr>
<tr>
<td>SB6552001</td>
<td>REAR STAND</td>
</tr>
<tr>
<td>SB6313001</td>
<td>PROGRAMMER HARNESS 3100</td>
</tr>
<tr>
<td>SB6545001</td>
<td>SIDE CAVER SD</td>
</tr>
<tr>
<td>Part Number</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>SB6546001</td>
<td>SIDE COVER USB</td>
</tr>
<tr>
<td>SB6547001</td>
<td>SIDE COVER BCR</td>
</tr>
<tr>
<td>SB6554001</td>
<td>PROGRAMMER CRADLE</td>
</tr>
<tr>
<td>SB6555001</td>
<td>CRADLE MOUNTING PLATE</td>
</tr>
<tr>
<td>SB6556001</td>
<td>PEN ASSY</td>
</tr>
<tr>
<td>SB6657001</td>
<td>RUBBER CUSHION</td>
</tr>
</tbody>
</table>