

Programming software for computer-controlled sewing machines

**PGM-20**

**Brief operation manual 1.10**

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## 1. Introduction

This manual describes how to use basic programs. Refer to the "HELP" of this program for detailed explanation of functions.

## 2. Starting and terminating the program

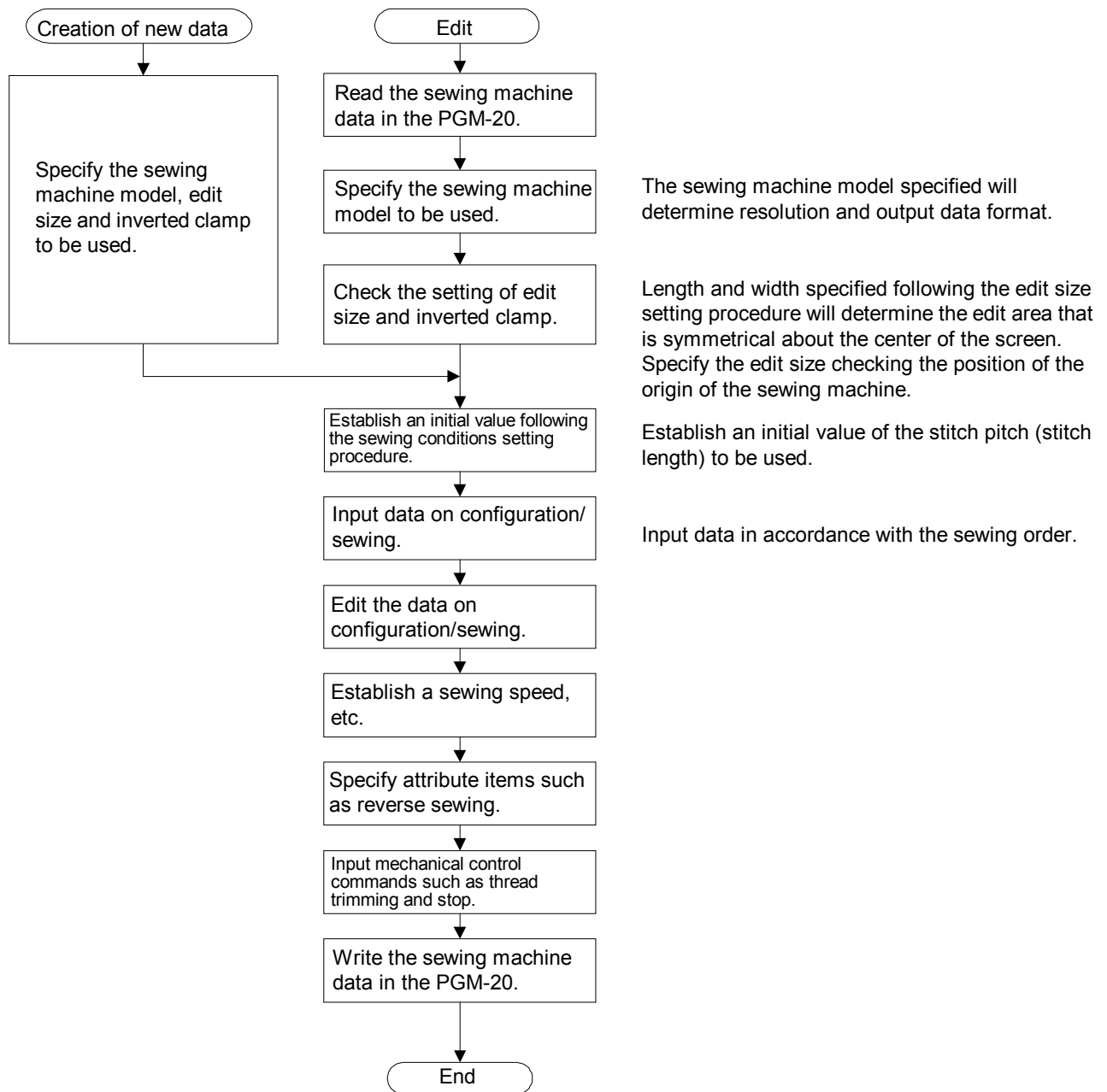
When the PGM-20 is installed in your personal computer, "JUKI PGM-20 X.XX" group will be created in the start menu program within which "JUKI PGM-20. EXE" will be created. Specify the "JUKI PGM-20. EXE" to start the program. When the program is initiated, the initial screen will appear on the display.

Click on "New" to create new pattern data, or "Open," "Pattern data H/D input," "Pattern data F/D input" or "Pattern data ROM input," according to the purpose, to read existing pattern data for edit.

To terminate the program, save the sewing data you want to store in memory and specify "Exit JUKI PGM-20" from the files contained in the menu bar.

### 3. General operation flow

The following chart gives the general operation flow and relevant precautions.



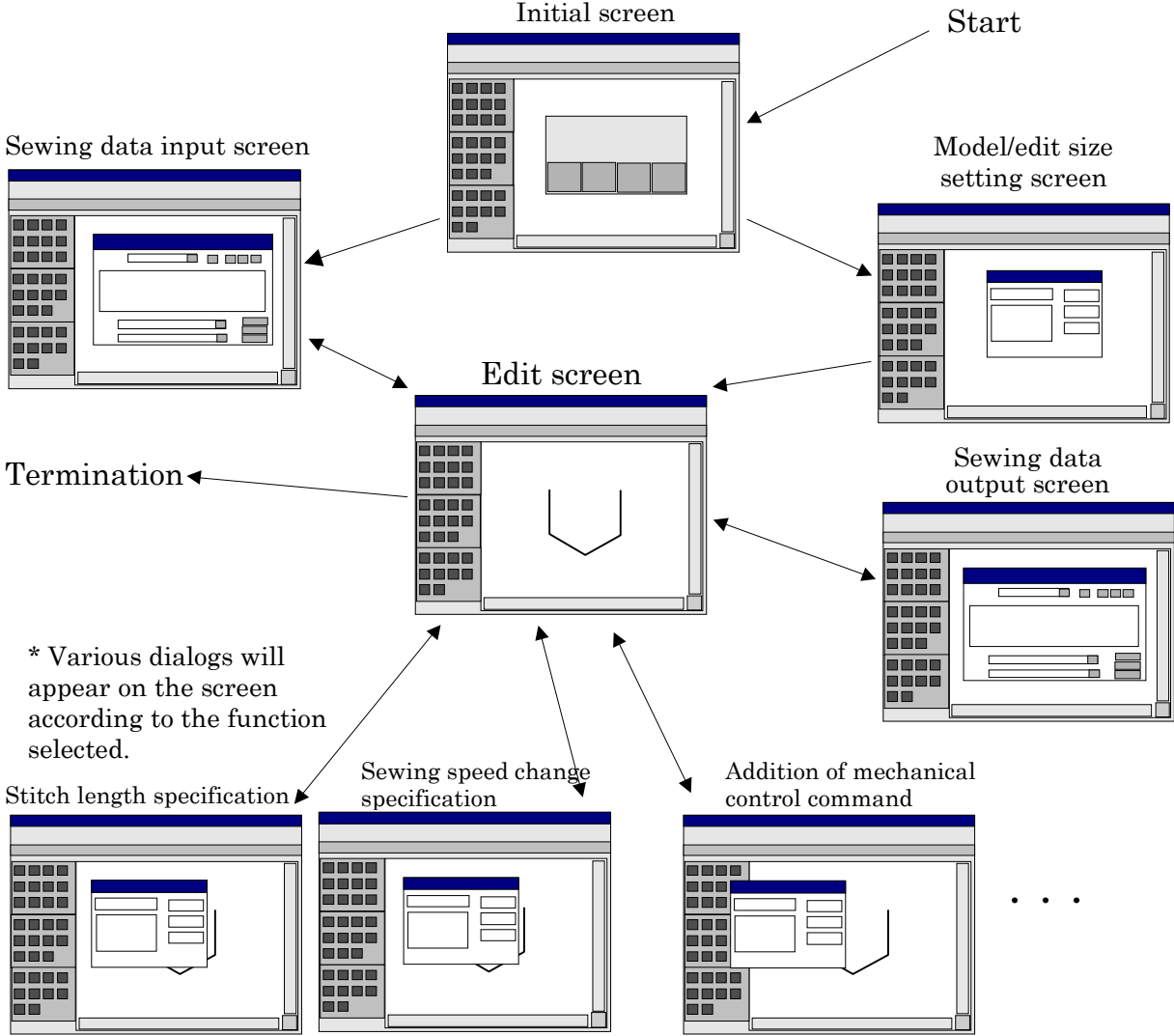
## 4. Precautions for use

The following precautions should always be followed when using the PGM-20.

1. Set the font size to the smaller one in the Windows95 screen font setting procedure. If the larger font is specified, some of characters to be displayed on the screen may be omitted from the screen.
2. PGM-20 is not able to handle elliptic configurations. If a circle or arc is enlarged/reduced with the scale in length and that in width set to different values, needle entry points will form an oval or a part of it. In this case, however, the configuration will remain the circle or arc. (This means that only the configuration points will be arithmetically computed with enlarged/reduced.) As a result, the needle entry points will be separated from the configuration to create point sewing data.
3. Several minutes will be taken to input/transfer data on/to a ROM.
4. The size of initial display on the edit screen will be determined depending on the size specified for the edit size or the largest one of the pattern sizes. Any reduced display smaller than the initial display size is not possible. The limit of the scale for the enlarged display is also determined by the size of initial display.
5. Since the reverse sewing is performed by tracing the original stitches produced by the normal-direction sewing, the original stitches and reverse stitches cannot be separated. As a result, no sewing can be added between any original stitch and reverse stitch. In the case where "insertion after element" is selected during the mechanical command inserting procedure, the mechanical command will be inserted after the last element of data including reverse sewing.
6. Grid display may not appear on the screen if the grid interval is excessively small. In this case, increase the grid interval or make the screen to give an enlarged view of the grid display.

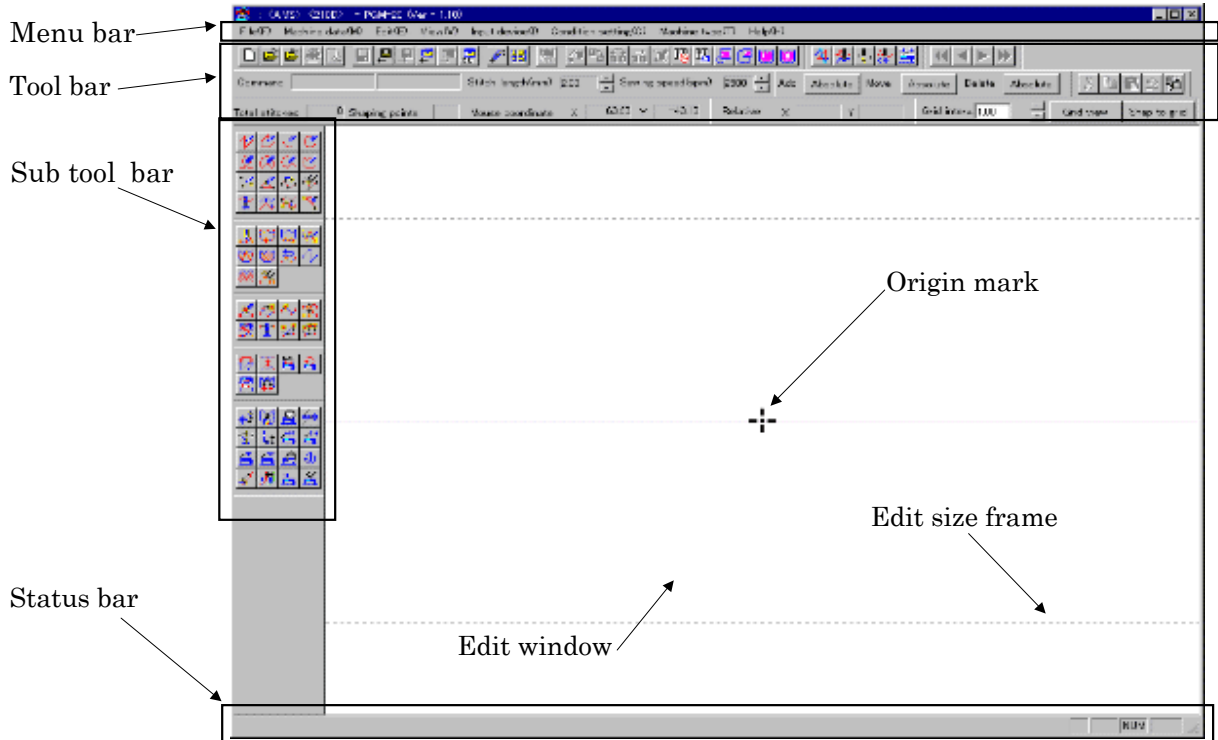
# 5. Change of screen

The screen generally changes as illustrated below.



## 6. Edit screen

The edit screen is illustrated below. Most operations are conducted on this screen.



Position the pointer in the function contained in the menu bar, tool bar and sub tool bar to be executed and click the mouse button. Then, operate the personal computer according to the messages given in the status bar or dialog box.

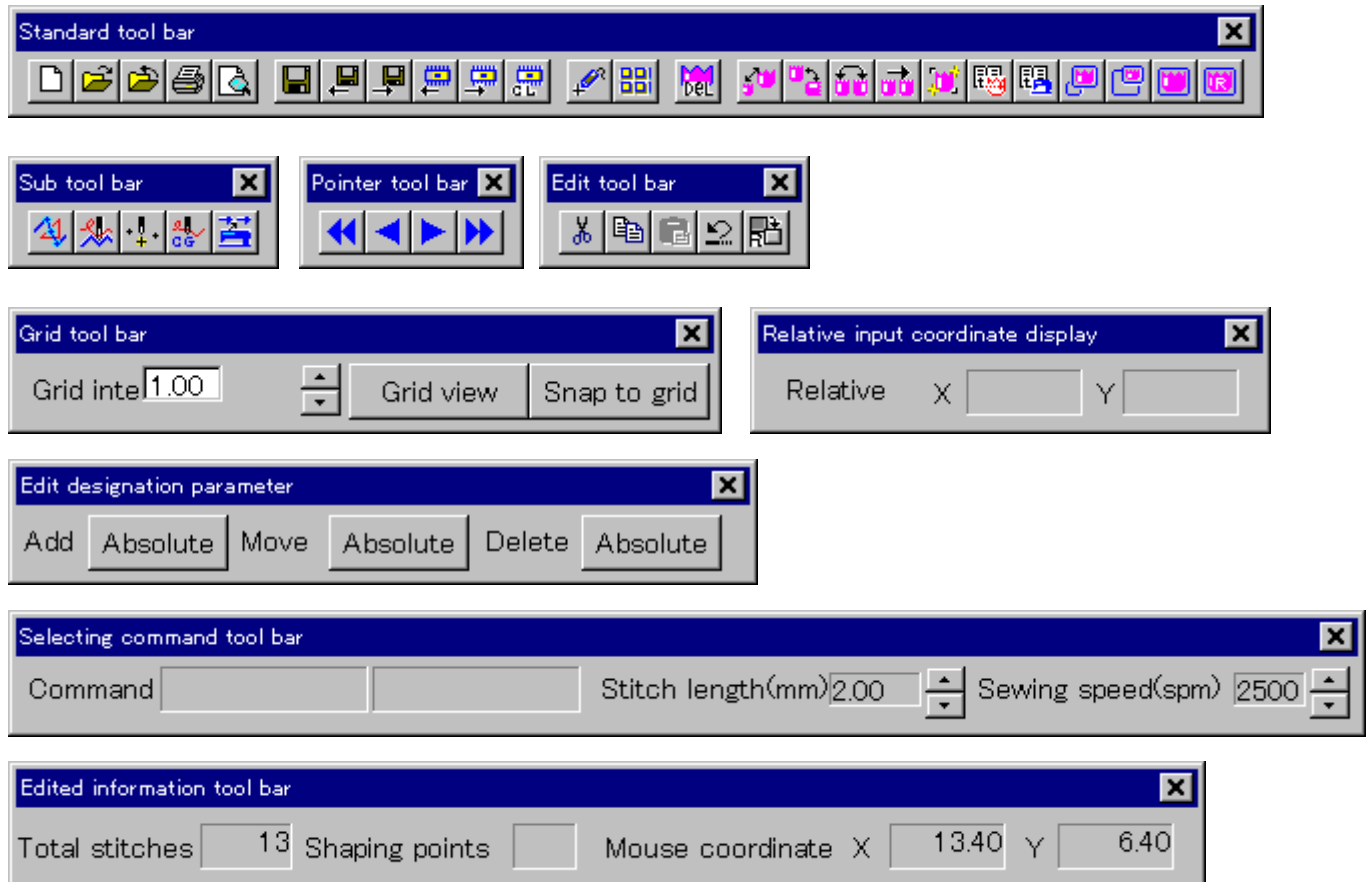
### 6.1. Menu bar

The menu bar contains the following functions.

<b>File</b> New Open Close Overwrite and save Rename and save Management information Add sub-pattern Page set-up Print preview Print Application end	<b>Machine data</b> H/D Input H/D Output F/D Input F/D Output ROM Input ROM transmission ROM data deletion ROM data list Input HEX file Transfer HEX file	<b>Edit</b> Undo Cut Copy Paste Delete Data enlargement/reduction Rotation Parallel move Mirror conversion	<b>View</b> Toolbar Statusbar Scalebar Enlarged indication Reduced indication Initial indication Re-indication Max./Min. indication Stitch point ON/OFF Display element Display mechanical control -comand in detail
<b>Input device</b> Digitizer input Keyboard input Keyboard input(add, move)	<b>Condition setting</b> Setting device Max./min. stitch length -setting Sewing conditions	<b>Machine type</b> Machine type/resolution Sewing size Clamp inversion setting	<b>Help</b> Contents Help Topics Version Information

## 6.2. Tool bar

The tool bar consists of selector buttons for the functions that are same with those given in the menu bar, selector buttons for other functions and information display section.



The standard tool bar provides buttons corresponding to the functions contained in the menu that are frequently used. Five different tool bars are displayed. Display of each of the sub tool bars turns on and off.

The pointer tool bar is used to move the pointer that indicates the target element to the initial point to the last point or move it forward/backward element-by-element. The grid tool bar is used to specify on/off or interval of the grid display and grid modification.

The selection command tool bar is used to display the selected function and display defaults or establish new settings of stitch pitch (stitch length) and grid modification.

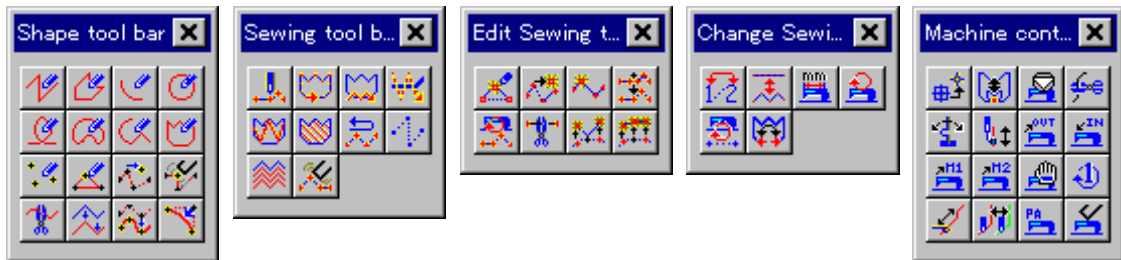
The edit information tool bar gives, from the left to the right, coordinates of input configuration point being input, the total number of stitches contained in all pieces of data, the number of input configuration points being input and mouse coordinate information.

Coordinates of input point to be displayed can be changed over between relative coordinates and absolute coordinates using the corresponding button.



### 6.3. Sub tool bar

There are five kinds of sub tool bars such as configuration input, sewing input, needle point edit, sewing change and mechanical control command. They are used to specify input/edit functions.



The configuration input sub tool bar contains buttons used to specify the type of configuration to be input, buttons used to specify edit functions to add, move and delete configuration points of a configuration input, and buttons used to specify configuration operating functions to create a composite curve, offset configurations and divide configuration elements.

The sewing input sub tool bar contains buttons related to the sewing input, such as buttons used to specify sewing functions such as point sewing, normal sewing and zigzag stitching used to input a pattern based on a configuration, and satin stitching and darning stitching used to fill a closed pattern, and buttons used to specify reverse stitching input, multi-sewing input and jump input functions and sewing deleting functions.

The needle point edit tool bar has the buttons corresponding to edit function used to add, move and delete needle entry points and element dividing function used to divide data at needle entry points.

The sewing change sub tool bar contains buttons corresponding to functions to change sewing order, sewing direction, stitch pitch (stitch length), sewing speed, jump speed and zigzag stitch density.

The mechanical control command tool bar contains buttons used to specify functions to input mechanical control commands such as thread trimming and pause, parameter changing function and mechanical control command deleting function.

Two of the buttons contained in the sub tool bars may sometimes be used in combination. In this case, the buttons that will remain inoperative even if the mouse cursor is positioned and mouse button is clicked will be displayed in gray.

# 7. Data

Data are classified into several groups such as configuration data on lines, arcs and circles, sewing data, and jump data that joins sewing data with mechanical control command such as thread trimming or with another sewing data. Sewing data consists of point sewing to enter the needle at desired positions stitch by stitch and normal sewing to enter the needle along a configuration. Satin stitching and area darning stitching are presented in point sewing form.

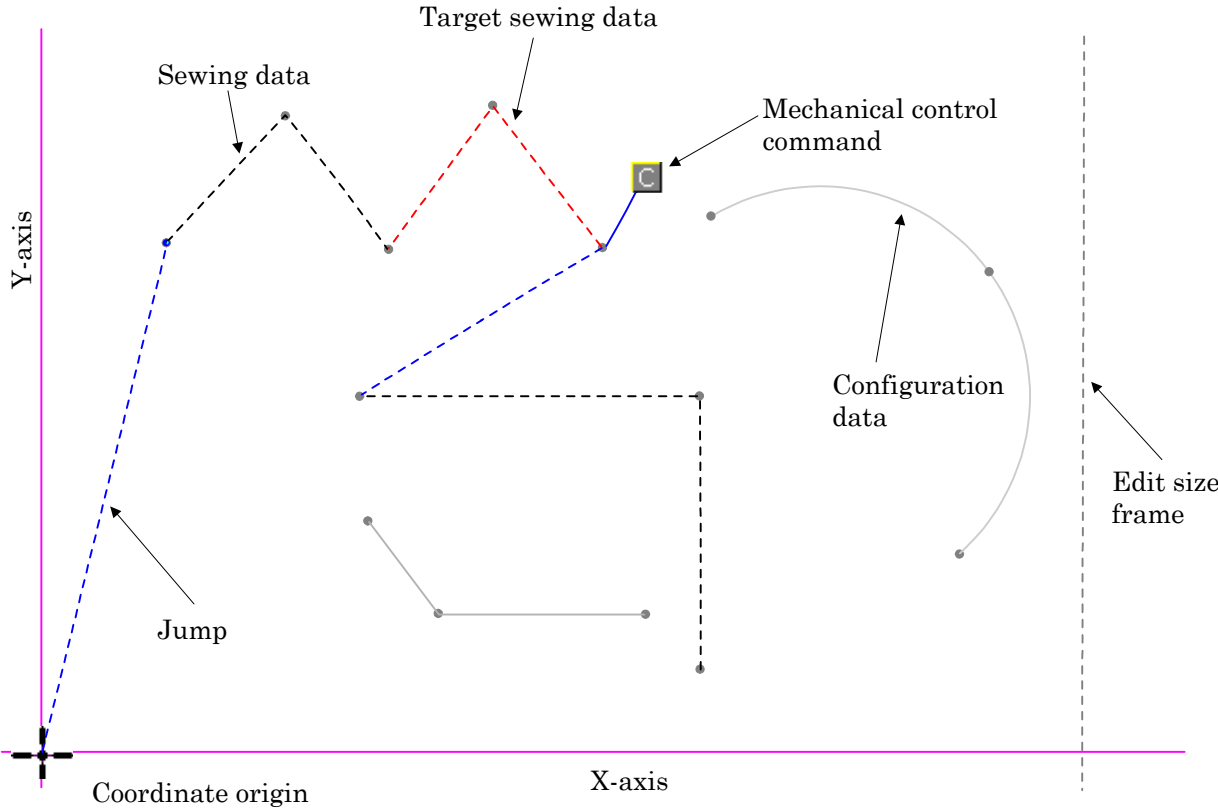
Configuration data/sewing data that is created in one step is called an "element."

Operations affect the element that is selected from among elements (it is also called the "target element" and indicated with a pointer). The selected element indicated with the pointer can be moved by clicking the mouse button, using the "Pointer move" contained in the tool bar or pressing the right and left arrow keys on the keyboard.

The input data is presented with its color changed in accordance with the kind of data.

Normally, configuration data is colored in gray, sewing data in black and jump data in blue by dotted line. In addition, the selected element is colored in blue if the element is configuration data and in red if it is sewing data or jump data created as desired.

Mechanical control commands are attached with marks in accordance with the kind of command. In the case where the needle point edit function is selected, the needle entry points will be presented as black circles.



## **7.1. Sewing data**

Sewing data is created, based on configuration data, by providing attributes such as normal sewing, zigzag stitching, satin stitching and area darning stitching. In this case, sewing data will be created along a configuration for normal sewing and zigzag stitching, or will be created as point sewing data to fill inside a closed configuration.

For normal sewing and zigzag stitching, configuration data is joined with sewing and remains at the original position. If configuration data is changed, sewing therefore will be changed also. It should be remembered that, needle positions will be initialized by changing the configuration even if the point-by-point needle positions in an element have been changed using the needle point edit function.

For satin stitching and area darning stitching, configuration data remains but in a different form, i.e., point sewing data. In this case, sewing data will not change even if the configuration is changed. However, the original sewing data can be modified to create a new data by utilizing the configuration data that has been used to create the original sewing data. For example, sewing data to fill inside of the configuration with darning stitches and edge the periphery of the configuration with zigzag stitches can be created with ease.

## **7.2. Jump data**

If two units of sewing data input are spaced from each other, jump data will be automatically inserted between them. Normally, the jump data automatically inserted will not be the target element even if moving the pointer on it. However, the jump data that is intentionally created with jump input function or 2nd origin input function, or for which traveling speed is intentionally changed will be taken in a manner same as sewing data and will be sometimes specified as the target data.

The aforementioned jump data is handled in a manner same as sewing data to permit modification of configuration using the needle point edit function. It should be noted, however, that the point on which the 2nd origin has been established cannot be edited. In this case, first delete the 2nd origin and edit the point.

## **7.3. Order of elements/sewing order of sewing data**

As the order of elements, an element input is placed after the target element. For the order arrangement of elements, elements provided with sewing attributes are independently arranged in order and configuration data elements are independently arranged in order. Select configuration data elements and move the pointer to any other position, and the configuration data elements will move in their sequential order. In this case, the pointer can move to such elements that have a sewing attribute at some mid point.

Sewing order of sewing data to be output will be the order of elements provided with the aforementioned sewing attribute.

## **7.4. Selection of elements with the mouse**

To select an element with the mouse, click on a location near a configuration point of the element. Once the selection is made, the selected element will be presented in blue. For sewing data, position the mouse cursor in a mid point of the configuration and click the mouse button. Once the selection is made, the selected element will be presented in red. For sewing data, stitches are not shown in the strict sense. However, clicking on a location near the position where stitches are presumed to exist will select the sewing data element.

## 8. Input function

Input procedure begins with the click-on the button corresponding to the sub tool bar that contains the desired type of input. Subsequent procedure slightly differ with configuration, sewing and mechanical control command. To abort the input procedure, press the ESCAPE key to resume the initial state of the input procedure.

### 8.1. Input of configuration and sewing

To input a configuration, position the mouse cursor in the button corresponding to linear input, arc input, circle input, dot sequence input, polygon input, open spline input or close spline input contained in the shape input sub tool bar in accordance with the type of configuration to be input and click the mouse button to invoke the configuration input mode. Click-on the same button again will reset the configuration input mode.

It is possible to provide sewing attributes simultaneously with the input of a configuration. In this case, click on the configuration specifying button, then click on the button corresponding to normal sewing, zigzag stitching, satin stitching or area darning stitching contained in the sewing input sub tool bar in accordance with the type of sewing to be input. Then, position the mouse cursor in the position of characteristics point of the configuration and click the mouse button. This enables another characteristics point to be input successively. If the BACK SPACE key is pressed at this time, the last previous input point will be canceled. If the ESCAPE key is pressed, all the points of the configuration being input will be canceled (the configuration that has already been entered will not be canceled). To terminate the input procedure, press the right button on the mouse or the ENTER key. This completes the input of one element. If sewing attributes are provided for the element, the dialog box to specify stitch pitch (stitch length) and sewing speed will be shown on the screen to establish desired values.

It is possible to provide sewing attributes to the configuration that has already been input. In this case, keep the button corresponding to normal sewing, zigzag stitching, satin stitching or area darning stitching contained in the sewing input sub tool bar held pressed, specify the element to which sewing attributes are to be provided and press the right button on the mouse or the ENTER key.

Point sewing in which needle entry points are specified stitch-by-stitch has no configuration. To specify a position for point sewing, click on the point sewing button as in the case of the input of a configuration.

The aforementioned position can be specified either the mouse or the digitizer. To specify the position with the digitizer, specify the digitizer input from the "Input device" contained in the menu bar. Then, the PGM-20 will require the input of a scale of the original drawing and two points to be used to make an X-axis base line.

## 8.2. Input of satin stitching and area darning stitching

To input satin stitching or area darning stitching, create first a configuration to be filled with satin stitches or darning stitches. (To create a configuration, click on the configuration specifying button and the button corresponding to satin stitching or area darning stitching, creation of a configuration and specification of sewing can be conducted successively.

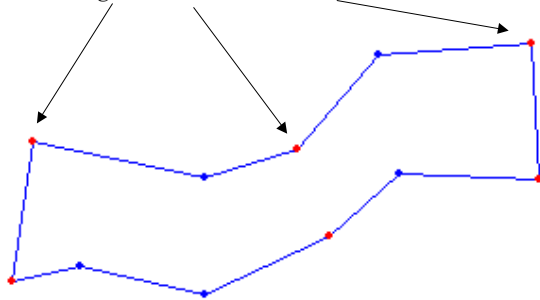
Specify the type of sewing according to the application.) The configuration to be created has to be one element. In the case of a complicated configuration, combine several configurations to create one compound pattern.

For area darning stitching, the configuration has to be a closed one (i.e., a configuration of which starting point meets the last point., for example a polygon, close spline or closed compound pattern).

For satin stitching, specify two sides along which the needle enters and the direction in which those sides advance. Clicking on the starting point and last point (starting point, mid point and last point for a closed configuration) will specify one side and its advancing direction.

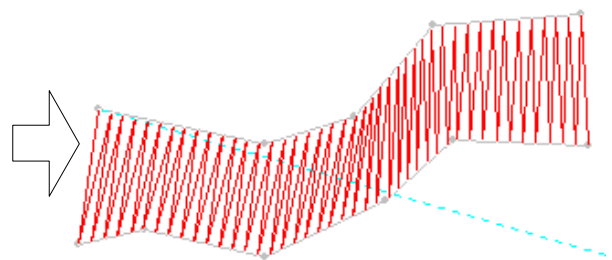
Take the same procedure for another side. The needle entry begins with the starting point specified and ends with the last previous point specified.

Specify a starting point, mid point and last point of a side in which the needle enters along the advancing direction.



Specify a starting point, mid point and last point of the opposite side in which the needle enters along the advancing direction.

In the case of a closed configuration



For area darning stitching, click on a configuration to specify a periphery, then click on a configuration to specify a portion to be filled with darning stitches (in the case where two or more portions are to be filled, click all), and press the right button of the mouse to enter the specified configurations. Then, specify two points that makes a base line which represents the advancing direction of darning stitching by clicking on them. Darning stitches will be produced from the starting point to the end point of the base line.

Satin stitching and darning stitching are handled as point sewing. To change the stitch pitch or other setting, delete only the sewing data and re-create new sewing data since the configuration itself remains.















### 8.3. Input of mechanical control commands

To input a mechanical control command, click on the button corresponding to the mechanical control command to be input. For some mechanical control commands, a dialog box will be displayed. For other mechanical control commands, a message will appear on the status bar. For the mechanical control commands, 14 different kinds of sewing machine control commands such as second origin, enlargement/reduction reference point, pause, thread trimming clamp inversion, intermediate presser height control, external output, external input, mark 1, mark2, delay, one rotation, tension controller No. 3, color change control can be input. Some of the commands are not available on some models of sewing machines. Carefully check whether or not the command to be input is available on your machine. A second origin and enlargement/reduction reference point can be input at any position desired. The intermediate presser height control can be input for two needle entry points desired.

The other mechanical control data can be input following the last previous element, desired needle entry point, desired jump point (the last point of the jump is included) or desired mechanical control command. It should be remembered that a thread trimming can only be input to a jump point. It also has to be remembered that mark 1 command consists of a pair of points. In addition, only one pair of the mark 1 command can exist in one data set. Mechanical control commands are handled as attachments to a configuration element or sewing element. This means that deleting the configuration/sewing element will also delete the mechanical control command contained in the element.

#### 8.3.1. Mark of mechanical control commands

Mark of mechanical control commands is next.

	SECOND ORIGIN
	ENLARGEMENT/REDUCTION REFERENCE POINT
	STOP COMMAND
	THREAD TRIMMING COMMAND
	CLAMP INVERSION COMMAND
	INTERMEDIATE HEIGHT CONTROL COMMAND
	EXTERNAL OUTPUT COMMAND
	EXTERNAL INPUT COMMAND
	MARK 1 COMMAND
	MARK 2 COMMAND
	DELAY COMMAND
	ONE ROTATION COMMAND
	TENSION CONTROLLER NO. 3 COMMAND
	COLOR CHANGE CONTROL COMMAND

## **9. Edit function**

### **9.1. Edit of configuration/sewing**

A configuration that has already been input can be changed by adding, moving or deleting configuration points. A configuration provided with normal sewing attribute can also be changed. In this case, click on the button corresponding to add, move or delete contained in the configuration input sub tool bar and click on a target configuration point. For the add or delete, two or more points can be specified.

Needle entry points can be directly added, moved or deleted. In this case, click on the button corresponding to add, move or delete contained in the needle point edit sub tool bar and click on a target needle entry point.

It should be remembered, however, deleting a configuration point or needle entry point will clear a mechanical control command attached to the point deleted.

To change the sewing speed, jump speed or stitch pitch (stitch length) of an element, click on the relevant button contained in the sewing change sub tool bar and specify a target element. In the case where you want to change jump speed, do not click on the starting point but on the last point of the jump.

To change the sewing speed between two points, click on the button corresponding to the point sewing speed change contained in the needle point edit sub tool bar and specify the starting point and end point of the section between which the sewing speed is to be changed. This function converts any sewing data into point sewing data when changing the sewing speed. In this case, however, the sewing element can easily be re-created since the configuration data still remains as another element.

### **9.2. Edit of mechanical control information**

To delete mechanical control information or change a parameter, click on the button contained in the mechanical control sub tool bar and click on the mark corresponding to the mechanical control command to be changed or deleted. For the parameter changing, the dialog box will be given on the display by specifying the mark corresponding to the parameter changing. Specify a desired value in the dialog box.

## 10. Data manipulation

Various kinds of data can be manipulated by selecting the "Edit" contained in the menu bar. Use the "/cut," "/copy" and "/paste" to cut and paste data or copy and paste it. This manipulation affects the current target element or selected element. Select an element and execute the "/cut" or "/copy," position the mouse cursor in a destination of data pasting and click the mouse button. Then, execute the "Paste" in the "Edit." In this case, a blue dotted-line frame will be presented on the screen. Specify a destination of data pasting using the frame for reference. The paste mode will not reset after executing the paste once but will remain to allow the data to be pasted to two or more destinations. To reset the paste mode, press the ESC key.

The clip board is not used for the "/cut," "/copy" and "/paste" supported by the PGM-20. This means that data copied using other application software cannot be used.

Furthermore, "/enlargement or reduction," "/rotation," "parallel move," "mirror inversion" and "delete" can also be performed. These manipulations affect the current target element, selected element or the whole data.

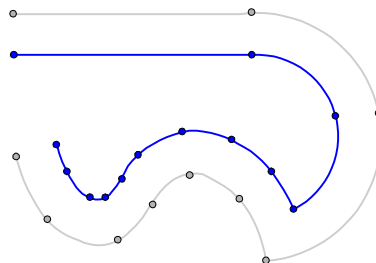
To select one element, simply click on the element to be manipulated. To select two or more elements, drag the mouse (move the mouse with its left button held pressed) when no button in the sub tool bar is pressed to display a rectangle-framed selection range on the screen. The element all of which points are placed in the range will be selected.

### 10.1. Compound pattern and its use

A line, arc, spline or other patterns can be combined to be handled as if they make a single pattern. Such a pattern is called the compound pattern. It should be noted, however, only sequential configurations can be combined into a compound pattern. There are two kinds of compound patterns, such as closed compound pattern and opened compound pattern. Use either kind of compound patterns according to the application.

To create a compound pattern, first click on the button corresponding to the compound pattern contained in the configuration input tool bar, then click on the configurations to be combined into a compound pattern following the order of joining. Finally, enter the pattern by pressing the right button of the mouse.

A created compound pattern can be used for offset, multi-sewing, satin stitching and area darning stitching. An offset configuration of the compound configuration consisting of a line, arc and spline can easily be created.



In the case where a compound pattern is used for offset or multi-sewing, an offset compound pattern is created by finding intersection points of the offset component configurations. In the event that graphic intersection points cannot be found, the offset component configurations will be joined by a line. In this case, the offset compound pattern can be deformed.



## 11. Input/output of sewing data

Normally, the sewing machine data function contained in the menu bar is used to read/write sewing data. The sewing machine data function delivers reading/writing on/from a floppy disk, ROM and hard disk. Specify the medium to be used.

In the case where the hard disk is used, sewing data will be stored in a directory created on the model-by-model basis under the directory that is specified in the "H/D storage directory path" contained in the "Device type" available from the "Condition setting."

The selection of the ROM can only take effect in the case where a PKW-1100 (Pecker-11) is connected as a ROM writer to the personal computer. Writing of data can only be executed for the sewing machine model AMS-205/-206 or LK-1900.

If any ROM writer other than PKW-1100 (Pecker-11) is used, sewing data can be saved and read in the form of HEX file that is allowed to be sent/received to/from the ROM writer.

To manipulate sewing data on the hard disk, use the "Open" or "Name and save" prepared in the "File" contained in the "Menu bar."

### 11.1. The notice of handling "ROM"

PGM-20 has already provided for the function which compiles the data of pattern on ROM.

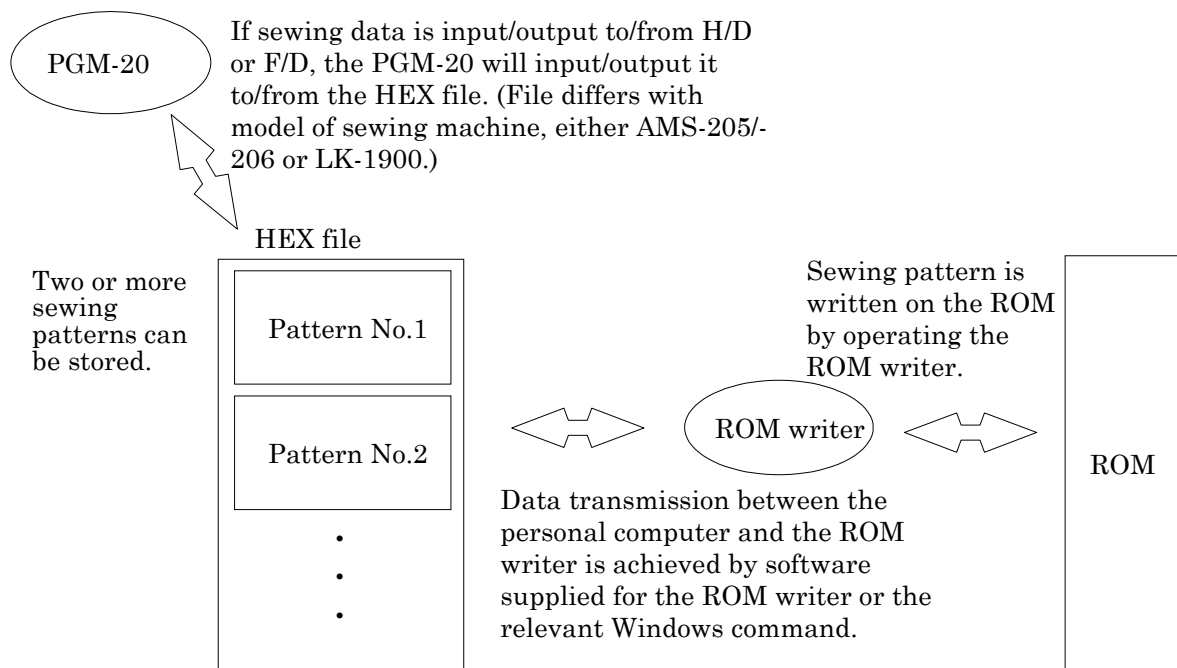
In order to replace the location of holding data properly, PGM-20 handles the output of the data of ROM(EEP-ROM) which is capable of erasing former data electrically.

Use "EEP-ROM" always for this reason.

However, only EP-ROM is available at LK-1900. In the case of the output of LK-1900's data, use an erased EP-ROM.

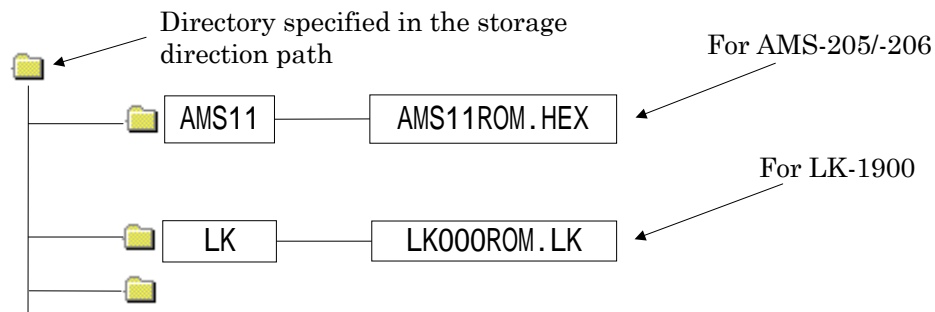
## 11.2. Input/output of files for ROM writer transmission

In the case where the AMS-205/-206 or LK-1900 Series model of sewing machine is used and a ROM writer other than the PKW-1100 (Pecker-11) is used, sewing data can be input/output from/to a file (HEX file) that can be transmitted to the ROM writer. Two or more sewing patterns can be store in the HEX file. Direction to the HEX file is given with the pattern number of a sewing pattern.



For example of Windows command, enter the relevant DOS command in response to the DOS prompt.  
If the ROM writer is connected to COM2 of RS-232C, type ">copy File name COM2." as output , type ">copy COM2 File name " as input.

When "H/D read," "H/D write," "F/D read," or "F/D write" prepared in the "Sewing data" contained in the menu bar is executed, reading/writing to/from the HEX file will be performed. At this time, the file is fixed in accordance with model of sewing machine as shown below.



To read sewing data from the ROM, transmit all data held in the ROM to the personal computer in the INTELEC HEX format. The location and name of the file conform to those shown in the chart given above. Then, execute "H/D read" (or "F/D read" for floppy disk) on the PGM-20 to read the sewing data. For writing, another sewing data can be additionally written in one HEX file. In this case, two and more units of sewing data are identified with pattern numbers. It should be noted that in the case where the HEX file holds another sewing pattern bearing the same pattern number, the new sewing data will replace the existing data when storing the former.

To write sewing data, transmit the aforementioned file to the ROM writer and write it on the ROM after performing the "H/D write."

Procedure for transmitting data between the personal computer and ROM writer differs with ROM writer. It is advisable to use software supplied for the ROM writer, if any.

## 12. Change of sewing machine model and edit size

Supported model of sewing machine and edit size prepared under the "Sewing data" can be changed. Select the "Sewing machine model" from the menu bar and execute the "Resolution and edit size" contained in the "Sewing machine model."

The edit size is automatically established by specifying the sewing machine model and type. It is possible to input or read data that exceeds the edit size. However, the sewing machine is not able to perform sewing beyond its sewing area even if the edit size is expanded. If the edit size is excessively large, it may not be sufficiently enlarged in the "Enlarged view." It is advisable not to specify a larger edit size unless it is really necessary.

To create sewing data for any sewing machine model that is not covered in the "Model list" in the "Sewing machine model," properly specify the model and type of sewing machine and resolution (the resolution is uniquely determined by the model and type of sewing machine and cannot be changed) to match the edit size to the sewing area of the machine.

### 12.1. Sewing machine model setting and sewing data

In the sewing machine model setting procedure, specify the sewing machine model for which sewing data is being handled. This setting determines the resolution of sewing data and affects the arithmetic computation of needle entry points. Specify also the type of output format, which differ with sewing machine model, of the sewing data and the data storage folder. It should be noted, however, that the sewing machine model will be automatically changed to the one that corresponds to the sewing data once the data is read. To change the sewing machine model over to the model of which resolution differs from the existing model specified, the configuration points and needle entry points can vary since they are arithmetically computed again based on the minimum unit of the resolution.

For example, if the AMS-210D model is specified in the "Sewing machine model" after reading sewing data intended for the AMS-210B and the "F/D write" contained in the "Sewing machine data" is executed with no additional operation, sewing data for the AMS-210D will be created, and vice versa.

### 13. Data entry with a digitizer

To enter data with a digitizer, the digitizer is required to operate normally to allow the PGM-20 to actuate. It is also required to specify the item corresponding to the digitizer in the "Condition setting/Setting device" in the menu of the PGM-20.

To enter data with the digitizer, specify the "Digitizer input" from the "Input device" contained in the menu bar. This will elect the digitizer input mode.

At this time, it is necessary to place the cursor of the digitizer on the digitizer panel. If the digitizer gives no response to the PGM-20, an error can arise.

Then, the PGM-20 will demand the input of a scale and base line of the original drawing. Specify the scale of the original drawing in percentage. For example, specify "200" (%) for a double-size original drawing.

Now, input a base line of the original drawing so as to align the coordinate axes of the PGM-20 with that of the original drawing. The PGM-20 will give a message telling the above, click on the OK button, position the cursor of the digitizer in a point lying on a base line that is to be used as an origin and press the Z button to input the point. Then, position the cursor of the digitizer in a desired point lying on the base line and press the Z button to input the point. Specify a second input point that is on the right-hand side of the first point as observed from you. The PGM-20 will process to make the position specified as the origin to be the origin on the screen.

Then, input coordinates by positioning the cursor of the digitizer in given points and press the Z button according to the original drawing. Once the completion of the entry of required coordinates, click on the "Digitizer exit" button to terminate the digitizer input mode. To enter data with the digitizer again, repeat the aforementioned procedure.

For the PGM-20, all operations are carried out with the mouse. The digitizer is used only for the input of coordinates. Under the digitizer input mode, the mouse can actuate no operation since the cursor of the digitizer is given priority. To change the configuration of a pattern or the type of sewing, operate the mouse with the cursor of the digitizer placed outside the digitizer panel.