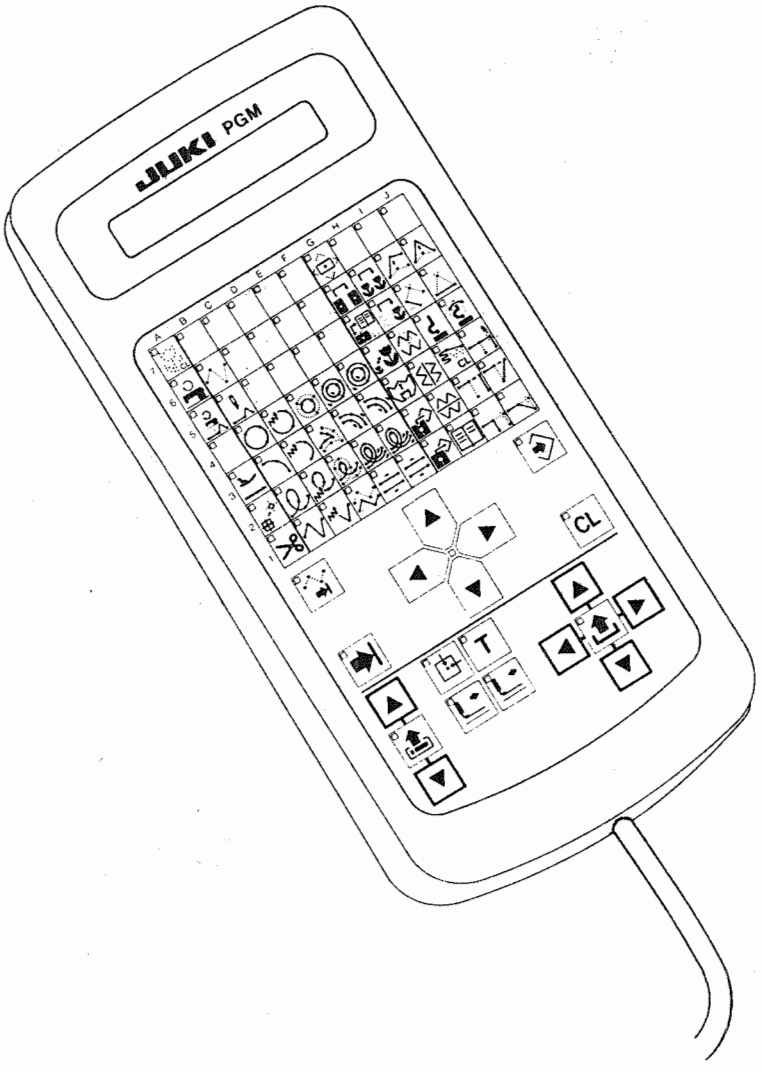
JUKI

AMS Series of Computer-Controlled Cycle Machines
PGM-5 Handy Programming Device

INSTRUCTION MANUAL



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INTRODUCTION

Congratulations on your purchase of the JUKI PGM-5 Handy Programming Device for the AMS Series of Computer-Controlled Cycle Machines.
This Instruction Manual explains the functions of the PGM-5 Handy Programming Device, including the precautions to be taken before and during a sewing operation.
Please read this Instruction Manual carefully before using the machine in order to get the most out of it and to enjoy using it for a long time.
You are recommended to read the Instruction Manual for the sewing machine before reading this manual.

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I. GENERAL

The PGM-5 is used with the AMS Series of sewing machines for inputting pattern data.
Pattern data can be easily created with this device.

1. Feature

1) Interactive indication method

The status and result of inputting the pattern data are indicated on the display of the PGM-5, thereby facilitating data input.

2) The various input features reduce the time required to input data

Since it is possible to input all kinds of data, including normal types of stitching such as linear stitching, spline stitching and arc stitching, as well as zigzag stitching and offset stitching, complicated pattern data can be input in a short period of time.

3) Patterns can be easily modified after input using the modification function

A number of modification functions are available including "delete a point", "move a point", "add a point" and "change the point speed", which means that any pattern can be easily modified after creation.

4) The test sewing function facilitates pattern confirmation

The input mode can be switched to the test sewing mode when the PGM-5 is used with the sewing machine. The created pattern can therefore be sewn in the test sewing mode before the data are written onto the floppy disk. Furthermore, the data can be immediately modified by referring to the result of test sewing.

5) The machine uses the MS-DOS operating system, which means that the pattern data on the floppy disks can be easily managed.

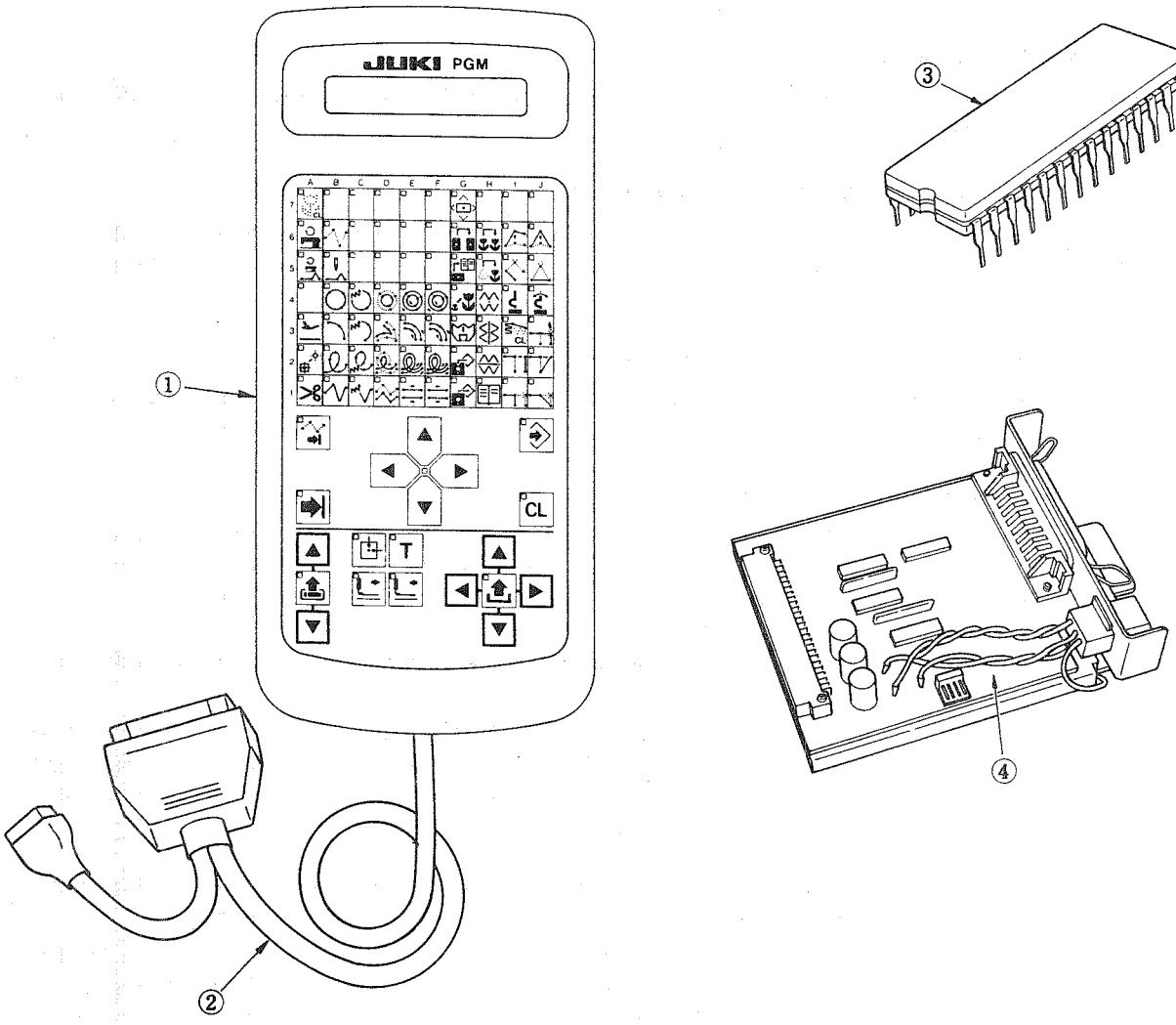
The AMS Series of sewing machines (excluding the AMS-205B/206B), which can be connected to the PGM-5, uses the MS-DOS type of floppy disk (2DD floppy disks), so when a pattern stored on a floppy disk under a certain pattern number is modified, it can be re-written on the floppy disk using the same pattern number. Furthermore, you can use a personal computer to copy or delete the pattern.

6) The pattern data created using the PGM-5 are interchangeable with the pattern data created using the input function from another source and with data created using a conventional floppy disk system.

A sewing machine connected to the PGM-5 is capable of reading the patterns created using the PGM-1 or PGM-10 (1D floppy disks) since the PGM-5 is capable of reading them. As a result, a pattern created using another input device can be partially modified to make a new pattern. (Note that any such pattern should be written onto an MS-DOS type of floppy disk.)

* MS-DOS is the registered trademark of Microsoft Inc., U.S.A.

2. Configuration



① PGM-5 main unit
② Connecting cable
③ EEP-ROM
④ ON-LINE 2 circuit board

} To be used when the PGM-5 is connected to the AMS-205B/-206B Sewing Machine.

3. Precautions to be taken when handling the PGM-5

1) Do not operate the device or store it in a place where the temperature fluctuates to a significant extent or the humidity is high. In addition, do not place it where it will be exposed to direct sunlight.

2) Do not hit the device against something. Do not d rop it, and do not shake it violently.

3) Clean the main unit using tissue paper or a soft cloth moistened with a small amount of water or neutral detergent. Do not allow water to enter the inside of the main unit. Using benzine, thinner (corrosive substance), chemicals or a chemical cloth may deform or discolor the device. Spraying insecticide on the device may also have the same effect.

4) Connect the connectors in the correct direction.

5) Pulling the cables strongly may break the wires or disconnect the connectors. Be sure to remove the cables by pulling the connectors, not the cables themselves.

6) Be sure to disconnect this device from the sewing machine in cases other than creating patterns.

7) If the power to the device is turned OFF due to a sewing machine malfunction, the data created so far will be lost.
In this case, re-create the pattern after the cause of the malfunction has been eliminated.

8) Use the EEP-ROM designated by JUKI (part number: HL010620000) with the device. If an EEP-ROM other than the designated one is used, it may not be possible to write onto the EEP-ROM.

9) Since the EEP-ROM consists of semi-conductors, take care when handling it (with regard to static electricity etc.) Handling it incorrectly will cause the data stored in the EEP-ROM to be erased or the EEP-ROM itself may break.

10) Take care not to insert the EEP-ROM into the socket in the opposite direction or with its pins bent. Inserting the EEP-ROM in the opposite direction or with its pins bent may cause it to break.

11) Be sure to install/remove the EEP-ROM in/from the device or turn ON/OFF the main power when the LED on the socket circuit board goes out. It you install/remove the EEP-ROM or turn ON/OFF the main power when the LED is lit up, the data written on the EEP-ROM may be erased or the EEP-ROM may break.

12) Do not press the push-button on the side of the device.

II. SPECIFICATIONS

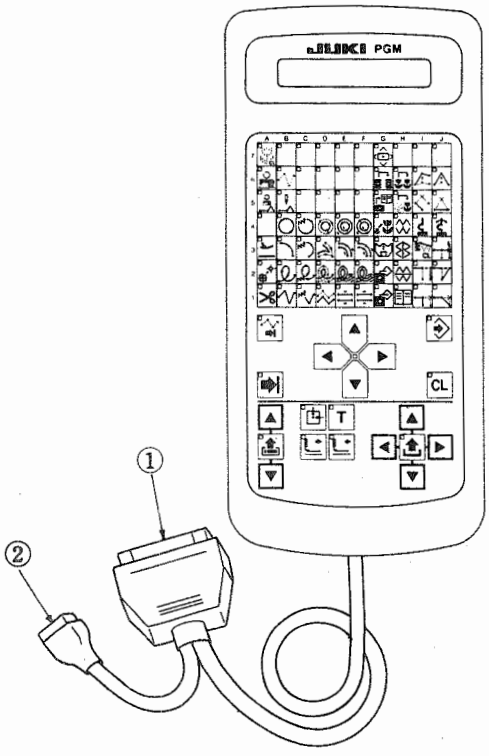
Specification/ connected models	AMS-205B/206B	AMS-210B	AMS-220B	AMS-224B
1. Pattern input area	Depending on the sewing area of the sewing machine to be connected			
2. Computation accuracy	± 0.2 mm	± 0.16 mm		
3. Enlargement/reduction	1% ~ 225%	1% ~ 400%		0.1% ~ 400.0% or 1% ~ 400%
4. Stitch length setting	0.2 mm ~ 6.2 mm	0.2 mm ~ 10.0 mm		
5. Sewing speed setting	200 s.p.m., 600 s.p.m. to 2000 s.p.m. (in increments of 100 s.p.m.)			
6. Number of stitches	Max. 3000 stitches	Max. 4000 stitches		
7. Memory medium	28C64 EEP-ROM 2764 P-ROM (used only for reading data)	3.5″ micro-floppy disk (double-sided, double-density: 2DD)		
8. Pattern specification	1 ~ 99	1 ~ 999		
9. Number of patterns stored in memory	1 ~ 32	44 ~ 691		
10. Working temperature range	5°C ~ 40°C			
11. Working humidity range	20% ~ 80% (without condensation)			
12. External dimensions	130 mm (W) x 278 mm (L) x 38 mm (H)			
13. Weight	1 kg			
14. Cable length	1.7 m			

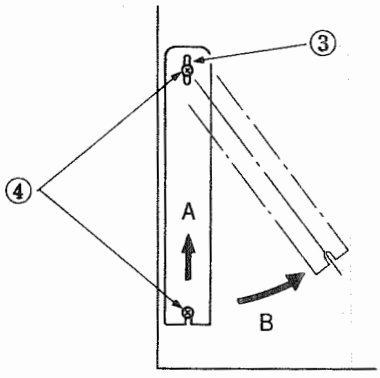
III. OPERATION

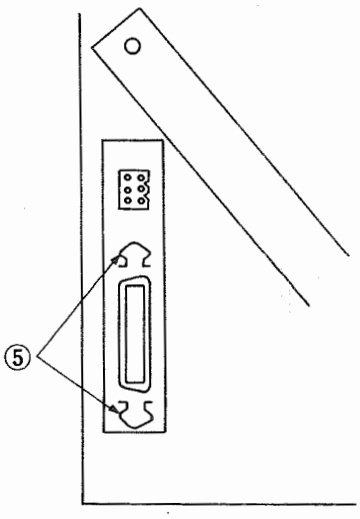
1. Connection

To use the PGM-5, connect it to one of the computer-controlled cycle machines in the JUKI AMS Series. Prepare for the sewing operation in accordance with the type of sewing machine to be used.

1) When the PGM-5 is connected to the AMS-210B/220B/224B







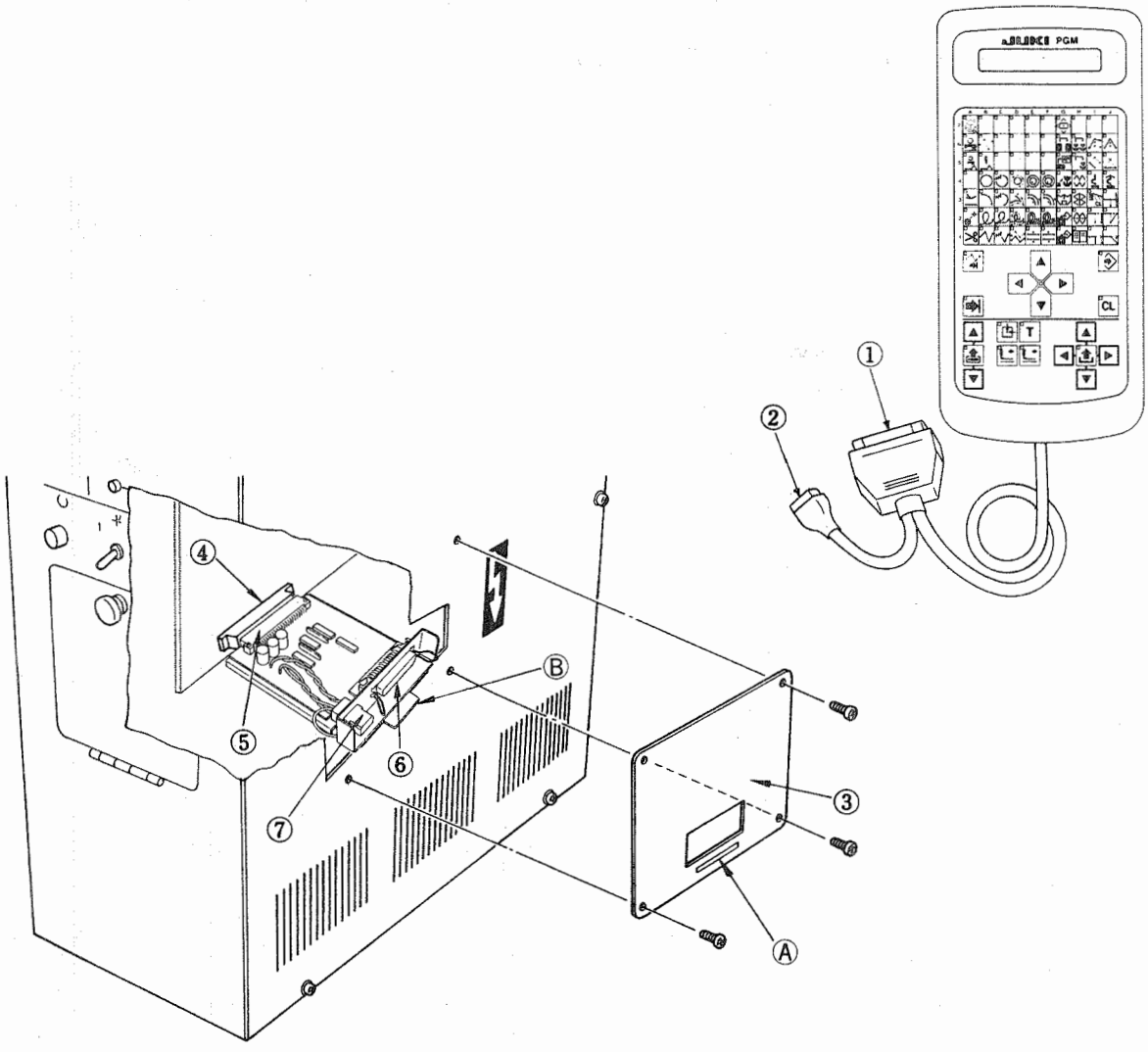
(1) Loosen setscrews (4) in connector cover (3) on the front of the control box. Move the connector cover in the direction of arrow A and then turn it in direction B.

(2) Connect signal connector (1) and power relay connector (2) coming out of the PGM-5 to the connectors inside the connector cover. Lock hooks (5) on both sides of signal connector (1).

(3) Turn OFF the power switch and remove the PGM-5 from the sewing machine following the installation procedure in reverse order.

2) When the PGM-5 is connected to the AMS-205B/206B

(Caution) With the ON-LINE 2 circuit board, the PGM-5 can be connected to the AMS-205B/206B.



(1) Remove lid ③ (small) from the control box (MC-511) of the AMS-205B/206B.

(Caution) If the ON-LINE circuit board to connect the PGM-2 is inserted, remove it.

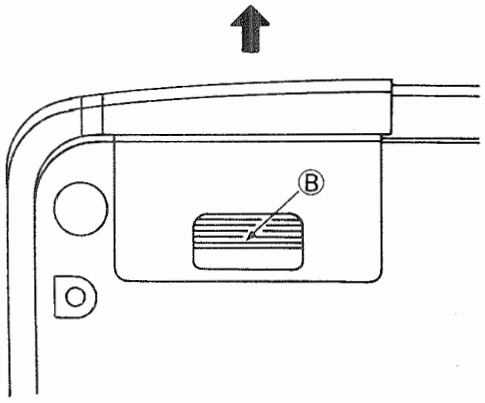
(2) Connect connector P11 ⑤ on the ON-LINE 2 circuit board to connector J12 ④ on the MAIN circuit board.

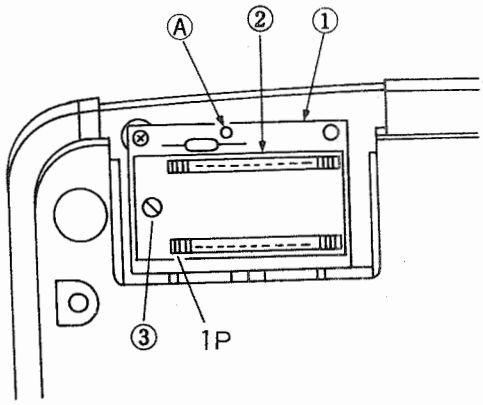
(3) Aligning hole Ⓐ in lid ③ with protruding section Ⓑ on the fixing plate of the ON-LINE 2 circuit board, fix them in place by tightening up the screws.

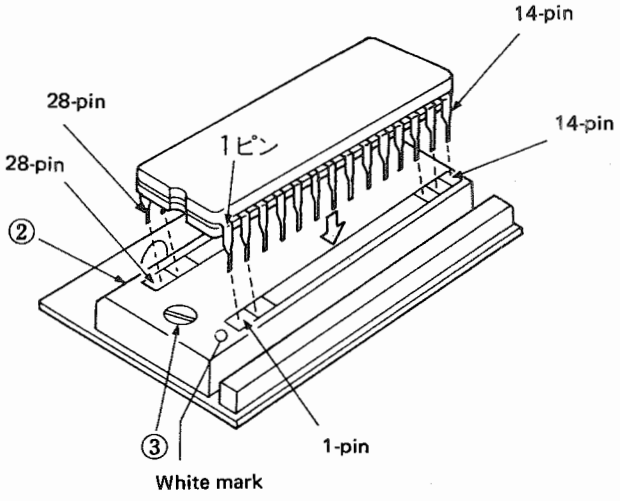
(4) Connect signal connector ① to power relay connector ② coming out of the PGM-5 to connectors ⑥ and ⑦ on the ON-LINE 2 circuit board.

3) How to install the EEP-ROM (when using the AMS-205B/-206B)

(Caution) Install or remove the EEP-ROM when LED (A) on socket circuit board goes OFF.







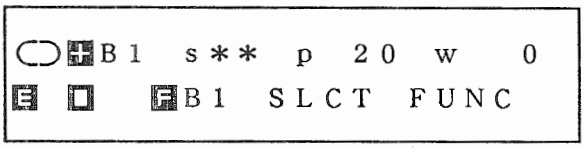
(1) Lightly pressing section (B) on the rear cover, slide the cover in the direction of the arrow ↑ . This will remove the rear cover.

(2) Turn cam (3) in IC socket (2) counterclockwise.

(3) Fit the EEP-ROM into IC receptacle (2) matching the pin numbers respectively. Make sure that the pins are securely inserted into the receptacle.

(4) Turn cam (3) clockwise to securely fix the EEP-ROM in position. At this time, confirm that the EEP-ROM does not easily come off the receptacle.

8) Press the [⇨|] or [⇦|] key on the JOG input section (to terminate the setting of the values required for the "Linear sewing".) The following indication will be shown on the display.



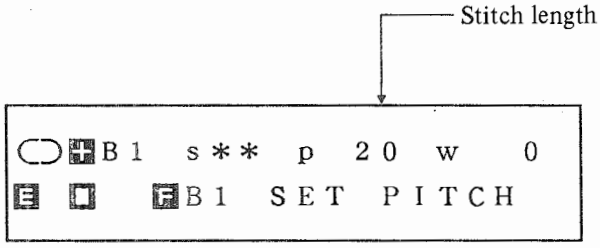
* The value of "20" indicated by "p" means that the set value is 2.0 mm.

(Note) 1. As many as 128 points can be continuously entered.

(Note) 2. How to specify the stitch length

* The steps in the procedure to specify the stitch length for linear sewing also applies to other types of stitching.

If [∿] (B1) is selected, the following indication will appear on the display.

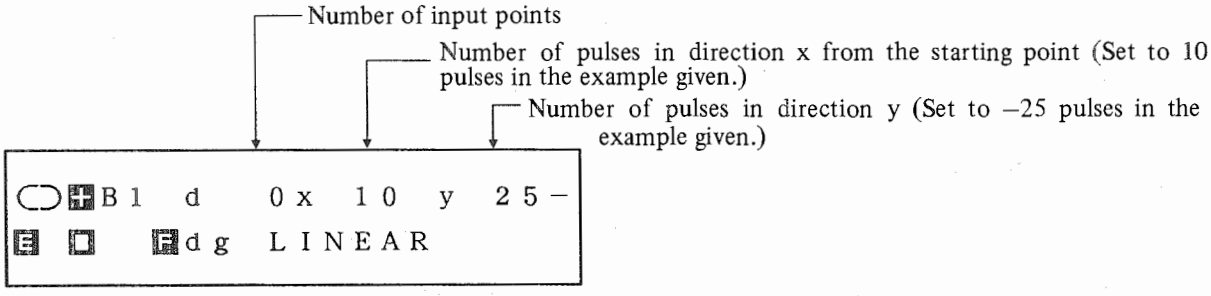


Press the [▲] or [▼] key on the set value input section to set the stitch length to the desired value (in increments of 0.1 mm). The value of p (stitch length) indicated on the display will change.
The stitch length can be specified from 0.2 to 10.0 mm for the AMS-210B/-220B/-224B or from 0.2 to 6.2 mm for the AMS-205B/-206B in increments of 0.2 mm. In the above example, the stitch length is set to 2.0 mm.

(Note) 3. Indication when a pattern is input

* The indication when a pattern is input for other types of stitching is the same as that for linear sewing.

The following indication is shown when a pattern is input.



* Length of one pulse AMS-210B/-220B/-224B : 0.16 mm
AMS-205B/-206B : 0.20 mm

(Note) 4. How to specify the sewing speed
The value set for the stitch length automatically determines the sewing speed. However, the sewing speed can be further controlled using the following function (temporary change of speed).

(Note) 1. Steps 3) and 4) can be repeated (as many as 128 points can be entered). You are allowed to skip pressing the key to terminate the input.

(Note) 2. The jump input function is valid not only from the origin, but also from any desired point on the pattern.

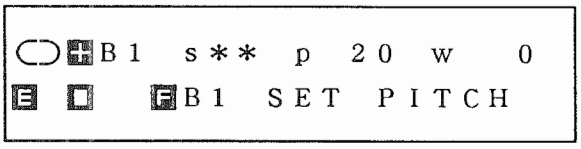
< Linear sewing > Linear sewing : (B1)

A straight line from the position of the needle is entered in accordance with the specified stitch length by inputting a single point.

1) Press the keys on the function selector section so that " " LED lights up.

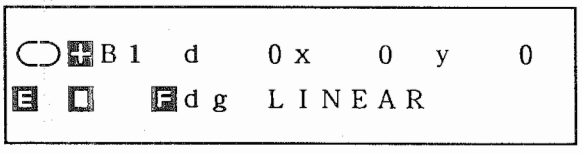
(Set the function to "Linear sewing".)

2) Press the key on the function selector section. The following indication will then appear on the display.



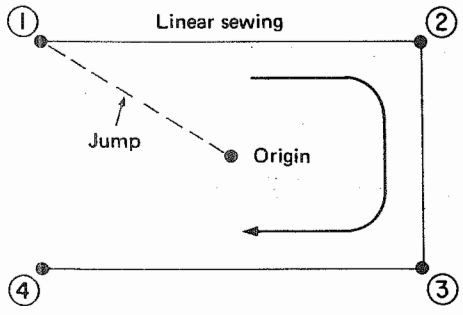
3) Press the or key on the set value input section so that the stitch length is set to the desired value (in increments of 0.1 mm). The value of "p" (stitch length) indicated on the display will change.

4) Press the key on the parameter changing section. The following indication will be shown on the display.



5) Press the keys on the JOG input section until the needle is brought to position ②.

The values of "x" and "y" on the display will change.



6) Press the key on the JOG input section. Pressing this key will change the value of "d".

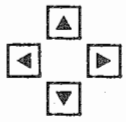
7) Repeat steps 5) and 6) to enter the points as far as point ④. (You may skip pressing the key after inputting point ④.)

IV. PATTERN INPUT

1. Normal sewing

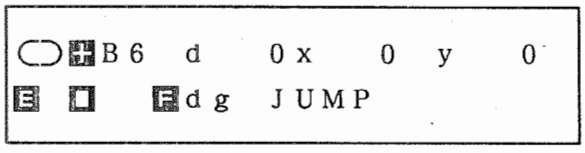
<Jump> Jump : (B6)

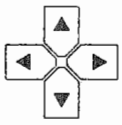
Use this function to move the feeding frame to a specified position without actuating the sewing machine.

1) Press the  keys on the function selector section so that the " " LED lights up.

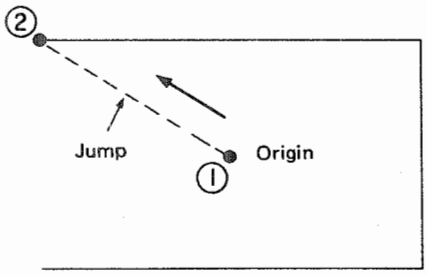
(Set the function to "Jump".)

2) Press the key on the function selector section.
The following indication will then appear on the display.



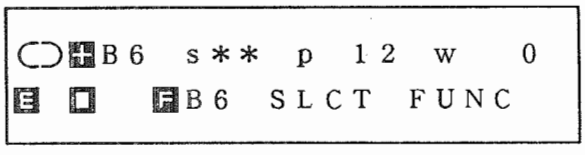
3) Press the  keys on the JOG input section until the needle is carried to position 2 .

The values of "x" and "y" on the display will change.



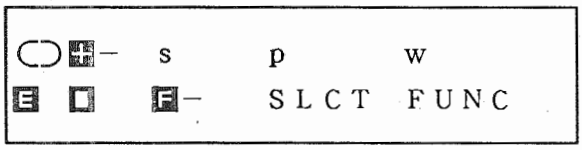
4) Press the key on the JOG input section. Pressing this key will change the value of "d". The value of "d" represents the number of input points.

5) Press the or key on the JOG input section (to terminate the "Jump" function).
The following indication will be shown on the display.



5. Operation outline

1. First, select the function.

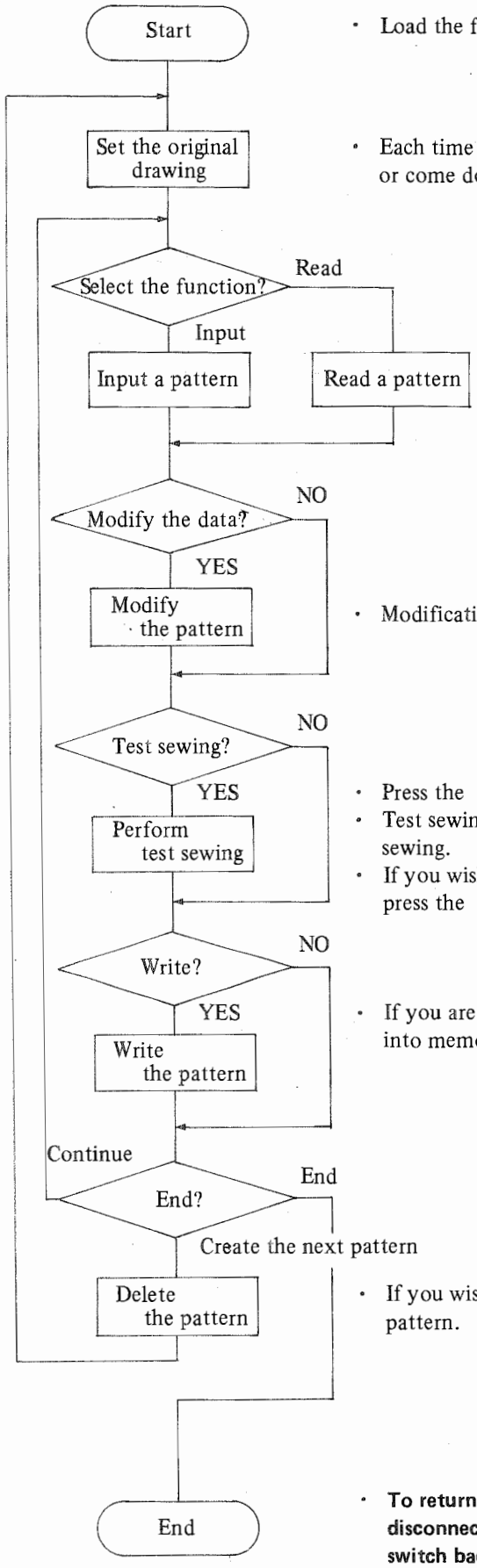


As long as the above indication is shown on the display, the LED indication on the function panel will change when the ▲ ◀ ▶ ▼ keys are pressed. In this way, change the LED indication using these keys until the LED of the desired function lights up. The desired function can now be selected by pressing the key.
The operation procedure following the above differs depending on the function. Refer to the explanation on each function for details.

2. Next, the values (stitch length etc.) to be set for each function are specified. Pressing the ▲ or ▼ key on the set value input section will change the set value indicated. If either key is held down for a few moments, the "fast forward" function will be actuated. Once the desired value is indicated, the value is specified by pressing the key.

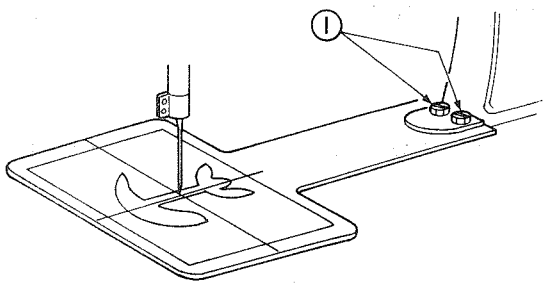
3. For the pattern input function, input a pattern after step 2 above. Pressing the ▲ ◀ ▶ ▼ keys on the JOG input section will change the needle position. If any of these keys are pressed for a few moments, the needle will travel a short distance. If they are pressed for a longer period of time, the needle will travel further. If any two keys of the four keys above are pressed .uj0 simultaneously, such as the ▲ ◀ , ◀ ▼ , ▲ ▶ , ▶ ▼ keys, the needle will travel diagonally. Move the needle until it reaches the desired position, and press the key. Doing this will input the point. Continue inputting the points until all the points of the pattern have been input. Then press the or key to terminate the pattern input.

4. Operation flow chart



- Load the floppy disk only after the power switch has been turned ON.
- Each time you press the feeding frame switch, the feeding frame will go up or come down.
- If you create a pattern that needs to be inverted, set the switches concerned to allow pattern inversion before you start inputting the pattern data.
- Select the function codes. Then execute the input functions as desired.
- All data stored in memory can be read.
- Modifications can be made including "Delete a point", "Move a point" etc.
- Press the [T] key of the function selector.
- Test sewing is performed following the same procedure as for normal sewing.
- If you wish to modify the data after checking the results of test sewing, press the [T] key to return the machine to the main unit input mode.
- If you are satisfied with the results of test sewing, write the pattern data into memory.
- If you wish to create another pattern, be sure to first delete the current pattern.
- **To return the machine to normal sewing, turn OFF the power switch, disconnect the PGM-5 from the sewing machine, and turn the power switch back ON again.**

4) Press the feeding frame switch to raise the feeding frame, and position the origin reference lower plate.



Turn the pulley until the hole in the origin reference lower plate is aligned with the tip of the needle. Then fix the lower plate in place using setscrews (1). Now press the feeding frame switch again to lower the feeding frame. Then turn the pulley until the tip of the needle is in a position similar to that in the drawing of the stitching direction. Now input the data.

(Caution) 1. Before inputting the data, format the floppy disk, referring to the Instruction Manual for the sewing machine.

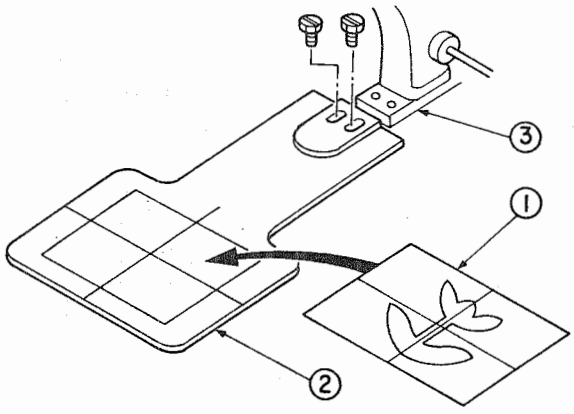
(Caution) 2. In the case of an EEP-ROM which has never been used with this device before, be sure to delete the whole of the ROM in advance.

3. Preparations prior to data input

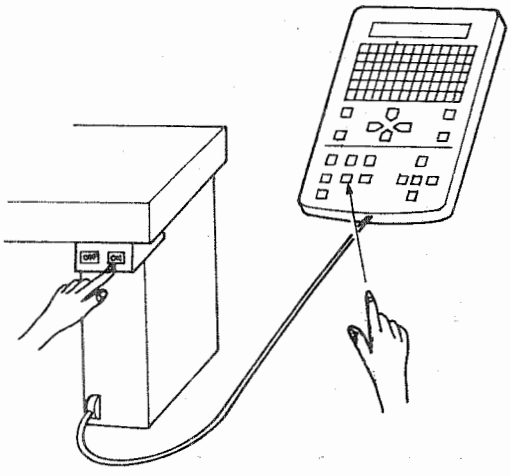
1) Make a full-scale drawing of the stitching direction on a sheet of graph paper.

(Caution) Make the drawing after referring to the Instruction Manual for the sewing machine, while making sure that the drawing remains within the specified sewing area, maximum stitch length etc.

2) Use a piece of adhesive tape to stick drawing (①) of the stitching direction on origin reference lower plate (②: optional), using the marker line as reference. Then attach the lower plate to feed plate (③), and temporarily fix it in place.



3) By pressing the [key] key, turn ON the power switch.



The PGM-5 will be initialized, the feeding frame will automatically come down, and the needle will move from the current position to the origin (center of the feeding frame).

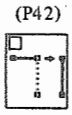
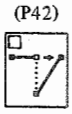
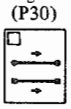
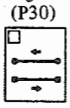
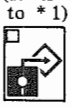
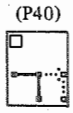
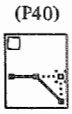
(Caution) Since the feeding frame comes down automatically, do not place your fingers near it.

The indicator will now display the following:

```
PGM-5  ON  LINE
    01-01-01
```

showing that the input functions of the PGM-5 are being executed. Once this indication is displayed, stop pressing the [key] key.

[List of functions]

	A	B	C	D	E	F	G	H	I	J
7	Pattern deletion (P51)						ROM pattern deletion (P65)			
6	Temporary change in the sewing speed (P18)	Jump (P15)					ROM pattern copy (P67)	Pattern copy (P69)	Linear apex movement (relative) (P47)	Linear apex movement (absolute) (P47)
5	Changing the point speed (P50)	Point sewing (P23)					ROM pattern list (P63)	Pattern movement (P71)	Linear apex deletion (relative) (P45)	Linear apex deletion (absolute) (P45)
4		Circle sewing (P22)	Circle zigzag stitching (P24)	Circle offset sewing (P27)	Circle double-stitch, normal-feed sewing (P30)	Circle double-stitch, reverse-feed sewing	Scale (Refer to * 3)	Point symmetry (P32)	Clamp inversion setting (P72)	Clamp inversion (P73)
3	Temporary stop (P36)	Arc sewing (P21)	Arc zigzag stitching (P24)	Arc offset sewing (P27)	Arc double-stitch, normal-feed sewing (P30)	Arc double-stitch, reverse-feed sewing (P30)	Reference point for enlargement/ reduction (P37)	Y symmetry (P32)	Element deletion (P49)	Point addition (P44)
2	Second origin (P35)	Spline sewing (P20)	Spline zigzag stitching (P24)	Spline offset sewing (P24)	Spline double-stitch, normal-feed sewing (P30)	Spline double-stitch, reverse-feed sewing (P30)	Pattern writing (Refer to * 2)	X symmetry (P32)	Point movement (relative) (P42) 	Point movement (absolute) (P42) 
1	Thread trimming (P35)	Linear sewing (P16)	Linear zigzag stitching (P24)	Linear offset sewing (P27)	Linear double-stitch, normal-feed sewing (P30) 	Linear double-stitch, reverse-feed sewing (P30) 	Pattern reading (Refer to * 1) 	Referring to the set value (P74)	Point deletion (relative) (P40) 	Point deletion (absolute) (P40) 

* The numbers in parentheses indicate the page numbers where the functions are explained in detail.

*1. Refer to page 52 for details on the AMS-210B/-220B/-224B and page 59 for details on the AMS-205B/-206B.

*2. Refer to page 57 for details on the AMS-210B/-220B/-224B and page 61 for details on the AMS-205B/-206B.

*3. Refer to page 54 for details on the AMS-210B/-220B/-224B and page 60 for details on the AMS-205B/-206B.

< Temporary change of speed > Temporary change of speed : (A6)

1) Press the keys on the function selector section so that the " " LED lights up.

(Set the function to "Temporary change of speed".)

2) Press the key on the function selector section. The following indication will then appear on the display.

```
B6  MAX.  SPD  =**
   B6  SPD  LIMIT
```

3) Press the or key on the set value input section to set the sewing speed to the desired value. The following indication will be shown on the display.

```
B6  MAX.  SPD  =1600
   B6  SPD  LIMIT
```

* In the above example, the sewing speed is set to 1600 s.p.m.

4) Press the key on the set value input section (to terminate the settings of the values required for "Temporary change of speed"). The following indication will be shown on the display.

```
B6  s16  p  20  w  0
   B6  SLCT  FUNC
```

(Note) After the desired speed has been entered, the speed can be controlled for every single stitch using the point speed changing function.

(Caution) 1. The speed specified using the temporary change of speed function is valid only when inputting the pattern data immediately after it has been specified.

(Caution) 2. The relationship between the indicated speed and the actual speed is listed on the following page.

Speed (Unit : s.p.m.)	Value indicated in step 2) on the previous page	Value indicated in step 4) on the previous page
200	MAX. SPM = 200	s 0 2
600	MAX. SPM = 600	s 0 6
700	MAX. SPM = 700	s 0 7
800	MAX. SPM = 800	s 0 8
900	MAX. SPM = 900	s 0 9
1000	MAX. SPM = 1000	s 1 0
1100	MAX. SPM = 1100	s 11
1200	MAX. SPM = 1200	s 1 2
1300	MAX. SPM = 1300	s 1 3
1400	MAX. SPM = 1400	s 1 4
1500	MAX. SPM = 1500	s 1 5
1600	MAX. SPM = 1600	s 1 6
1700	MAX. SPM = 1700	s 1 7
1800	MAX. SPM = 1800	s 1 8
1900	MAX. SPM = 1900	s 1 9
2000	MAX. SPM = 2000	s 2 0
**	Value automatically determined by the stitch length.	s * *

< Spline sewing >

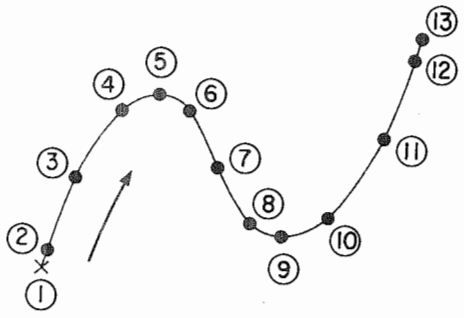
Spline : (B2)

Use the spline sewing function to enter a gently curving line.

1) Press the keys on the function selector section so that the " " LED lights up.

(Set the function to "Spline sewing".)

2) Press the key on the function selector section.



3) Press the or key on the set value input section so that the stitch length is set to the desired value.

4) Press the key on the set value input section.

5) Press the keys on the JOG input section until the needle is brought to position ②

6) Press the key on the JOG input section.

7) Repeat steps 5) and 6) to enter the points as far as point ⑬. (You may skip pressing the key after inputting point ⑬.)

8) Press the or key on the JOG input section (to terminate the setting of the values required for "Spline sewing").

(Note) 1. As many as 128 points can be continuously entered.

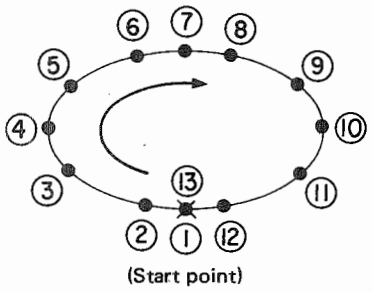
(Note) 2. To enter spline sewing with a simple shape, select the input points following the procedure described below.

(1) Select the apexes of the curve to be created as the input points (⑤ and ⑨).
(2) Select the points before and after the points selected in step (1) as the following input points (④, ⑥, ⑧ and ⑩).
(3) Then select the points positioned in the middle of the gentle curves as the input points (③, ⑦ and ⑪).
(4) Select the points near both ends of the curve and the end point to be entered as the input point (②, ⑫ and ⑬).

Enter the points following the procedure described above in the same order of steps. Pay special attention to the following items.

- Increase the number of input points for sharp curves and decrease the number for gentle curves.
- You should select at least three input points for one curve.

(Note) 3. The spline sewing function is used to enter oval shapes.



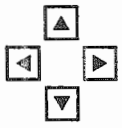
1) The joining points of the curved lines should be specified for gentle curves.

2) Select the input points so that they are positioned symmetrically.

(Note) 4. The stitch length and sewing speed are specified according to the same procedure as that for linear sewing. The indication when inputting a pattern using the spline sewing function is also the same as that when using the linear sewing function.

< Arc sewing > Arc sewing : (B3)

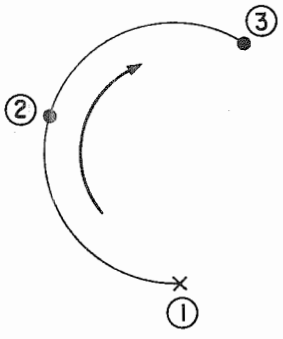
By inputting two points, use this function to enter an arc starting from the needle position and in accordance with the specified stitch length. The sewing will proceed in the direction of the points specified in the order of input. Both clockwise and counterclockwise seams can be entered.

1) Press the  keys on the function selector section so that the " " LED lights up.

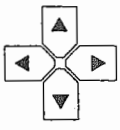
(Set the function to "Arc sewing".)

2) Press the key on the function selector section.

3) Press the or key on the set value input section to set the stitch length to the desired value.



4) Press the key on the set value input section.

5) Press the  keys on the JOG input section until the needle is brought to position ② .

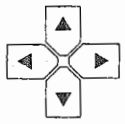
6) Press the key on the JOG input section.

7) Repeat steps 5) and 6) to enter the points as far as point ③. (You may skip pressing the key after inputting point).

8) Press the or key on the JOG input section (to terminate the setting of the values required for "Arc sewing").

(Note) The stitch length and sewing speed are specified according to the same procedure as that for linear sewing. The indication when inputting a pattern using the arc sewing function is also the same as that when using the linear sewing function.

(Caution) You must input two or more, but no more than three, points for arc sewing.
The [ ] and [ ] keys, are invalid unless you have finished inputting the two points. The and [ ] keys become invalid once you have finished inputting the two points.



< Circle sewing >

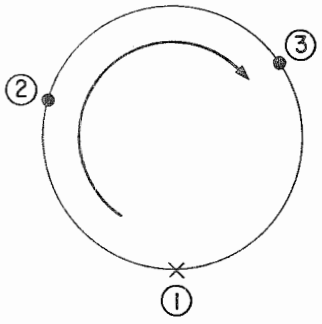
Circle sewing: [ ] (B4)

By inputting two points, use this function to enter a circle starting from the needle position and in accordance with the specified stitch length. The sewing will proceed in the direction of the points specified in the order of input. Both clockwise and counterclockwise seams can be entered.

1) Press the [ ] and [ ] keys on the function selector section so that the "Circle sewing" LED lights up.
(Set the function to "Circle sewing".)

2) Press the [ ] key on the function selector section.

3) Press the [ ] key or [ ] key on the set value input section to set the stitch length to the desired value.



4) Press the [ ] key on the set value input section.

5) Press the [ ] keys on the JOG input section until the needle is brought to position ② .

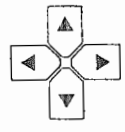
6) Press the [ ] key on the JOG input section.

7) Repeat steps 5) and 6) to enter the points as far as point ③. (You may skip pressing the [ ] key after inputting point ③ .)

8) Press the [ ] or [ ] key on the JOG input section (to terminate the setting of the values required for "Circle sewing").

(Note) The stitch length and sewing speed are specified according to the same procedure as that for linear sewing. The indication when inputting a pattern using the circle sewing function is also the same as that when using the linear sewing function.

(Caution) You must two or more, but no more than three, points for circle sewing.
The [ ] and [ ] keys are invalid unless you have finished inputting the two points. The and [ ] keys become invalid once you have finished inputting the two points.

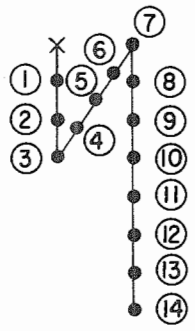


< Point sewing > Point sewing : (B5)

Use this function to directly enter the needle entry points for every single stitch.

1) Press the keys on the function selector section so that the "Point sewing" LED lights up.
(Set the function to "Point sewing".)

2) Press the key on the function selector section.



3) Press the keys on the JOG input section until the needle is brought to position ②.

4) Press the key on the JOG input section.

5) Repeat steps 3) and 4) to enter the points as far as point ⑭. (You may skip pressing the key after inputting point ⑭.)

6) Press the or key on the JOG input section (to terminate the setting of the values required for "Point sewing").

(Note) 1. As many as 128 points can be continuously entered. If you wish to enter more than 128 points, temporarily terminate the input procedure and start again from the function setting.

(Note) 2. The stitch length and sewing speed are specified according to the same procedure as that for linear sewing. The indication when inputting a pattern using the point sewing function is also the same as that when using the linear sewing function.

2. Zigzag stitching

Linear zigzag stitching : (C1)

Spline zigzag stitching : (C2)

Arc zigzag stitching : (C3)

Circle zigzag stitching : (C4)

Use this function to create the zigzag needle entry points to the left and right, while observing from the input reference line. This function is very convenient when inputting the data for zigzag stitching on emblems etc.

1) Press the keys on the function selector section so that the "Zigzag stitching" LED lights up.

(Set the function to "Zigzag sewing".)

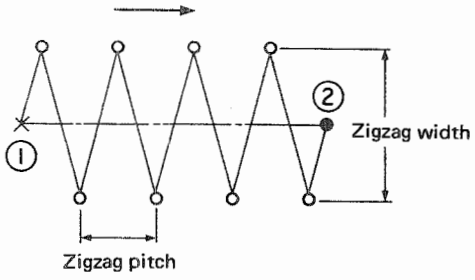
2) Press the key on the function selector section.

3) Press the or key on the set value input section to set the stitch length to the desired value (in increments of 0.1 mm).

4) Press the key on the set value input section.

5) Press the or key on the set value input section to set the stitch width to the desired value (in increments of 0.1 mm).

6) Press the key on the set value input section.



7) Press the keys until the needle is brought to position ②.

8) Press the key on the JOG input section.

9) Press the or key on the set value input section.

(Note) 1. Repeat steps 7) and 8) to continuously enter as many as 128 points. You may skip pressing the [→] key after inputting the last point.

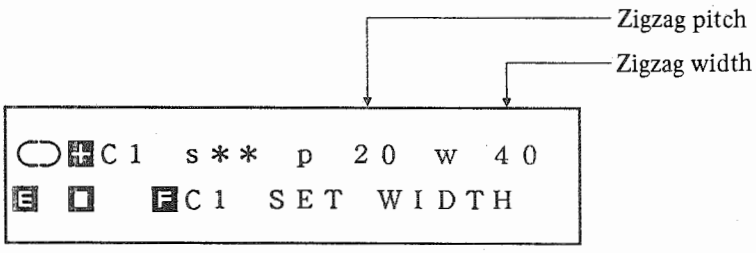
(Note) 2. How to specify the zigzag pitch and width.

(1) Press the [▲] or [▼] key on the set value input section to set the zigzag pitch and width to the desired values (in increments of 0.1 mm).

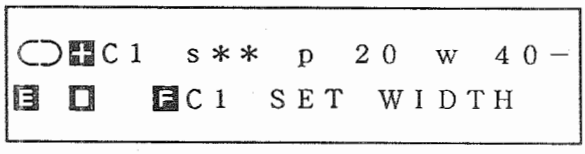
(2) Once the zigzag pitch and width are set to the desired values, press the [SET] key on the set value input section.

* In example 1, the zigzag pitch is set to 2.0 mm, while the zigzag width is set to 4.0 mm.
* The zigzag pitch can be specified from 0.2 to 10.0 mm for the AMS-210B/-220B/-224B, or from 0.2 to 6.2 mm for the AMS-205B/-206B.
* If no minus (–) sign is attached to the last figure, the zigzag stitching will start from the left-hand side of the input reference line (in the direction of sewing). If a minus (–) sign is attached to the last figure, the zigzag stitching will start from the right-hand side of the input reference line (in the direction of sewing).
* The zigzag width can be specified from –10.0 to 10.0 mm for the AMS-210B/-220B/-224B, or from –6.20 mm to 6.20 mm for the AMS-205B/-206B, in increments of 0.1 mm.

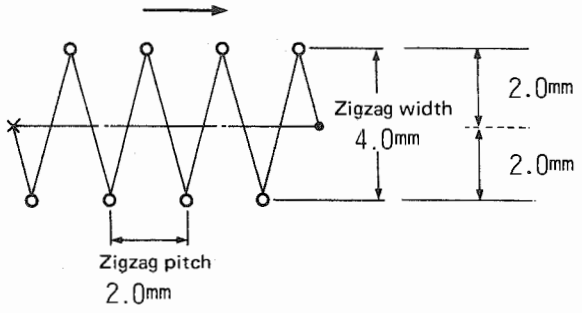
Example 1. When the zigzag stitching starts from the left-hand side of the input reference line, with the zigzag pitch set to 2.0 mm and the zigzag width set to 4.0 mm.



Example 2. When the zigzag stitching starts from the right-hand side of the input reference line, with the zigzag pitch set to 2.0 mm and the zigzag width set to 4.0 mm.

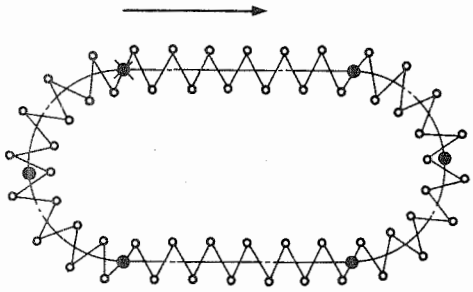


The indication above is shown on the display, and the patterns illustrated below will be created.

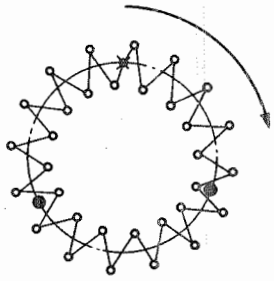


(Note) 3. Example of zigzag stitching input (drawing of the direction of the stitches)

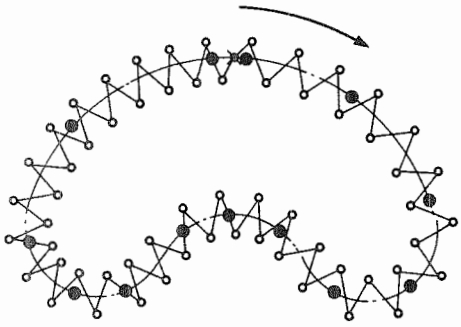
(1) Linear and arc



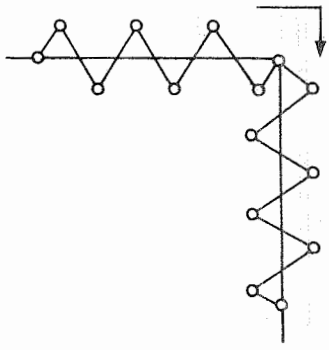
(2) Circle



(3) Spline



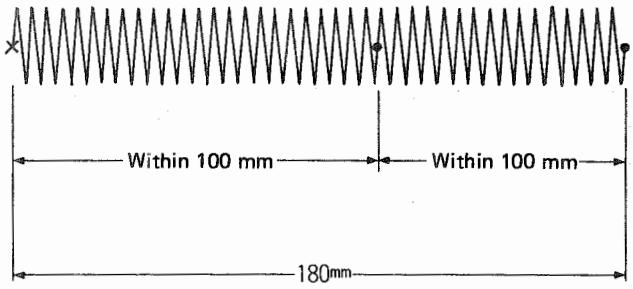
(4) Linear and linear



(Caution) 1. If you have specified a large value close to the limit for the zigzag pitch or width, the distance between the needle entry points may exceed the maximum stitch length permitted with respect to the combination of the zigzag pitch and width. In this case, Error 6 may occur when you perform test sewing or when you try to write the data onto the floppy disk.

(Caution) 2. If you have specified a small value for the zigzag pitch, the number of needle entry points may exceed the maximum number of needle entry points permitted for a pattern. In this case, Error 6 (Detailed Code 2) may occur. If this error occurs, re-input the data after appropriately dividing up the linear zigzag stitching so that the number of needle entry points does not exceed the limit.

Example) For linear zigzag stitching with the zigzag pitch set to 0.2 mm, you can enter the data continuously to sew a seam as long as approximately 100 mm, by pressing the [◈] key once.



3. Offset sewing

Linear offset sewing : (D1)　　Spline offset sewing : (D2)

Arc offset sewing : (D3)　　Circle offset sewing : (D4)

Use this function to create needle entry points with a predetermined distance between the input reference line toward the left and right. This is very convenient when attaching small parts by first inputting the data according to their peripheral measurements.

1) Press the ▲ ◀ ▶ ▼ keys on the function selector section so that the "" LED lights up.

(Set the function to "Offset sewing".)

2) Press the key on the function selector section. The following indication will be shown on the display.

```
D1  s**  p  20
   D1  SET  PITCH
```

3) Press the ▲ or ▼ key on the set value input section to set the stitch length to the desired value (in increments of 0.2 mm). The value of "p" on the indication will change accordingly.
   *1) The stitch length can be specified from 0.2 to 10.0 mm for the AMS-210B/-220B/-224B, or from 0.2 to 6.2 mm for the AMS-205B/-206B, in increments of 0.2 mm.

4) Press the key on the set value input section. The following indication will appear on the display.

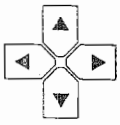
```
D1  s**  p  20  w  10
   D1  SET  WIDTH
```

   *2) The value of "p" in the above indication means that the stitch length is set to "20".

5) Press the ▲ or ▼ key on the set value input section to set the stitch width to the desired value (in increments of 0.1 mm). The value of "w" (width) in the indication will change accordingly.
   *3) The stitch width can be specified from –99.9 mm to 99.9 mm in increments of 0.1 mm.
   If no minus (–) sign is attached to the last figure, the seam will be created on the left-hand side of the input reference line (in the direction of sewing). If a minus (–) sign is attached to the last figure, the seam will be created on the right-hand side of the input reference line (in the direction of sewing).
   In Example 1. given on the next page, a minus (–) sign is attached to the last figure, but no minus (–) sign is attached to the last figure in Example 2.

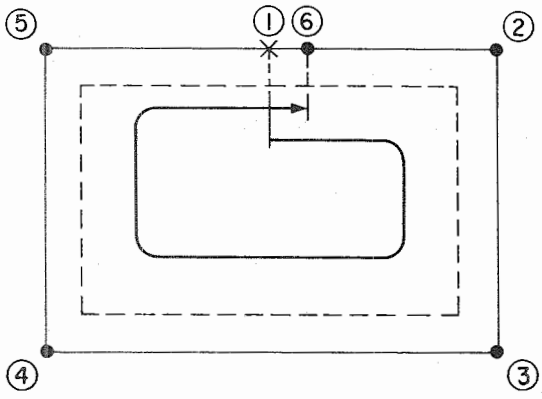
6) Press the key on the set value input section. The following indication will be shown on the display.

```
D1  d    0 x    0  y    0
   dg  LINEAR  (⎓)
```

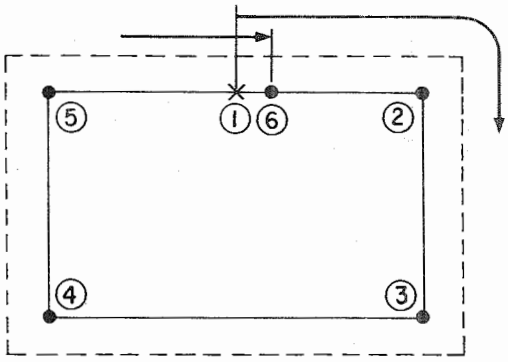
7) Press the  keys on the JOG input section until the needle is brought to position (2).

The values of "x" and "y" in the indication will change accordingly.

Example 1.



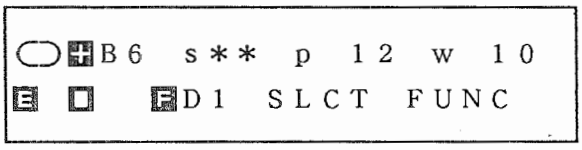
Example 2.



8) Press the key on the JOG input section.
When this key is pressed, the value of "d" in the indication will change.

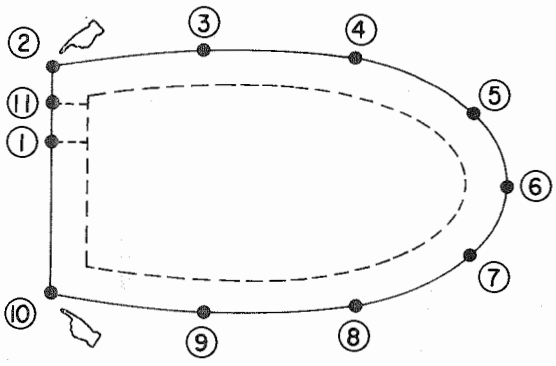
9) Repeat steps 7) and 8) until point (6) is reached. (You may skip pressing the key after point (6) has been entered.)

10) Press the or key on the set value input section (to terminate the setting of the values required for linear offset sewing).



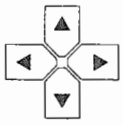
*4) The value of "w" in the above indication means that the stitch width is set to "10".

(Note) The shape illustrated below can be easily entered using the spline offset sewing input function.



(1) Select spline offset (D2) at point ①. Then specify the values for the stitch length and width.

(2) Input point ② .

(3) Press any of the  keys once to move the needle by the length of one pulse.

(4) Press the key on the JOG input section.

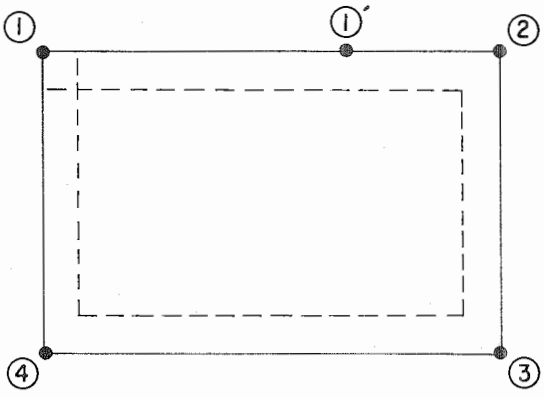
(5) Enter points ③ through ⑩ .

(6) Move the needle by the length of one pulse as in step 3).

(7) Press the key on the JOG input section.

(8) Input point ⑪ .

(Caution) 1. If you start inputting the data for the shape illustrated in the figure from point ①, continue inputting points ②, ③, ④ and ① in the order stated, and the pattern shown by the broken line will be created. To create a correctly proportioned polygon, start inputting the points not from a corner such as point ①, but from a point in the middle of a side such as point ①'.



(Caution) 2. The input points should be selected so that the shape is drawn in one stroke.

(Caution) 3. In the case of cycle offset or arc offset sewing, if the stitch width is set to a value larger than the radius of the circle or arc you wish to create, the created circle or arc will be different from the pattern you are expecting.

4. Double-stitch sewing

Linear double-stitch sewing	:	(E1)	Spline double-stitch sewing	:	(E2)
Arc double-stitch sewing	:	(E3)	Circle double-stitch sewing	:	(E4)
Linear double-stitch reverse sewing	:	(F1)	Spline double-stitch reverse sewing	:	(F2)
Arc double-stitch reverse sewing	:	(F3)	Circle double-stitch reverse sewing	:	(F4)

Use this function to create needle entry points not only on the input reference line, but also on a line width a predetermined distance to the input reference line.

1) Press the ▲ ◀ ▶ ▼ keys on the function selector section so that the "Double-stitch sewing" LED lights up.

(Set the function to "Double-stitch sewing".)

2) Press the key on the function selector section. The following indication will appear on the display.

```
E1  s**  p  20
E   F1  SET PITCH
```

3) Press the ▲ or ▼ key on the set value input section to set the stitch length to the desired value.

4) Press the key on the set value input section. The following indication will appear on the display.

```
E1  s**  p  20  w  100
E   F1  SET WIDTH
```

5) Press the ▲ or ▼ key on the set value input section to set the stitch width to the desired value.

6) Press the key on the set value input section. The following indication will appear on the display.

```
E1  d   0x   0  y   0
E   Fdg LINEAR (=-=)
```

7) Press the ▲ ◀ ▶ ▼ keys until the needle is brought to the desired position.

8) Press the key on the JOG input section.

9) To terminate the input width the JOG keys, press the or key on the JOG input section.

(Note) 1. Repeat steps 7) and 8) to continuously enter as many as 128 points. You may skip pressing the key after inputting the last point.

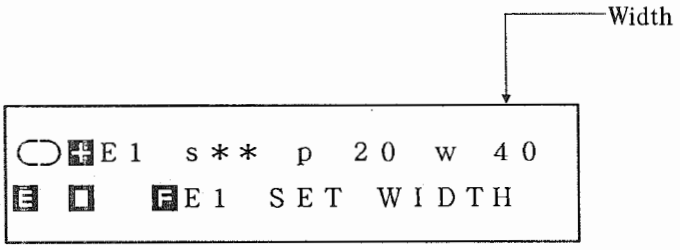
(Note) 2. How to specify the stitch width

(1) Press the or key on the set value input section to set the stitch width to the desired value (in increments of 0.1 mm). The value of "w" in the indication will change accordingly.

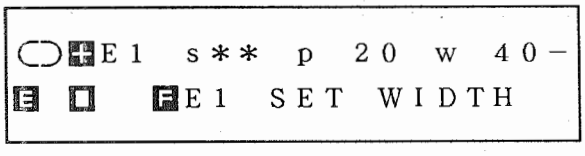
(2) Once the stitch width has been set to the desired value, press the key on the set value input section.

* In example 1, the stitch width is set to 4.0 mm.
* If no minus (–) sign is attached to the last figure, the double-stitch sewing will start from the left-hand side of the input reference line (in the direction of sewing).
  If a minus (–) sign is attached to the last figure, the double-stitch sewing will start from the right-hand side of the input reference line (in the direction of sewing).
* The stitch width can be specified from –99.9 mm to 99.9 mm in increments of 0.1 mm.

Example 1. When the double-stitch sewing starts from the left-hand side of the input reference line, with the stitch width set to 4.0 mm.

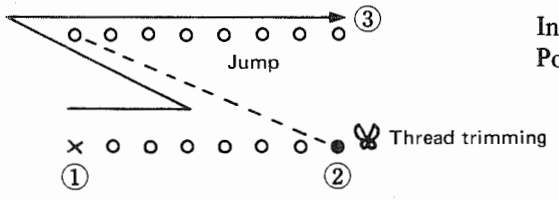


Example 2. When the double-stitch sewing starts from the right-hand side of the input reference line, with the stitch width set to 4.0 mm.



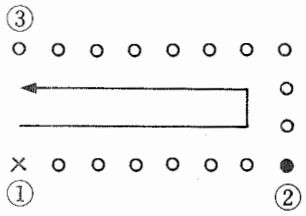
(Note) 3. Difference between normal feed sewing and reverse feed sewing.

Example 3. Seam for normal feed sewing



Input points (1) and (2) in the order started.
Point (3) is the end of input points.

Example 4. Seam for reverse feed sewing



Input points ① and ② in the order started.
Point ③ is the end of input points.

(Caution) In the case of circle double-stitch sewing or arc double-stitch sewing, if the stitch width is set to a value larger than the radius of the circle or arc you wish to create, the created circle or arc will be different from the pattern you are expecting.

5. Symmetry

x symmetry : (H2) y symmetry : (H3) Point symmetry : (H4)

Use this function to make a x-symmetrical, y-symmetrical or point symmetrical pattern to the pattern created.

1) Press the keys on the function selector section so that the " " LED lights up.
(Set the function to "Symmetry".)

2) Press the key on the function selector section. The following indication will appear given on the display.

```
B 1  s * *  p  2 0  w  0
B 1 B 1  X - S Y M M E T R Y
```

* The indication shown above is an example of how-to create a symmetrical pattern using the data for linear sewing (B1).

3) If the operation has been completed normally, the indication shown above will change as follows :

```
B 1  s * *  p  2 0  w  0
B 1 B 1  S L C T  F U N C
```

(Note) 1. For the indication shown in step 2), the following indication will appear if a y-symmetrical or point symmetrical pattern is created.

Example 1) For y-symmetry

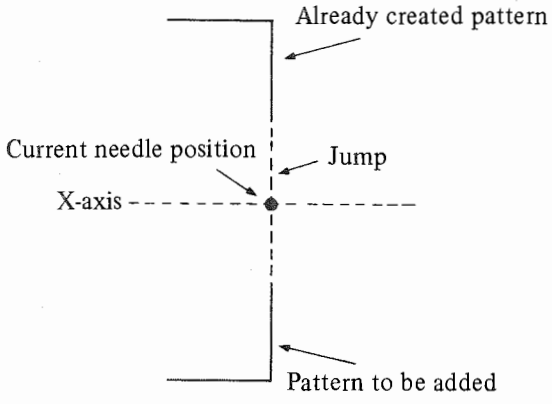
```
B 1  s * *  p  2 0  w  0
B 1 B 1  Y - S Y M M E T R Y
```

Example 2) For point symmetry

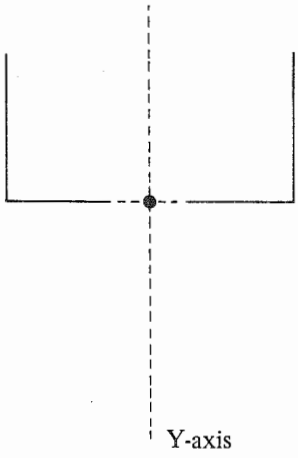
```
B 1  s * *  p  2 0  w  0
B 1 B 1  P − S Y M M E T R Y
```

(Note) 2. The of symmetry input function can be executed for the whole pattern taking the current needle position as reference. However, before you execute this function, specify the current needle position with regard to the reference point you wish to use.

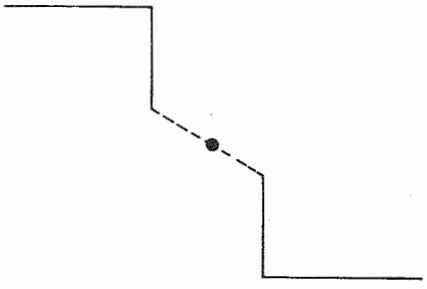
(1) X-symmetry
A pattern symmetrical to the created pattern on the x-axis which crosses the current needle position.



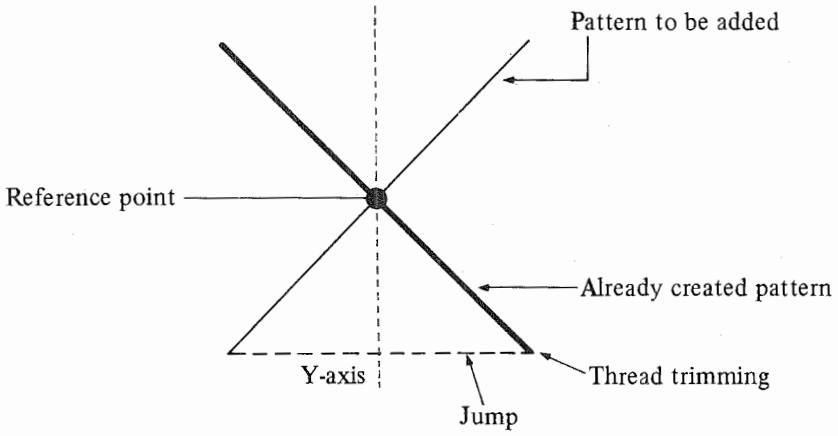
(2) Y-symmetry
A pattern symmetrical to the created pattern on the y-axis which crosses the current needle position.



(3) Point symmetry
A pattern symmetrical to the created pattern with regard to the current needle position.



(Note) 3. When this function is executed, the thread trimming data and jump data are automatically input according to the specified position of the reference point of symmetry.



6. Machine control commands

< Thread trimming >

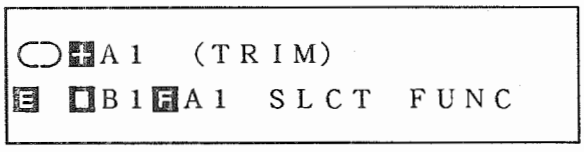
Thread trimming : (A1)

With this command, the thread is trimmed during the pattern data.

1) Press the keys on the function selector section so that the " " LED lights up.

(Set the function to "Thread trimming".)

2) Press the key on the function selector section. The following indication will appear given on the display.



* Example of the indication when the linear sewing (B1) function has been specified immediately before inputting the thread trimming data.

< Second origin >

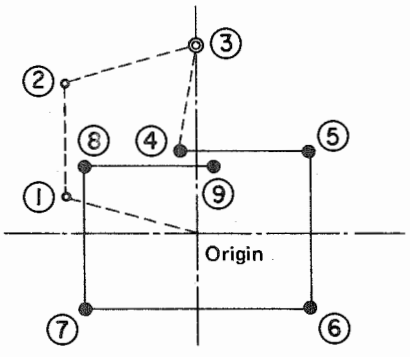
Second origin : (A2)

The second origin can be specified between the origin and the sewing start point, thereby allowing the workpiece to be easily set in place.

1) Press the keys on the function selector section so that the " " LED lights up.

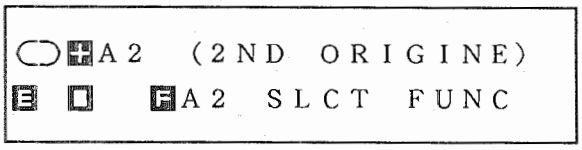
(Set the function to "Second origin".)

2) Press the key on the function selector section.



If the second origin is set at point ③ in the section entered using the jump function as in the figure illustrated, the sewing machine will perform a series of operations after the origin retrieval starting jumping from point ①, then to points ② and ③. The machine will then stop at point ③. After that, the machine will perform a cycle sewing operation from point ③ through point ⑨ .

(Note) Before using this function, set the current needle position at a certain point on the pattern created using the jump input function. The following indication will appear on the display.



(Caution) When enlarging/reducing a pattern, the path from the first origin to the second origin will be excluded.

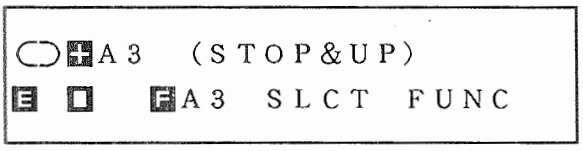
< Temporary stop > Temporary stop : (A3)

This function is used to temporarily stop the sewing machine with its needle up during sewing. Press the Start switch to re-start the sewing machine brought to a stop using the temporary stop function.

1) Press the keys on the function selector section so that the " " LED lights up.

(Set the function to "Temporary stop".)

2) Press the key on the function selector section. The following indication will appear on the display.

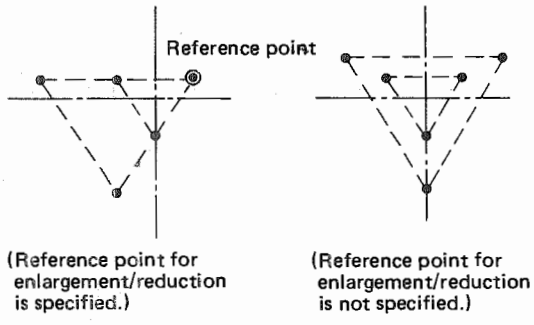


(Note) If you wish to temporarily stop the sewing machine after thread trimming, specify the thread trimming function, followed by the temporary stop function.

< Reference point for enlargement/reduction >

Reference point for enlargement/reduction : (G3)

This function is used to input the reference point for enlargement/reduction at any desired point in the created pattern data. If the reference point for enlargement/reduction is not specified, the pattern will be enlarged/reduced using the origin as reference.



(Reference point for enlargement/reduction is specified.)

(Reference point for enlargement/reduction is not specified.)

1) Press the ◀ ▶ ▲ ▼ keys on the function selector section so that the " " LED lights up. (Set the function to "Reference point for enlargement /reduction".)

2) Press the key on the function selector section.

(Note) 1. If you have specified two or more reference points for enlargement/reduction, only the last input point will be valid.

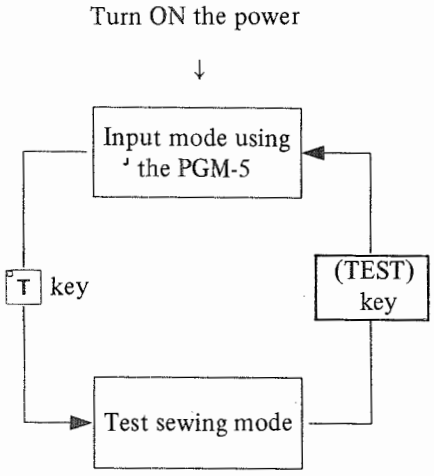
(Note) 2. Before executing this function, set the current needle position to a predetermined reference point.

(Caution) 1. This function only works with the AMS-210B/-220B/-224B. This function is not available with the AMS-205B/-206B.

(Caution) 2. When a pattern is read while enlarged/reduced, the pattern will be enlarged/reduced using the specified reference point for enlargement/reduction. When a pattern is enlarged/reduced during sewing, it will also be enlarged/reduced using the specified reference point for enlargement/reduction.

V. TEST SEWING

Is the AMS is in the input mode when using the PGM-5, the machine will be switched alternately between the input mode and the sewing mode in the following way.



Input mode using the PGM-5

- In this mode, the pattern data can be entered or modified using the keys of the PGM-5.
- In this mode, the created pattern data are read from or written onto the floppy disk.

Test sewing mode

- In this mode, the entered or modified pattern can be test sewn using the PGM-5.
- The operation procedure of the sewing machine in the test sewing mode is the same as that in the normal sewing mode of the AMS.

(Caution) 1. When using the device with the AMS-205B/-206B, press the "Set Ready" switch on the main unit of the sewing machine for test sewing instead of the [TEST] key.

(Caution) 2. Refer to the Instruction Manual for the main unit input functions for details on the [TEST] key. Refer to the Instruction Manual for the sewing machine for details on the "Set Ready" switch.

(Note) When using the AMS-210B/-220B/-224B, the operation mode can be switched from the input mode using the PGM-5 to the test sewing mode by pressing the [TEST] key on the main unit of the sewing machine.

< Switching from the input mode using the PGM-5 to the test sewing mode >

The created pattern data can be checked by immediately performing test sewing.

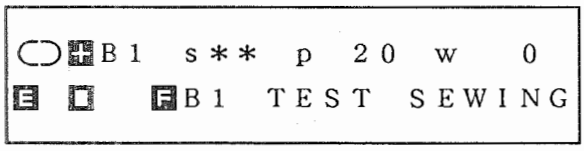
1) Press the [T] key on the PGM-5.

(Note) When using the AMS-210B/-220B/-224B, the operation mode can be switched from the input mode using the PGM-5 to the test sewing mode by pressing the [TEST] key on the main unit of the sewing machine instead of pressing the [T] key.

2) The feeding frame will retrieve the origin and travel to the sewing start point. The work clamp will then go up.

3) Test sewing can be performed during a normal sewing procedure. Be sure to check the shape of the created pattern by performing test sewing before you start actual sewing. (Refer to the relevant Instruction Manual for each model in the AMS Series for details on the operation procedure.)

4) The following indication will appear on the display of the PGM-5.



(Caution) In the test sewing mode, all keys on the PGM-5 will be inoperative.

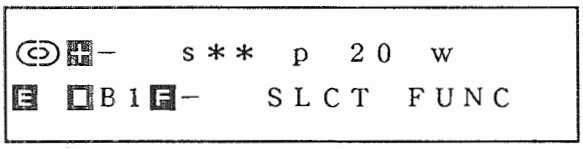
< Switching from the test sewing mode to the input mode using the PGM-5 >

After test sewing, you can return the machine to the input mode using the PGM-5.

1) Press the TEST key on the main unit of the sewing machine. When using the AMS-205B/-206B, press the "Set Ready" switch on the main unit of the sewing machine instead of the TEST key.

2) The feeding frame will return to its origin, and the work clamp will come down.

3) The following indication will appear on the display. This indication shows that the needle is still at its origin (before the created pattern data), and the machine is waiting for you to select the function to be used. If you wish to modify or add data to the pattern, press the key to move the needle from its origin.



(Caution) If the power to the sewing machine is turned OFF due to a sewing machine malfunction, the data created up to that moment will be erased. In this case, re-create the pattern after the cause of the malfunction has been eliminated.

VI. PATTERN MODIFICATION

To modify the created pattern, move the needle to the position of the data to be modified using the ◀ or ▶ key.

1. Modify a point

< Point deletion > Point deletion (relative) : (I1) Point deletion (absolute) : (J1)

The pattern data in the designated section can be cleared by each needle entry point using this function. Two different types of point deletion (point deletion (relative) and point deletion (absolute)) can be used, depending on whether the pattern data after the point to be erased is to move after the point has been deleted.
Point deletion is used to erase the pattern data created by means of the point sewing input function as well as the data created using other types of input function including the linear sewing input function.

1) Bring the needle to position (1) and press the ▲ ◀ ▶ ▼ keys on the function selector section so that the "Point deletion (absolute)" LED lights up. (Set the function to "Point deletion (absolute)".)

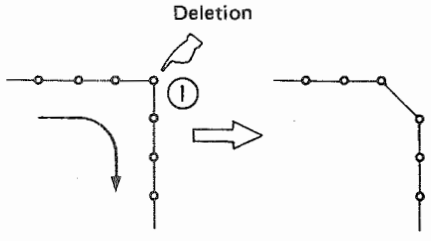
2) Press the ↵ key on the function selector section. The following indication will appear on the display.

```
B1  CNVT  PNT (Y/C) ?
    B1  DL  PNT·A=
```

Y : yes
C : cancel

The above indication means that the operation mode can be switched to the point sewing input function. If you wish to continue deleting, press the CL key on the set value input section. If you wish to stop deleting, press the ↵ key on the JOG input section. The following indication will then appear on the display.

```
B1  s**  p  20
    B1  DL  PNT·A=  1
```

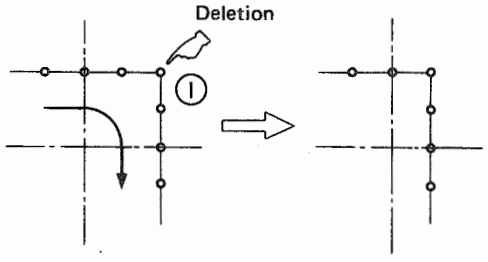


3) Move the needle to the section containing the point to be deleted by pressing the ◀ key on the function selector section. This designates the section containing the point to be erased. If the needle goes beyond the section concerned, press the ▶ key on the function selector section to return the needle to the section containing the point to be deleted.
The number of needle entry points to be deleted will be shown after the "=" of "DL PNT.A =" in the indication.

4) Press the ↵ key on the set value input section.

5) The point deletion function will then be executed.

The figure illustrated on the previous page is an example of point deletion (absolute). In this case, the pattern data after the deleted point will not move.
On the other hand, if you wish to erase the point shown in the figure using point deletion (relative), bring the needle to position (1) and press the ▲ ◀ ▶ ▼ keys on the function selector section so that the "Point deletion (relative)" LED lights up. (Set the function to "Point deletion (relative).) In this case, the pattern data after the deleted point will move, while maintaining the relationship of the whole pattern data before the point was deleted.



(Caution) 1. **Take care not to allow the point interval to exceed the largest stitch length (10.0 mm for the AMS-210B/-220B/-224B, or 6.2 mm for the AMS-205B/-206B) after the point has been deleted. If there are data exceeding the largest stitch length, error "6" will occur when test sewing is started, or when trying to write the data onto the floppy disk.**

(Caution) 2. **The created pattern data may exceed the sewing range after the point has been deleted. In this case, the feeding frame will stop in a position beyond the sewing range, even if you try to confirm the pattern data by pressing the or key on the function selector section. If this occurs, use the pattern modification function to correct the pattern data so that they stay within the sewing range.**

< Point movement > Point movement (relative) : (I2) Point movement (absolute) : (J2)

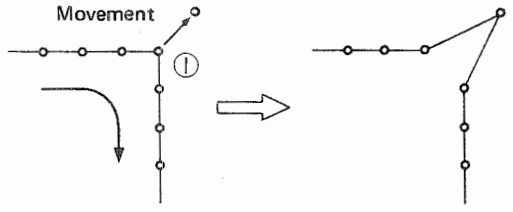
The designated needle entry point can be moved using this function. Two different types of point movement (point movement (relative) and point movement (absolute)) can be used, depending on whether the pattern data after the point to be moved is to move after the point has been moved.
Point movement is used to move the pattern data created by means of the point sewing input function as well as the data created using other types of input function including the linear sewing function. When this function is used for the pattern data created using the linear sewing input function etc., the operation mode will be switched to the point sewing input mode when the point movement function is executed.

1) Bring the needle to position ① and press the keys on the function selector section so that the " " LED lights up. (Set the function to "Point movement (absolute)".)

2) Press the key on the function selector section. The following indication will appear given on the display.

```
B1  CNVT  PNT (Y/C) ?
    B1  MOVE  PNT·A
```

The above indication means that the operation mode can be switched to the point sewing input mode. If you wish to continue moving, press the key on the set value input section. If you wish to stop moving, press the CL key on the JOG input section.



3) Move the needle to the section containing the point to be moved by pressing the keys on the JOG input section.

4) Press the key on the JOG input section (you may skip this step).

5) Press the key on the JOG input section.

[Indication of the point to be moved]

```
B1  1  40x  20  y  15
B1 B1  MOVE  PNT·A
```

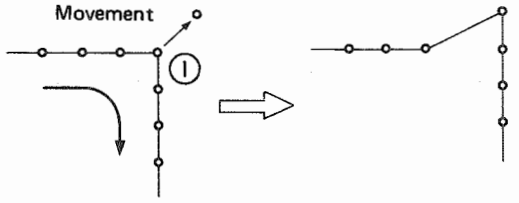
Distance from the designated point to be moved to the current position of the needle (set to 4.0 mm in the example given).

Number of pulses in direction x from the designated point to be moved to the current position of the needle (set to 20 pulses in the example given).

Number of pulses in direction y from the designated point to be moved to the current position of the needle (set to 15 pulses in the example given).

(Note) The value indicating the distance from the designated point to be moved to the current position of the needle will automatically change since the stitch length depends on the sewing machine being used. The indication shown on the previous page is an example of when the AMS-210B/-220B/-224B is used.

The figure illustrated on the previous page is an example of point move (absolute). In this case, the pattern data after the point which has moved will not move.
On the other hand, if you wish to erase the point shown in the figure using point move (relative), bring the needle to position (1) and press the ▲ ◀ ▶ ▼ keys on the function selector section so that the " " LED lights up. (Set the function to "Point move (relative).)



In this case, the pattern data after the point which has moved will also move, while maintaining the relationship of the whole pattern data before the point was moved.

(Caution) 1. Although the LED of the key on the JOG input section will light up, the key itself will be inoperative even if it is pressed.

(Caution) 2. Take care not to allow the point interval to exceed the largest stitch length (10.0 mm for the AMS-210B/-220B/-224B, or 6.2 mm for the AMS-205B/-206B) after the point has been moved. If there are data exceeding the largest stitch length, error "6" will occur when the test sewing is started, or when trying to write the data onto the floppy disk.

(Caution) 3. The created pattern data may exceed the sewing range after the point has been moved. In this case, the feeding frame will stop in a position beyond the sewing range, even if you try to confirm the pattern data by pressing the or key on the function selector section. If this occurs, use the pattern modification function to correct the pattern data so that they stay within the sewing range.

< Point addition >

Point addition : (J3)

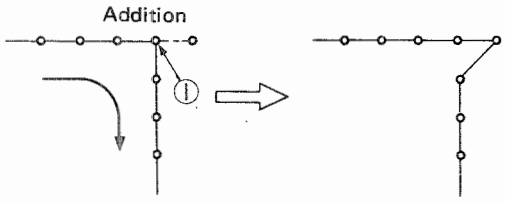
This function is used to add a point after the needle entry point has been designated. The pattern data after the point has been added will not move. The point add function is used to add a point in the pattern data created by means of the point sewing input function as well as the data created using other types of input function including the linear sewing input function. When the point add function is used for the pattern data created using the linear sewing input function etc., the operation mode will be switched to the point sewing input mode when the point has been added.

1) Bring the needle to position (1) and press the keys on the function selector section so that the " " LED lights up. (Set the function to "Point addition".)

2) Press the key on the function selector section. The following indication will appear on the display.

```
B1  CNVT  PNT (Y/C) ?
    B1  ADD  PNT · A
```

The above indication means that the operation mode can be switched to the point sewing input mode. If you wish to continue adding, press the key on the set value input section. If you wish to stop adding, press the CL key on the JOG input section.



3) Move the needle to the section containing the point to be added by pressing the keys on the JOG input section.

4) Press the key on the JOG input section (you may skip this step).

5) Press the key on the JOG input section.

(Caution) **1. Although the LED of the key on the JOG input section will light up, the key itself will be inoperative even if it is pressed.**

(Coution) **2. Take care not to allow the point interval to exceed the largest stitch length (10.0 mm for the AMS-210B/-220B/-224B, or 6.2 mm for the AMS-205B/-206) after the point has been added. If there are data exceeding the largest stitch length, error "6" will occur when the test sewing is started, or when trying to write the data onto the floppy disk.**

(Caution) **3. The created pattern data may exceed the sewing range after the point has been added. In this case, the feeding frame will stop in a position beyond the sewing range, even if you try to confirm the pattern data by pressing the or key on the function selector section. If this occurs, use the pattern modification function to correct the pattern data so that they stay within the sewing range.**

(Note) The PGM-5 is provided with a function that allows new data to be added to the created pattern data. The function is used to add an element to the desired position in the created pattern data.

2. Modify an apex

< Linear apex deletion >

Linear apex deletion (relative) : (I5) Linear apex deletion (absolute) : (J5)

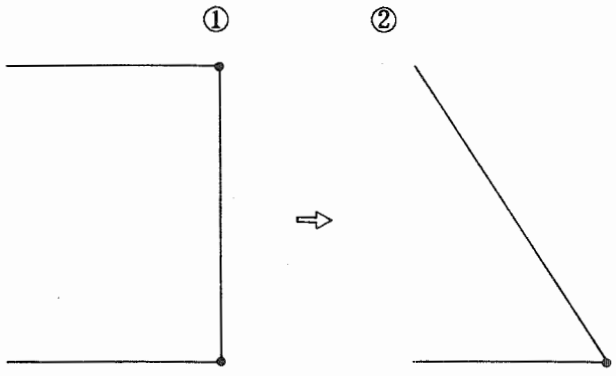
An apex designated in the linear pattern data can be cleared using this function. Two different types of linear apex deletion (linear apex deletion (relative) and linear apex deletion (absolute)) can be used depending on whether the pattern data after the apex to be erased is to move after the apex has been deleted.

This function cannot be executed at a needle entry point other than the last needle entry point of the pattern elements or the apex of the pattern.

1) Bring the needle to position (1) and press the ▲ ◀ ▶ ▼ keys on the function selector section so that the "" LED lights up. (Set the function to "Linear apex deletion (absolute)".)

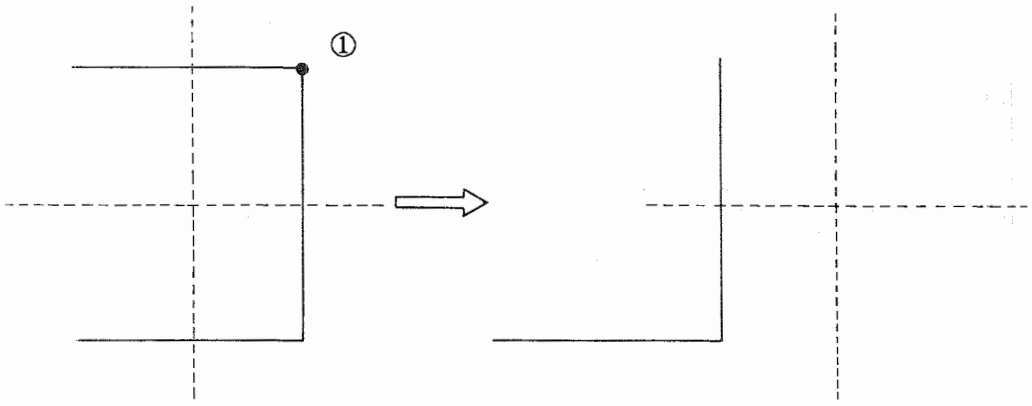
2) Press the key on the function selector section. The following indication will appear on the display.

3) The apex will be deleted, and the needle will go back to position (2), thereby confirming that apex has been deleted.



The figure illustrated on the previous page is an example of linear apex deletion (absolute). In this case, the pattern data after the deleted point will not move.

On the other hand, if you wish to erase the point shown in the figure using point deletion (relative), bring the needle to position (1) and press the ▲ ◀ ▶ ▼ keys on the function selector section so that the " " LED lights up. (Set the function to "Linear apex deletion (relative).)



(Caution) **1. This function is only valid for linear pattern data and the pattern data being entered using the PGM-5. However, it is invalid for the pattern data read from EEP-ROM (AMS-205B, 206B).**

(Caution) **2. The created pattern data may exceed the sewing range after the apex has been deleted. In this case, the feeding frame will stop in a position beyond the sewing range, even if you try to confirm the pattern data by pressing the [ ] or [ ] key on the function selector section. If this occurs, use the pattern modification function to correct the pattern data so that they stay within the sewing range.**

< Linear apex move >

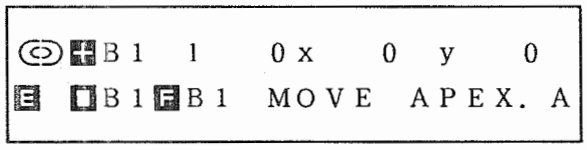
Linear apex move (relative) : (I6) Linear apex move (absolute) : (J6)

An apex designated in the linear pattern data can be moved using this function. Two different ways of moving a linear apex (linear apex move (relative) and linear apex move (absolute)) can be used depending on whether the pattern data after the apex has been moved is to move.

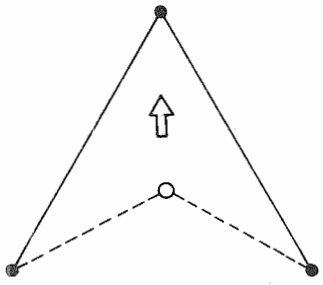
This function cannot be executed at a needle entry point other than the last needle entry point of the pattern elements or the apex of the pattern.

1) Bring the needle to position (1) and press the keys on the function selector section so that the "" LED lights up. (Set the function to "Linear apex move (absolute)".)

2) Press the key on the function selector section. The following indication will appear on the display.



If you wish to cancel apex movement, press the CL key on the JOG input section.

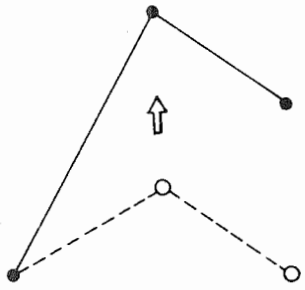


3) Move the needle to the destination of the apex to be moved by pressing the keys on the JOG input section.

4) Press the key on the JOG input section.

(Note) The value indicating the distance from the designated point to be moved to the current needle position will automatically change, since the stitch length depends on the sewing machine being used.

The figure illustrated on the previous page is an example of linear apex movement (absolute). In this case, the pattern data after the point which has been moved will not move.
On the other hand, if you move the point shown in the figure using linear apex movement (relative), bring the needle to position (1) and press the ▲ ◀ ▶ ▼ keys on the function selector section so that the " " LED lights up. (Set the function to "Linear apex movement (relative)".)
In this case, the pattern data after the point which has moved will move, while maintaining the relationship of the whole pattern data before the point was moved.



(Caution) 1. **Although the LED of the and keys on the JOG input section will light up, the keys themselves will be inoperative even if they are pressed.**

(Caution) 2. **This function is only valid for linear pattern data and the pattern data being entered using the PGM-5. However, it is invalid for the pattern data read from floppy disks or EEP-ROM (AMS-205B, 206B).**

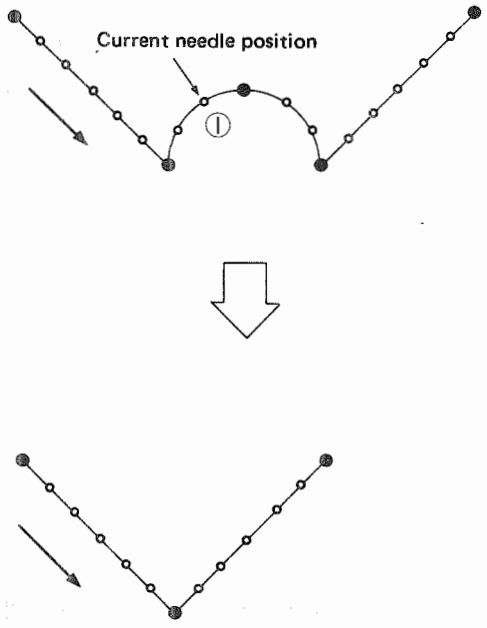
(Caution) 3. **Take care not to allow the point interval to exceed the largest stitch length (10.0 mm for the AMS-210B/-220B/-224B, or 6.2 mm for the AMS-205B/-206B) after the point has been moved. If there are data exceeding the largest stitch length, error "6" will occur when test sewing is started, or when trying to write the data onto the floppy disk.**

(Caution) 4. **The created pattern data may exceed the sewing range after the apex has been moved. In this case, the feeding frame will stop in a position beyond the sewing range, even if you try to confirm the pattern data by pressing the or key on the function selector section. If this occurs, use the pattern modification function to correct the pattern data so that they stay within the sewing range.**

3. Element deletion

< Element deletion > Element deletion : (I3)

This function is used to erase a designated element. The whole pattern data after the deleted element will move accordingly, while maintaining the relationship before the element was deleted.



1) Bring the needle to position (1) and press the ◀ ▶ ▲ ▼ keys on the function selector section so that the "CL" LED lights up.

(Set the function to "Element deletion".)

2) Press the key on the function selector section.

The element where the needle is currently positioned will be erased, and the whole pattern data after the erased element will move up accordingly. The needle will then be brough to the end of the element immediately before the erased element.

(Caution) 1. Element data once erased can never be restored.

(Caution) 2. The created pattern data may exceed the sewing range after the apex has been erased. In this case, the feeding frame will stop in a position beyond the sewing range, even if you try to confirm the pattern data by pressing the or key on the function selector section. If this occurs, use the pattern modification function to correct the pattern data so that they stay within the sewing range.

(Note) You can also cancel a machine control command as well as a sewing element including point sewing, linear sewing etc.

An element is the smallest unit of pattern data.
Normally, an element is created through a series of operations starting with the setting of the function, followed by inputting the coordinates until the termination of data input by pressing the or key on the JOG input section.
The machine control commands including the thread trimming command are regarded as elements.
The created element may be divided into two or more elements using the modification functions including the point delete function etc.
The element to which the needle currently belongs is indicated on the "Stitch type" position using the relevant function code (for example, arc zigzag stitching will be shown as B5 on the function indicator section (after), since it is created as a point sewing element).

4. Point speed changing

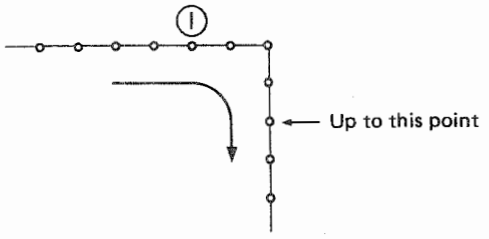
< Point speed changing > Point speed changing : (A5)

This function is used to control the pattern data sewing speed in the section designated in the unit of the needle entry point.
This function is used to change the point speed in the pattern data created by means of the point sewing input function as well as the data created using other types of input function including the linear sewing input function.

1) Bring the needle to position (1) and press the ◀ ▶ ▲ ▼ keys on the function selector section so that the " " LED lights up. (Set the function to "Point speed change".)

2) Press the key on the function selector section. The following indication will appear on the display.

```
B 1   s * *   p   2 0
  B 1 B 1   C H N G   S P D = 0 0
```



3) Press the ▲ or ▼ key on the set value input section until the desired sewing speed is indicated. The value indicated after "s" will change accordingly. See the list given on page 19.

4) Press the key on the set value input section.

5) Move the needle to specify the section containing the points for which the sewing speed is to be changed by pressing the key on the function selector section. If the needle goes beyond the desired section, press the key on the function selector section to return the needle to the correct section. The number given after "CHNG SPD=" will change accordingly.

6) Press the key on the set value input section.

VII. PATTERN OPERATION

1. Pattern deletion

< Pattern deletion > Pattern deletion : (A7)

This function is used to erase all the created pattern data.

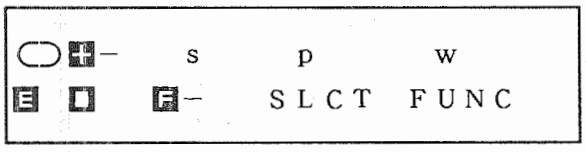
1) Press the ▲ ◀ ▶ ▼ keys on the function selector section so that the " " LED lights up.

(Set the function to "Pattern deletion".)

2) Press the key on the function selector section. The following indication will appear on the display.

* An example of the indication given when linear sewing (B1) has worked before executing the pattern deletion function.

3) Pressing the key on the set value input section will execute the pattern deletion function. If the pattern deletion function has been executed normally, all the created pattern data will be deleted, and the work clamp will move to allow the needle to return to its origin.
The following indication will appear on the display.



(Note) If you wish to cancel the command to delete the pattern, press the CL key. However, note that, once the machine starts executing the command, it cannot be interrupted.

(Coution) 1. Pattern data once deleted can never be restored. Furthermore, not only the pattern data, but also the various specified values will return to their original values indicated at the start of data input. Turn OFF the power switch. Then turn it back ON again while holding down the key. This will have the same result as executing the command to delete a pattern.

(Caution) 2. When you press the key, the work clamp will automatically move toward its origin.

(Caution) 3. If you wish to create a new pattern after the created pattern data have been written onto the floppy disk (or ROM), or if other pattern data are to be read from the floppy disk (or ROM) after reading other pattern data, be sure to delete the current pattern data using this function. The new pattern read from the floppy disk (or ROM) will be added to the already existing pattern data so that they are located after the current needle position.

2. Pattern reading/writing

2-1. For the AMS-210B/-220B/-224B

< Pattern reading > Pattern reading : (G1)

This function is used to read the pattern data stored on the floppy disk.

1) Press the ▲ ◀ ▶ ▼ keys on the function selector section so that the " " LED lights up. (Set the function to "Pattern reading".)

2) Press the key on the function selector section. The following indication will appear on the display.

Pattern number to be read

```
IN PTN NO=   1
READ PTN
```

3) Press the ▲ or ▼ key on the set value input section until the pattern number of the data to be read from the floppy disk is shown.
The number of the pattern in the indication will change accordingly.

4) Press the key on the set value input section.

5) The pattern will now start to be read from the floppy disk. If the pattern reading has been executed normally, the following indication will appear on the display.

```
s   p   w
B 6   SLCT FUNC
```

(Note) 1. The new pattern read from the floppy disk will be added to the already existing pattern data, while taking the current position of the needle as the origin.

(Note) 2. The newly read pattern will be added at the desired position in the current pattern data by changing the needle position using the [←] or [→] key on the function selector section.

(Note) 3. As long as you have specified the scale using the scale setting function (: G4) before reading the pattern, it will be possible to read the pattern while enlarged/reduced according to the scale. You can now select either "INC or DEC of the stitch length" or "INC or DEC of the number of stitches" using the INC/DEC of the stitch length or the stitch number selector switch in the control box of the sewing machine. Refer to the Istruction Manual for the sewing machine for details on the switch setting.

(Note) 4. To terminate this operation, press the [CL] key on the JOG input section. However, note that you cannot cancel the reading of the pattern data from the floppy disk while the operation is being executed.

< Scale setting >

Scale setting : (G4)

This function is used to set the scale when a pattern is to be read from the floppy disk.

<< For the AMS-210B/-220B >>

1) Press the keys on the function selector section so that the " " LED lights up.

(Set the function to "Scale".)

2) Press the key on the function selector section. The following indication will appear on the display.

```
B1  X-SCALE·%=  100
   B1  ENLRGE (X, Y)
```

* Example of the indication when linear sewing (B1) has been performed before this operation is started.

3) Pressing the or key on the set value input section, specify the X-scale. Then press the key on the set value input section. The following indication will appear on the display. Now you can input the Y-scale.

```
B1  Y-SCALE·%=  100
   B1  ENLRGE (X, Y)
```

4) Pressing the or key on the set value input section, specify the Y-scale. Press the key on the set value input section, and the value specified for the X/Y-scale will be executed. If the scale has been set normally, the following indication will appear on the display.

```
B1  s**  p  20  w  0
   B1  SLCT FUNC
```

(Note) 1. If you wish to cancel this function, press the CL key on the JOG input section.

(Note) 2. In steps 3) and 4), you can specify the scale from 1% to 400% (100% is the original size). If you keep pressing the relevant key for a certain period of time, the vlaue of the scale may change more quickly.

(Note) 3. You can read the data while enlarged/reduced according to the designated scale.

<< For the AMS-224B >>

1) Press the ▲ ◀ ▶ ▼ keys on the function selector section so that the " " LED lights up.

(Set the function to "Scale".)

2) Press the key on the function selector section. The following indication will appear on the display.

```
B1  Y-SCALE·%=  101
    B1  ENLRGE (X, Y)
```

* Example of the indication when linear sewing (B1) has been performed before this operation is started.

* The scale is indicated in increments of 0.1% for the AMS-224B. In the above example, the value of the X-scale is 10.1%.

3) Pressing the ▲ or ▼ key on the set value input section, specify the X-scale in the front of the decimal point in increments of 1%. Then press the key on the set value input section after the desired scale has been reached. The following indication will appear on the display.

```
B1  X-SCALE·%=1200
    B1  ENLRGE (X, Y)
```

* The X-scale is set to 120.0% in the above example.

4) Pressing the ▲ or ▼ key on the set value input section, specify the X-scale after the decimal point in increments of 0.1%. Then press the key on the set value input section after the desired scale has been reached. The following indication will appear on the display. Now you can input the Y-scale.

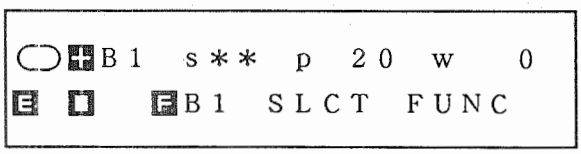
```
B1  Y-SCALE·%=  100
    B1  ENLRGE (X, Y)
```

5) Pressing the ▲ or ▼ key on the set value input section, specify the Y-scale in the front of the decimal point in increments of 1%. Press the key on the set value input section after the desired scale has been reched. The following indication will appear on the display.

```
B1  Y-SCALE·%=2000
    B1  ENLRGE (X, Y)
```

* The Y-scale is set to 200.0% in the above example.

6) Pressing the [▲] or [▼] key on the set value input section, specify the Y-scale after the decimal point in increments of 0.1%. Then press the [SET] key on the set value input section after the desired scale has been reached.
If the scale has been set normally, the following indication will appear on the display.



(Note) 1. You can specify the X-scale as well as the Y-scale in two stages. You can specify the scale in increments of 1% in the first stage. Then you can specify it in increments of 0.1% in the second stage.
For example, if you wish to change the setting of scale set to 100% in the previous operation to 156.7%, you can set the scale to 156.0% in the first stage, and then set it to 156.7% in the second stage.

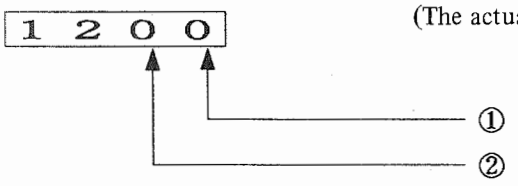
(Note) 2. If you wish to cancel this function, press the key [CL] on the JOG input section.

(Note) 3. In steps 3), 4), 5) and 6), you can specify the scale from 1.0% to 400.0% (100.0% is the original size). If you keep pressing the relevant key for a certain period of time, the value of the scale may change more quickly.

(Note) 4. You can read the data while enlarged/reduced according to the designated scale.

(Note) 5. The relationship between the indicated value and the actual value is shown below.

Example 1) Indicated value



(The actual value is 120.0%.)

① In steps 4) and 6), the scale changes from the first figure of the indicated value (the first figure after the decimal point of the actual value).
0(0%), ..., 1200(120.0%), 1201(120.1%), 1202(120.2%), 1203(120.3%) ....., 4000(400.0%)

② In steps 3) and 5), the scale changes from the second figure of the indicated value (digits after the decimal point).
0(0%), ..., 1200(120.0%), 1210(121.0%), 1220(122.0%), 1230(123.0%), ..., 4000(400.0%)

< Pattern writing > Pattern writing : (G2)

This function is used to write the created data onto the floppy disk.

1) Press the keys on the function selector section so that the " " LED lights up.

(Set the function to "Writing".)

2) Press the key on the function selector section. The following indication will appear on the display.

Pattern number to be written

```
B4  OT  PTN  NO=    1
    B4  WRITE  PTN
```

* Example of the indication when circle sewing (B4) has been performed before this operation is started.

3) Press the or key on the set value input section until the pattern number (1 to 999) of the data to be written onto the floppy disk is indicated. The pattern number in the indication will change accordingly.

4) Press the key on the set value input section. The machine will then check whether the designated pattern data already stored in the floppy disk. If the pattern data is stored under the designated number, the following indication will appear on the display (if the pattern data is not stored under the number, step 5) will be executed to write the pattern data onto the floppy disk).
If you wish to update the data, press the key on the set value input section. If you wish to cancel the writing of the pattern data onto the floppy disk under the designated number, press the CL key on the JOG input section.

```
-   OVERRIDE (Y/C) ?
    G2  WRITE  PTN
```

5) The machine will start writing the pattern data onto the floppy disk under the designated number. If the pattern data have been written normally onto the floppy disk, the following indication will appear on the display.

```
-   s**  p  20  w   0
    G2-   SLCT  FUNC
```

(Caution) 1. Be sure to unlock the write-protect tab before writing the pattern data onto the floppy disk.

(Caution) 2. If it is the first time to write pattern data onto the floppy disk, be sure to format the floppy disk beforehand. Refer to the Instruction Manual for the sewing machine for details on how to format a floppy disk.

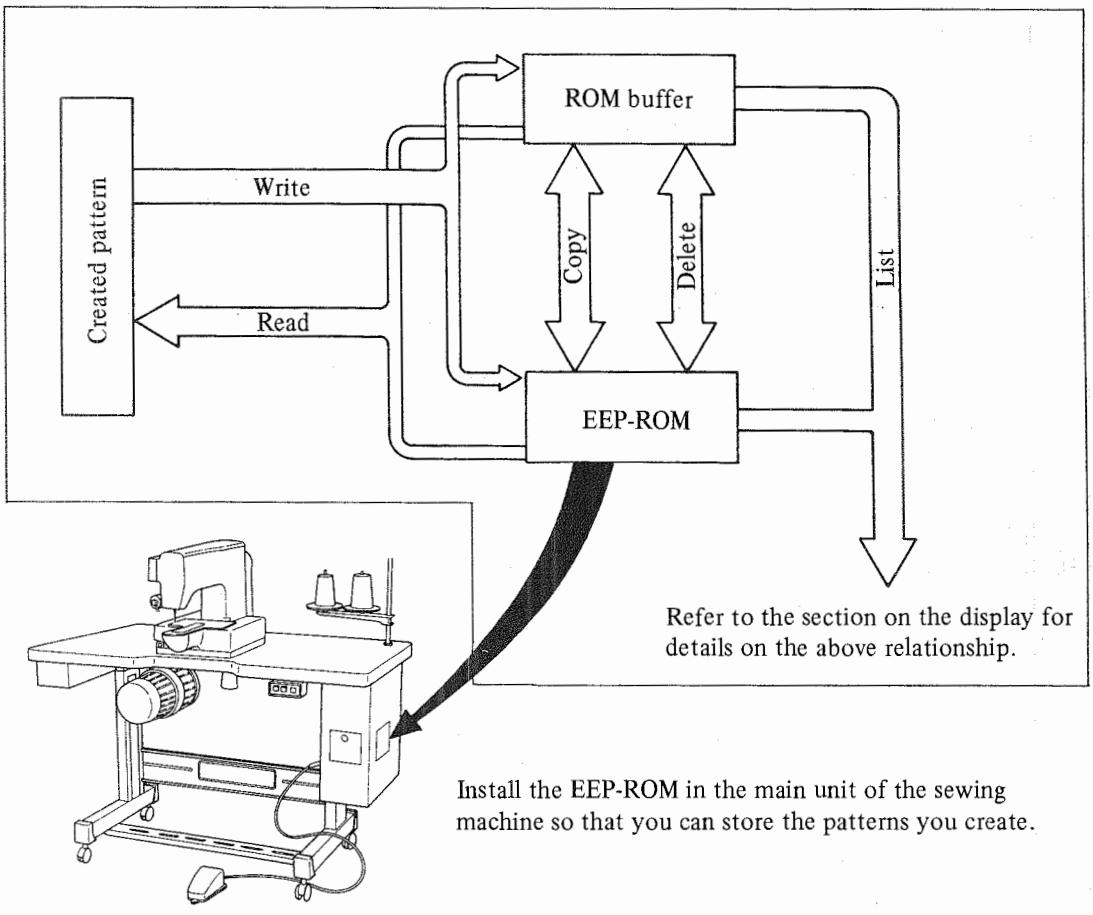
(Note) 1. Use the pattern reading/writing functions to edit the patterns stored on the floppy disk. At this time, you can also change the pattern number.

(Note) 2. If you wish to terminate the operation, press the [CL] key on the JOG input section. However, note that it is impossible to interrupt the writing of the pattern data onto the floppy disk while this operation is being executed.

2-2. For the AMS-205B/-206B

The relationship between the created pattern and the EEP-ROM. ROM buffer.

PGM-5



As illustrated in the above figure, the EEP-ROM and ROM-buffer can be handled in a similar way. Pattern data can be read out, written onto, and deleted from the EEP-ROM as well as the ROM buffer. In addition, data stored in the EEP-ROM can be copied onto the ROM buffer, and vice versa. The EEP-ROM stores the data which are first written onto the EEP-ROM for as long as possible, unless the data are deleted from it, while the EEP-ROM can be installed in the sewing machine so that sewing can be performed according to the pattern data stored in the EEP-ROM. The ROM buffer, however, stores the pattern data for a predetermined period of time (refer to [Caution] on page 62) once the power to the PGM-5 is turned OFF. Furthermore, you are not allowed to remove the ROM buffer from the PGM-5.

In the explanation below, the ROM means the EEP-ROM itself, and the ROM buffer means the storage area where the pattern data are stored so that they can be created and edited.

< **Pattern reading** > Pattern reading : (G1)

This function is used to read the pattern data stored in the ROM and ROM buffer.

1) Press the ▲ ◀ ▶ ▼ keys on the function selector section so that the " " LED lights up.

(Set the function to "Pattern reading".)

2) Press the key on the function selector section. The following indication will appear on the display.

```
MEM=▓  /PTN=  1
   G1  READ  PTN
```

* " ▓ " indicates the ROM and " M " indicates the ROM buffer.

3) Press the ▲ or ▼ key on the set value input section, select either the ROM (▓) or the ROM buffer (M) as the source from which the desired pattern data are to be read, and press the key on the set value input section. "MEM=" in the indication will then be followed by either " ▓ " or " M " according to the selected source.

4) Press the ▲ or ▼ key on the set value input section until the pattern number to be read from the selected source is shown. The specified pattern number will be shown after "PTN=" in the indication.

5) Press the key on the set value input section, the pattern will now start to be read from the selected source. If the pattern reading has been executed normally, the following indication will appear on the display.

```
   s     p     w
B6 -  SLCT  FUNC
```

(Note) 1. The new pattern read from the selected source will be added to the already existing pattern data, while taking the current needle position as the origin.

(Note) 2. The newly read pattern will be added at the desired position in the current pattern data by changing the needle position using the or key on the function selector section.

(Note) 3. To terminate this operation, press the CL key on the JOG input section. However, note that you cannot cancel the reading of the pattern data from the ROM while this operation is being executed.

(Note) 4. As long as you have specified the scale and the method of enlarging/reducing the pattern before reading the pattern, it will be possible to read the pattern while enlarged/reduced according to the predetermined scale and the method used.

(Caution) The created pattern data stored in the ROM buffer will remain as long as the back-up function works normally after the power to the PGM-5 has been turned OFF. They will be erased once the back-up function stops working. The back-up function works for 150 hours (after being charged for 15 hours).

< Scale setting >

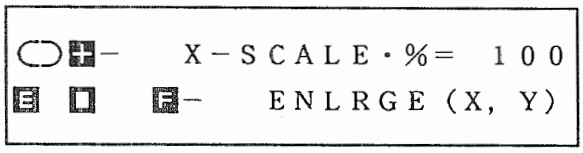
Scale setting : (G4)

This function is used to set the scale when a pattern is to be read from the ROM or ROM buffer.

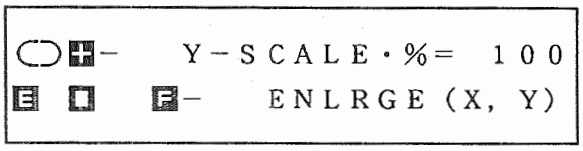
1) Press the keys on the function selector section so that the " " LED lights up.

(Set the function to "Scale".)

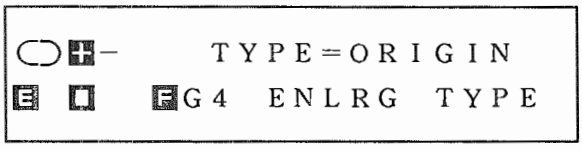
2) Press the key on the function selector section. The following indication will appear on the display.



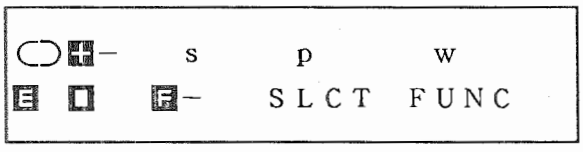
3) Pressing the or key on the set value input section, specify the X-scale. Then press the key on the set value input section. The following indication will appear on the display. Now you can input the Y-scale.



4) Pressing the or key on the set value input section, specify the Y-scale. Then press the key on the set value input section. Now you can specify the method of enlarging/reducing the pattern.



5) Press the or key on the set value input section until the center of the enlargement/reduction is aligned with the origin or the sewing start point. Then press the key on the set value input section. If the scale has been set normally, the following indication will appear on the display.



(Note) 1. If you wish to cancel this function, press the key CL on the JOG input section.

(Note) 2. In steps 3) and 4), you can specify the scale from 1% to 255% (100% is the original size). If you keep pressing the relevant key for a certain period of time, the value of the scale may change more quickly.

(Note) 3. You can read the data while the pattern is enlarged/reduced according to the designated scale.

< Pattern writing >

Pattern writing : (G2)

This function is used to write the created data onto the ROM or ROM buffer.

1) Press the ▲ ◀ ▶ ▼ keys on the function selector section so that the " " LED lights up.

(Set the function to "Writing".)

2) Press the key on the function selector section. The following indication will appear on the display.

```
B 1   MEM=▓  /PTN=   1
    G 2   WRITE  PTN
```

* Example of the indication when linear sewing (B1) is used as the pattern data to be written.
* " ▓ " indicates the ROM, while " M " indicates the ROM buffer.

3) Press the ▲ or ▼ key on the set value input section, and select either the ROM (▓) or the ROM buffer (M) as the area onto which the desired pattern data are to be written. Then press the key on the set value input section. " M E M = " in the indication will now be followed by either " ▓ " or " M " according to the selected area.

4) Press the ▲ or ▼ key on the set value input section until the pattern number (1 to 99) of the data to be written onto the ROM or ROM buffer is indicated. Then press the key on the set value input section. The specified pattern number will now be shown after " P T N = " in the indication.

5) Press the key on the set value input section. The machine will then check whether the designated pattern data has already been registered on the ROM. If the pattern data have been stored under the designated number, the following indication will be shown on the display (if the pattern data has not been stored under that number, step 6) will be executed to write the pattern data onto the selected objective.).
If you wish to update the data, press the key on the set value input section. If you wish to cancel the writing of the pattern data onto the ROM or ROM buffer under the designated number, press the CL key on the JOG input section.

```
B 1   OVERRIDE (Y/C) ?
    G 2   WRITE  PTN
```

* Example of the indication when linear sewing (B1) is used as the pattern data to be written onto the ROM or ROM buffer.

6) The machine will start writing the pattern data onto the ROM or ROM buffer under the designated number. If the pattern data have been written normally onto the floppy disk, the following indication will appear on the display.

```
B 1   s**  p  20  w   0
    B 1   SLCT  FUNC
```

(Note) 1. Use the pattern read function and the pattern write function to edit the pattern stored in the ROM or ROM buffer. At this time, you can also change the pattern number.

(Note) 2. If you wish to terminate the operation, press the [CL] key on the JOG input section. However, note that it is impossible to interrupt the writing of the pattern data onto the ROM or ROM buffer while this operation is being executed.

(Caution) 1. If it is the first time to write pattern data onto the ROM, be sure to delete the whole data in the ROM (P65) beforehand.

(Caution) 2. The created pattern data stored in the ROM buffer will remain as long as the back-up function works normally after the power to the PGM-5 has been turned OFF. They will be erased once the back-up function stops working. The back-up function works for 150 hours (after being charged for 15 hours).

3. Edit a ROM pattern

In the explanation below, the ROM means the EEP-ROM itself, and the ROM buffer means the storage area onto which the pattern data are to be temporarily stored so that they can be created and edited. Like 2-2., the function described in "3. Edit a ROM pattern" is only operative when using the AMS-205B/-206B with the PGM-5.

< ROM pattern list >

Pattern list : (G5)

This function is used to display the list of pattern numbers stored in the ROM or ROM buffer.

1) Press the ▲ ◀ ▶ ▼ keys on the function selector section so that the " " LED lights up.

(Set the function to "Pattern list".)

2) Press the key on the function selector section. The following indication will appear on the display.

```
B1  MEM=▓
    G5  ROM  LIST
```

* " ▓ " indicates the ROM, while " M " indicates the ROM buffer.

3) Press the ▲ or ▼ key on the set value input section, and select either the ROM (▓) or the ROM buffer (M) from which the patterns are to be listed. Then press the key on the set value input section. "MEM=" in the indication will be followed by either " ▓ " or " M " according to the selected area.

4) Press the key on the set value input section. The following indication will appear on the display.

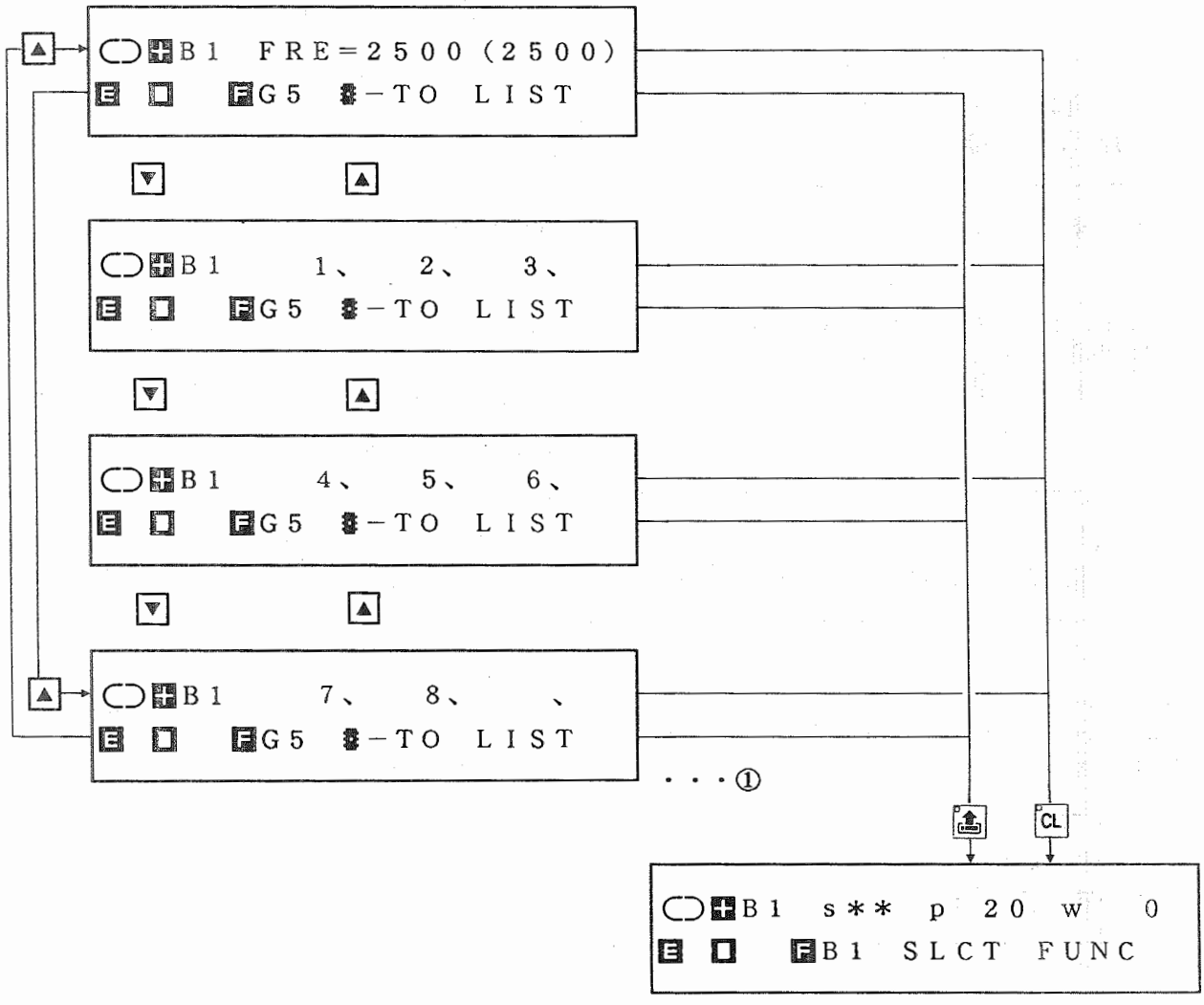
```
B1  FRE=2500 (2500)
    G5  ▓-TO  LIST
```

Number of stitches in the largest space area inside the space area (number of remaining stitches)

Number of stitches in the whole space area (number of free stitches)

Selected ROM area

5) Press the [▲] key on the set value input section, and the pattern numbers for three patterns will be listed on the display in reverse order starting from the last one. If you keep pressing the key, the initial indication of the pattern list shown in step 4) will finally appear on the display. Press the [▼] key on the set value input section, and the pattern numbers for three patterns will be listed on the display in the order registered. If you keep pressing the key, the initial indication of the pattern list shown in step 4) will be finally restored. Pressing the [CL] key on the JOG input section or the [⇧] key on the set value input section will restore the function menu.



(Note) 1. If the pattern numbers given in the last list of pattern numbers exceed the largest number of the pattern stored in the ROM or ROM buffer (in example ① given above, the number of patterns is 8), the pattern list after the largest pattern number will be blank.

(Caution) 1. The number of remaining stitches and the number of free stitches are to be used as general reference. Even when the total number of stitches indicated as the reference of the set value is smaller than the number of remaining stitches, a JOG input error (overflow area) may occur at the time of writing the pattern onto the ROM or ROM buffer.

(Caution) 2. The created pattern data stored in the ROM buffer will remain as long as the back-up function works normally after the power to the PGM-5 has been turned OFF. They will be erased once the back-up function stops working. The back-up function works for 150 hours (after being changed for 15 hours).

< ROM pattern deletion > Pattern deletion : (G7)

This function is used to erase all or part of the created pattern data.

1) Press the ▲ ◀ ▶ ▼ keys on the function selector section so that the " " LED lights up.

(Set the function to "Pattern deletion".)

2) Press the key on the function selector section. The following indication will appear on the display.

```
MEM=▒/ALL
   G7  ROM  DEL
```

* " ▒ " indicates the ROM, while " M " indicates the ROM buffer.

3) Pressing the ▲ or ▼ key on the set value input section, select the area to be deleted from M/ALL, M/PART, ▒/ALL and ▒/PART.
Then press the key on the set value input section.

3-1) If you select delete all, the following indication will appear on the display.

```
   SURE        (Y/C) ?
   G7  ▒-TO  DELETE
```

* The above example shows that the deletion of all the pattern data with " ▒ " has been selected.

If you wish to execute the deletion of all the pattern data, press the key on the set value input section. The following indication will then appear on the display.
If you wish to cancel the delete function, press the CL key on the JOG input section.

```
   MEM=▒/ALL
   G7  ROM  DEL
```

3-2) If you select partial deletion, press the key on the function selector section, the following indication will appear on the display. Press the ▲ or ▼ key on the set value input section until the pattern number you wish to delete is shown on the display.

```
   PTN NO =      1
   G7  ▒-TO  DELETE
```

* The above example shows that the deletion of part of the pattern data with " ▒ " has been selected.

Pressing the [↵] key on the set value input section will designate the pattern number selected. The following indication will then appear on the display.

```
C+-    SURE        (Y/C) ?
E □    FG7 ⇕-TO DELETE
```

If you wish to execute the deletion of part of the pattern data, press the [↵] key on the set value input section. The following indication will appear on the display.
If you wish to cancel the delete function, press the [CL] key on the JOG input section.

```
C+-    MEM=⇕/ALL
E □    FG7 ROM DEL
```

4) If the pattern has been deleted normally, the following indication will appear on the display.

```
C+-    s      p      w
E □    F-   SLCT FUNC
```

(Note) 1. If you wish to terminate the operation, press the [CL] key on the JOG input section. However, note that it is impossible to interrupt pattern deletion while the operation is being executed.

(Note) 2. If it is the first time write pattern data onto the ROM, be sure to delete all the data in the ROM using this function beforehand.

(Caution) The created pattern data stored in the ROM buffer will remain as long as the back-up function works normally after the power to the PGM-5 has been turned OFF. They will be erased once the back-up function stops working. The back-up function works for 150 hours (after being charged for 15 hours).

< ROM pattern copy > ROM pattern copy : (G6)

This function is used to copy the pattern data from the ROM to the ROM buffer, or vice versa.

1) Press the keys on the function selector section so that the " " LED lights up.

(Set the function to "Pattern copy".)

2) Press the key on the function selector section. The following indication will appear on the display.

```
TYPE=M->■/ALL
   G6  ROM  COPY
```

* "■" indicates the ROM and the "M" indicates the ROM buffer.

3) Pressing the or key on the set value input section, select the area to be deleted from ■→M/ALL , M→■/ALL , ■→M/PART , M→■/PART .
Then press the key on the set value input section.

3-1) If you select copy ALL, the following indication will appear on the display.

```
TYPE=M->■/ALL
   G6  ROM  COPY
```

The above example shows that all the pattern data stored in "M" will be copied onto "■" .

3-2) If you select partial copy, the following indication will appear on the display.

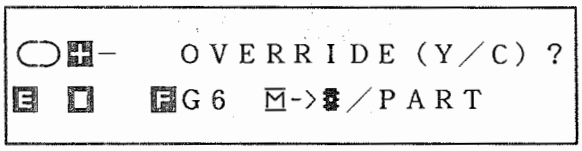
```
TYPE=M->■/PART
   G6  ROM  COPY
```

The above example shows that a part of the pattern data stored in "M" will be copied onto "■".

Press the or key on the set value input section until the pattern number (I N = * * *) you wish to use as the source of the copy is shown on the display. Then press the key on the set value input section. Specify the pattern number (O U T = * * *) you wish to use as the destination of the copy in the same way as for the source of the copy.

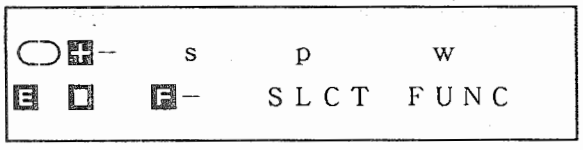
```
IN=  1  /OUT=  1
   G6  M->■  COPY
```

4) The machine will now start copying. The machine will first check whether the pattern number designated as the destination of the copy has already been registered in the ROM or ROM buffer. If the pattern data has not been stored, the machine will execute the copy function. If the pattern data has already been stored under the designated number, the following indication will appear on the display.



If you wish to update the data, press the [ENT] key on the set value input section. Pressing the [CL] key on the JOG input section will terminate the following steps in the copying procedure without updating the data.

5) If the pattern has been deleted normally, the following indication will appear on the display.



(Note) 1. If you wish to terminate the operation, press the [CL] key on the JOG input section. However, note that it is impossible to interrupt pattern copying while the operation is being executed.

(Caution) The created pattern data stored in the ROM buffer will remain as long as the back-up function works normally after the power to the PGM-5 has been turned OFF. They will be erased once the back-up function stops working. The back-up function works for 150 hours (after being charged for 15 hours).

4. Pattern copy

Pattern copy : (H6)

This function is used to copy as many as three patterns already created.

1) Press the ▲ ◀ ▶ ▼ keys on the function selector section so that the " " LED lights up.

(Set the function to "Pattern copy".)

2) Press the key on the function selector section. The following indication will appear on the display.

```
B4  1    0x    0  y    0
E   B4   CPY  PTN=    0
```

* The indication is an example of when a circle sewng pattern (B4) is used as the pattern to be copied.

3) Using the ▲ ◀ ▶ ▼ keys on the JOG input section, specify the desired destination of the copy.

4) Pressing the key on the JOG input section will designate the destination of the copy. The number of copies indicated after "CPY PTN=" will change accordingly.

5) When you wish to terminate inputting the destination of the copy with the JOG keys, press the key on the JOG input section.
If the pattern has been copied normally, the following indication will appear on the display.

```
B4  s**  p  20  w    0
E   B4   SLCT  FUNC
```

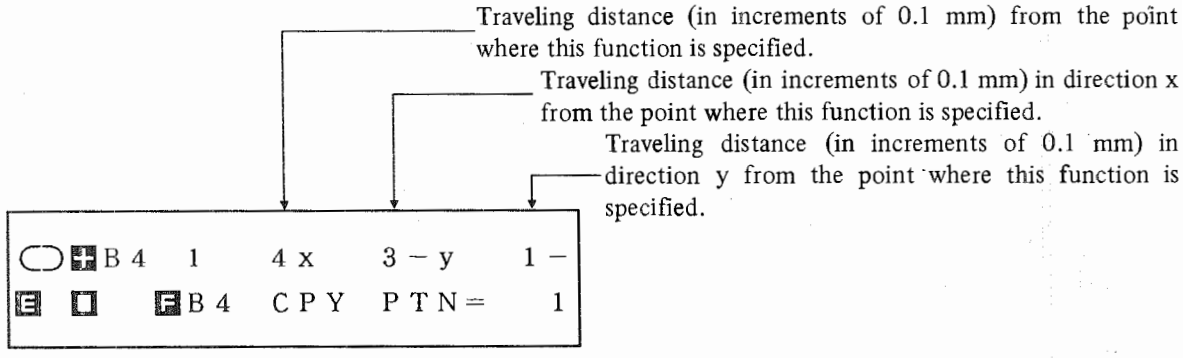
(Note) 1. You may repeat steps 3) and 4) as many as three times.
(You are allowed to skip pressing the key to terminate the input.)

(Note) 2. When you wish to cancel the pattern copy function, press the CL key on the JOG input section.

(Note) 3. You can delete the entered points to be copied using the key on the function selector section before pressing the or key on the JOG input section in step 5).

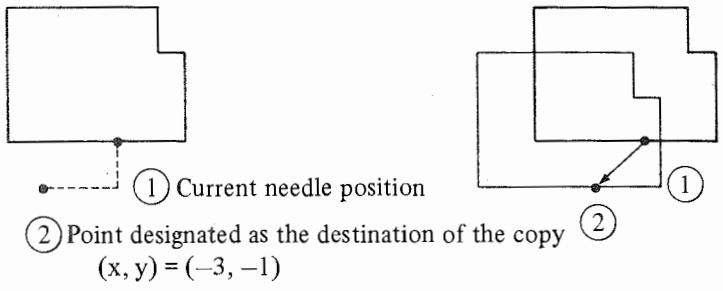
(Note) 4. Designating the destination of the copy.
The pattern copy function of the machine copies a pattern in whole taking the current needle position as reference for copy.

* When the destination of the copy is set to a position reached by moving the needle from its current position by –3 in direction x and by –1 in direction y (distance = 4).



* The following figure will be obtained after the execution of the copy function has been completed.

(1) Before copying (2) After copying



* The thread trimming function is executed at the sewing end of the original pattern, while the jump function is executed until the sewing start of the copied pattern is reached.

(Caution) Although the LED of the key will light up, the key itself will be inoperative even if it is pressed.

5. Pattern move

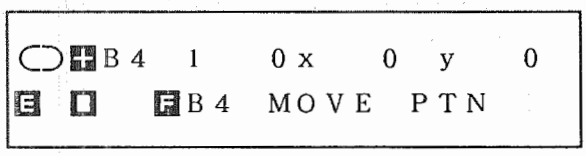
Pattern move : (H5)

This function is used to move the created pattern on a parallel axis.

1) Press the keys on the function selector section so that the " " LED lights up.

(Set the function to "Pattern move".)

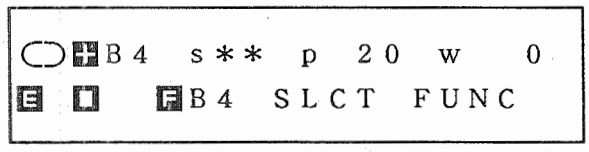
2) Press the key on the function selector section. The following indication will appear on the display.



* The indication is an example of when a circle sewing pattern (B4) is used as the pattern to be moved.

3) Using the keys on the JOG input section, specify the desired destination of the pattern to be moved.

4) Pressing the key on the JOG input section will execute the pattern move function. If the pattern has been moved normally, the following indication will appear on the display.

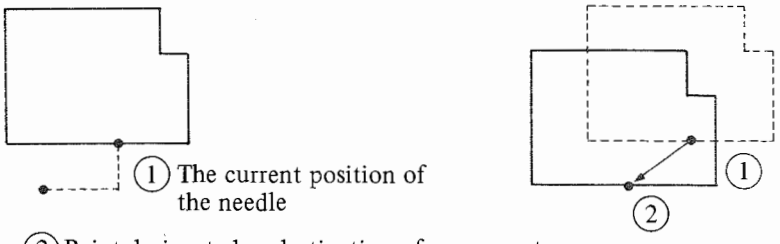


(Note) 1. When you wish to cancel the pattern move function, press the CL key on the JOG input section.

(Note) 2. Designating the destination of the copy.
The pattern copy function of the machine copies a pattern in whole taking the current needle position as reference for copy.

* The following figure will be obtained after the execution of the pattern move function has been completed. In the example given, the original pattern is moved from the current needle position by –3 in direction x and by –1 in direction y (distance = 4).

(1) Before moved (2) After moved



① The current position of the needle

② Point designated as destination of movement
(x, y) = (–3, –1)

* Thread trimming is inserted at the sewing end point of the original pattern and jump is inserted until the sewing start point of the moved pattern is reached.

(Caution) The LED of the key lights up, however, it is inoperative even if it is pressed.

Ⅷ. PATTERN INVERSION

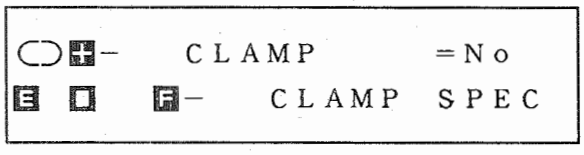
< Clamp invert function setting > Clamp invert function setting : (I4)

If you use the clamp invert function, you should set the function using this feature.

1) Press the ▲ ◀ ▶ ▼ keys on the function setting section so that " " LED lights up.

(Set the function to "Clamp invert function setting".)

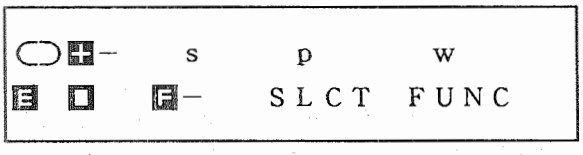
2) Press the key on the function setting section. The following indication will be shown on the display.



[Inverting function setting]

3) Press the ▲ or ▼ key on the set value input section until the desired form of inversion is displayed on the display.
   - No : Without the invert function
   - Auto : Automatic inversion
   - Man. : Optional inversion

4) Press the key on the set value input section (this completes the clamp invert function setting). The following indication will be shown on the display.



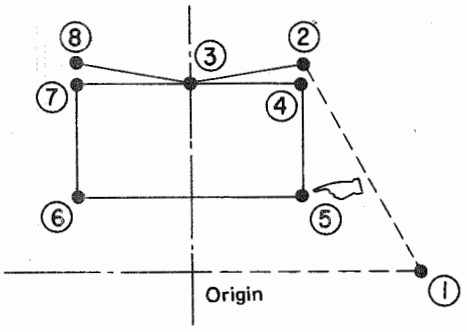
(Caution) 1. Be sure to set the invert function at the start of pattern input in prior to the other functions. You cannot execute this function after you have input the pattern data.

(Caution) 2. If you do not execute this function at the start of pattern input, the machine operates regarding that the "Without the invert function" has been specified.
If you read the pattern data in this state using the pattern read function (function code : G1), the setting of the invert function written in the pattern data will be valid.

(Caution) 3. After you have set the invert function using the invert setting function, the setting of the invert function written in the pattern data stored on the floppy disk will be ignored when the pattern is read from the floppy disk using the pattern read function (function code : G1) to allow the invert function set using the clamp invert setting function.

< Clamp inversion > Clamp inversion : [J4]

Use this function to input the point of inversion when the optional inversion is selected in the invert function setting.



1) Bring the needle to position (5) and Press the [▲] [◀] [▶] [▼] keys on the function selector section so that "[J4]" LED lights up.

(Set the function to "Clamp inversion".)

2) Press the [SET] key on the set value input section (this completes the clamp invert function setting).

The example given shows the case where the machine jumps from the origin to point (2), inverts point (2) through (5), and performs linear stitching for points (6), (7), (3) and 8 in the order given. (Although points (2) and (4) are illustrated as separated, they are in fact one and the same point. Points (7) and (8) are also one and the same point.)

After completion of inputting the inversion points, the following indication will be given on the display.

```
J4  (RVRCE CLAMP)
   J4 SLCT FUNC
```

(Caution) 1. The point of inversion on the created pattern data can be specified as you wish. However, the inverting crank will face to the ( ) (left) at the sewing start and will then turn to the ( ) (right) at the first inversion point. After that, it will turn ( ) in alternate directions at every point of inversion. Consequently, the specified number of points of inversion should be an odd number. If an even number is specified, the inverting crank will face to the ( ) (left). As a result, the crank may come in contact with the needle at the sewing end causing the needle to break.

(Caution) 2. You cannot specify a point of inversion in the following positions.

- **Jumping section at the sewing start**
- **Immediately after the second origin**
- **Immediately after the thread trimming**

IX. CHECKING THE SET VALUE

< Checking the set value > Checking the set value : (H1)

The number of stitches, scale etc. of the created pattern data can be visually checked on the display whenever you wish.

1) Press the keys on the function selector section so that " " LED lights up.

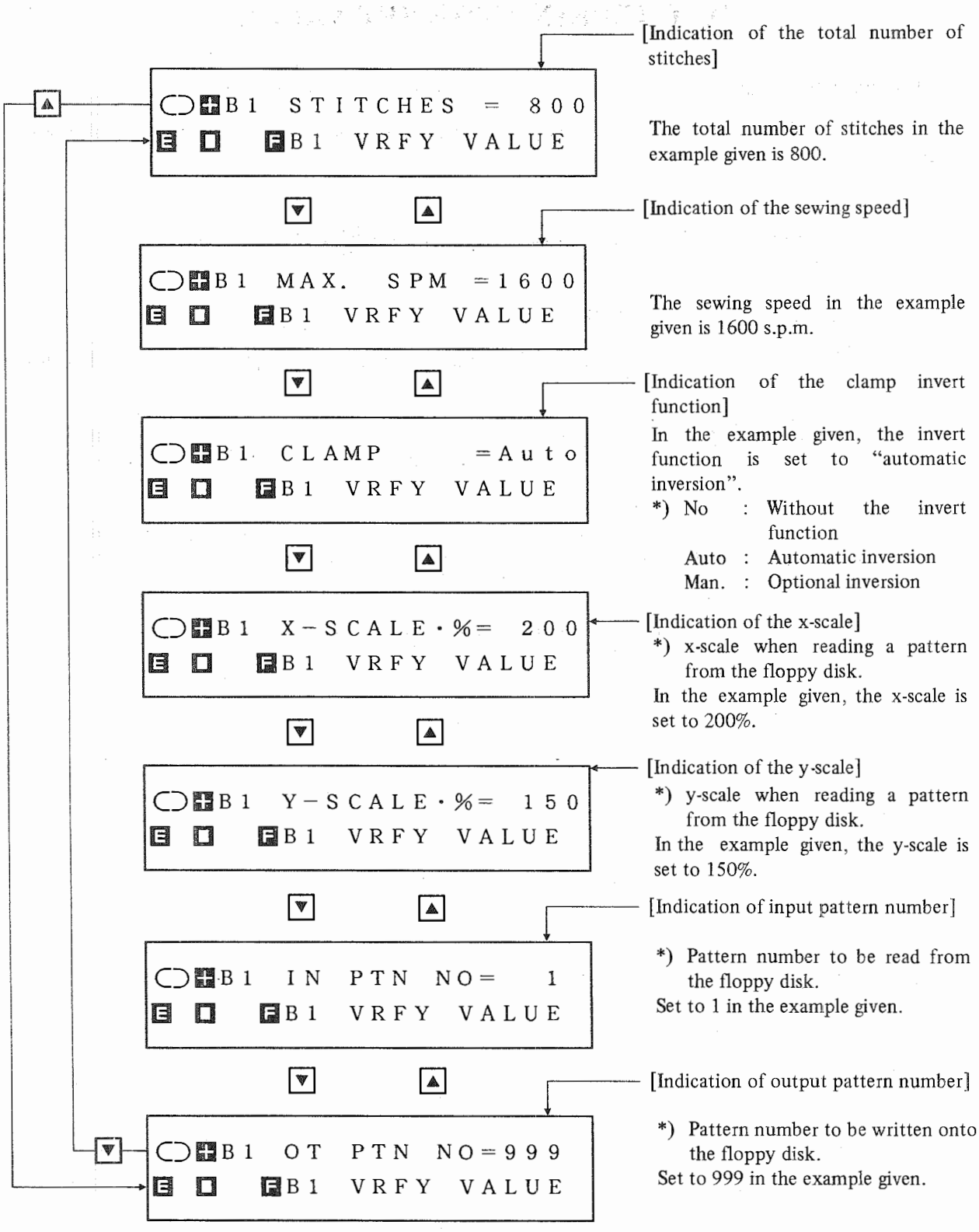
(Set the function to "Checking the set value".)

2) Press the key on the function setting section. The indication on the display shows the total number of stitches.

3) Hereinafter, pressing the key or key on the set value input section will enable you to visually check each set value in turn. Press the key on the set value input section or the CL key on the JOG input section.

(Note) 1. If you press the key on the set value input section after the indication giving the output pattern number has been shown on the display, the initial indication which gives the total number of stitches will be shown on the display.

(Note) 2. The transition of indications on the display will be shown on the next page.



[Indication of the total number of stitches]

The total number of stitches in the example given is 800.

[Indication of the sewing speed]

The sewing speed in the example given is 1600 s.p.m.

[Indication of the clamp invert function]

In the example given, the invert function is set to "automatic inversion".

*) No : Without the invert function
Auto : Automatic inversion
Man. : Optional inversion

[Indication of the x-scale]

*) x-scale when reading a pattern from the floppy disk.

In the example given, the x-scale is set to 200%.

[Indication of the y-scale]

*) y-scale when reading a pattern from the floppy disk.

In the example given, the y-scale is set to 150%.

[Indication of input pattern number]

*) Pattern number to be read from the floppy disk.

Set to 1 in the example given.

[Indication of output pattern number]

*) Pattern number to be written onto the floppy disk.

Set to 999 in the example given.

(Note) 3. If you cancel this function, press the CL key on the JOG input section or the key on the set value input section.

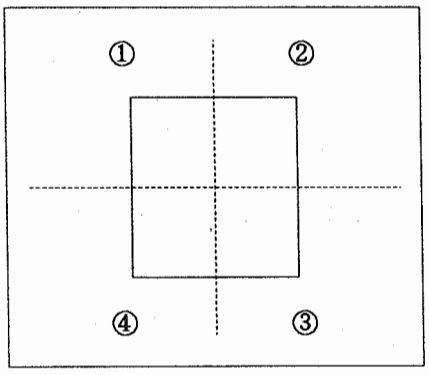
X. OPERATING PROCEDURE

< Example of a series of operating procedure >

The following describes a series of operating procedure starting from the preparation before input through test sewing.

Step 1 Make drawing of the direction of the stitches on a sheet of graph paper. Then set the sheet of graph paper on the machine. (See page P11.)

For example, apply a sheet of graph paper on which the direction of the stitches are drawn.



Step 2 Turn ON the power switch while pressing the key on the function selector section. (See page P11.)

Step 3 Move the needle using the jump function until point (1) is reached. (See page P15.)

Step 4 Input points (2), (3), (4) and (1) using the linear sewing input function following the order given. (See page P16.)

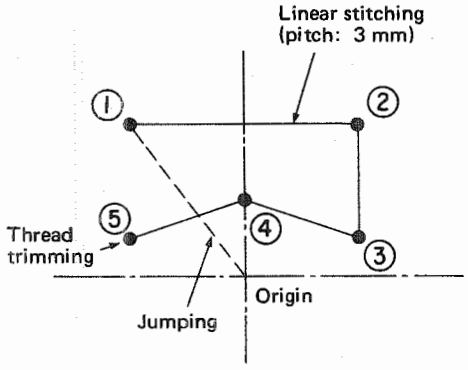
Step 5 Perform test sewing of the pattern which has been entered in steps 1 through 4. (See page P37.)

Step 6 Upon completion of test sewing, if you wish to store the pattern entered in memory, write the pattern entered onto the memory medium. (For the AMS-210B/-220B/-224B, refer to page . For the AMS-205B/-206B, refer to page 61.)

< Pattern input >

New let's input the pattern illustrated below using the input functions.

Create the pattern by jumping from the origin to point (1) and linear stitching from point (2) through (5) with a stitch length of 3 mm. Then trim the thread at the sewing end.



Step 1 Set the original drawing on the machine.

Step 2 Press the ◀ ▶ ▲ ▼ keys on the function selector section so that "〰" LED lights up.

(Set the function to "Jump".)
Then press the [⇧] key on the function setting section.

Step 3 Pressing the ◀ ▶ ▲ ▼ keys on the JOG input section, bring the needle to point (1).

Step 4 Press the [◈] key on the JOG input section. (You may skip this procedure.)

Step 5 Press the [⇥] key or [⇥|] key on the JOG input section.

Step 6 Press the ◀ ▶ ▲ ▼ keys on the function selector section so that "〰" LED lights up.

(Set the function to "Linear sewing".)
Then press the [⇧] key on the function setting section.

Step 7 Press the [▲] key or [▼] key on the set value input section until a stitch length of "30" is shown on the display. Then press the [⇧] key on the set value input section.

Step 8 Press the ◀ ▶ ▲ ▼ keys until the needle reaches position (2) shown in the figure.

Step 9 Press the [◈] key on the JOG input section.

Step 10 Repeat steps 8 and 9 until points through (5) have been entered. (You may skip pressing the [◈] key after point (5) has been entered.)

Step 11 Press the [⇥] key or [⇥|] key on the JOG input section.

Step 12 Press the ◀ ▶ ▲ ▼ keys on the function selector section so that "✂" LED lights up.

(Set the function to "Thread trimming".)
Then press the [⇧] key on the function selector section.

< Pattern modification >

You can modify a pattern created using the function or read from the floppy disk, by using eleven different kinds of modification functions. To modify a pattern, move the needle to the position of the data to be modified using the key or key on the function selector section.
The following is an explanation of the pattern modification procedure using the pattern created in the section "Pattern input" on the previous page.

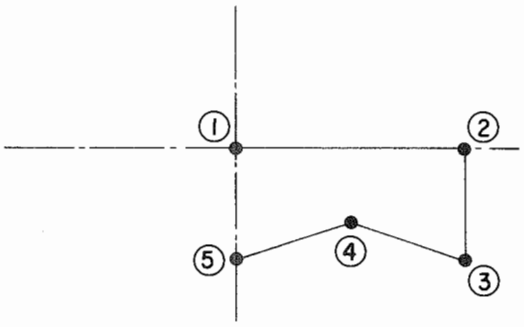


Fig. 1

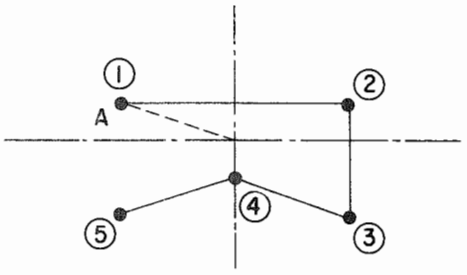


Fig. 2

Step 1 Press the key or key on the function selector section until the needle moves to the section of data up to point ① created using the jump input function.
(The needle will be brought to its origin.)

Step 2 Press the keys on the function selector section so that " CL " LED lights up.
(Set the function to "Element deletion".)
Then press the key on the function selector section. This erases the data up to point ① created using the jump input function. The needle will then return to its origin. The pattern now has a linear stitch between point ② and point ⑤ starting from the origin as illustrated in Fig. 1.

Step 3 Press the keys on the function selector section so that " " LED lights up.
(Set the function to "Jump".) Then press the key on the function selector section.

Step 4 Press the keys on the JOG input section until the needle has moved to A in Fig. 2.

Step 5 Press the key on the JOG input section (you may skip this step).

Step 6 Press the key or key on the JOG input section.

Step 7 Using the key or key on the function selector section, move the needle to confirm that the position of the pattern has moved as illustrated in Fig. 2

Step 8 Press the key or key until the needle has moved to position ② shown in Fig. 2.

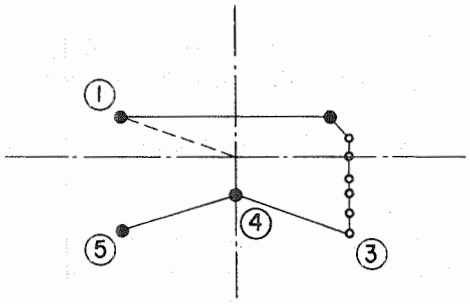


Fig. 3

Step 9 Press the ▲ ◀ ▶ ▼ keys on the function selector section so that " " LED lights up.

(Set the function to "Point deletion (absolute)".)
Then press the key on the function selector section.

Step 10 Then the following indication will be shown on the display.

```
B 1  CNVT  PNT (Y/C) ?
  B 1 B 1  DL  PNT · A=  1
```

Press the key on the set value input section.

Step 11 If you wish to delete a certain number of entry points, designate the section consisting the points to be deleted by pressing the key on the function selector section to move the needle. Now press the key on the set value input section only.

Step 12 Move the needle using the key or key on the function selector section, and confirm that the needle entry point has been erased as illustrated in Fig. 3.

Step 13 Move the needle to the position where a point is to be added (the position where the needle stayed upon execution of step 11). Then press the ▲ ◀ ▶ ▼ keys on the function selector section so that " "

LED lights up.
(Set the function to "Point addition (absolute)".)
Then press the key on the function selector section.

Step 14 The following indication will be shown on the display.

```
B 1  CNVT  PNT (Y/C) ?
  B 5 B 1  ADD  PNT · A
```

Press the key on the set value input section.

Step 15 Press the ▲ ◀ ▶ ▼ keys on the JOG input section until the needle reaches the position where a point is to be added. Then press the key on the JOG input section.

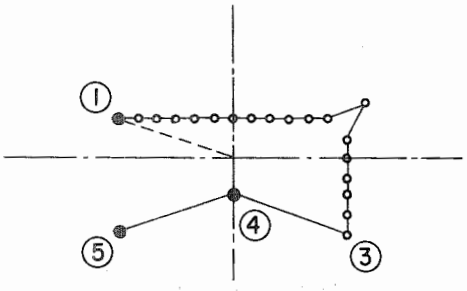


Fig. 4

Step 16 Move the needle using the key or key on the function selector section, and confirm that the needle entry point has been added as illustrated in Fig. 4.

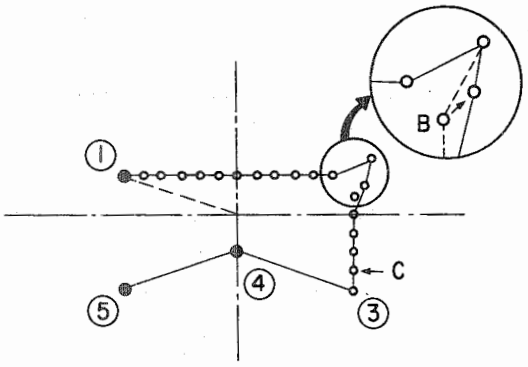


Fig. 5

Step 17 Move the needle to position B as illustrated in Fig. 5. Then press the keys on the function selector section so that " " LED lights up. (Set the function to "Point movement (absolute)".)

Then press the key on the function selector section

Step 18 The following indication will be shown on the display

B 5 CNVT PNT (Y/C) ?
B 5 B 5 MOVE PNT · A

Press the key on the set value input section.

Step 19 Press the keys on the JOG input section until the needle reaches the position where a point is to be moved. Then press the key on the JOG input section.

Step 20 Move the needle using the key or key on the function selector section, and confirm that the needle entry point has been moved as illustrated in Fig. 5

Step 21 Move the needle to position C as illustrated in Fig. 5.

Then press the keys on the function selector section so that " " LED lights up. (Set the function to "Point deletion (relative)".)

Then press the key on the function selector section.

Step 22 The following indication will be shown on the display.

```
B5  CNVT  PNT (Y/C) ?
B5 B5  DL  PNT·R=  1
```

Press the key on the set value input section.

Step 23 Press the key on the function selector section until the needle reaches position (3) in Fig. 5. Then press the key on the set value input section.

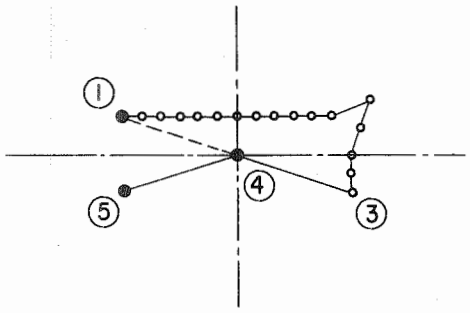


Fig. 6

Step 24 Move the needle using the key or key on the function selector section, and confirm that the needle entry point has been erased and the pattern after the deleted point has moved as illustrated in Fig. 6.

Step 25 Move the needle to position (4) in Fig. 6.

Then press the keys on the function selector section so that " " LED lights up.
(Set the function to "Point movement (relative)".)
Then press the key on the function selector section.

Step 26 The following indication will be shown on the display.

```
B1  CNVT  PNT (Y/C) ?
B1 B1  MOVE  PNT·R
```

Press the key on the set value input section.

Step 27 Press the keys on the JOG input section until the needle reaches the position where a point is to be moved. Then press the key on the JOG input section.

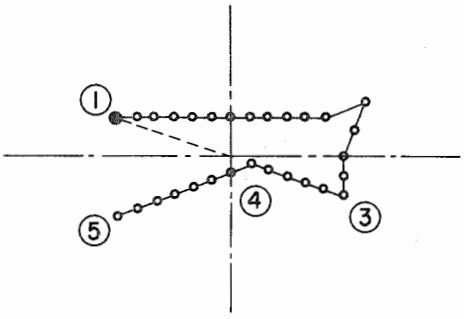


Fig. 7

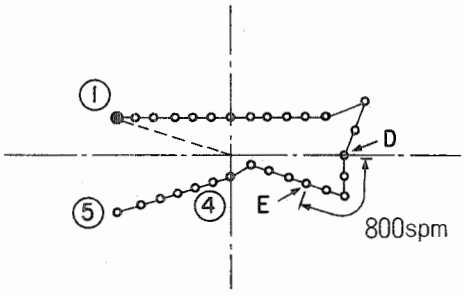


Fig. 8

Step 28 Move the needle using the key or key on the function selector section, and confirm that the needle entry point has been moved and the pattern after the moved point has moved as illustrated in Fig. 7.

Step 29 Move the needle to position D shown in Fig. 8.

Then press the keys r on the function selector section so that " " LED lights up. (Set the function to "Point speed changing".)
Then press the key on the function selector section.

Step 30 Press the key or key until the desired speed is shown on the display (set to 800 s.p.m. in the example given). Press the key on the set value input section.

Step 31 Press the key on the function selector section until the needle has been brought to position E. Then press the key on the set value input section.

Step 32 Move the needle using the key or key on the function selector section, and confirm that the sewing speed for the section shown in Fig. 8 has been changed by the indication on the display.

< Test sewing >

By performing test sewing, you should confirm the shape of the pattern read out from the floppy disk or created using the input functions.

Step 1 Press the [T] key on the function selector section. For the AMS-205B/-206B, press the "Set Ready" switch after pressing the [T] key.

Step 2 The feeding frame will retrieve the origin and move to the sewing start position. The work clamp then will go up.

Step 3 Test sewing can be performed during a normal sewing procedure. By performing test sewing, check the shape of the created pattern data before you start actual sewing. (Refer to the Instruction Manual for the sewing machine regarding the sewing machine operation.)

Step 4 After completion of test sewing, press the [Test sewing] key on the main unit of the sewing machine when the PGM-5 is used with the AMS-210B/-220B/-224B.
Press the "Set Ready" switch if the PGM-5 is used with the AMS-205B/-206B.
The feeding frame will retrieve the origin. The work clamp will come down. Now the machine will enter the standby mode, waiting for a function to be set after the origin retrieval (before the created pattern data). If you wish to modify the pattern data or add more data, press [L] key to move the needle.

(Caution) Refer to the Instruction Manual for the main unit input function regarding the [Test sewing] key. Refer to the Instruction Manual for the sewing machine regarding the "Set Ready" switch.

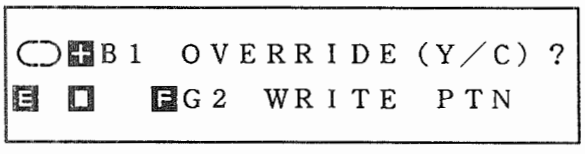
< Pattern writing >

Write onto the floppy disk the pattern which has either been read from the floppy disk or created using the input functions.

Step 1 Then press the [▲] [◀] [▶] [▼] keys on the function selector section so that " " LED lights up.

(Set the function to "Pattern writing".) Then press the [↑] key on the function selector section.

Step 2 Press the [▲] key or [▼] key on the set value input section until the output pattern number of the data which is desired to be written onto the floppy disk is shown. Then press the [↑] key.
The machine checks whether the designated pattern data have already been stored under the specified number on the floppy disk. If the pattern data are already stored on the floppy disk under the designated number, the following indication will be shown on the display.
If the pattern data under the designated number are not stored on the floppy disk, the data will be written onto the floppy disk under the designated number.



If you wish to update the data stored on the floppy disk under the designated number, press the [↑] key on the set value input section.
If you wish to cancel writing the pattern data onto the floppy disk under the designated number, press the [CL] key on the JOG input section.

< Pattern reading >

Pattern data stored on the floppy disk are read out from it.

Step 1 Press the ▲ ◀ ▶ ▼ keys on the function selector section so that " " LED lights up.

(Set the function to "Scale setting".) Then press the key on the function selector section.

Step 2 Press the ▲ key or ▼ key on the set value input section until the desired x-scale is shown on the display. Then press the key on the set value input section. (For the AMS-210B/-220B/-224B, scale should be 1 to 400% (100% is the original size). For the AMS-205B/-206B, scale should be 1 to 255% (100% is the original size).)

Step 3 Press the ▲ key or ▼ key on the set value input section until the desired y-scale is shown on the display. Then press the key on the set value input section. (For the AMS-210B/-220B/-224B, scale should be 1 to 400% (100% is the original size). For the AMS-205B/-206B, scale should be 1 to 255% (100% is the original size).) Note that steps 1 through 3 described above are unnecessary if the pattern is not enlarged/reduced.
For the AMS-205B/-206B, the enlarging/reducing method is specified after this step. Press the ▲ key or ▼ key on the set value input section until the desired method of enlargement/reduction is shown on the display and then press the key on the set value input section.

Step 4 Press the ▲ ◀ ▶ ▼ keys on the function selector section so that " " LED lights up.

(Set the function to "Pattern reading".) Then press the key on the function selector section.

Step 5 Press the ▲ key or ▼ key on the set value input section until the desired pattern number is shown on the display. Then press the key. Now the machine starts reading the pattern desired from the floppy disk.

< ROM edition >

<< ROM edition No. 1 >>

A pattern number is changed.

Step 1 Press the ▲ ◀ ▶ ▼ keys on the function selector section so that " " LED lights up.

(Set the function to "ROM pattern copy".)

Step 2 Press the ▲ key or ▼ key on the set value input section until the copying method is set to " ▦ → M/PART ". Then press the ↵ key on the set value input section.

Step 3 Press the ▲ key or ▼ key on the set value input section until the pattern number to be used as the source of copy is indicated on the display. Then press the ↵ key on the set value input section.

Step 4 Press the ▲ key or ▼ key on the set value input section until the pattern number to be used as the destination of copy is indicated on the display.
Then press the ↵ key on the set value input section.

Step 5 Press the ▲ ◀ ▶ ▼ keys on the function selector section so that " " LED lights up.

(Set the function to "ROM pattern deletion".)

Step 6 Press the ▲ key or ▼ key on the set value input section until the objective of deletion is set to " ▦ /PART ". Then press the ↵ key on the set value input section.

Step 7 Press the ▲ key or ▼ key on the set value input section until the pattern number to be deleted is indicated on the display. Then press the ↵ key on the set value input section.

Step 8 Press the ▲ ◀ ▶ ▼ keys on the function selector section so that " " LED lights up.

(Set the function to "ROM pattern copy".)

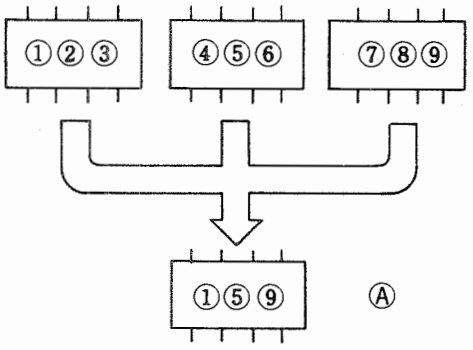
Step 9 Press the ▲ key or ▼ key on the set value input section until the copying method is set to " M → ▦ /PART ". Then press the ↵ key on the set value input section.

Step 10 Press the ▲ key or ▼ key on the set value input section until the pattern number to be used as the source of copy is indicated on the display. Then press the ↵ key on the set value input section.

Step 11 Press the ▲ key or ▼ key on the set value input section until the pattern number to be used as the destination of copy is indicated on the display. Then press the ↵ key on the set value input section.

<< ROM edition No. 2 >>

Several pattern data stored on the ROM are gathered to be unified as one ROM



Step 1 Press the ▲ ◀ ▶ ▼ keys on the function selector section so that " [ROM pattern copy] " LED lights up.
(Set the function to "ROM pattern copy".)

* The [ROM] in the figure indicates the ROM and ① through ⑨ indicate the pattern data.
* Pattern data ①, ⑤ and ⑨ are gathered from the relevant ROMs and they are made to one ROM pattern data.

Step 2 Press the ▲ key or ▼ key on the set value input section until the copying method is set to " [ROM] → M/PART ". Then press the [SET] key on the set value input section.

Step 3 Press the ▲ key or ▼ key on the set value input section until the pattern number to be used as the source of copy is indicated on the display. Then press the [SET] key on the set value input section.

Step 4 Press the ▲ key or ▼ key on the set value input section until the pattern number to be used as the destination of copy is indicated on the display. Then press the [SET] key on the set value input section.

Step 5 Repeat steps 1 through 4 until all the pattern data desired on the ROM buffer. Exchange the ROM loaded accordingly.

Step 6 Load ROM Ⓐ on the device on which the gathered pattern data are to be written.

Step 7 Press the ▲ ◀ ▶ ▼ keys on the function selector section so that " [ROM pattern copy] " LED lights up.
(Set the function to "ROM pattern copy".)

Step 8 Press the ▲ key or ▼ key on the set value input section until the objective of deletion is set to " M → [ROM] /ALL ". Then press the [SET] key on the set value input section.

<< ROM edition No. 2 >>

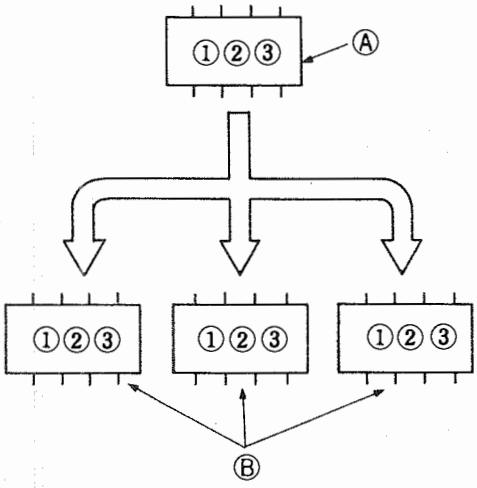
Certain pattern data are copied to make several numbers of the same pattern data on the several ROMs.

Step 1 Press the ▲ ◀ ▶ ▼ keys on the function selector section so that " " LED lights up.

(Set the function to "ROM pattern deletion".)

Step 2 Press the ▲ key or ▼ key on the set value input section until the copying method is set to " /ALL ". Then press the key on the set value input section (Erase all the pattern data stored on the).

Step 3 Load ROM (A) which is used as the original.



* The in the figure indicates the ROM and (1) through (3) indicate the pattern data.

* Pattern data (1), (2) and (3) are stored on ROM (A). The same pattern data are copied onto ROM (B)

Step 4 Press the ▲ ◀ ▶ ▼ keys on the function selector section so that " " LED lights up.

(Set the function to "ROM pattern copy".)

Step 5 Press the ▲ key or ▼ key on the set value input section until the copying method is set to " → /ALL ". Then press the key on the set value input section.

Step 6 Load ROM (B) on which the copied pattern data are created.

Step 7 Press the ▲ ◀ ▶ ▼ keys on the function selector section so that " " LED lights up.

(Set the function to "ROM pattern copy".)

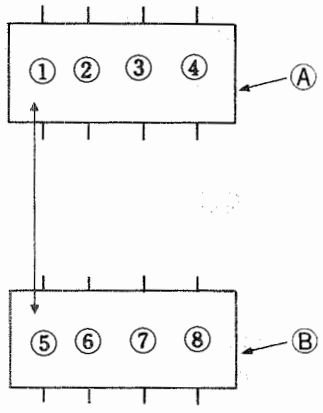
Step 8 Press the ▲ key or ▼ key on the set value input section until the objective of deletion is set to " → /ALL ". Then press the key on the set value input section.

Step 9 Repeat steps 4 through 6.

<< ROM edition No. 3 >>

Pattern data are exchanged between the two different ROMs.

Step 1 Load the first ROM on the device.



*1. The ▭ in the figure indicates the ROM and ① through ⑨ indicate the pattern data.

*2. Pattern data ① stored on ROM Ⓐ is exchanged with pattern ⑤ stored on ROM Ⓑ with each other.

Step 2 Press the ▲ ◀ ▶ ▼ keys on the function selector section so that " " LED lights up.

(Set the function to "ROM pattern copy".)

Step 3 Press the ▲ key or ▼ key on the set value input section until the copying method is set to " → M/PART ". Then press the key on the set value input section.

Step 4 Press the ▲ key or ▼ key on the set value input section until pattern number (①) to be used as the source of copy is indicated on the display. Then press the key on the set value input section.

Step 5 Press the ▲ key or ▼ key on the set value input section until pattern number (⑤) to be used as the destination of copy is indicated on the display.
Then press the key on the set value input section.

Step 6 Now, load ROM Ⓑ which is used next to ROM Ⓐ .

Step 7 Press the ▲ ◀ ▶ ▼ keys on the function selector section so that " " LED lights up.

(Set the function to "ROM pattern copy".)

Step 8 Press the ▲ key or ▼ key on the set value input section until the copying method is set to " → M/PART ". Then press the key on the set value input section.

Step 9 Press the ▲ key or ▼ key on the set value input section until pattern number (⑤) to be used as the source of copy is indicated on the display. Then press the key on the set value input section.

Step 10 Press the ▲ key or ▼ key on the set value input section until pattern number (①) to be used as the destination of copy is indicated on the display.
Then press the key on the set value input section.

Step 11 Load ROM Ⓐ on the device.

Step 12 Press the ▲ ◀ ▶ ▼ keys on the function selector section so that " " LED lights up.

(Set the function to "ROM pattern deletion".)

Step 13 Press the ▲ key or ▼ key on the set value input section until the copying method is set to "→/PART". Then press the key on the set value input section.

Step 14 Press the ▲ key or ▼ key on the set value input section until pattern number (①) to be erased is indicated on the display. Then press the key on the set value input section. (Erase the pattern data which are not necessary any longer.)

Step 15 Press the ▲ ◀ ▶ ▼ keys on the function selector section so that " " led lights up.

(Set the function to "ROM pattern copy".)

Step 16 Press the ▲ key or ▼ key on the set value input section until the copying method is set to "M→/PART". Then press the key on the set value input section.

Step 17 Press the ▲ key or ▼ key on the set value input section until pattern number (⑤) to be used as the source of copy is indicated on the display. Then press the key on the set value input section. (Call the pattern number you desired to copy on ROM Ⓐ on the display.)

Step 18 Press the ▲ key or ▼ key on the set value input section until pattern number (①) to be used as the destination of copy is indicated on the display. Then press the key on the set value input section. (Now, you can specify any pattern number as desired.)

Step 19 Load ROM Ⓑ on the device and repeat steps 12 through 18 following the way described. In this case, set the pattern number to be deleted in step 14 to ⑤ and set the pattern number to be used as the source of copy to ① and the pattern number to be used as the destination of copy to ⑤ in step 17.

* By following the steps of procedure described above, pattern numbers ②, ③, ④ and ⑤ are stored on ROM Ⓐ and ①, ⑥, ⑦, ⑧ and ⑨ are stored on ROM Ⓑ.

XI. ERROR CODES

If an error occurs when the PGM-5 is in operation, an error code will be shown on the "Error Display" section. According to the detailed information on the error, relevant detailed error code will be shown on the display as illustrated in Fig. 1, followed by a buzzer sound.

(Caution) When you perform test sewing etc., error indication will appear on the display of the main unit of the sewing machine. In this case, refer to the Instruction Manual for the sewing machine.

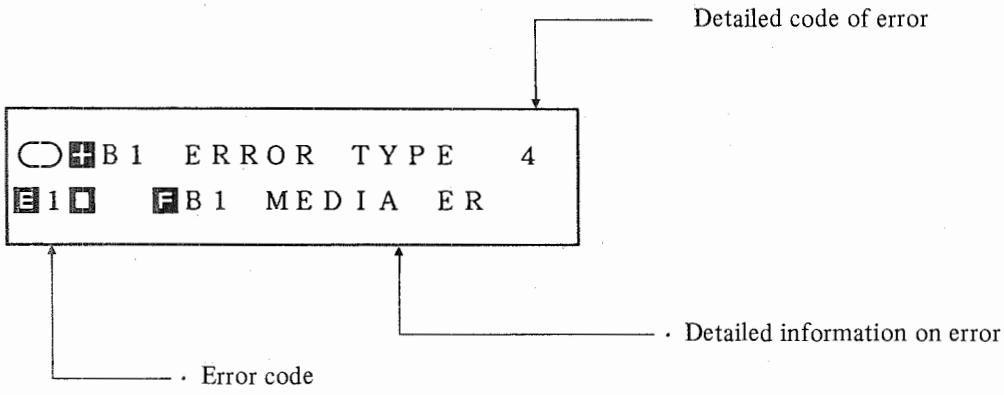


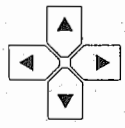
Fig. 1

[Corrective measure when an error occurs]

If the error code is indicated as shown in Fig. 1, press the key on the set value input section after the cause of the error has been fully checked. The needle will return to its origin.
Now, move the needle to the desired position by pressing the key or key on the function selector section. Then continue with the input procedure.

The following table shows the classification of cause and corrective measures using error codes (numbers) and detailed codes.

No.	Description	Cause	Corrective measure	Error during test sewing
1	Memory medium error Detailed code : 3	* An attempt has been made to read a pattern number not stored on the floppy disk. * An attempt has been made to write pattern data on the 1D type floppy disk.	* Re-read the desired pattern using the correct pattern number. * Replace the 1D type floppy disk with the MS-DOS type one and re-write the pattern data on it.	
	Detailed code : 4	The floppy disk has not been loaded.	Load the floppy disk.	
	Detailed code : 5	An error has occurred when reading the data from the floppy disk.	Try again. If the error occurs, the floppy disk may be damaged.	
	Detailed code : 6	An error has occurred when writing the data on the floppy disk.		
	Detailed code : 7	The write-protect tab is locked when writing the data on to the floppy disk.	Unlock the write-protect tab and write the data onto the disk.	
	Detailed code : 8	The floppy disk is full when writing the data onto the floppy disk.	Use another floppy disk.	
	Detailed code : 29	An error has occurred when writing the data on the EEP-ROM.	Try again. If the error occurs, the EEP-ROM may be damaged. In this case, replace the EEP-ROM.	
	Detailed code : 35	The number of patterns stored on the EEP-ROM has exceeded 32 (the maximum number of the patterns to be stored on the EEP-ROM).	Use another EEP-ROM.	

No.	Description	Cause	Corrective measure	Error during test sewing
1	Memory medium error Detailed code : 36	An attempt has been made to write the pattern data under a pattern number stored on the EEP-ROM.	Write the pattern data under another pattern number.	
	Detailed code : 37	An attempt has been made to read a pattern number not stored on the EEP-ROM.	Re-read the pattern using the correct pattern number.	
2	Enlargement error Detailed code : 18	The stitch length has exceeded the largest value, or the computable range has been exceeded in an attempt to make a pattern enlargement based on the number of stitches.	Re-set the x/y scale and start operation again.	
3				Needle up error
4	Travel limit error Detailed code : 9 : None	* When inputting a pattern, the maximum sewing area has been exceeded while operating the  keys. * The feeding frame is raised when inputting a pattern.	* Press any key other than the key of which direction has reached outside the sewing range. This allows the data to be input continuously. * For the AMS-210B/-220B /-224B Press the CL key on the JOG input section. Then depress the feeding frame switch so that the feeding frame comes down. * For the AMS-205B/-206B Press the feeding frame switch so that the feeding frame comes down. This allows the data to be input continuously.	

No.	Description	Cause	Corrective measure	Error during test sewing
4	Travel limit error Detailed code : 9 : None (Continued from the previous page)	* When moving the needle using the key or key on the function selector section, the maximum sewing area has been exceeded. * When moving the needle after the data input using the key on the JOG input section, the maximum sewing area has been exceeded.	* Since the data have been normally created, subsequent data can be entered continuously. However, the maximum sewing area has been exceeded, correct the data so that they do not exceed the maximum sewing area.	
5				Emergency stop error
6	Input error when the handy input device is used Detailed code : 1	During data input, an error has occurred due to a misoperation.	Perform the series of operations from the function setting again.	
	Detailed code : 2	* The number of stitches in the pattern has exceeded the maximum number of stitches. * At the time of creating a pattern using the zigzag stitching input function, the number of needle entry points has been exceeded the maximum number.	* Check the number of stitches. (You may create a pattern containing the number of stitches described in the specifications.) * Divide the pattern accordingly and create the patterns so that the number of needle entry points does not exceed the maximum number.	
	Detailed code : 10	A hardware error has occurred.	Perform the series of operations from the function setting again.	
	Detailed code : 13	The data read from the floppy disk contain an error.	Confirm the pattern data.	
	Detailed code : 15	The data for point stitching in the pattern contain a stitch whose length exceeds the maximum stitch length.	Add a point to the pattern data so that stitch length does not exceed the maximum value.	

No.	Description	Cause	Corrective measure	Error during test sewing
6	Input error when the handy input device is used Detailed code : 28	The EEP-ROM is full when writing the data onto it.	Replace the EEP-ROM.	
	Detailed code : 30 to 34, 38, 39, 41, 50 to 53	Hardware error	You should repair the main unit of the PGM-5.	
	Detailed code : None	During data input, an error has occurred due to a misoperation.	Perform the series of operations from the function setting again.	
7				Machine lock or needle position detector error
8				Solenoid connector error
9				Thread breakage error

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Please do not hesitate to contact our distributors or agents in your area for further informations when necessary.

※Appear and specification listed in this instruction manual are subjected to change without notice.

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