

**PROGRAMMABLE ELECTRONIC PATTERN SEWER
WITH CYLINDER BED PROFILE S III
PROGRAMMER**

BAS-304

INSTRUCTION MANUAL



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EXPLANATION OF THE KEYBOARD AND DISPLAY

X/Y display

This display indicates the amount of work clamp movement in the X direction or Y direction when the feed key is pressed.

Command indicator

The command indicator will illuminate when the feed key, mirror key, cancel key, or line key is pressed, i.e., only if they are operating properly.

Feed key

After the thread trimming operation is completed this key is to be used if the sewing operation is not to be restarted immediately following the position at which the thread trimming operation was performed.

Mirror key

This key is to be used to program a symmetrical mirror image of a pattern design which has already been input or to program a turning pattern design. It is also to be used to perform such operations as enlarging/reducing.

Cancel key

This key is to be used to cancel any of the points in the pattern design which has already been programmed.

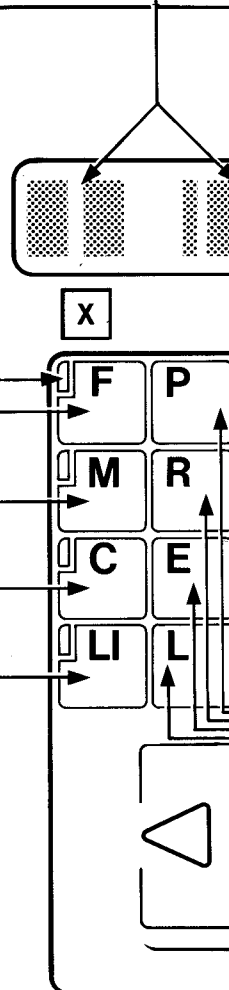
Line key

This key enables the operator to easily program the straight-line portion of the pattern design.

Direction keys

When these keys are pressed, the position of the needle will move in the direction indicated by the arrow.

However, if the command indicator "F", "M" or "LI" is not displayed, the position of the needle will not move more than 8.0 mm.



STEP display

- This display indicates the number of steps when the **+** key or **-** key is used.
- It also indicates the various numerical input commands.
- If the programmable sewing speed becomes less than 500 spm while in the (**L**) mode, the display will flash on and off up to 100 spm to warn the operator.

Numerical keys

When these keys are pressed, they will be indicated on the display in sequential order below the STEP display.

Minus key

- When this key is pressed, the work clamp will move in reverse of the program direction as many steps (i.e., the number of times the **L** key is pressed) indicated on the STEP display.
- If any input command key is pressed accidentally, this key can be used to clear the command.

Plus key

- When this key is pressed, the work clamp will move in the program direction as many steps (i.e., the number of times the **L** key is pressed) indicated on the STEP display.
- If any input command key is pressed accidentally, this key can be used to clear the command.

Program key

This switch is to be used to select either the sewing mode or the program mode.

Reset key

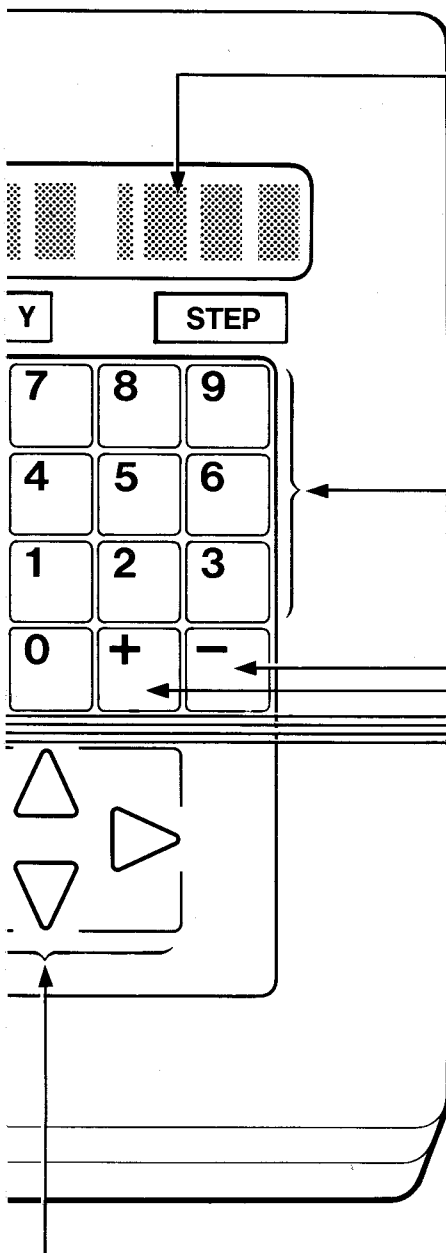
If this key is pressed during the program mode, the presser clamp will move to the point of origin. Furthermore, if "222" is displayed in the STEP display and the **R** key is pressed, the program will be erased completely.

End key

Upon completion of a program, if "111" is displayed on the STEP display and the **E** key is pressed, the termination of the stitch pattern will be programmed.

Load key

If this key is pressed, the position of the needle at that time will be programmed. Note that even if this key is pressed more than once while the needle is maintained in the same position, the input command will be programmed only once.



COMMAND LIST

- This command list is to be used to program an operation. Refer to this list to input the program correctly.

111 E END

222 R DATA CLEAR

333 L REPEAT

555 L TRACE

666 L LOW SPEED

440 L POINT SYMMETRY

441 L X SYMMETRY

442 L Y SYMMETRY

443 L REVERSE

001 M ORIGINAL

011 M / 010 M

F 666 SPLIT PROGRAMS

F 777 HORIZONTAL MOVEMENT IN MID-PROGRAM

F 888 SPLIT PROGRAMS WITH NO THREAD TRIMMING

F 999 BASTING PROGRAMS

888 M EXPANSION/CONTRACTION MODE SPECIFICATION

F EXPANSION/CONTRACTION MODE RATIO SPECIFICATION

M EXPANSION/CONTRACTION MODE RATIO SPECIFICATION

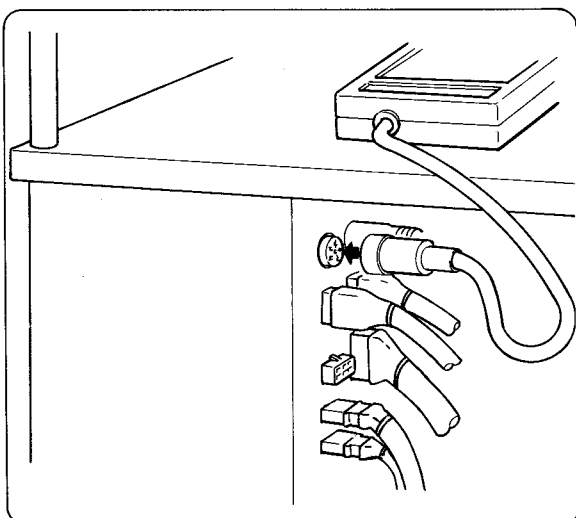
M Smoothing (Set pitch, ex.: for 3 mm pitch, enter 030 M .)

789 L Smoothing terminate, be to sure enter at every corner.

2 M Double stitch command (Set width, ex.: for 2 mm width, enter 220 M .)

9 M Enlarged input command (Set enlargement ratio; ex.: to double the size, enter 902 M .)

HOW TO USE THE PROGRAMMER



- (1) Connect the cord of the programmer to the terminal in the control box.
- (2) Turn the power on, and then press the P key (program key) to enter the program mode.
- (3) When programming is completed, press the P key again to cancel the program mode and enable sewing.

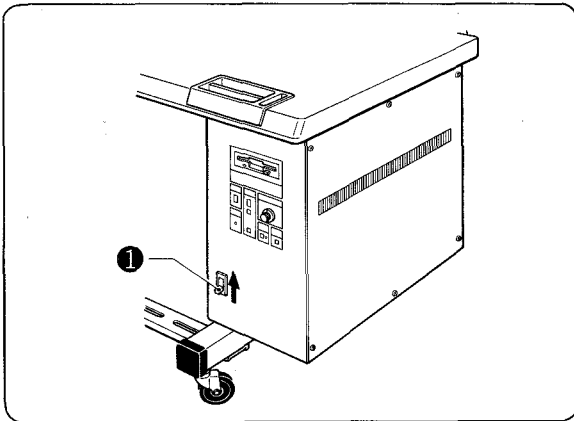
PROGRAMMING PROCEDURE

1 Preliminary procedure

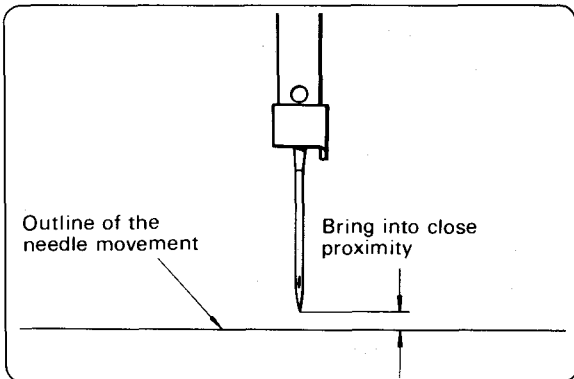
- (1) Outline the pattern of the needle movement on a piece of graph paper.
 At this time, be sure to use a thin piece of graph paper.
 Tape the pattern of the needle path to the feed plate so that it will not move.

«Note»

- Outline the pattern design to actual size. (If an enlarged pattern is used, draw the pattern to 2, 5, or 10 times actual size.)
- Design the pattern in such a way that the stitch length does not exceed 8.0 mm in either the X or Y direction.
- The maximum spm is 2,000.
- The maximum pattern size is 50 mm in the X direction and 50 mm in the Y direction.
- There are no limits in establishing the initial stitch position, performing a backstitch operation, or setting the sewing direction.



- (2) Turn the power switch ① on.



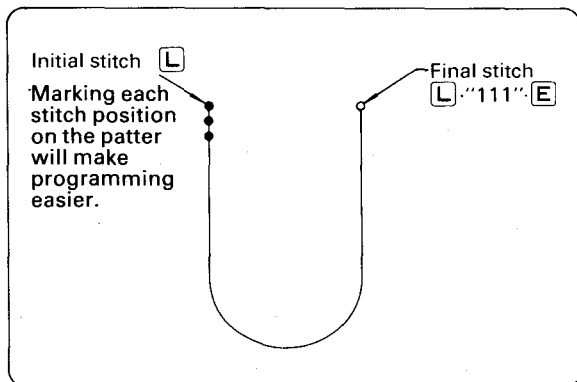
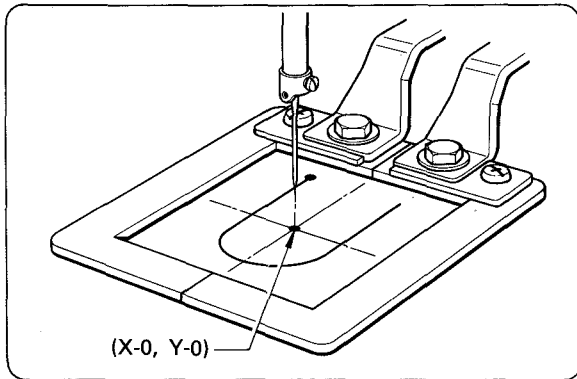
- (3) Manually rotate the pulley to move the needle point along the stitch pattern.

☆ Cautions on sewing

- The sewing speed of this machine is automatically regulated according to the stitch length. The relationship between stitch length and sewing speed is shown in the table below.

| Stitch length | Sewing speed |
|---------------|-------------------|
| 0.2 ~ 3.0 mm | 1,000 ~ 2,000 spm |
| 3.2 ~ 4.4 mm | 750 ~ 1,500 spm |
| 4.6 ~ 6.2 mm | 600 ~ 1,200 spm |
| 6.4 ~ 8.0 mm | 600 ~ 800 spm |

2 To program the pattern one stitch at a time

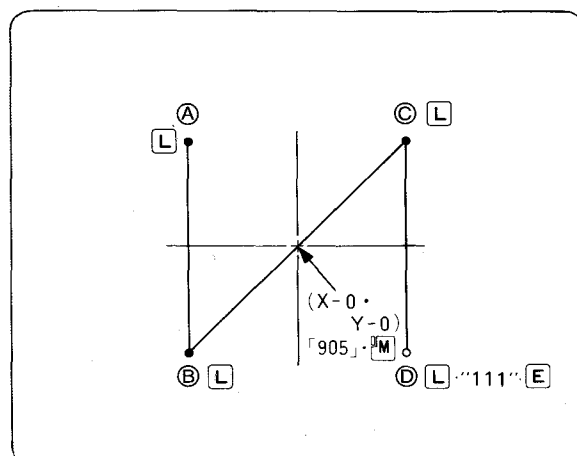
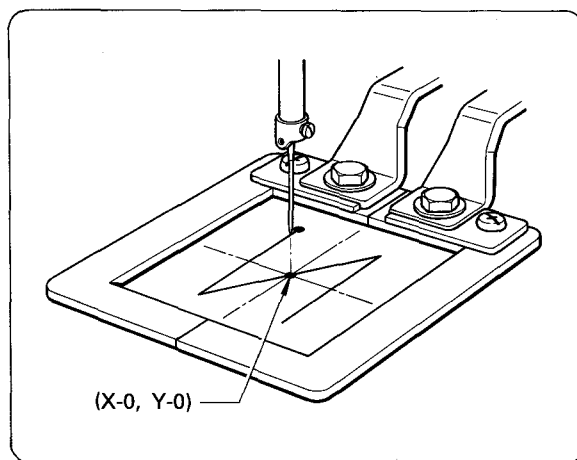


Example: Program the pattern in the figure at left.

- (1) Press the **[P]** key. The work clamp will move to the point of origin (X-0; Y-0), the numeral "0" will be indicated on the STEP display, and the command indicator "F" will illuminate.
 - (2) Operate the direction keys to move the work clamp to the initial stitch position.
 - (3) When the tip of the needle and the initial stitch position on the outline of the needle movement become aligned, press the **[L]** key. Thus, the initial stitch will be programmed.
 - (4) Repeat the above procedure to program the remaining stitches of the pattern.
 - (5) After the **[L]** key is pressed to program the final stitch, press the numeral key **[1]** 3 times to indicate "111" on the STEP display, and then press the **[E]** key.
 - (6) The work clamp will move back to the initial stitch position.
 - (7) Press the R/W switch to write the pattern to disk.
(Refer to page 24.)
- ※ Press the **[P]** key to enter the sewing mode.

3 To program with the enlarged input mode

- Programming a fine pattern stitch by stitch is simplified by enlarging the pattern and entering it with the enlarged input mode.



Example: Program the pattern below with a 5-times enlargement of the actual pattern.

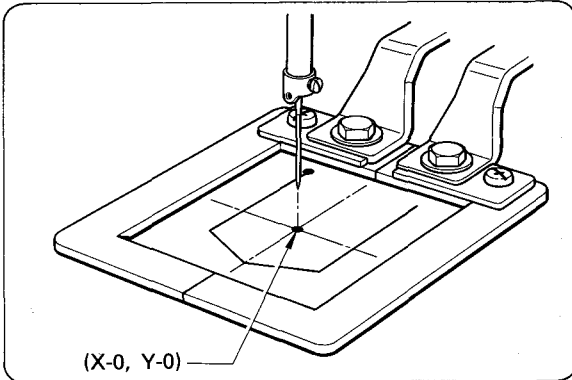
- (1) Prepare the pattern used for programming. (This should be a 500% enlargement (based on the center point of the work clamp) of the actual pattern.)
 - (2) Press the **[P]** key. The work clamp will move to the point of origin (X-0; Y-0), "0" will appear in the STEP display, and command indicator "F" will light.
 - (3) Use the numerical keypad to display 9 in the STEP display. The last two digits entered are the enlargement ratio, which can be set for 2, 5, or 10 times. As a 5-times enlargement is being used, the display should read "905".
 - (4) Press the **[M]** key.
 - (5) Use the direction keys to position the needle at sewing start position the **[A]** on the pattern, and then press the **[L]** key.
The first stitch is now programmed.
 - (6) Use the direction keys and **[L]** key to program each of the successive points **[B]** through **[D]**.
 - (7) After pressing the **[L]** key at **[D]**, press numeral key **[1]** three times. Confirm that "111" is in the STEP display, and then press the **[E]** key.
 - (8) The work clamp will return to the initial stitch position.
※ To check the program, press key **[9]** three times to display "999" in the STEP display, and then press the **[+]** key. The work clamp will move stitch by stitch through the pattern starting at the initial stitch position.
 - (9) Press the R/W switch to write the pattern to disk.
(Refer to page 24.)
- ※ Press the **[P]** key to enter the sewing mode.

4 To program a stitch pattern containing numerous straight lines in the pattern design

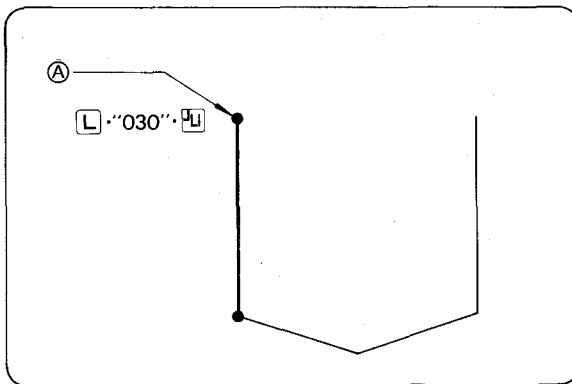
- To program the straight-line portions of the pattern design, use the **[L]** key (Line key) to facilitate the programming operation.

Example: Program the pattern in the figure below.

- (1) Press the **[P]** key. The work clamp will move to the point of origin (X-0; Y-0), the numeral "0" will be indicated on the STEP display, and the command indicator "F" will illuminate.
- (2) Operate the direction keys to move the work clamp to the initial stitch position.
- (3) When the tip of the needle and the initial stitch position **(A)** on the outline of the needle movement become aligned, press the **[L]** key. Thus, the initial stitch will be programmed.



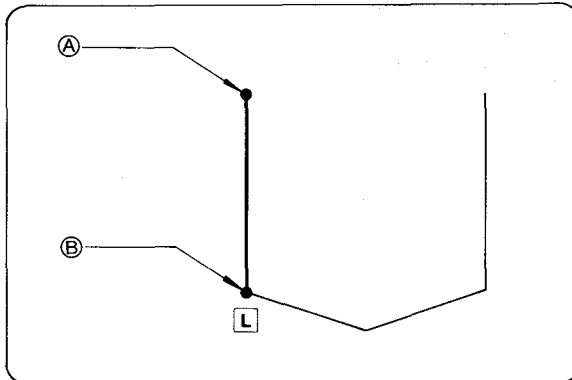
- (4) Operate the numeral keys to indicate the proper pitch on the STEP display.
(For example, to set the proper stitch length when the actual stitch length is 3 mm, use the numeral keys to indicate "030" on the STEP display.)
* If the pitch is not indicated on the STEP display, or if it exceeds 8.0 mm "080", it will automatically be set to 2 mm.
- (5) Press the **[L]** key. The command indicator "LI" will illuminate.



- (6) Use the direction keys to move the work clamp to the final stitch position **(B)** on the straight line portion of the pattern design.

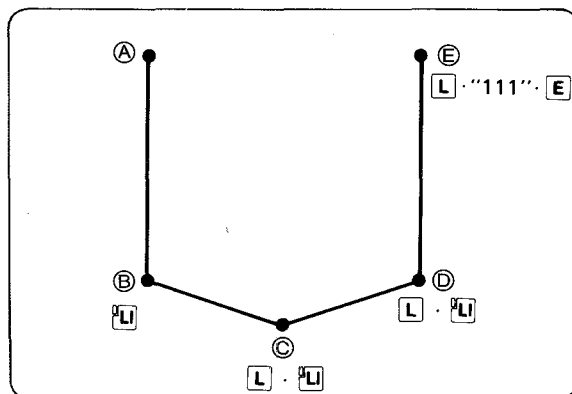
Note 1 When more than 120 stitches are required between point **(A)** and point **(B)**, the operation speed of the work clamp will suddenly decrease to warn the operator.

Therefore, press the **[L]** key and then the **[L]** key between point **(A)** and point **(B)** to reprogram the remaining stitches on the straight-line portion of the pattern design.



- (7) Press the **[L]** key when the tip of the needle becomes aligned with point **(B)** on the outline of the needle movement. Thus, the straight-line portion from point **(A)** to point **(B)** will be programmed.
- (8) Repeat the above procedure to program the remaining straight-line portions from point **(B) → C**, **(C) → D**, **(D) → E**.

Note 2 For diagonal lines, e.g. **(B) → C**, **(C) → D**, there are instances in which the line may not turn out to be straight unless the line is subdivided into smaller portions.

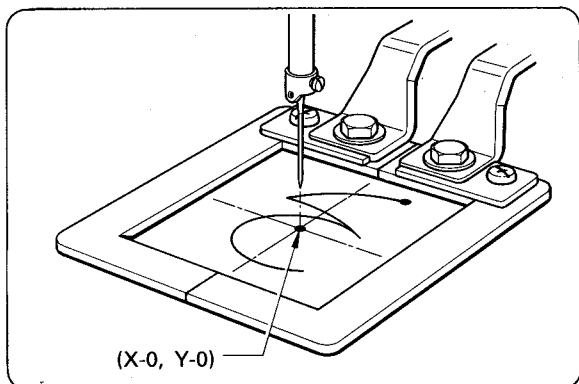


- (9) Press the **[L]** key at the position indicated by the letter **(E)**. Then, press the numeral key **[1]** 3 times to indicate "111" on the STEP display, and then press the **[E]** key.
- (10) The work clamp will move back to the initial stitch position.
- (11) Press the R/W switch to write the pattern to disk.
(Refer to page 24.)
* Press the **[P]** key to enter the sewing mode.

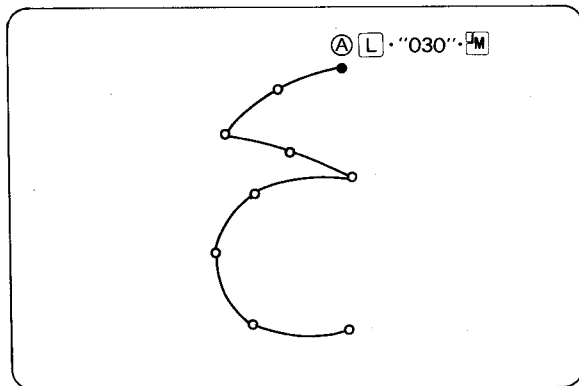
5 To program with the smoothing function

- Curved line patterns can be programmed more simply using the numerical keypad and the **[M]** key instead of programming stitch by stitch.

Example: Program the pattern in the figure below.



- (1) Press the **[P]** key. The presser clamp will move to the point of origin (X-0, Y-0), "0" will appear in the STEP display, and command indicator "F" will light.
- (2) Use the direction keys to move the work clamp to the initial stitch position.



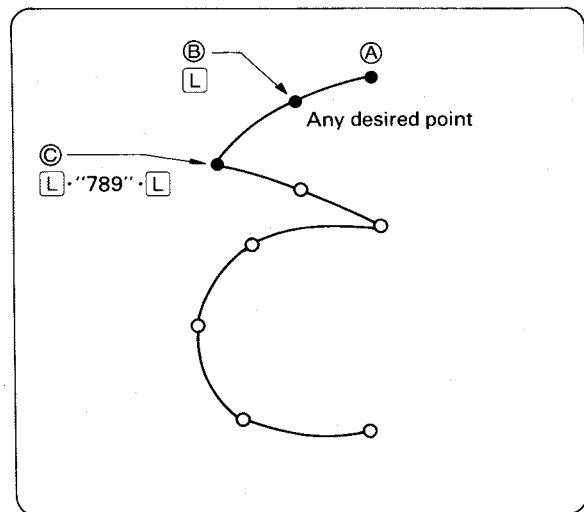
- (3) Use the direction keys to position the needle at sewing start position ① on the pattern, and then press the **[L]** key.

The first stitch is now programmed.

- (4) Use the numeral keys to enter the stitch length in the STEP display. (e.g., If the stitch length is 3 mm, "030" should be displayed.)

※ If the stitch length is not specified, or if a stitch length greater than 8.0 mm ("080" in the STEP display) is entered, it will be automatically be reset to 2 mm.

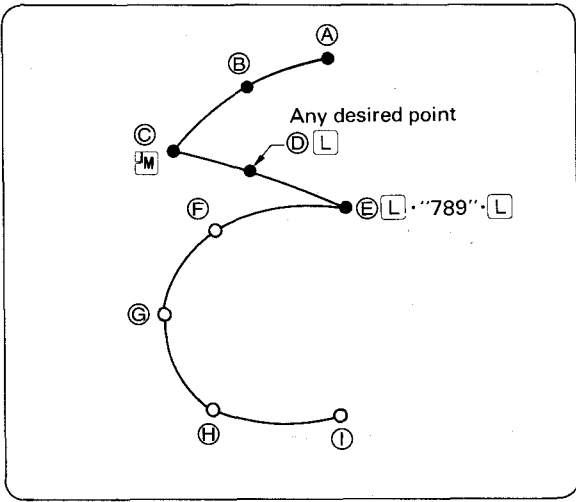
- (5) Press the **[M]** key. Command indicators "F" and "M" will be on.



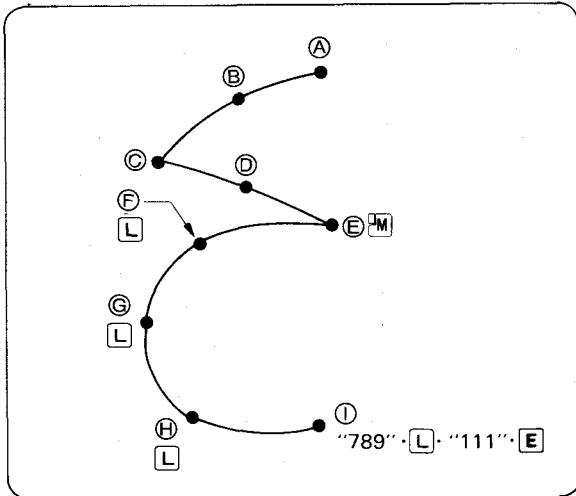
- (6) Use the direction keys to move to point ②, and then press the **[L]** key. Point ② is now programmed.

- (7) Use the direction keys to move to point ③, and then press the **[L]** key. Point ③ is now programmed.

- (8) At corners such as ③, as the pattern should be broken. Display "789" in the STEP display, and press the **[L]** key. An electronic alarm will beep, indicating the pattern is being processed. This completes programming of interval ① ~ ③.



- (9) Press the **M** key. (If the stitch length is to be changed, specify the new stitch length before pressing the **M** key.)
- (10) Use the direction keys to move to points **D**, and then press the **L** key. Point **D** is now programmed.
- (11) Use the direction keys to move to point **E**, and then press the **L** key. Point **E** is now programmed.
- (12) As in step (8), display "789" in the STEP display, and press the **L** key. This completes programming of interval **C ~ E**.



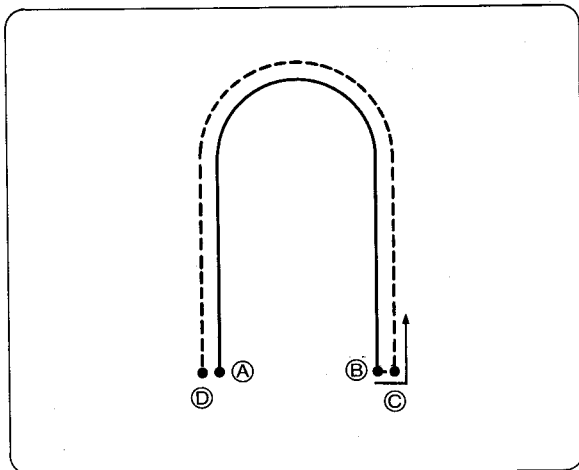
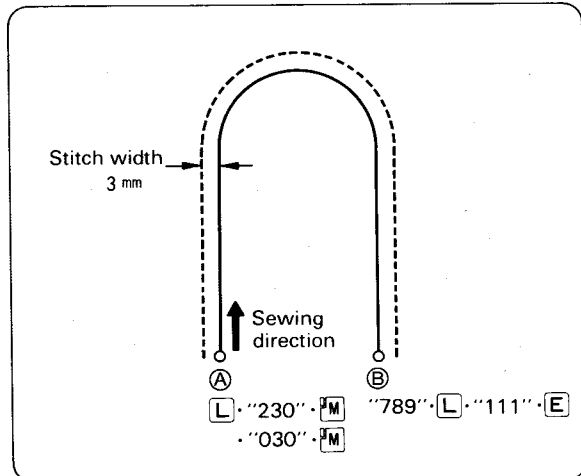
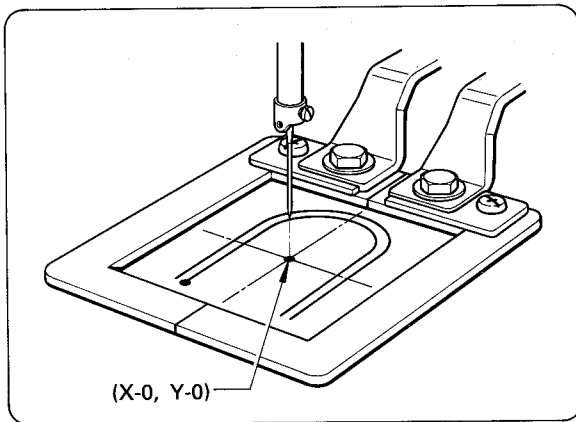
- (13) Press the **M** key. (if the stitch length is to be changed, specify the new stitch length before pressing the **M** key.)
- (14) Use the direction keys and the **L** key to program points **F**, **G** and **H**.
- (15) As in step (8), at the last point **I** display "789" in the STEP display, and press the **L** key. This completes programming of interval **E ~ I**.
 - * Programming can also be continued from point **I** after step (15).
- (16) Press numeral key **1** three times. Confirm that "111" is in the STEP display, and then press the **E** key.
- (17) The work clamp will return to the initial stitch position.
- (18) Press the R/W switch to write the pattern to disk. (Refer to page 24.)
 - * Press the **P** key to enter the sewing mode.

Note 1 At corners such as **C** and **E**, be sure to break the pattern. If the pattern is not broken, these corners will also be rounded by the smoothing function.

Note 2 Using as many intermediate points (**B**, **D**, **F**, **G**, **H** in the figure) as possible will provide better results.

6 To program double stitch patterns

- Programming a pattern with two seams at a constant width apart can be easily accomplished with smoothing.
- When sewing a double seam pattern as shown below, the second seam will be sewn to the left of the base (main) pattern line. It is therefore necessary to consider and determine the base line of the pattern to obtain the desired effect.



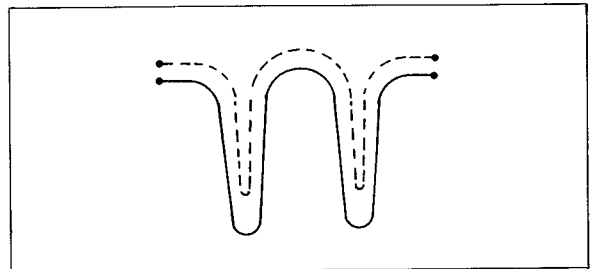
Example: Program the pattern in the figure at left.

- (1) Press the **[P]** key. The work clamp will move to the point of origin (X-0; Y-0), "0" will appear in the STEP display, and command indicator "F" will light.
- (2) Use the direction keys to move the work clamp to the initial stitch position.
- (3) Use the direction keys to position the needle at the sewing start position **(A)** on the pattern, and then press **[L]** key. The first stitch is now programmed.
- (4) Use the numerical keypad to display "2□□" in the STEP display. The last two digits entered are the stitch width, which can be set from 2 ~ 9.8 mm. If a 3 mm stitch width is desired, the display should read "230".
- (5) Press the **[M]** key.
- (6) Use the numeral keys to enter the stitch length in the STEP display. (e.g., If the stitch length is 3 mm, "030" should be displayed.)
- ※ If the stitch length is not specified, or if a stitch length greater than 8.0 mm ("080" in the STEP display) is entered, it will be automatically be reset to 2 mm.
- (7) Press the **[M]** key. Command indicators "F" and "M" will be on.
- (8) Program to point the **(B)** using the smoothing function. (See **[5]** Smoothing, page 7.)
- (9) At **(B)**, enter "789" in the STEP display with the keypad, and press the **[L]** key. Then press the **[I]** key three times to display "111", and press the **[E]** key. An electronic alarm will beep, indicating the pattern is being processed. After processing is completed, the needle will move slowly from **(B)** → **(C)** → **(D)**. Programming is completed when the needle reaches **(D)**.
- (10) Press the R/W switch to write the pattern to disk. (Refer to page 24.)

※ Press the **[P]** key to enter the sewing mode.

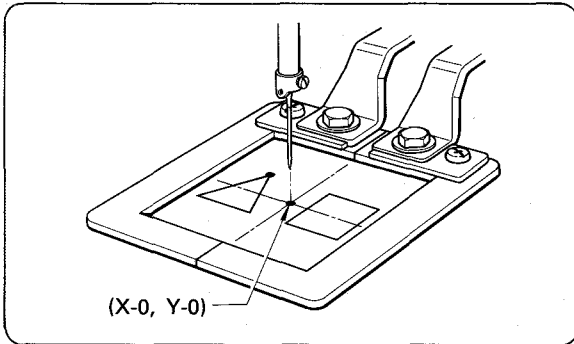
Note 1 Be sure to use the smoothing function alone when programming double stitch patterns.

Note 2 If the base pattern contains extremely short corners or fine curves, it may not be possible to obtain the desired double stitch pattern.



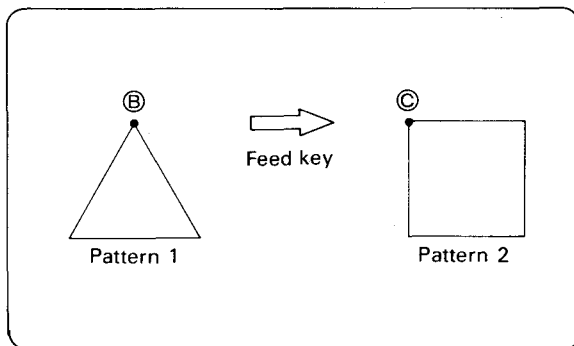
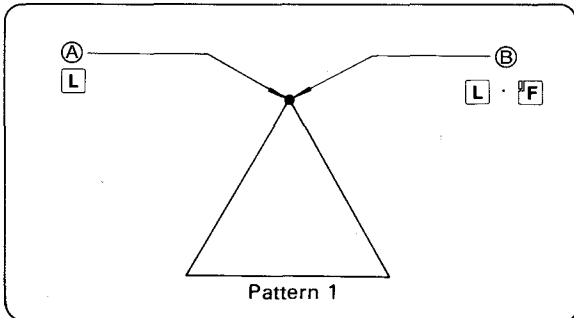
7 To program an intermittent stitch sewing operation

- After the thread trimming operation is completed, if the sewing operation is to be continued without lifting the work clamp, use the **F** key (Feed key) to facilitate the programming operation.

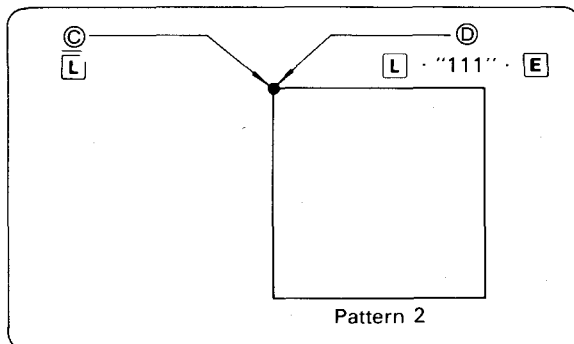


Example: Program the pattern in the figure at left.

- (1) Press the **P** key. The work clamp will move to the point of origin (X-0; Y-0), the numeral "0" will be indicated on the STEP display, and the command indicator "F" will illuminate.
- (2) Operate the direction keys to move the work clamp to the initial stitch position.
- (3) When the tip of the needle and the initial stitch position **A** on the outline of the needle movement become aligned, press the **L** key. Thus, the initial stitch will be programmed.
- (4) Repeat the above procedure to program the remaining stitches of pattern 1.
- (5) Press the **L** key at the final stitch position **B** of pattern 1, and then press the **F** key. At this time, the command indicator "F" will illuminate.

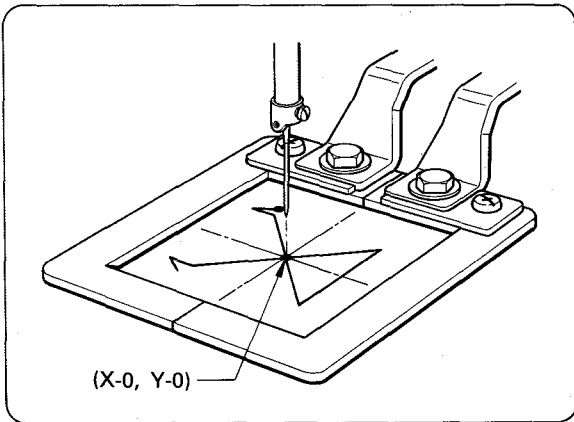


- (6) Operate the direction keys to move the work clamp to the initial stitch position of pattern 2.
 - (7) When the tip of the needle and the initial stitch position **C** of pattern 2 become aligned, press the **L** key. Thus, the operation will be programmed to restart from point **C** after the thread trimming operation is completed at point **B**.
 - (8) Repeat the above procedure to program the remaining stitches of pattern 2.
 - (9) Press the **L** key at the final stitch position **D**, and press the numeral key **1** 3 times to indicate "111" on the STEP display. Then, press the **E** key.
 - (10) The work clamp will move back to the initial stitch position.
 - (11) Press the R/W switch to write the pattern to disk. (Refer to page 24.)
- ※ Press the **P** key to enter the sewing mode.



8 To program a basting stitch

- Basting stitches can be easily programmed using the feed stitch mode.

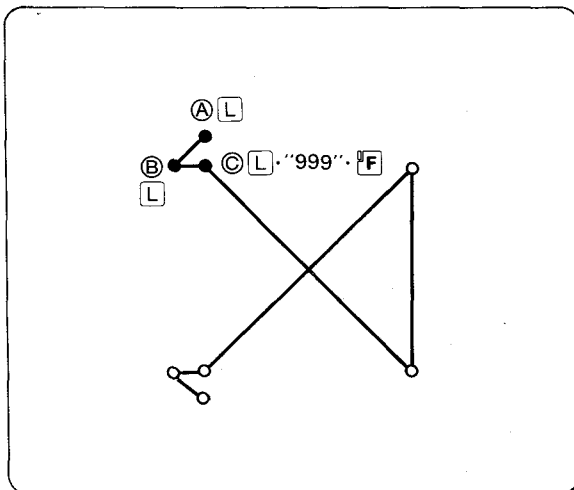


Example: Program the pattern in the figure at left.

- Press the **P** key. The work clamp will move to the point of origin (X-0; Y-0), "0" will appear in the STEP display, and command indicator "F" will light.
- Use the direction keys to move the work clamp to the initial stitch position.
- Use the direction keys to position the needle at the sewing start position **A** on the pattern, and then press the **L** key.

The first stitch is now programmed.

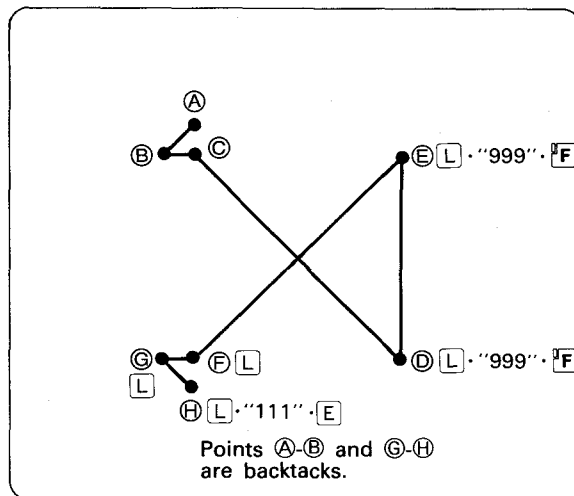
- Use the direction keys and key **L** to program stitch by stitch to **B** and **C**. (Refer to page 5.)
- At **C**, press the **9** key three times to display "999" in the STEP display, and then press the **F** key.



- Use the direction keys to move to point **D**.
- Press the **L** key.
- Program to **F** using the same procedure described in steps (5), (6) and (7).
- Use the direction keys and key **L** to program stitch by stitch to **G** and **H**. (See page 5.)
- After pressing the **L** key at the last stitch **H**, press the **1** key three times to display "111" in the STEP display, and then press the **E** key.
- The work clamp will return to the sewing start position.
- Press the R/W switch to write the pattern to disk. (Refer to page 24.)

※ Press the **P** key to enter the sewing mode.

Note With this basting program, you can skip between sewing points without trimming the thread.



9 To program a symmetrical mirror image of a pattern design

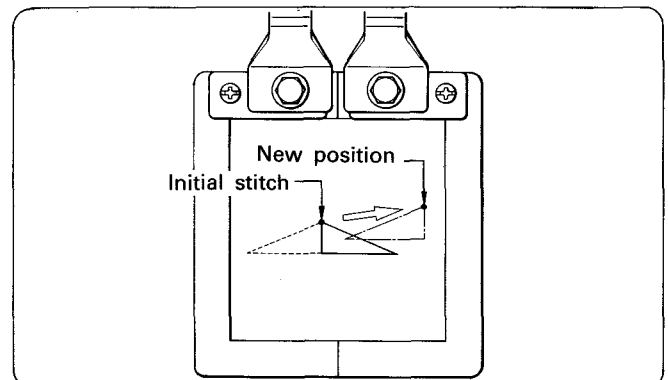
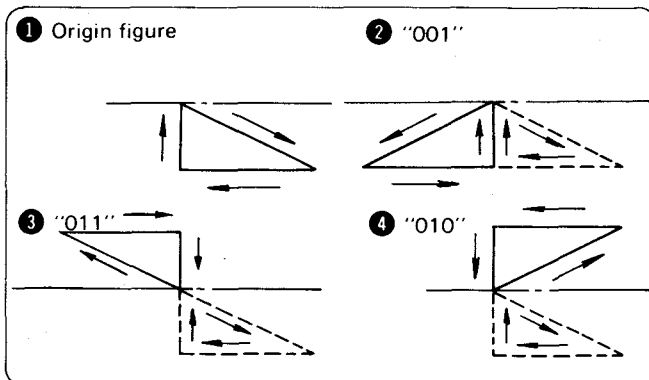
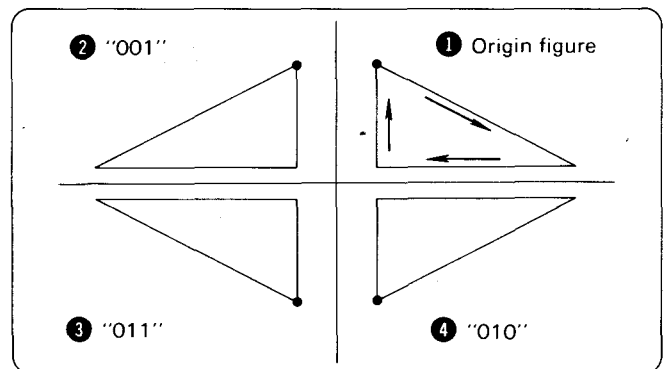
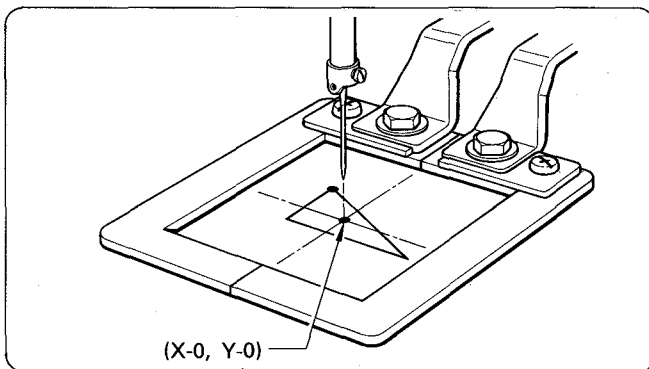
A. Use the M key (Mirror key) to program a symmetrical mirror image of a stitch pattern which has already been programmed.

Example: Program a symmetrical mirror image of the pattern in the figures below.

- (1) Press the P key. The work clamp will move to the point of origin (X-0; Y-0), the numeral "0" will be indicated on the STEP display, and the command indicator "F" will illuminate.
- (2) Insert the disk containing the stitch pattern into the disk drive.
- (3) Press the R/W switch. The data indicator will illuminate and the program data will be read into the memory.
- (4) If the pattern in section ① of the figure on the left is the original design, press "001" to program the pattern in section ②, "011" to program the pattern in section ③, and "010" to program the pattern in section ④. Operate the numeral keys to indicate the appropriate number on the STEP display.
- (5) Press the M key, and then press the L key.
- (6) Press the R/W switch to write the pattern to disk. (Refer to page 24.)
- ※ Press the P key to enter the sewing mode.

Note 1 When the M key is used to compose a symmetrical mirror image, the program will be input with the initial stitch position as the starting point of the entire symmetrical pattern as shown in the figures below.

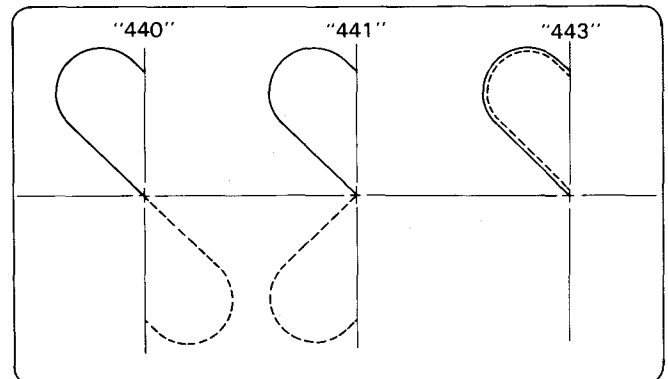
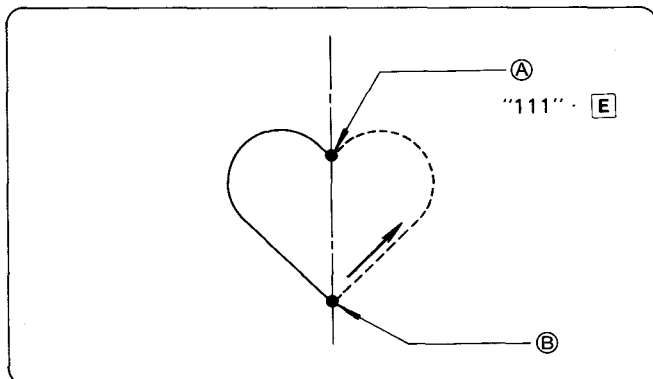
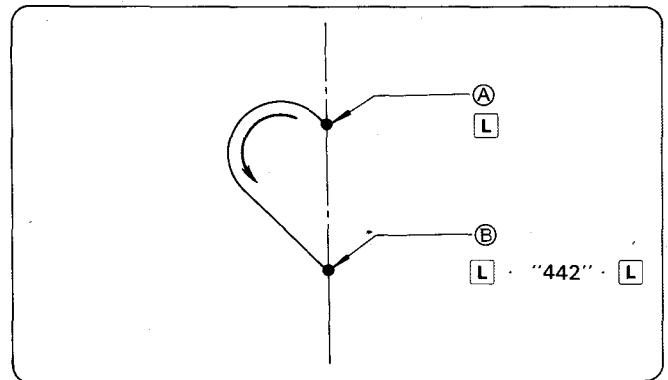
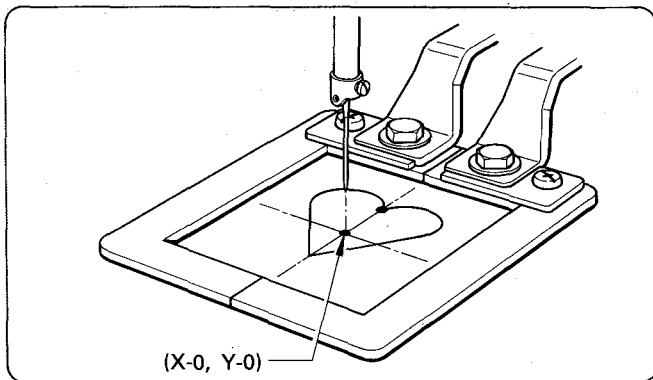
Note 2 In the event that the mirror image may extend beyond the limits of the work clamp, or if the entire symmetrical pattern is to be moved to the center of the work clamp, etc., press the R key after completing the procedure from 1~5 mentioned above. Then, press the direction keys to move the work clamp to the newly-established initial stitch position, and press the L key. Thus, the newly-established initial stitch position will be programmed.



B. To program a symmetrical pattern design, the operator is only required to program one-half of the pattern and use of the numeral keys to program the remaining half of the design.

Example: Program, on the Y axis, a symmetrical mirror of the pattern in the figures below.

- (1) Press the **[P]** key. The work clamp will move to the point of origin (X-0; Y-0), the numeral "0" will be indicated on the display, and the command indicator "F" will illuminate.
 - (2) Operate the direction keys to move the work clamp to the initial stitch position.
 - (3) When the tip of the needle and the initial stitch position **(A)** on the outline of the needle movement become aligned, press the **[L]** key. Thus, the initial stitch will be programmed.
 - (4) Repeat the above procedure to program the left-side half of the stitch pattern from point **(A)** to point **(B)**.
 - (5) Press the **[L]** key at point **(B)**. Then, operate the numeral keys to indicate "442" on the STEP display, and press the **[L]** key once again.
 - (6) The tip of the needle will slowly move from point **(B)** to point **(A)**, and the right side half of the pattern design will be automatically programmed. At this time, if the presser-lifter pedal is pressed, the work clamp will be fast-forwarded.
 - (7) When the tip of the needle becomes aligned with point **(A)**, press the numeral key **[1]** 3 times to indicate "111" on the STEP display. Then, press the **[E]** key.
 - (8) The work clamp will move back to the initial stitch position.
 - (9) Press the R/W switch to write the pattern to disk. (Refer to page 24.)
- ※ Press the **[P]** key to enter the sewing mode.
 ※ **Repeat Y-axis (442), origin point (440), and X-axis (441) to program pattern (443).**



B. To program a symmetrical pattern design, the operator is only required to program one-half of the pattern and use of the numeral keys to program the remaining half of the design.

Example: Program, on the Y axis, a symmetrical mirror of the pattern in the figures below.

- (1) Press the **[P]** key. The work clamp will move to the point of origin (X-0; Y-0), the numeral "0" will be indicated on the display, and the command indicator "F" will illuminate.
 - (2) Operate the direction keys to move the work clamp to the initial stitch position.
 - (3) When the tip of the needle and the initial stitch position **(A)** on the outline of the needle movement become aligned, press the **[L]** key. Thus, the initial stitch will be programmed.
 - (4) Repeat the above procedure to program the left-side half of the stitch pattern from point **(A)** to point **(B)**.
 - (5) Press the **[L]** key at point **(B)**. Then, operate the numeral keys to indicate "442" on the STEP display, and press the **[L]** key once again.
 - (6) The tip of the needle will slowly move from point **(B)** to point **(A)**, and the right side half of the pattern design will be automatically programmed. At this time, if the presser-lifter pedal is pressed, the work clamp will be fast-forwarded.
 - (7) When the tip of the needle becomes aligned with point **(A)**, press the numeral key **[1]** 3 times to indicate "111" on the STEP display. Then, press the **[E]** key.
 - (8) The work clamp will move back to the initial stitch position.
 - (9) Press the R/W switch to write the pattern to disk. (Refer to page 24.)
- ※ Press the **[P]** key to enter the sewing mode.
 ※ **Repeat Y-axis (442), origin point (440), and X-axis (441) to program pattern (443).**

