

Text for extended option output

This is a complement of the chapter 4 “Extended option output” of the instruction manual for BAS300E series programmer and helps users take advantage of extended option output showing programming examples.

This text is composed of two chapters; “Basic” containing the programming examples which enables operation check using standard sewing machine only, and “Advanced” containing the programming examples for users who create the check PCB by themselves.

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Basic

1. Preparation

- Sewing machine with the pneumatic work clamp (except for BAS-311E solenoid specification)
- Control PROM version MN-C or later (products manufactured in or after June 1998 are equipped with this PROM as a standard part.)
- Programmer
- Instruction manual for programmer (see the instruction manual for page reference.)

2. Examples of simple option output

- Option output can be programmed up to No. 16 (see page 195). No. 15 is the air valve output for the left work clamp, and No.16 is the air valve output for the right work clamp. If these two outputs are programmed as option outputs, these do not operate as the work clamps but operate as the option outputs.

The following example operations are to program No. 15 and 16 and check their operations (if the right and left work clamps operate as programmed, the operations of No. 15 & 16 are good).

- Some of the following examples involve sewing operation with the work clamp raised, be extremely careful in that case.

2-1 ON & OFF operation synchronizing with one machine operation

- Create program that enables the right and left work clamps automatically to rise and descend (option output No. 15 is ON and OFF) at sewing start.

①Prepare the programmer, follow “Operating the extended option output” (see page 184) to display the output setting screen.

②Referring to the condition number table of machine operation mode (see page 191), set the option output No. 15 to ON when the condition No. 2 is set, and the timer 2 to 1 second (1000ms). Input on the setting screen as follows:



- Press the RETURN key to save the data after inputting the numerical data.
- For input check, move the cursor to OUPUTPUT No., set it to No. 16 by pressing the + key once, and set it back to No. 15 by pressing the – key.

③Press the ESC key, and write the data with the FD write icon.



- ④ Press the P key to turn off the display of the programmer, and turn the power off and on again.
- Since initial setting is done when the power is turned ON, turn the power off and on after writing extended option output. In this case, the output No. 15 is initial-set to work as an extended option not as the left work clamp.
- ⑤ Read short sewing data that consists of around 10 stitches, set the DIP SW A No. 1 (the presser foot does not rise at sewing finish) to ON, and carry out sewing.
- If the left work clamp rises for 1 second and descends every time the feed returns to the sewing start position, it proves that No. 15 has worked as programmed.

2-2 Modifying programmed data

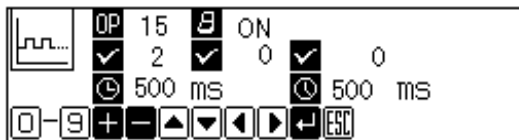
- Modify the data created in the previous procedure 2-1
- One FD can store only one option program. (FD file name is “bas900. seq”)

① After checking that the FD written in 2-1 is in the operation panel, display the extended option output home screen shown in the following.

② Read the written data with FD read icon.



③ Display the output setting screen, set the timer 1 to 0.5sec (500mS) and the timer 2 to 0.5sec (500mS). Input as follows:



For the timer 2, move the cursor to “1000”, which has already been set, write “0500” over it.

④ After overwriting the option program to the FD following the same step of ③ and ④ of 2-1, press the P key to turn off the display of the programmer, and turn the power off and on again.



⑤ Read the sewing data and carry out sewing. Check that the left work clamp does not rise soon after the feed returns to the sewing start position (because the timer 1 was set from 0 to 0.5 sec.) and the time of the work clamp rise has become short (because the timer 2 was set from 1 to 0.5 sec).

2-3 Programming ON and OFF separately

- 2-1 and 2-2 are examples that No. 15 automatically returns to OFF after it is ON during the set time of the timer 2.

The following procedure is to create the program which enables the left work clamp automatically to open at sewing start (option output No. 15: ON) and close at the same time of sewing start

(option output No. 15: OFF). This is for checking the case that the output conditions of ON and OFF are different.

①Prepare the programmer, and display the output setting screen.

②Referring to the condition number table of machine operation mode (see page 191), set the option output No. 15 to ON when the condition No. 2 (after the feed is completed at the sewing start position) is set, Input on the setting screen as follows:



③Move the cursor to “ON”, press the + key. ON, OFF, and F/F are switched every time the + key is pressed. After setting “OFF”, referring to the condition number table of machine operation mode (see page 191), set the option output No. 15 to OFF when the condition No. 3 (before sewing start) is set. Input on the setting screen as follows:



④After overwriting the option program to the FD, press the P key to turn off the display of the programmer, and turn the power off and on again.



⑤Read the sewing data and carry out sewing. When the feed returns to the sewing start position, check that the left work clamp rises, and descends at sewing start.

- As shown in the above, when the timer 2 is “00”, the option output number stays ON or OFF after the condition is met.

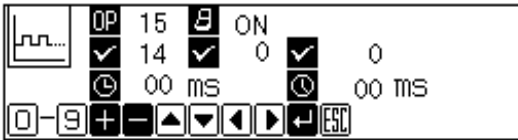
2-4 Setting option output No. to ON using trigger data during sewing

- No. 15 was set to ON at sewing start position in 2-2. The following procedure is to set No. 15 to ON during sewing. For OFF setting, keep the setting of 2-3 so that No. 15 stays OFF at sewing start.

①Read the written data with the FD read icon.



②Referring to the condition number table of machine operation mode (see page 191), set the No. 15 to ON when the condition No. 14 (trigger data detection) is set. Input on the setting screen by overwriting as follows:



Move the cursor to “ON”, and press the – key to switch to OFF. Check the data that was set in 2-3 remains.

③After overwriting the option program to the FD, press the P key to turn off the display of the programmer.



④Press the P key again, read the sewing data and edit it, and input the trigger data at a desired position (see page 100 of the instruction manual for the programmer). Set the option output No. 15, and sewing stop: OFF. Input on the setting screen as follows:



⑤Put the sewing data in memory by a new program No. after inputting the trigger data. Press the P key to turn off the display of the programmer. Turn the power off and on again.

Carry out sewing. Check that the left work clamp rises at a position of the trigger data and descends at sewing start.

2-5 Outputting in succession (sequence output)

- Create the program for sequence output after the work clamp rises at sewing finish, on the assumption that the option output is for the stacker (the device that removes and stacks materials after sewing finish).

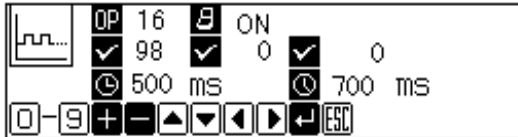
Set the option output No. 15 to be ON and OFF first and then No.16 to be ON and OFF synchronizing with the work clamp rise. The conditions of sewing finish are added in the following 2-6.

①Prepare the programmer, and display the output setting screen.

②Referring to the condition number table of standard output (see page 192), set the output condition of No. 15 to ON when the condition No. 30 (after work clamp rise) is set, and the timer 2 to 1.2 seconds (1200ms). Input on the setting screen as follows:



③Referring to the condition number table of the extended option output (see page 193), set the condition No. 98 (when No. 15 is ON), the timer 1 to 0.5 second (500ms), and the timer 2 to 0.7 second (700ms). Input on the setting screen as follows:



④After overwriting the option program to the FD, press the P key to turn off the display of the programmer, and then turn the power off and on again.



⑤Read the sewing data and carry out sewing. After setting the DIP SW A No.1 to OFF (after sewing is completed, the work clamp automatically rises), carry out sewing. Synchronizing with the timing of the work clamp rise (the right and left work clamps are operating as option outputs in this case), the left work clamp (No. 15) is turned ON, the right work clamp (No. 16) is turned ON in 0.5 second, and the both work clamps descend in 0.7 second.

Check that No. 15 and 16 are turned ON and OFF by pressing the presser lifter pedal. When starting sewing again, check that the stepping work clamp is at down position.

- In sequence output (output is ON and OFF in succession), specify machine operation as its output condition for the output that turns ON first, and it will be convenient to specify the first output ON or OFF as output condition for the next output.

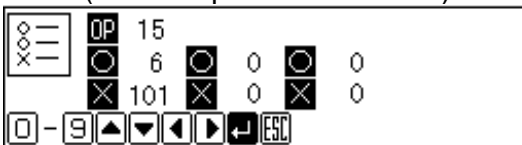
2-6 Adding enabling conditions (AND) to sequence output

- In the previous procedure 2-5, the option output No. 15 and 16 are ON and OFF by pressing the presser lifter pedal as well. The following procedure is to add an enabling condition in order to set No. 15 and 16 to be ON and OFF at sewing finish only.

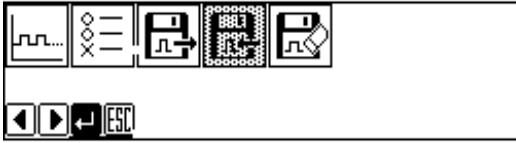
①Read the written data with the FD read icon.



②Display the enabling condition setting screen from the extended option output home screen. Referring to the condition number table of machine operation mode (see page 191), set the enabling condition of No. 15 to the condition No. 6 (after sewing finish): ENABLE O, and to the condition No. 101 (when output No. 16 is OFF): DISABLE x.



③After overwriting the option program to the FD, press the P key to turn off the display of the programmer, and then turn the power off and on again.



- If enabling conditions have been set, the enabling condition is set to “DISABLE” immediately after the power is turned on.

④Read the sewing data and carry out sewing. Check that the right and left work clamps (option output No. 15 and 16) are not operated by the presser lifter pedal, and No. 15 and 16 are ON and OFF at the timing of the work clamp rise at sewing finish.

*Be sure to check that the stepping work clamp is at down position before pressing the start SW.

- If enabling condition is set to ENABLE O, it is normally necessary to set DISABLE x as well.
- In the case of the example above, set enable condition (AND) of output which turns ON or OFF first, and set the condition number which the last output of sequence turns ON or OFF as disable condition.
- As the example in 2-5, if enabling condition is not set, the contents which was set on the output setting screen determines the option output to be ON or OFF.

3. Copying created option output data

- Copying the created option output data to other machines
- The following is the operation on the machine which the data is copied to.

①Prepare the programmer, and follow the extended option output operation (see page 184) to display the extended option output home screen (see below).

②Insert the original FD with data, and read the written data with the FD read icon.



③Insert a new FD, and write the data with the FD write icon.



•After writing the data, press the P key to turn off the display of the programmer so that the extended output option data is registered into the machine at the timing of the display of the programmer being turned off.

•For the operation check, turn the power off and on again.

•If you need copying data for several machines on one machine, repeat the operation above to make copies of an original FD, and register the data into a machine when the machine is used.

For registering data to machines, if an original FD and a copied FD have already been copied, it is not necessary to repeat the operation above.

4. Deleting extended option output from the machine

① Prepare the programmer, and follow the extended option output operation (see page 184) to display the extended option output home screen (see below).

② Delete the extended option output from the machine with the delete icon.



③ Press the P key to turn off the display of the programmer, and turn the power off and on again.

Read the sewing data and carry out sewing. Check that the extended option output has been deleted.

- The back up of extended option output data remains on FD. If the operation of the previous procedure 3. is carried out, extended option output data can be registered again.
- Extended option output is also deleted by the all-clear operation of the machine (see the instruction manual for the machine).

Advanced

1. Preparation

- In addition to the things required in the Basic, prepare check PCB (see the appendix of this text)

2. Things that can not be done by the extended option output function

- ① In case of the number of outputs exceeding 16 (including the work clamp output)
- ② In case of the number of inputs exceeding 13
- ③ Since input check can not be accomplished during sewing, it is not possible to turn output ON or OFF by judging input of the presser lifter pedal, etc. during sewing (overlap operation by input check).
- ④ Sequence output can not be accomplished during sewing.
 - By inputting trigger data of the sewing data (see page 100 of the instruction manual for the programmer), it is possible to turn the output ON or OFF.
 - By inputting trigger data, it is possible to pause the machine and start sequence (it is possible to turn output ON and OFF in this case).
- ⑤ If there are too many AND conditions (enabling conditions), the extended option output function is not available, therefore, the operations such as changing several modes and prohibiting output by 4 or more inputs are not possible.
 - 2 input AND condition can be set per one option output, therefore, 3 input AND condition can be made by using one output as a virtual output (see the following example).
- ⑥ Built-in step motor output can not be controlled by the extended option output function.

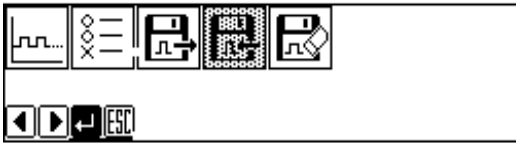
3. Examples of option output (Advanced)

3-1 Automating sewing start

- By setting the memory SW No. 22 to ON, the machine starts sewing after the option output No. 1 is ON.
 - Create the program which starts sewing after the work clamp descends.
- ① Set the memory SW No. 22 to ON.
 - ② Prepare the programmer, and display the output setting screen.
 - If option programs which have already been registered, delete them with the delete icon, and turn the power off and on again.
 - ③ Referring to the condition number table of the standard output (see page 192), set the output condition of No. 1 to ON when the condition No. 31 (after work clamp descends) is set, and set the timer 2 to 100ms on the setting screen as follows:



④Write the option program to the FD, press the P key to turn off the display of the programmer, and then turn the power off and on again.



⑤Read the sewing data. Press the starting pedal so that the feed moves to a sewing start position after the origin position is detected. Pressing the starting pedal normally starts sewing, however if the memory SW No. 22 is ON, sewing will not start. Check that sewing starts after work clamp rises and descends by pressing the presser lifer pedal twice.

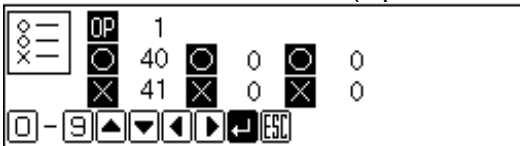
3-2 Start control by input check for automatic start

·In addition to 3-1, add the option input No. 1 to enabling conditions.

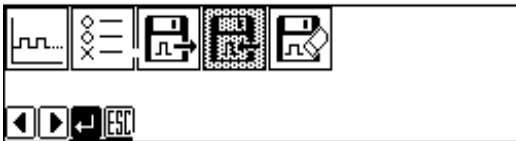
①Read the written data with the FD read icon.



②Display the enabling condition setting screen. Referring to the condition number table of the extended option external input (see page 192), set the condition No. 40 (input 1: ON): ENABLE and the condition No. 41 (input 1: OFF): DISABLE .



③After overwriting the option program to the FD, press the P key to turn off the display of the programmer, and turn the power off and on again.



④In addition to 3-1, check that sewing starts only when the option input No. 1 is ON.
 · As the example above, since the work clamp rise and descent is sequence-controlled by option output, the sequence for automatic material loading before sewing can be made.

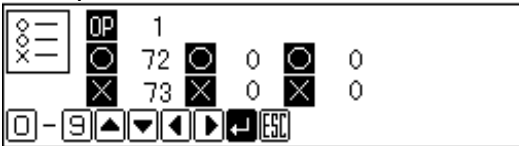
3-3 Adding the input check to make 3 input AND

- In addition to 3-1, set enabling condition to the option input No. 1 and 2: ON. The condition No. 31 (after the work clamp descends) has already been set as output condition, therefore, 3 input AND has been set.
- Up to 2 input AND per one option output can be set, therefore, use one output as a virtual output to make 3 input AND condition. Use the option output No. 2 as a virtual output in this case.

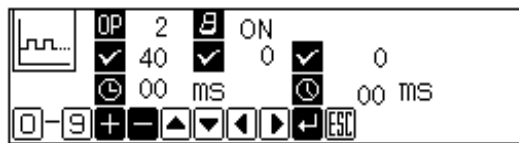
① Read the written data with the FD read icon.



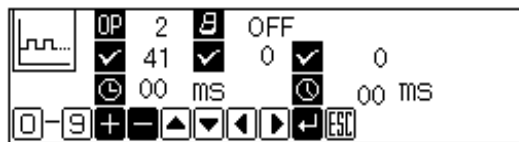
② Display the enabling condition setting screen. Referring to the condition number table of the extended option output (see page 193), set the enabling condition of No. 1 to the condition No. 72 (output 2: ON): ENABLING and the condition No. 73 (output 2: OFF): DISABLING by writing over the previous data.



③ Referring to the condition number table of the extended option external input (see page 192), set the output condition of No. 2 to ON when the condition No. 40 (input 1: ON) is set. Input on the setting screen as follows:



④ Referring to the condition number table of the extended option external input (see page 192), set the output condition of No. 2 to OFF when the condition No. 41 (input 1: OFF) is set. Input on the setting screen as follows:



⑤ Referring to the condition number table of the extended option external input (see page 192), set the enabling condition of No. 2 to the condition No. 42 (input 2: ON): ENABLING , and the condition No. 43 (input 2: OFF): DISABLING .



⑥ After overwriting the option program to the FD, press the P key to turn off the display of the programmer, turn the power off and on again.



⑦ Check that sewing starts when the work clamp descends when the option input No. 1 and No. 2 are ON.

- The output condition of the virtual output No. 2: ON is the condition No. 40 (input1: ON) as shown in the example above. If the input 1 has been ON since the power was turned ON, the virtual output No. 2 can not be ON.

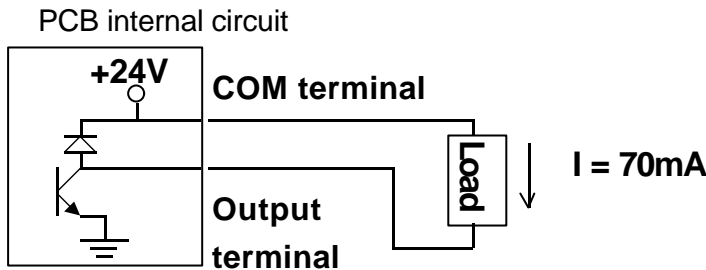
3-4 Emergency stop during sequence

- Program the example 1 of the instruction manual and check the option output at emergency stop
- ① Delete the registered option program with the delete icon, and turn the power off and on again.
 - ② Following the example 1 (sequence 1 for stacker) of page 196 of the instruction manual for the programmer, program the output No. 4, 5, 6, and the enabling condition of No. 4.
 - ③ If the option output is operated as programmed, press the emergency stop SW during sequence operation.
 - Emergency stop during sequence is a pause of sequence, and sequence is completed if emergency stop is canceled.
 - ④ Add the condition No. 15 (after an emergency stop occurs) when the output No. 4, 5, and 6 are OFF.
 - If the emergency stop SW is pressed, output are immediately turned OFF.

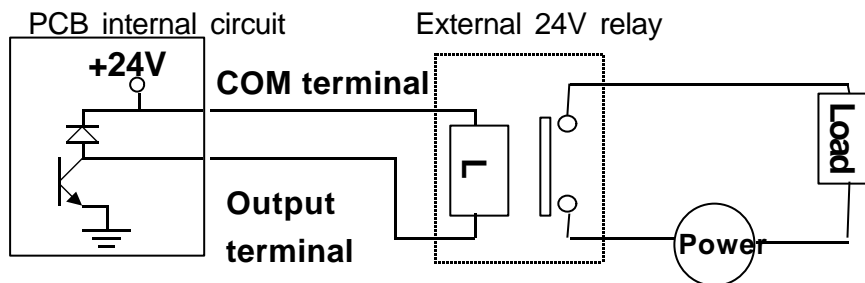
4. Programming

4-1 Selecting hardware on output side

- Output is NPN open collector output.



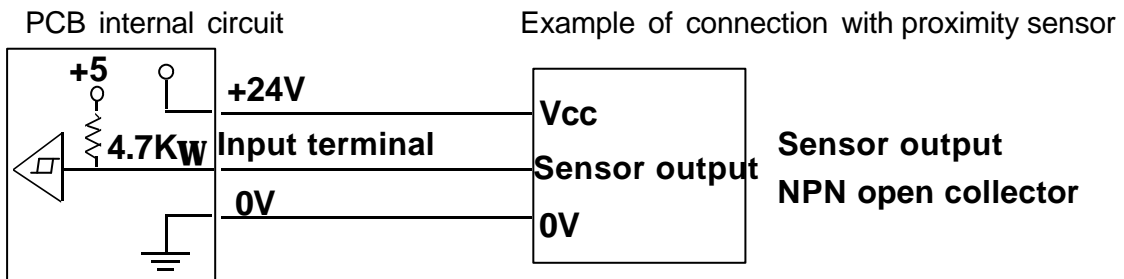
- On the assumption that output activates the air valve (option part).
- Use a 24 VDC relay if not using a 24 V air valve.



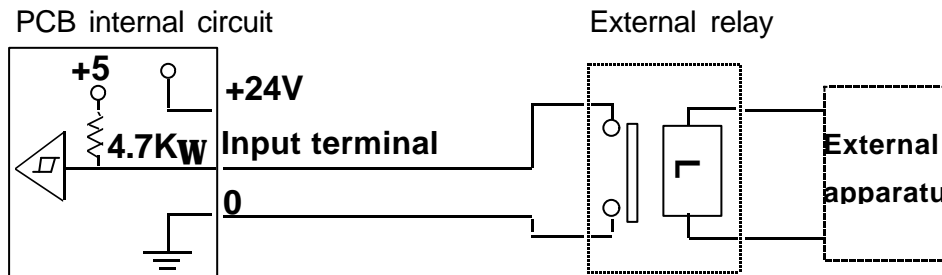
- No fuses are built in the output circuit. To prevent circuit damage when forming short output, it is recommendable to install an external fuse on each output.

4-2 Selecting hardware on input side

- Input is non-insulating IC input.



- Insulate input using a relay if not using a contact switch or a 24 V sensor.



- Use a relay for electronic circuit whose maximum applicable load is 5 V and 1m A or less.

4-3 Creating the I/O layout table

•Complete the table with selected hardware.

Option output table

Option output No.	Layout		Connector	
	Name	Explanation	No.	Pin
1			P4 (AIR)	5
2				6
3				7
4			P21 (EXOUT)	1
5				2
6				3
7				4
8				5
9				6
10				7
11				8
12			P4 (AIR)	8
13				4
14				3
15				2
16				1

*Common terminal of P4 is pin 11, and output voltage is +24V

*Common terminal of P21 is pin 9 and 10, and output voltage is +24V

Option input table

Option input No.	Layout		Connector			
	Name	Explanation	No.	Pin		
				Signal	+24V	0V
1			P8 (EXINA)	2	3	1
2				5	6	4
3				8	9	7
4				11	12	10
5				14	15	13
6			P9 (EXINB)	2	3	1
7				5	6	4
8				8	9	7
9				11	12	10
10				14	15	13
11			P1	10	9	11
12			P3	5	4	6
13			P4	12	11	9

4-4 Creating the timing chart and the program setting value table

• Refer to the three examples of page 196-198 of the instruction manual.

- ① Create the timing chart showing ON and OFF of I/O in operation order.
- ② Based on the timing chart and condition number table (see instruction manual page 191-), create a program setting value table.
- ③ Input program setting value by the programmer.

4-5 Starting condition added to the first edition

Condition No.	Operation meeting the condition
18	Immediately after the power is turned on and the preparation of machine operation is completed.
19	After the air pressure drop error is detected.
20	After split is completed (before moving to the next sewing start position).
21	After split is completed (after moving to the next sewing start position).

Appendix

1. Parts for extended option
2. Check PCB circuit diagram
3. Block diagram

Parts for extended option output

P4 AIR Housing and pin for connector

For option output 1-3 and 12-16

For option input 13

Manufacturer	Japan Solderless Terminal MFG. Co., LTD.
Housing production code	H12P-SHF-AA
Pin contact production code	BHF-001T-0.8BS
Crimping tool production code	YC-122R

P21 EXOUT Housing and pin for connector

For option output 4-11

Manufacturer	Japan Solderless Terminal MFG. Co., LTD.
Housing production code	H10P-SHF-AA
Pin contact production code	BHF-001T-0.8BS
Crimping tool production code	YC-122R

Parts for extended option input

P8 EXINA Housing and pin for connector

For option input 1-5

Manufacturer	Japan Solderless Terminal MFG. Co., LTD.
Housing production code	PHDR-16VS
Pin contact production code	BPHD-001T-P0.5
Crimping tool production code	YC-610R

P9 EXINB Housing and pin for connector

For option input 6-10

Manufacturer	Japan Solderless Terminal MFG. Co., LTD.
Housing production code	PHDR-18VS
Pin contact production code	BPHD-001T-P0.5
Crimping tool production code	YC-610R