MOTIONPACK-SG1

SINGLE AXIS MOTION CONTROLLER PROGRAMMER

DESCRIPTIVE INFORMATION

YASKAWA

MANUAL NO. SIE-C884-1.1

〈Safety Precautions〉

Safety precautions in this manual apply to MOTIONPACK-SG1.
Please read this manual carefully and be sure you understand the information provided before operation.
Keep this manual at your disposal for daily maintenance and inspection.

General Precautions

- Some drawings in this manual are shown with the protective covers or shields removed, in order to describe the detail with more clarity. Make sure all covers and shields are replaced before operating this product, and operate it in accordance with the directions in the manual.
- The figures and photographs in this manual show a representative product for reference purpose and may differ from the product actually delivered to you.
- This manual may be modified when necessary because of improvement of the product, modification, or changes in specifications.
  Such modification is made as a revision by renewing the manual No. on front cover.
- To order a copy of this manual, if your copy has been damaged or lost, contact your Yaskawa representative listed on the last page starting the manual No. On the front page.
- If any of the nameplates affixed to the product become damaged or illegible, please send the nameplates to your Yaskawa representative.
- Yaskawa is not responsible for any modification of the product made by the user since that will void our guarantee.

Notes for Safe Operation

Read this manual thoroughly before installation, operation, maintenance or inspection for the MOTIONPACK-SG1.

The functions and performance are not determined only by positioning control device itself. Before operation, read thoroughly the machine tool builder's documents relating to the machine tool concerned.

In this manual, the Notes for Safe Operation are classified as "WARNING" or "CAUTION".

⚠WARNING : Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to personnel.
Symbol is used in labels attached to the product.

⚠ CAUTION : Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury to personnel and damage to equipment.
It may also be used to alert against unsafe practices.

Even items described in ⚠ CAUTION may result in a vital accident in some situations. In either case, follow these important items.
Please note that symbol mark used to indicate caution differs between ISO and JIS.

ISO	JIS
	

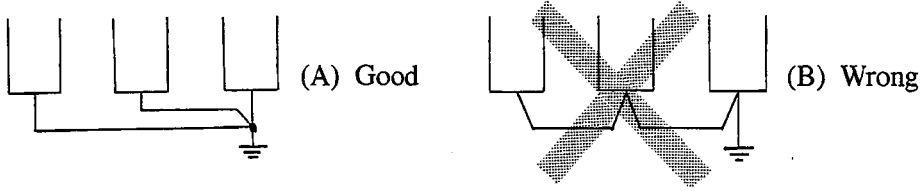
In this manual, symbol mark stipulated by ISO is used.
On products, caution symbol marks of ISO and JIS are used in labels.
Please follow the same safety instructions concerning caution.

1 APPLICATION SAFETY PRECAUTIONS

⚠ WARNING

- Make sure to note the following precautions in order to avoid any risk of electric shock or machine malfunctions.

  - Do not touch any unit, terminals , etc. while the power is ON.
    Failure to observe this warning may lead to electric shock or device malfunction.
  - Immediately after switching the power OFF, the product retains some electric charge. Do not touch any parts which are live when the power is ON for 5 minutes after switching the power OFF.
    Failure to observe this warning may lead to electric shock or device malfunction.
  - Select the cable size in conformance with local electrical codes or the cable manufacturer's technical data.
  - Ground at one point. (Ground resistance 100 Ω or less)
  - Be sure to separate the grounding line of the unit from a power unit.
    Failure to observe this warning may lead to malfunction.
  - When more than one unit exists, grounding should be made as shown in Fig. (A), but not as shown in Fig. (B).



- Do not damage cables, subject them to excessive stress, or pinch them.
  Excessive load on cables may cause electric shock.
- When the unit is turned ON, never touch its rotating parts.
  Failure to observe this warning may result in personal injury.
- Never modify the product.
  Failure to observe this warning may result in electric shock, fire, or product failure.

⚠ CAUTION

- Use the product in an environment with the following characteristics.
  Using it in an environment in which it is subject to high temperatures, high humidity, dust, corrosive gasses, vibration or impacts may cause fire, electric shock or malfunction.

  ① Free from gasses or vapors that create a potentially explosive atmosphere.
  ② Free from corrosive oil, organic solvents, etc.
  ③ Relative humidity in the range 30 to 85 % RH, with no condensation.
  ④ Ambient temperature in the range 0 to 55 ℃ with no freezing.
  (Installation site must not be exposed to direct sunlight, must be distanced from heat generating devices, and must be indoors.)
  ⑤ Vibration not exceeding 4.9 m/s^2 (0.5 G).

- Install the units in accordance with the following.
  Failure to observe this caution may result in product failure or malfunction.

  ① Mount the unit vertically with screws or bolts.
  ② The unit will generate heat, therefore, install it with adequate clearance around it.
  ③ When circulating air inside the enclosure, do not blow air directly onto the unit (in order to prevent dust contamination).
  ④ Arrange units so that maintenance, inspection or replacement of parts may be made easily.

- Design and install the box in accordance with the following.
  Failure in box such as electric control panel may result in product failure or malfunction.

  ① Use an airtight enclosure.
  ② Limit the average temperature increase of internal air within the enclosure to under 10 ℃ (50 ˚F) compared to the ambient temperature.
  ③ Use a fan to circulate air in order to improve the cooling efficiency of a closed enclosure and to prevent abnormal temperature rise.
  ④ Seal the cable inlet, door, etc. completely.
  ⑤ The board inside the unit attracts airborne particles because of its high voltage and may result in malfunction, therefore, provide a structure to prevent the entry of dust.
  ⑥ Install packing on the cable inlet, doors, back covers, etc. to eliminate gaps or openings.

- Do not let foreign matter such as electric wire scrap enter the unit.
  Failure to observe this caution may result in fire, product failure or malfunction.

- Set the power line capacity higher than the power consumption of the device.
  Failure to observe this caution may result in product malfunctions.

- The current capacity of 24 VAC external power unit for input/output contacts is determined by the number of contact points to be used. When the current capacity is low, install an additional external power unit.

2 RECEIVING

⚠ CAUTION

- Check the product if it meets your order.
  Installation of improper product may result in personal injury or product damage.

3 STORAGE

⚠ CAUTION

- Do not store the product in locations subject to rain, water droplets, or harmful gases or liquids.
  Failure to observe this caution may result in product failure.
- Select a storage area indoors that is clean and meets the following temperature and humidity requirements.
  Failure to observe this caution may result in product failure.
  Ambient temperature : - 20 ℃ to +85 ℃
  Relative humidity : 10 % to 90 %

4 TRANSPORT

⚠ CAUTION

- Do not lift the cable when moving the product.
  Failure to observe this caution may lead to personal injury or product failure.

5 INSTALLATION

⚠ CAUTION

- When installing the product, avoid shutting the inlet port or exhaust port. Also avoid foreign matter from entering the device.
  Failure to observe this caution may lead to fire or product failure.
- Avoid strong impact during installation.
  Failure to observe this caution may result in product failure.

⚠ CAUTION

- Always turn the power OFF (including the primary power supply) before carrying out the wiring.
  Carrying out the wiring with the power ON may lead to electric shock.
- Be sure to connect the grounding terminal of the motor to the grounding terminal of the drive unit.
  Failure to observe this caution may lead to electric shock, fire, or malfunction.
- Ground at one point (Ground resistance 100 Ω or less)
  Failure to observe this caution may lead to electric shock, fire, or malfunction.
- Be sure to separate the grounding line of the unit from a power unit.
  Failure to observe this warning may lead to malfunction.
  - Correct and precise wiring should be performed by qualified, authorized personnel only.
    Failure to observe this caution may result in electric shock, fire, or malfunction.
  - Select the type of wire and its size according to your requirement and current capacity.
    When the ambient temperature exceeds 30℃(86°F), the allowable current goes down.
  - Select the cable size in conformance with local electrical codes or the cable manufacturer's technical data.
    Failure to observe this caution may result in fire.
- Use twisted wire or multi-core twisted pair shielded wire for general signal wires and feedback signal wires for the encoder.
  This helps the prevention of malfunction.
- Connect wires in the shortest possible length.
  This helps the prevention of malfunction.
- Connect the power supply of 100/110 VAC to the control power terminal.
  Connect the power supply of 24 VDC to the terminal of I/O signals.
  Connecting it to power supply with different voltage may cause fire.

  ① The input power supply to CPU unit works normally until a momentary power loss of 1/2 cycle or the voltage drop by 50% within 1 cycle.

  ② The allowable range of voltage fluctuation should be -15% to 10%; however, use the average voltage at the rated 200 VAC, 220 VAC, or 230 VAC.
- External connection wiring should be made with consideration of the following points :
  Failure to observe this caution may result in fire or malfunctions.
  - Mechanical strength
  - Influence of noise
  - Wiring distance
  - Signal voltage

⚠ CAUTION

- Do not run the I/O signal wires with power wires or in the same duct with power wires.
  Sufficient separation of signal wires from power wires will reduce the noise influence slight.
- In the event of noise from a power wire, use a noise filter to prevent it.
  Correct use of noise filter will reduce the noise influence.

7 OPERATIONS

⚠ CAUTION

- Before carrying out cutting operation with a new program, confirm safety by performing single block operation.
  If this check operation is not performed, unexpected operation may be performed due to mis-setting of the amount of offset, and resulting accidents involving injuries to personnel.
- The end user must not change parameters relating to machine accuracy, travel axis control and spindle axis control.
  The parameters are set to the optimum values for each machine, and changing them could therefore result in unexpected operation. This could cause tool damage due to interference, and resulting accidents involving injuries to personnel.
- Strictly observe the cautions in the user's manual when using programming functions.
  Ignoring these cautions could lead to accidents involving injuries to personnel and malfunctions.

8 MAINTENANCE AND INSPECTION

⚠ WARNING

- Always turn the power OFF (including the primary power supply) before carrying out daily inspection.
  Carrying out the inspection with the power ON may lead to electric shock.
- Wait 5 minutes after turning the power (including the primary power supply) OFF before removing or replacing any unit or part.
- Be sure to turn the power OFF before replacing the battery.
  Failure to observe this warning may lead to electric shock.

⚠ CAUTION

- To prevent personnel other than those involved in maintenance and inspection work from turning the power ON while maintenance and inspection is in progress, place sign stating "Do not turn the power ON" or words to that effect at the primary power supplies of related control panels and other relevant locations.
  Failure to observe this caution may lead to electric shock.
- Replace fuses and batteries with the designated products.
  Failure to observe this caution may result in fire or product failure.
- Electric devices such as CMOS ICs are used on the control boards. If you touch them with your bare fingers the static electrical charge in your body could destroy them; care must be taken when handling these devices. Before handling these devices for maintenance purposes, first discharge the statistic electricity in your body by touching a grounded metal device.
  Failure to observe this caution could lead to injuries and product failures.
- Do not install or remove boards, wiring, connectors, etc., while the power is ON.
  Failure to observe this caution could lead to electric shock, product failure, and malfunction.
- When an alarm occurs, eliminates its cause and confirm safety before resetting it.
  Failure to observe this caution could result in malfunction.
- Be sure to check the following points on completing maintenance and inspection work.
  - Check that all fastening bolts are tightened.
  - Check that no tools or other objects have been left inside the control panel.
  - Check that the control panel door is closed properly.

  Failure to carry out these checks may lead to electric shock, injuries, fire, and malfunction.
- For details on trouble relating to the machine-related sequence, refer to the manual issued by the machine tool builder.
- Never attempt to disassemble or modify units or devices inside the control panel.
  Failure to observe this caution may lead to fire, product failure, or malfunction.

CONTENTS

1 SPECIFICATIONS

Table 1.1 Specifications

Item	Ratings
Type	JEMP-PSG1
Indicator	Liquid crystal module with EL back-light 16 characters × 4 lines and display LEDs
EL Service Lifetime	Luminance is deteriorated a little after approx 2000 hours elapse.
Switch	Operation key switch × 40
Auxiliary Memory Unit	No-contact method memory card (reader/writer built-in)
Printer Board	RS-232C level interface built-in (D-SUB 9-pin)
Power Supply	Supplied from controller through cable
Environment	Operation ambient temperature : 0 to 50℃ natural air cooling Storage ambient temperature : −20 to +60℃ Ambient humidity : 30 to 95%RH (non-condensing) Vibration resistance : In accordance with JIS C 0911 (up to 1G) Shock resistance : In accordance with JIS C 0912 (up to 10G) Atmosphere : Free from inflammables, corrosive gases, dust, metallic dust, high temperature or high humidity.
External Dimensions	85 (W) × 190 (H) × 37 (D) (in mm)
Approx. Mass	450 g

2 PANEL

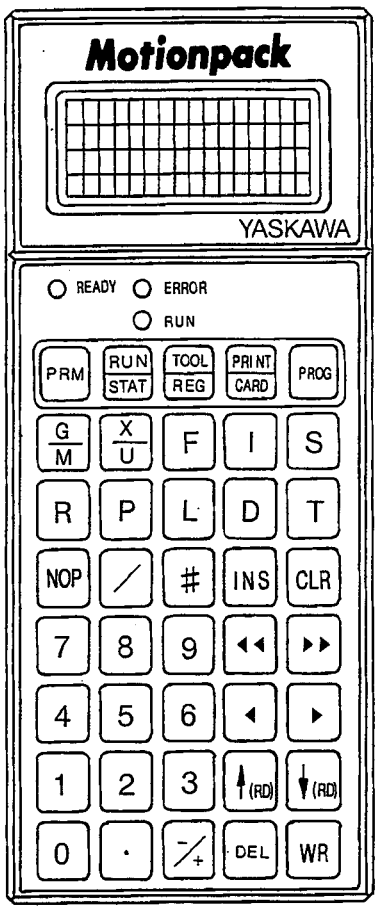


Fig. 2.1 Panel

Key Name	Functions (Applications)
PRM	Used for parameter checking or setting.
REG	Used for register checking or setting.
TOOL	Used for compensated value checking or setting.
PROG	Used for program checking, change, creation, deletion or move.
RUN	Used for current operation status checking.
STAT	Used for status checking.
PRINT	Used for parameter, program, register or compensated value print-out.
CARD	Used for parameter, program, register or compensated value load/save or checking card directory information.
◀◀ ▶▶	Used for data value change and moves the cursor to the head of the next (former) character line. (The cursor move is a rotation move.)
◀ ▶	Used for data value change and moves the cursor to the next character in a character line. (The cursor move is a rotation move.)
DEL	Used for character deletion. (Characters after the deleted character go to one space to the left.) Used for program (block) deletion.
CLR	When this key is pressed one time during any data setting in a menu that is currently developed, the screen before the data input is displayed. When it is pressed again, the latest input screen is displayed if there is a formally input menu selection screen ; if not, the RUN status is displayed.
NOP	Used for programming or NOP block creation.
INS	Used for character insertion or block insertion.
WR	Used for data writing-in to Motionpack SG1. Used for menu definition.
↓ (↑)	Used for data read-in from Motionpack SG1. Used for page feeding.
#	Used to express in hexadecimal (A to F) for parameter (SERVO, SPINDLE) check and setting. By selecting 0 to 5 after # is pressed, the value will be expressed in A to F respectively.

Other keys are over-writing input (characters). / key is not used.

3 OPERATION METHOD AND CONNECTION

3.1 OPERATION METHOD

(1) Cable Connection

Connectors, one for connection with the controller and another for connection with the printer are provided for the programmer bottom and side, respectively.

Connect the programmer with the controller using exclusive-use cables. Do not fail to lock the connectors when the exclusive-use programmer is used.

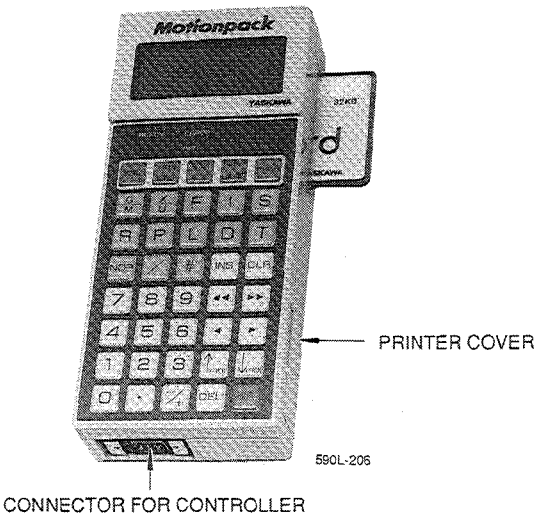


Fig. 3.1 Programmer

(2) Operation

Since the programmer has the power supply and signals stored in a cable, it can operate as soon as the cable is connected. (See Table 3.1.)

The programmer does not have a reset key. If it is necessary to reset, remove the connector for controller and connect it again. (Reset is enabled at the power supply startup.)

Table 3.1 Contents of Display (Normal/Error)

Display	Color	Contents
READY	Green	Lights when exclusive-use programmer operates normally.
ERROR	Red	Lights when communication with controller is not executed normally.

(3) Panel Mounting

The programmer can be mounted on the panel face. In this case, mount the programmer at the rear side using three taps on the rear side.

(4) Liquid Crystal Adjustment

The programmer can adjust the liquid crystal display contrast or EL back-light luminance (bright) if necessary. For adjustment, open the printer cover and use a driver.

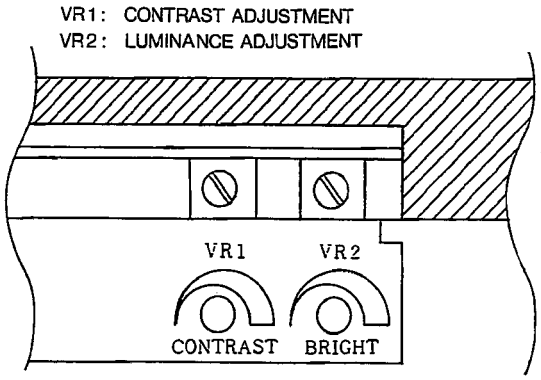


Fig. 3.2 Liquid Crystal Adjustment

(5) Precautions on Memory Card Application

Since the memory card is of no-contact method, it does not have any connectors.

Therefore, if the card is not inserted to the reader/writer slit firmly, the data cannot be read or written and "card access error" occurs. The error message is shown below.

The error also occurs if the card is removed during reading or writing since files in the card are damaged.

If "card access error" is displayed, insert the card again and attempt to execute. However, should the error not be cleared, it is necessary to execute the card all-clear.

```
Card access
      error

-push CLR key-_
```

3.2 CONNECTION WITH CONTROLLER

(1) Connector at Programmer Side

Main Port (DELC-J9PAF-12L9) : Connection with controller

5		9	0₅V
4	*RXD	8	0₅V
3	RXD	7	+5 V
2	*TXD	6	+5 V
1	TXD		

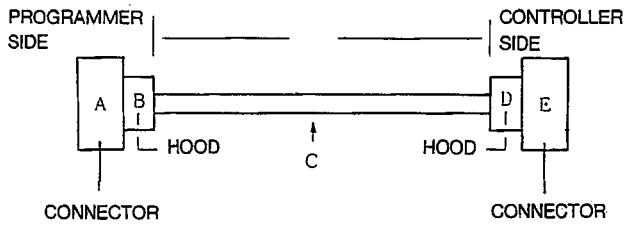
Connector No.	Programmer Side Connector	Applicable Connector	Hood	Manufacturer
Main	DELC-J9PAF-12L9	DE-9SF-N	DE-C8-J9-F1-1	JAE

(2) Connector at Controller Side

CN5 (DELC-J9SAF-12L9) : Connection with programmer

9	0₅V	5	
8	0₅V	4	*RXD
7	+5 V	3	RXD
6	+5 V	2	*TXD
		1	TXD

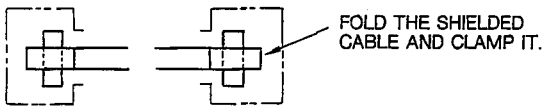
(3) Exclusive-use Cable (Attached)



Type : CMPR-WU13
(3 m)

Fig. 3.3 Exclusive-use Cable (Attached)

A Connector DE-9SF-N		C Cable UL Shielded Cable DP8409123		E Connector DE-9PF-N	
	Pin No.	Cable Core	Cable Color	Pin No.	Signal Name
	1	Twisted	Grey	1	TXD
	2		White (grey)	2	*TXD
	3	Twisted	Orange	3	RXD
	4		White (orange)	4	*RXD
	5	Twisted	Light green	5	
	6		White (light green)	6	+5 V
	7		Red	7	+5 V
	8		Yellow	8	GND
	9		Green (yellow)	9	GND



3.3 CONNECTION WITH PRINTER

Connection with the printer is in accordance with the RS-232C serial interface specifications. Hand-shake between the programmer and the printer is performed either by flag control method or X-ON/X-OFF control method.

(1) Flag Control Method

When the printer is in receiving disable status (e.g. when the buffer RAM memory is almost full), the output signal from the printer is turned off and transmission from the programmer is stopped temporarily. Then when transmission is ready, the printer turns on the output signal and the data transmission from the programmer is permitted.
This method is as shown in the Fig. 3.4.

TxD: Transmission data
RxD: Receiving data
CTS: This signal status determined whether a signal is output from TxD or not.
REV, DTR: Indicates the printer status, equivalent to "BUSY". Informs whether the printer can receive the data or not.
SG: Signal grounding
FG: Frame grounding

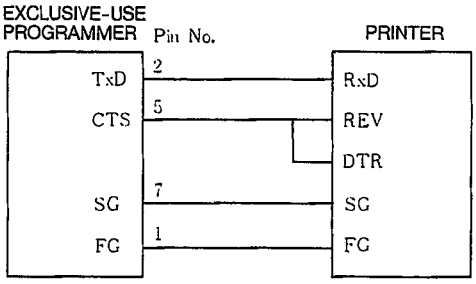


Fig. 3.4 Connection in Flag Control

(2) X-ON/X-OFF Control Method

The printer receiving status (whether it can receive the data or not) is controlled by sending a control code from the printer side.
X-ON (DC1 code <11H>) or X-OFF (DC3 code <13H>) is sent to the exclusive-use programmer when the printer is ready to receive the data or when the printer is not ready to receive the data, respectively, the exclusive-use programmer sends the data according to the instruction.
This method is as shown in the Fig. 3.5.

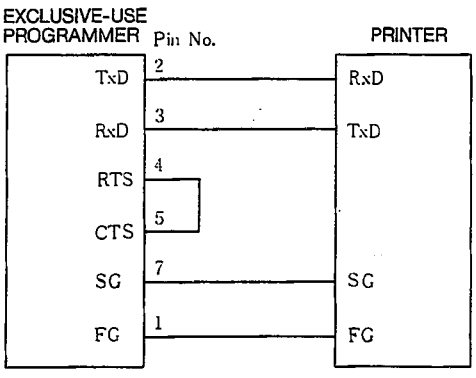


Fig. 3.5 X-ON/X-OFF Control Method

(3) Connector at Programmer Side

RS-232C port (DELC-J9SAF-12L9) : Connection with printer

1	FG	6	(RESERVED)
2	TXD	7	0₅V
3	RXD	8	(RESERVED)
4	RTS	9	(RESERVED)
5	CTS		

Connector No.	Programmer Side Connector	Applicable Connector	Hood	Manufacturer
Printer	DELC-J9SAF-12L9	DE-9PF-N	DE-C8-J9-F1-1	JAE

4 FUNCTION LIST

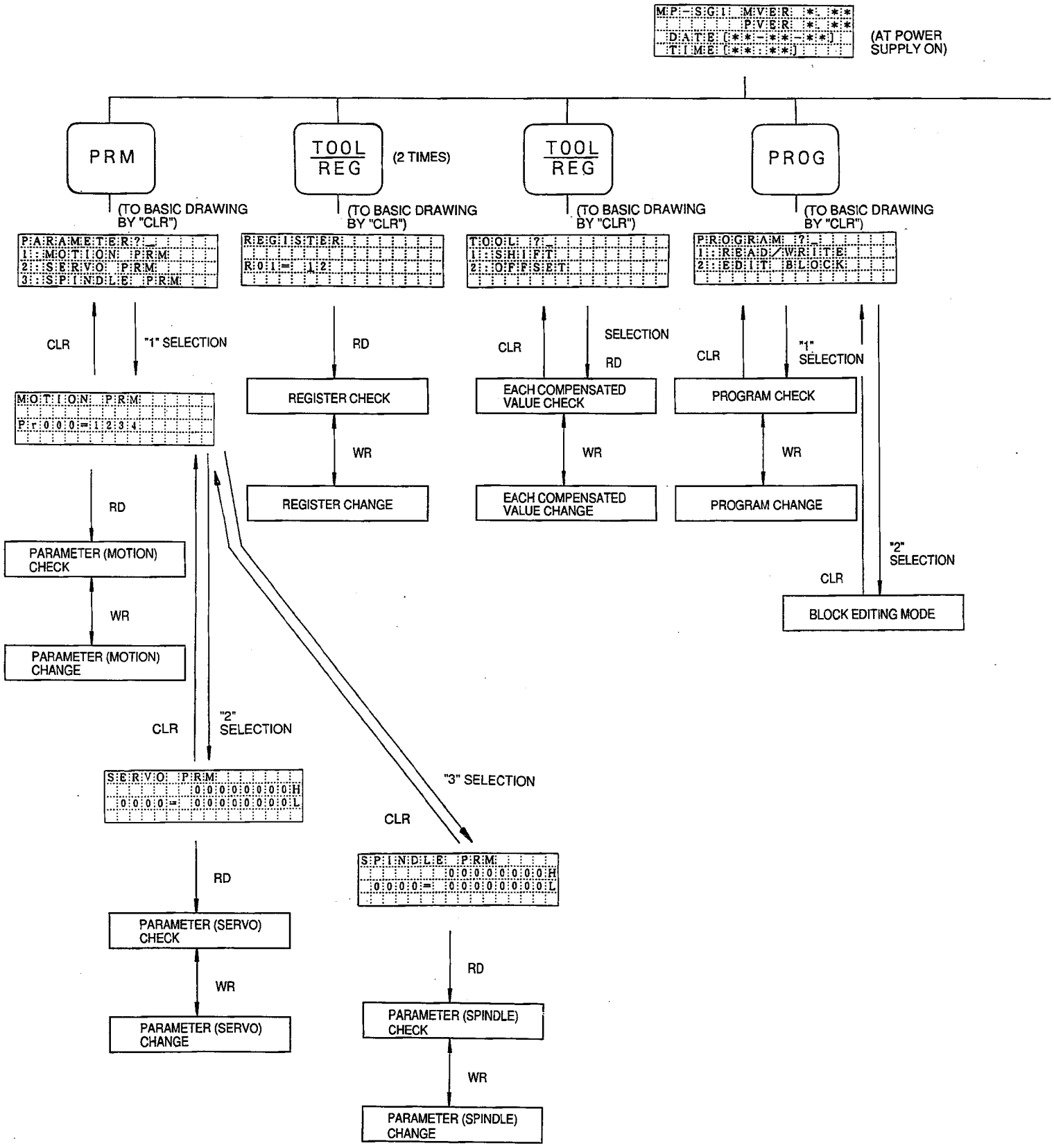
Table 4.1 Function List

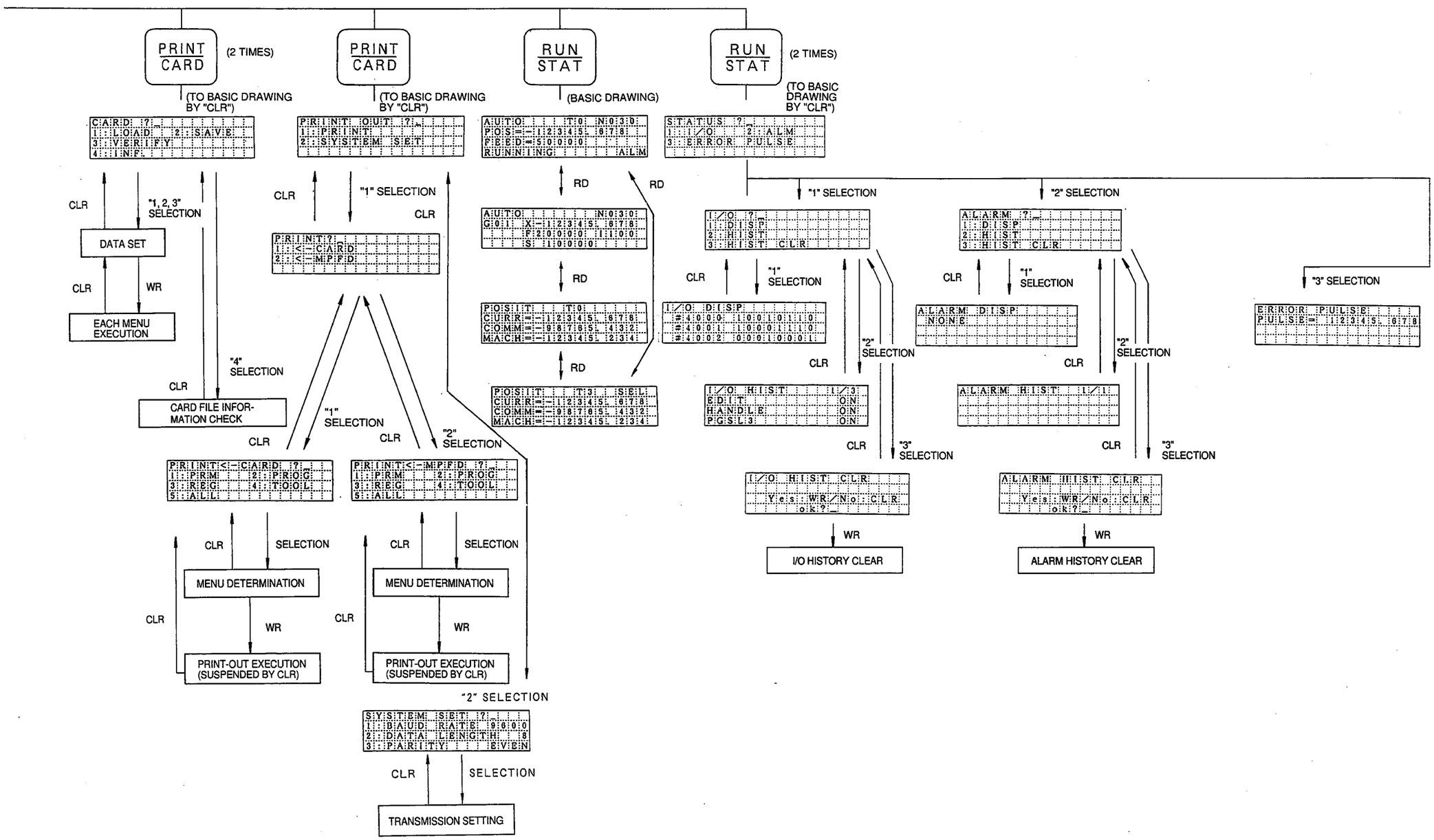
No.	Function Name	Contents
1	Parameter (MOTION) check	Displays the specified parameter (MOTION) contents.
2	Parameter (MOTION) set	Sets a value to the specified parameter (MOTION).
3	Parameter (SERVO) check	Displays the specified parameter (SERVO) contents.
4	Parameter (SERVO) set	Sets a value to the specified parameter (SERVO).
5	Parameter (SPINDLE) check	Displays the specified parameter (SPINDLE) contents.
6	Parameter (SPINDLE) set	Sets a value to the specified parameter (SPINDLE).
7	Register check	Displays the specified register contents.
8	Register set	Sets a value to the specified parameter.
9	Compensated value check	Sets a shifted value or offset value of the specified coordinate system.
10	Compensated value set	Sets a shifted value or offset value of the specified coordinate system.
11	Program check	Displays the specified block program contents.
12	Program change	Sets a program to the specified block.
13	Program (block) deletion	Deletes the specified block program.
14	Program (block) copy	Copies the specified block program to other block.
15	Program (block) move	Moves the specified block program to other block.
16	Memory card read	Transmits a program or parameter from the memory card to the Motionpack.
17	Memory card write-verify	Transfer or verify a program or parameter from the memory card to the Motionpack.
18	Printer output	Outputs a program or parameter from the card to the printer.
19	RUN display (mode, current position, current N number, speed, waiting status, alarm occurrence)	Displays each data as described in the parentheses to the left in order to monitor the Motionpack run status.
20	RUN display (Current executing program display)	Displays the program contens that is being executed.
21	RUN display (Various position data)	Displays the position data in order to monitor the Motionpack run status.
22	Status display (I/O status)	Displays the I/O signal status in order to monitor the Motionpack run status.
23	Status display (alarm message display)	Displays an alarm message.
24	Status display (Position deviation display)	Displays the position deviation value.

5 OPERATION METHOD

5.1 MENU FLOW CHART

The menu flow chart of the programmer operation is shown below.



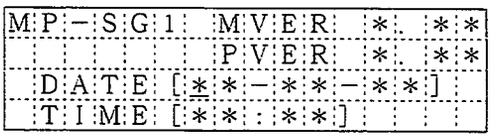

PRINT CARD
(2 TIMES)
(TO BASIC DRAWING BY "CLR")
CARD ?_
1 : LOAD 2 : SAVE
3 : VERIFY
4 : INF.
CLR
"1, 2, 3" SELECTION
DATA SET
CLR
WR
EACH MENU EXECUTION
"4" SELECTION
CLR
CARD FILE INFOR-MATION CHECK
PRINT CARD
(TO BASIC DRAWING BY "CLR")
PRINT OUT ?_
1 : PRINT
2 : SYSTEM SET
CLR
"1" SELECTION
CLR
PRINT ?
1 : <- CARD
2 : <- MPFD
RUN STAT
(BASIC DRAWING)
AUTO T0 N030
POS=-1234567 8
FEED=500000
RUNNING ALM
RD
RD
AUTO N030
G01 X=1234567 8
F2000000 1100
S 1000000
RD
POSIT T0
CURR=-1234567 8
COMM=-9876543 2
MACH=-1234567 234
RD
POSIT T3 SEL
CURR=-1234567 8
COMM=-9876543 2
MACH=-1234567 234
RUN STAT
(2 TIMES)
(TO BASIC DRAWING BY "CLR")
STATUS ?_
1 : I/O 2 : ALM
3 : ERROR PULSE
"1" SELECTION
"2" SELECTION
"3" SELECTION
I/O ?
1 : DISP
2 : HIST
3 : HIST CLR
CLR
"1" SELECTION
I/O DISP
#40000 0001 0110
#40001 0000 1110
#40002 0000 0001
CLR
"2" SELECTION
I/O HIST 1/3
EDIT ON
HANDLE ON
PGSL3 ON
CLR
"3" SELECTION
I/O HIST CLR
Yes : WR / No : CLR
ok ?_
WR
I/O HISTORY CLEAR
ALARM ?_
1 : DISP
2 : HIST
3 : HIST CLR
CLR
"1" SELECTION
ALARM DISP
NONE
CLR
"2" SELECTION
ALARM HIST 1/1
CLR
"3" SELECTION
ALARM HIST CLR
Yes : WR / No : CLR
ok ?_
WR
ALARM HISTORY CLEAR
"3" SELECTION
ERROR PULSE
PULSE= 12345 678
CLR
"1" SELECTION
CLR
"2" SELECTION
PRINT<-CARD ?
1 : PRM 2 : PROG
3 : REG 4 : TOOL
5 : ALL
CLR
SELECTION
MENU DETERMINATION
CLR
WR
PRINT-OUT EXECUTION (SUSPENDED BY CLR)
PRINT<-MPFD ?
1 : PRM 2 : PROG
3 : REG 4 : TOOL
5 : ALL
CLR
SELECTION
MENU DETERMINATION
CLR
WR
PRINT-OUT EXECUTION (SUSPENDED BY CLR)
"2" SELECTION
SYSTEM SET ?
1 : BAUD RATE 9600
2 : DATA LENGTH 8
3 : PARITY EVEN
CLR
SELECTION
TRANSMISSION SETTING

5.2 INITIAL SCREEN

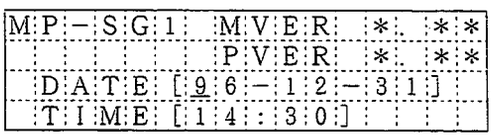
indicates an operation procedure.

Power supply ON

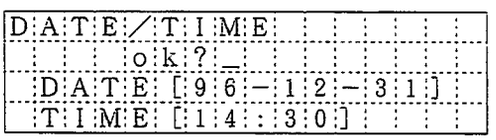
Displays the Motionpack version and PP side version at power supply ON.
Then, depressing a function key opens the menu.



9, 6, 1, 2, 3,
1, 1, 4, 3, 0
(14 : 30 o'clock on 31st December, 1996)



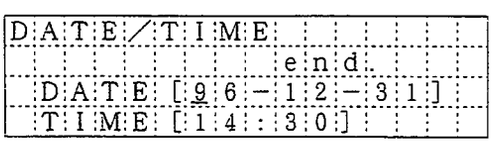
Press WR key.



Press WR key.

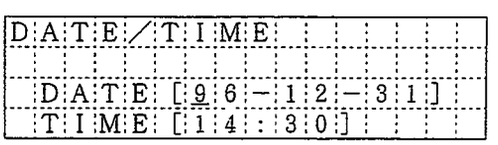
(The execution can suspended by pressing CLR key.)

"14:30 o'clock on 31st December, 1996" is stored to the Motionpack.



Press CLR key.

Redisplays the calendar of current time.



5.3 PARAMETER (MOTION) CHECK

Press [PRM] key.

Displays the Parameter Mode Screen.

```
PARAMETER?_
1:MOTION PRM
2:SERVO PRM
3:SPINDLE PRM
```

Press [1] and [WR] keys.

If the parameter was read-out before, the last read-out parameter number (stored in PP) is displayed (Pr000 is displayed at initialization).

```
MOTION PRM

Pr000= 1234
```

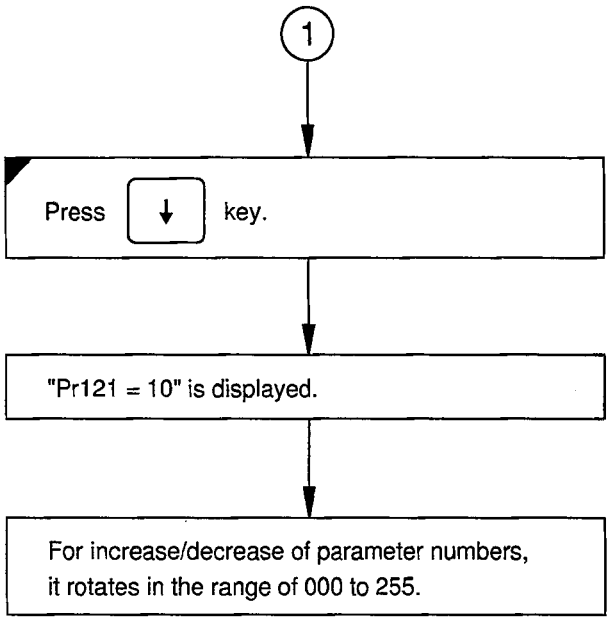
Press [▶▶], [1], [2], [0], and [↑] ([↓]) keys.

"Pr120 = 98765432" is displayed.
The number section blinks when the cursor is in the parameter number section. Then, the parameter value is cleared at the number change.

```
MOTION PRM

Pr120= 98765432
```

(1)

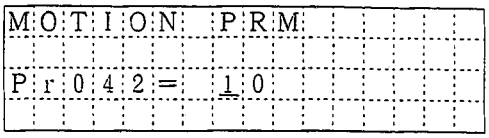


MOTION PRM
Pr121= 10

5.4 PARAMETER (MOTION) CHANGE

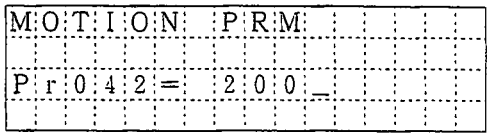
The current value is displayed for the parameter (motion) checking procedures described above.

Pr042 = 10 is displayed.



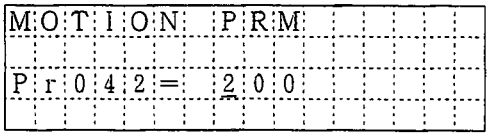
Press [2], [0] and [0] keys.

A number cannot be input in the space for signs (7th column) though it is attempted. In this case, it is automatically input in the 8th column.



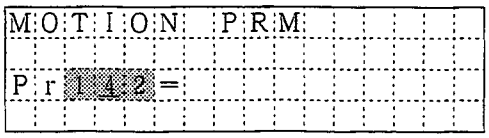
Press [WR] key.

200 is written-in to Pr042. At the same time, Pr042 = 200 is displayed and the cursor indicates the head of data.
*When a write-in error occurs, "inputerr" is displayed in the "PARAMETER" display section.



Press [▶▶] and [1] key.

The cursor indicates the head of the Pr number. The number section blinks when the cursor is in the parameter number section. Then the parameter value is cleared at the number change.

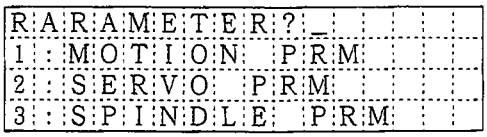


5.5 PARAMETER (SERVO) CHECK

The data are expressed in hexadecimal.

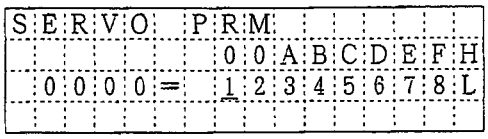
Press [PRM] key.

Displays the Parameter Mode Screen.



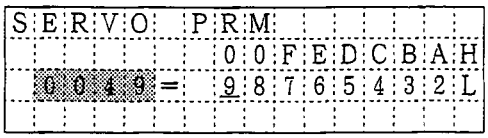
Press [3] and [WR] keys.

If the parameter was read-out before, the last read-out parameter number (stored at PP) is displayed (Pr000 is displayed at initialization).

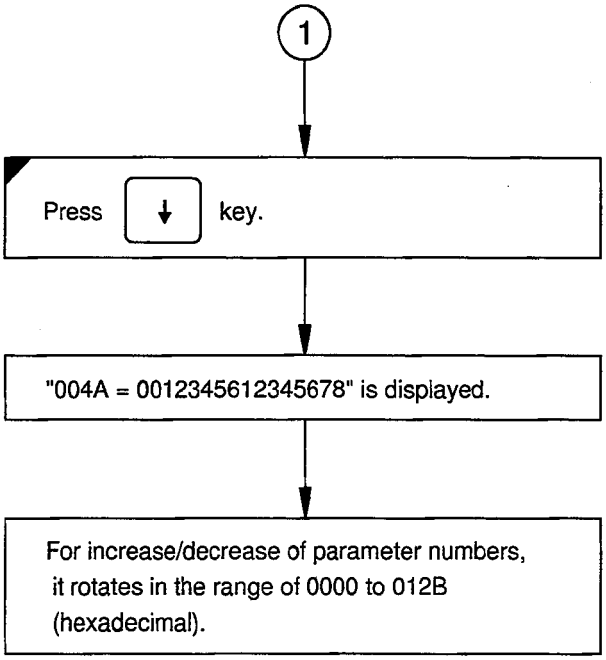


Press [◀◀], [0], [0], [4], [9] and [↓] ([↑]) keys.

"0049 = 00FFDCBA98765432" is displayed.
The number section blinks when the cursor is in the parameter number section. Then, the parameter value is cleared at the number change.



(1)



S	E	R	V	O		P	R	M							
							0	0	1	2	3	4	5	6	H
	0	0	4	A	=		1	2	3	4	5	6	7	8	L

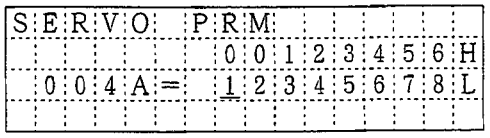
5.6 PARAMETER (SERVO) CHANGE

The data are expressed in hexadecimal.

The current value of parameter can be displayed in the same procedures for PARAMETER (SERVO) CHECK.

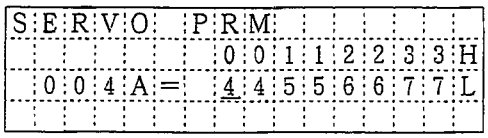
↓

"004A = 0012345678" is displayed.



↓

Press 4, 4, 5, 5, 6, 6, 7, 7, 0, 0, 1, 1, 2, 2, 3 and 3 keys.

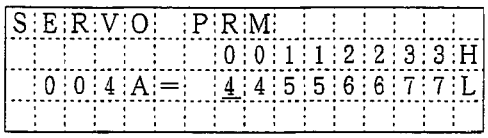


↓

Press WR key.

↓

0011223344556677 is written-in to 004A and the cursor indicates the head of 4th byte of data.
*When a write-in error occurs, "inputerr" is displayed in the "SERVO PRM" display section.

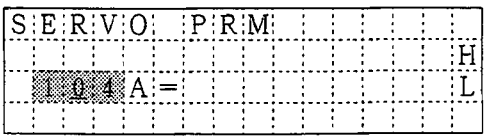


↓

Press ◀◀ and 1 keys.

↓

The number section blinks when the cursor is in the parameter number section. Then, the parameter value is cleared at the number change.

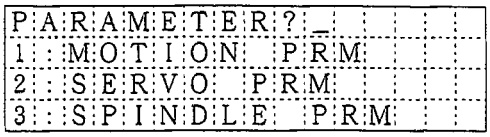


5.7 PARAMETER (SPINDLE) CHECK

The data are expressed in hexadecimal.

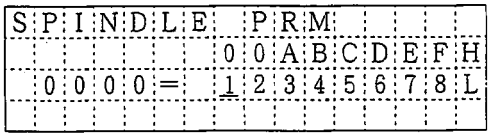
Press [PRM] key.

Displays the Parameter Mode Screen.



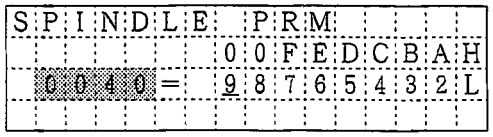
Press [3] and [WR] key.

If the parameter was read-out before, the last read-out parameter number (stored at PP) is displayed (Pr000 is displayed at initialization).

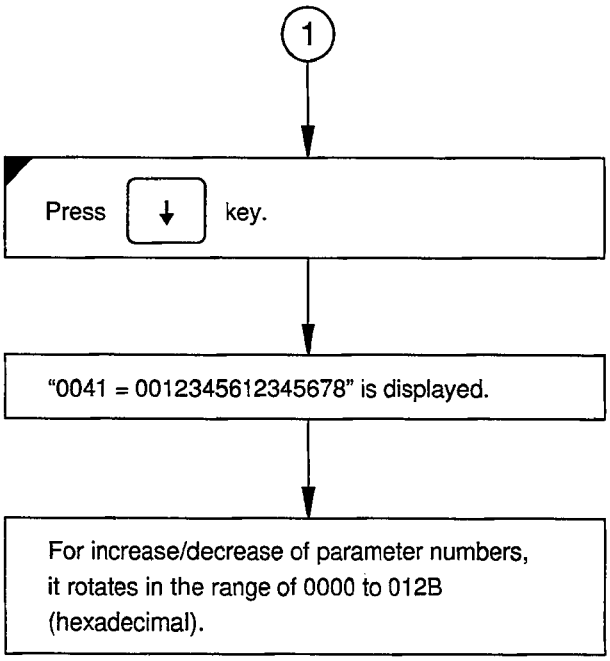


[◀◀], [0], [0], [4], [0] and [↓] ([↑]) keys.

"0040 = 00FFDCBA98765432" is displayed. The number section blinks when the cursor is in the parameter number section. Then, the parameter value is cleared at the number change.



(1)

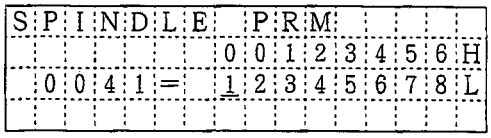


SPINDLE PRM													
						0	0	1	2	3	4	5	6 H
	0	0	4	1	=	1	2	3	4	5	6	7	8 L

5.8 PARAMETER (SPINDLE) CHANGE

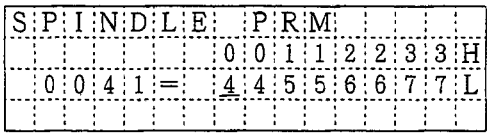
The data are expressed in hexadecimal.

The current value of parameter can be displayed in the same procedures for PARAMETER (SPINDLE) CHECK.



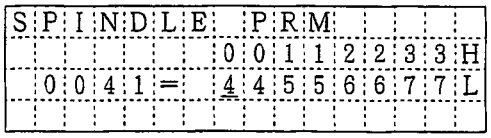
"0041 = 0012345678" is displayed.

Press 4, 4, 5, 5, 6, 6, 7, 7, 0, 0, 1, 1, 2, 2, 3 and 3 keys.



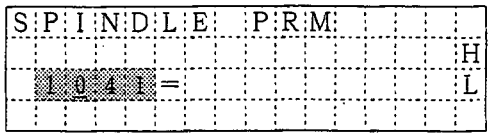
Press WR key.

"0011223344556677" is written-in to 0041 and the cursor indicates the head of 4th byte of data.
*When a write-in error occurs, "inputerr" is displayed in the "SPINDLE PRM" display section.



Press ◀◀ and 1 keys.

The number section blinks when the cursor is in the parameter number section. Then, the parameter value is cleared at the number change.



5.9 REGISTER CHECK

Press [TOOL/REG] key to enter the register mode.

If the registers were read out before, when the register mode is selected, the last read-out register (stored in PP) is displayed. (R01 is displayed at initialization.)

R E G I S T E R												
R 0 1 =			1	2								

Press [▶▶], [4], [1] and [↓] ([↑]) keys.

The cursor moves to the register number section and R41 is input.

By pressing [↓] key, the contents of R41 is displayed and the cursor moves to the data section.

R E G I S T E R												
R 4 1 =			9	8								

Press [↓] ([↑]) key.

Pressing [↓] key changes R41 and R42 to display the contents while [↑] key changes it to R40.

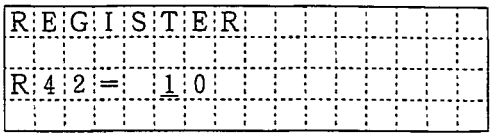
For increase/decrease of the register numbers, it rotates in the range of 01 to 99.

R E G I S T E R												
R 4 2 =			1	0								

5.10 REGISTER CHANGE

The current value is displayed for the register checking procedures.

R42 = 10 is displayed and the cursor indicates the head of data.

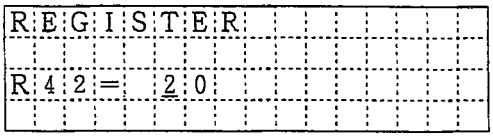


Press [2], [0] and [WR] keys.

20 is displayed in the R42 data section and

R42 = 20 is set by the [WR] key.

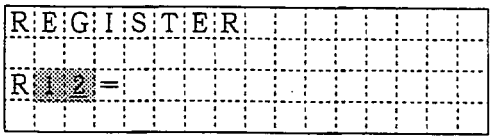
Then the cursor moves to the head of the data.



Press [▶▶] and [1] keys.

By pressing [▶▶] key, the cursor moves to the register number section and [1] is input at the cursor position.

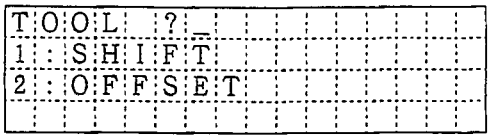
The number section blinks when the cursor is in the register number section and the register value is cleared at the number change.



5.11 COMPENSATED VALUE (SHIFTED VALUE) CHECK

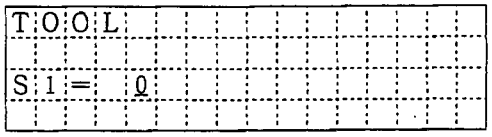
Press [TOOL REG] key to enter the compensated value mode.

The compensated value mode screen is displayed.



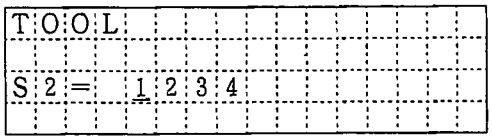
Press [1] and [WR] keys.

If the shifted values were read out at shifted value mode, the last read-out shifted number stored in PP) is displayed. (S1 is displayed at initialization.)



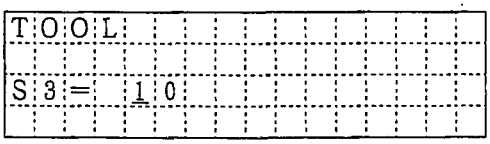
Press [▶▶], [2] and ([↓], [↑]) keys.

The contents of S2 are displayed.



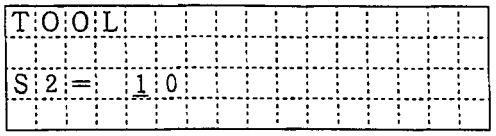
Press [↓] ([↑]) key.

S3 (S1) is displayed.
For increase/decrease of the shifted number, it rotates in the range of 1 to 9.



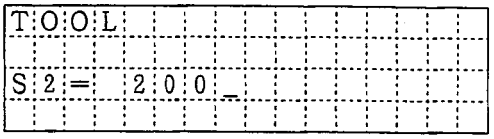
5.12 COMPENSATED VALUE (SHIFTED VALUE) CHANGE

- Initial Screen - the current value is displayed for the shifted value checking procedures.



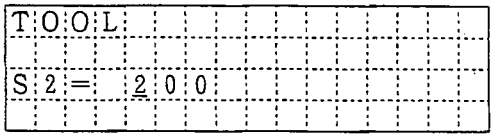
(S2 change)

Press [2] , [0] and [0] keys.



(S2 write-in)

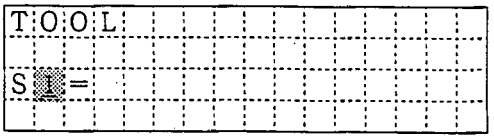
Press the [WR] key.



(Other shifted value change)

Press [▶▶] and [1] keys.

The number section blinks.
The shifted value display is cleared at the number change.



5.13 COMPENSATED VALUE (OFFSET VALUE) CHECK

Press [TOOL REG] key to enter the compensated value mode.

The compensated value mode screen is displayed.

```
TOOL  ?_
1:SHIFT
2:OFFSET
```

Press [2] and [WR] keys.

If the shifted values were read out at shifted value mode, the last read-out shifted number (stored in PP) is displayed. (O8 is displayed at initialization.)

Press [▶▶], [8] and ([↓]) [↑] keys.

The contents of O8 are displayed.

```
TOOL
O8=  1234
```

Press [↓] ([↑]) key.

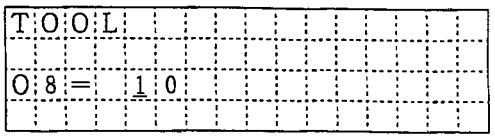
The contents of O9 (O9) are displayed.

```
TOOL
O9=  10
```

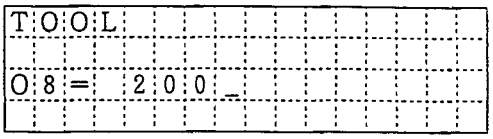
Only O8 and O9 are the offset values.

5.14 COMPENSATED VALUE (OFFSET VALUE) CHANGE

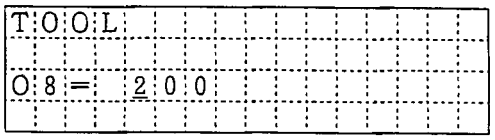
-Initial Screen - the current value is displayed for the shifted value checking procedures.



Press [2] , [0] and [0] keys.



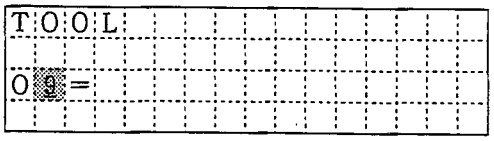
Press [WR] key.



(Other offset, register change)

Press [▶▶] and [9] keys.

The number section blinks when the cursor is in the offset number section and the offset value display is cleared at the number change.



Press [PROG] key.

The initial screen is displayed.

Press [1] and [WR] keys.
(READ/WRITE mode)

If the blocks were read-out before, the contents of the last read-out block number is displayed. At initialization, the display is as shown on the right.

Press [3], [0] and [↓] keys.

The contents of block number N030 are displayed.

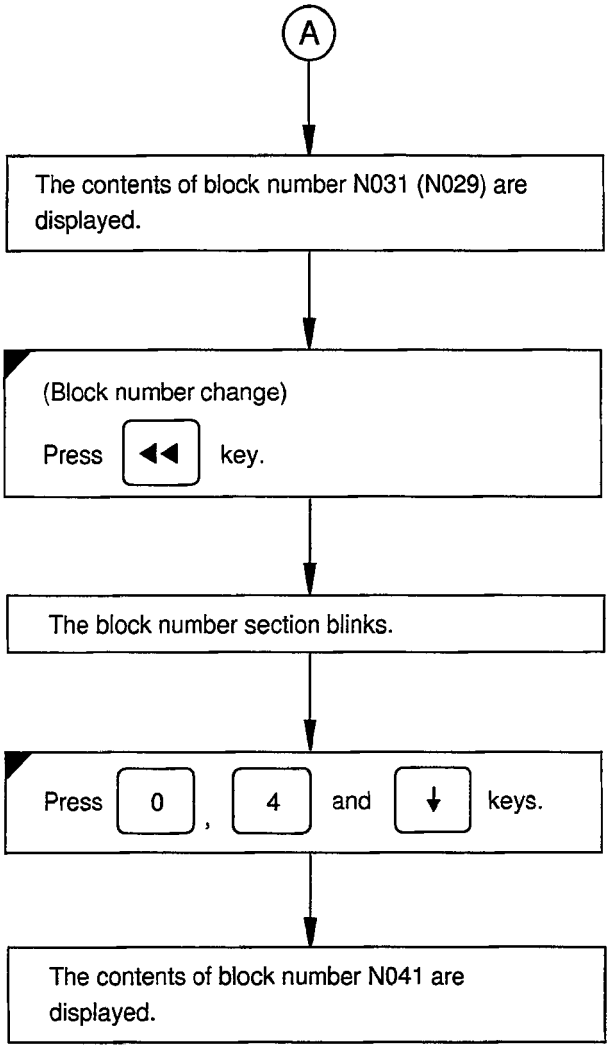
Press [↓] ([↑]) key.

(A)

```
PROGRAM  ?_
1:READ/WRITE
2:EDIT BLOCK
```

```
PROGRAM    N_
```

```
PROGRAM      N030
G67 P200
```



P	R	O	G	R	A	M				N	0	3	1	
G	0	1		X	−	2	0	0	0	.	0	0	0	0
				F	2	0	0	0	0		I	1	0	0
				S		1	0	0	0	0				

P	R	O	G	R	A	M				N	0	3	1	
G	0	1		X	−	2	0	0	0	.	0	0	0	0
				F	2	0	0	0	0		I	1	0	0
				S		1	0	0	0	0				

P	R	O	G	R	A	M				N	0	4	1	
G	0	5		X	−	2	0	0	0	.	0	0	0	0
				F	2	0	0	0	0		I	1	0	0
				S		1	0	0	0	0				

Press [PROG] key. Select "READ/WRITE".

(The contents of the desired block number are displayed.)

Press [4] , [0] and [↓] keys.

```
PROGRAM      N040
G01  X-20000.  000
     F20000    I100
     S100000
```

To change the command

Press ([▶]) key.

Press [6] , [7] and [▶▶] keys.

The cursor display is moved to P.

Press ([▶]), [1] , [2] and [3] keys.

```
PROGRAM      N040
G67  P123
```

Press [WR] key.

```
PROGRAM      N040
G67  P123
```

To change a part of the command

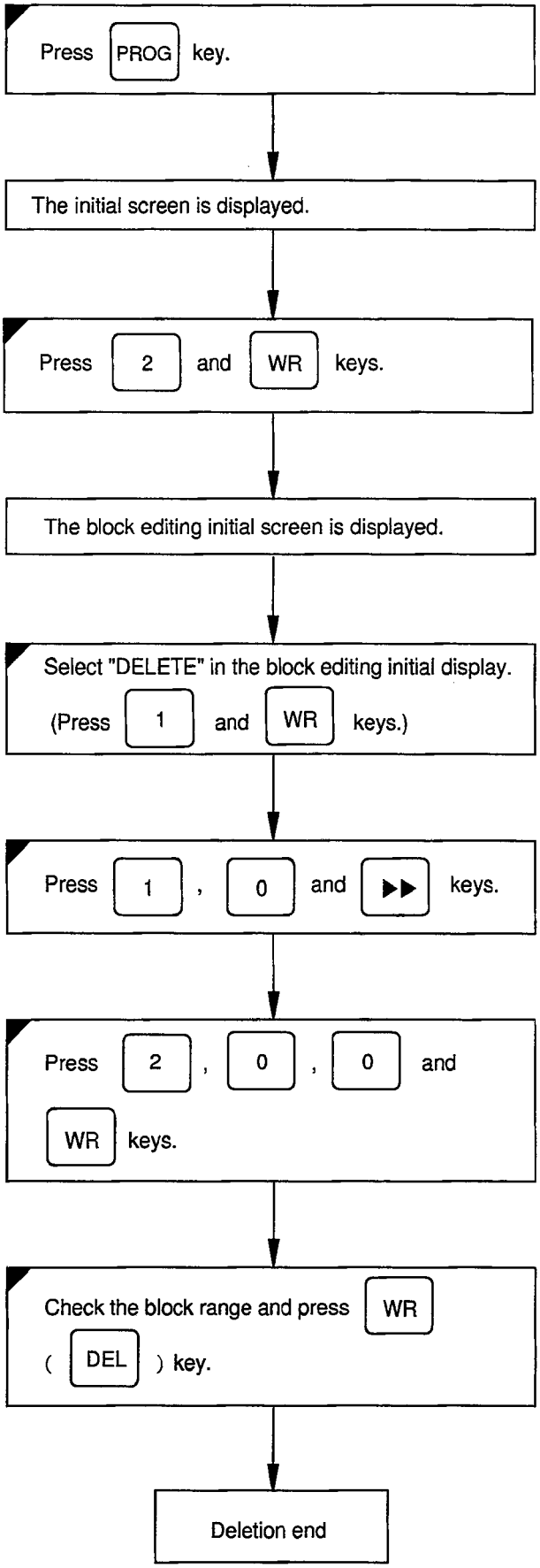
Press [▶▶] , [▶] , [▶] and [4] keys.

```
PROGRAM      N040
G01  X-40000.  000
     F20000    I100
     S100000
```

Press [WR] key.

The cursor moves to "G".

5.17 PROGRAM (BLOCK) DELETION



Program Initial Screen

```
PROGRAM ?_
1 : READ/WRITE
2 : EDIT BLOCK
```

Program Editing Initial Screen

```
BLOCK ?_
1 : DELETE
2 : COPY
3 : MOVE
```

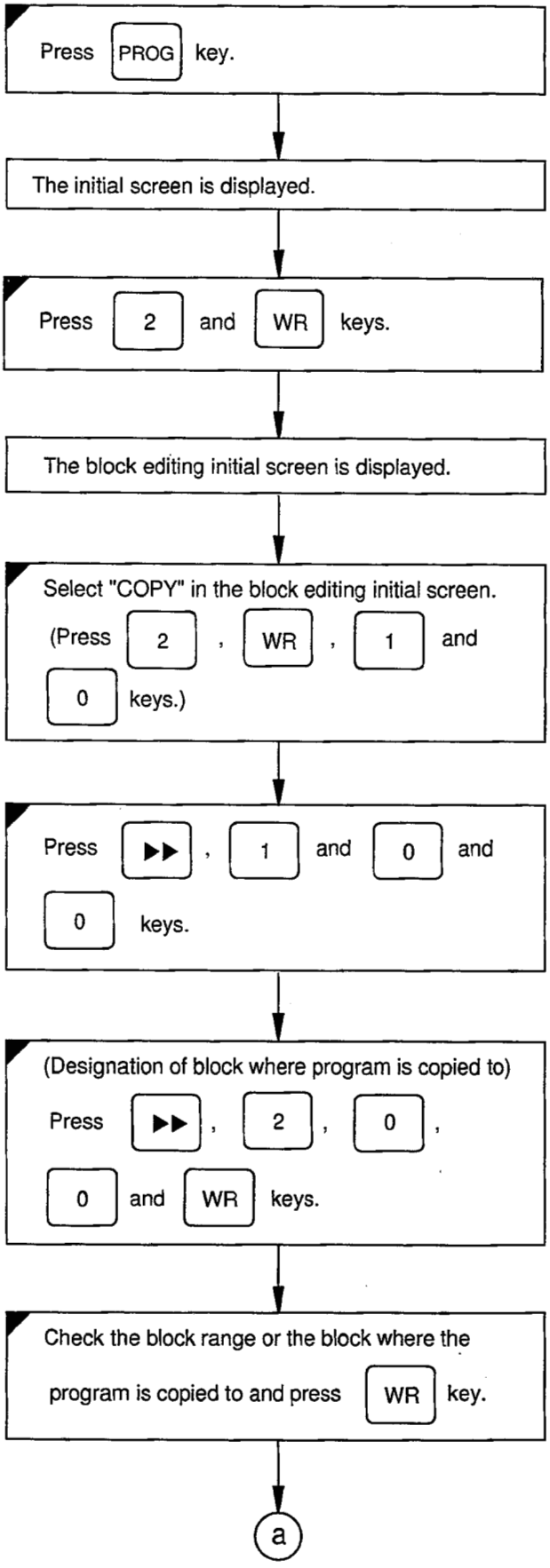
```
BLOCK DELETE
N_ - N
```

```
BLOCK DELETE
N10 - N_
```

```
BLOCK DELETE
N10 - N200
ok?_
```

```
BLOCK DELETE
N10 - N200
end.
```

5.18 PROGRAM (BLOCK) COPY



Program Initial Screen

```
PROGRAM ?_
1:READ/WRITE
2:EDIT BLOCK
```

Block Editing Initial Screen

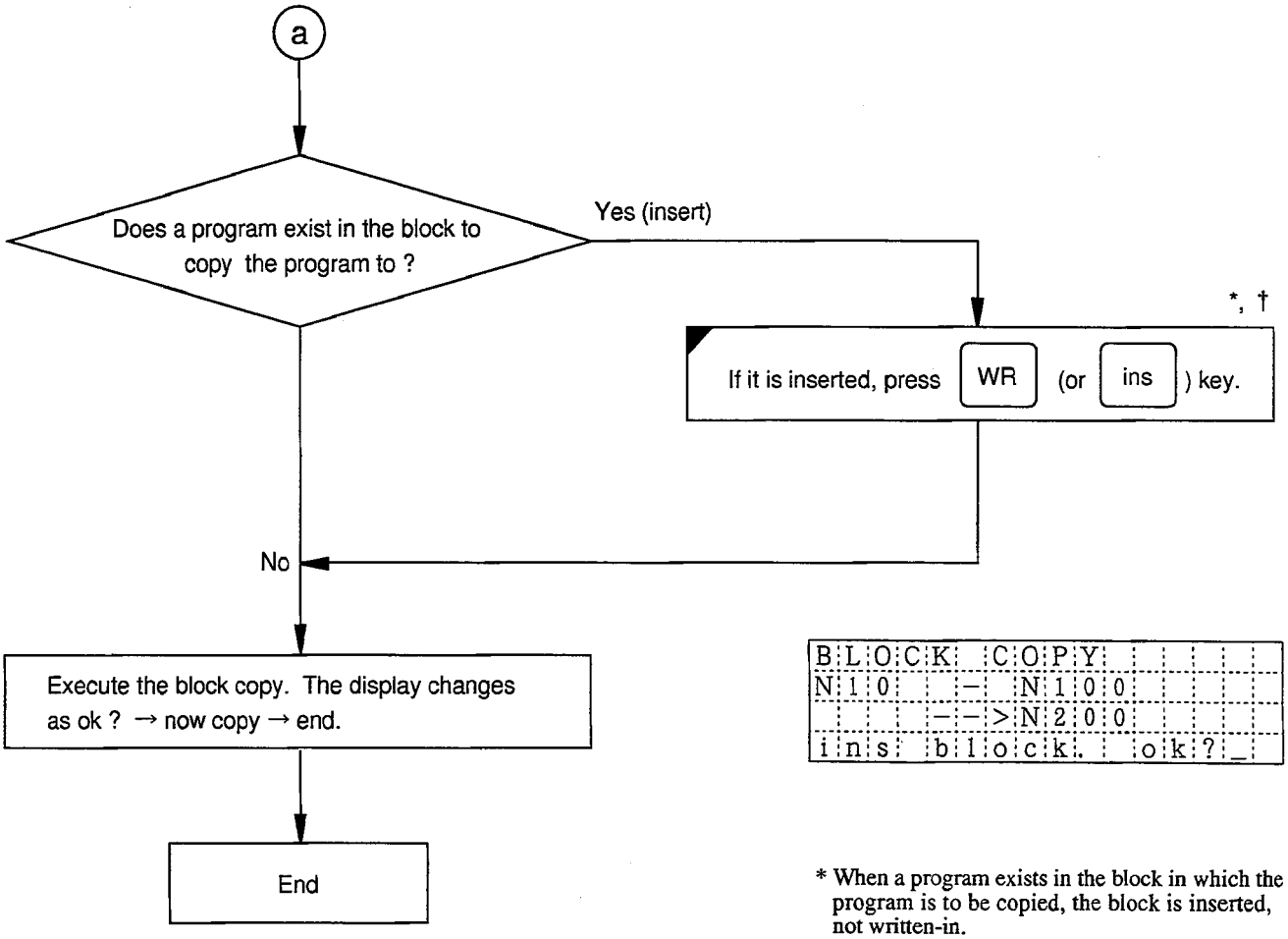
```
BLOCK ?_
1:DELETE
2:COPY
3:MOVE
```

Block Range Designation

```
BLOCK COPY
N10_ - N
   --->N
```

```
BLOCK COPY
N10 - N100
   --->N
```

```
BLOCK COPY
N10 - N100
   --->N200
 ok?_
```




```
BLOCK COPY
N10  - N100
   -->N200
ins block ok?_
```

```
BLOCK COPY
N10  - N100
   -->N200
  end..
```

* When a program exists in the block in which the program is to be copied, the block is inserted, not written-in.

† An error message is displayed if block insertion is not possible.

5.19 PROGRAM (BLOCK) MOVE

Press [PROG] key.

The initial screen is displayed.

```
PROGRAM ?_
1:READ/WRITE
2:EDIT BLOCK
```

Press [2] and [WR] keys.

The block editing initial screen is displayed.

```
BLOCK ?_
1:DELETE
2:COPY
3:MOVE
```

Select "MOVE" in the block editing initial screen.

Press [3], [WR], [1] and [0] keys.

```
BLOCK MOVE
N10_ - N
```

Press [▶▶], [1] and [0] and [0] keys.

```
BLOCK MOVE
N10 - N100
   -->N
```

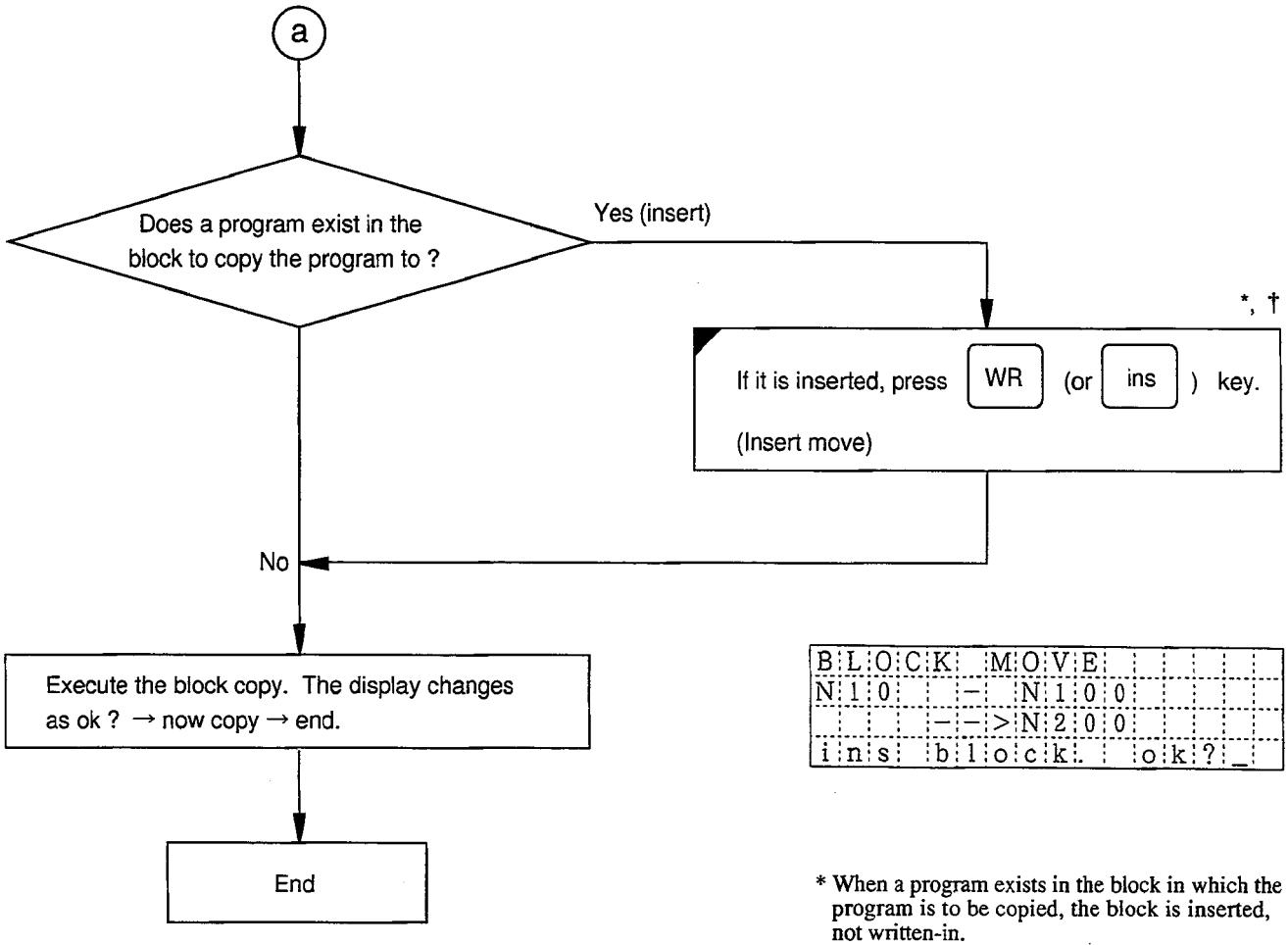
(Designation of block where program is moved to)

Press [▶▶], [2], [0], [0] and [WR] keys.

```
BLOCK MOVE
N10 - N100
   -->N200
ok?_
```

Check the block range or the block where the program is moved to and press [WR] key.

(a)



* When a program exists in the block in which the program is to be copied, the block is inserted, not written-in.

† An error message is displayed if block insertion is not possible.

Press PRINT/CARD key to display card mode.

The card initial screen is displayed.

Specify LOAD.

Press 1 and WR keys.

Specify the axis No.

Press 2 and WR keys.

2 indicates an axis designation file No.

Select a number among 1 to 5

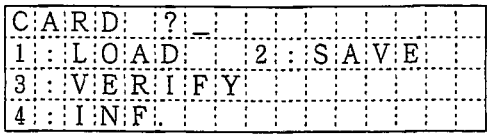
according to the data type in the load initial screen.
Select a program.

Press 2 and WR keys.

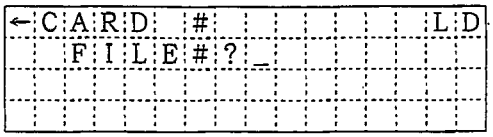
Press WR key.

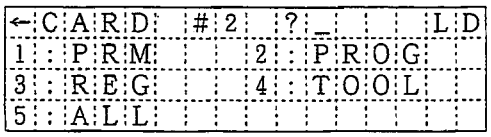
End

Card Initial Screen

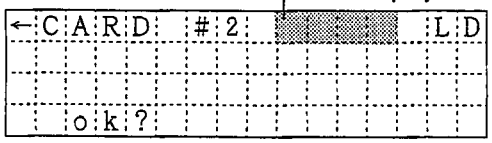


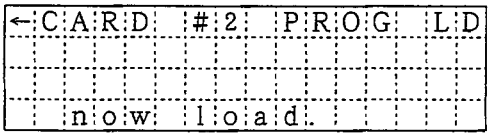
Axis Designation Initial Screen

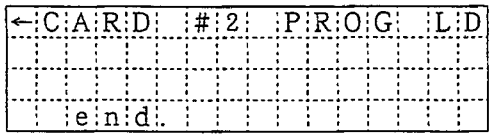




Data types displayed.







5.21 MEMORY CARD WRITE

Press PRINT/CARD key to display card mode.

The card initial screen is displayed.

Specify SAVE.

Press 2 and WR keys.

The axis designation initial screen is displayed.

Specify the axis No.

Press 1 and WR keys.

1 indicates an axis designation file No.

Select a number among 1 to 5

according to the data type in the save initial screen.

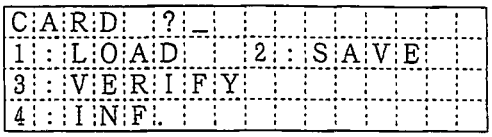
Select a program.

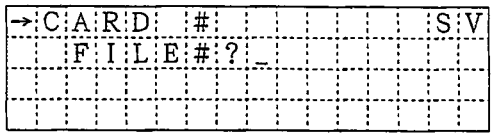
Press 2 and WR keys.

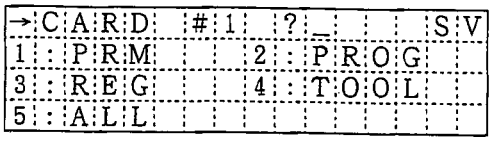
Press WR key.

End

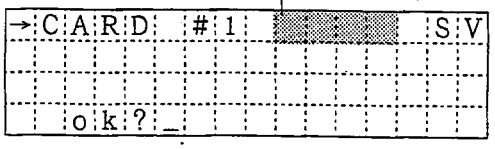
Card Initial Screen

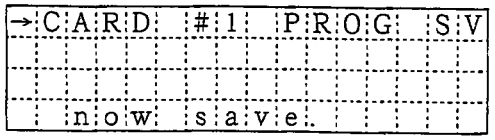


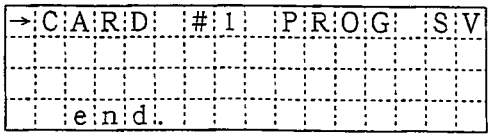




Data types displayed.







5.22 MEMORY CARD VERIFY

Press [PRINT/CARD] key to display card mode.

The card initial screen is displayed.

Specify VERIFY.

Press [3] and [WR] keys.

The axis designation initial screen is displayed.

Specify the axis No.

Press [1] and [WR] keys.

1 indicates an axis designation file No.

Select a number among [1] to [5]

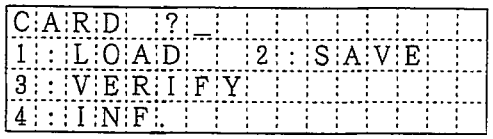
according to the data type in the verify initial screen.
Select a program.

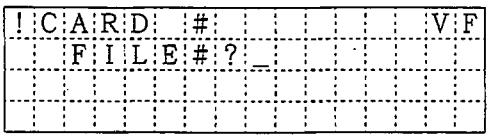
Press [2] and [WR] keys.

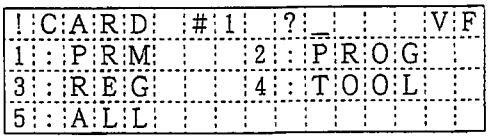
Press [WR] key.

End

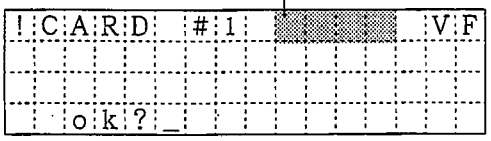
Card Initial Screen

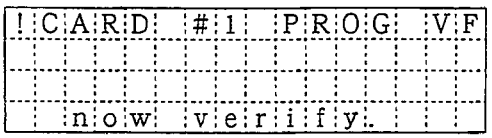


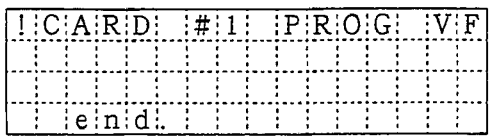




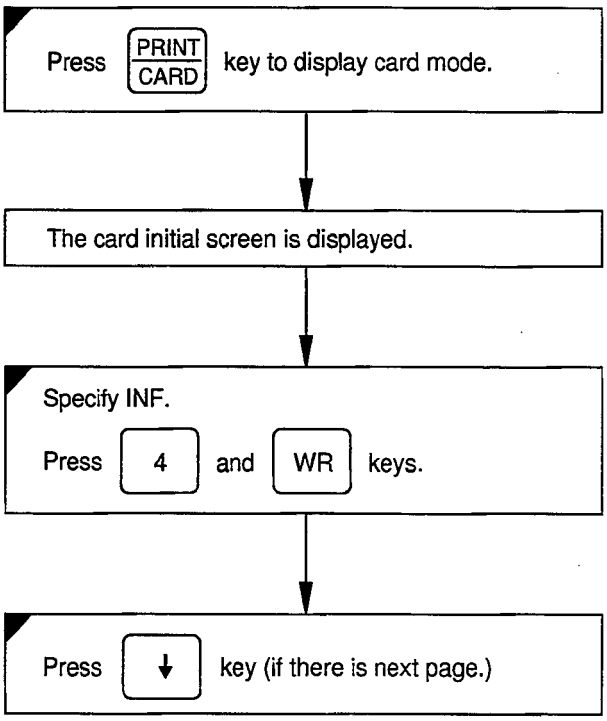
Data types displayed.







5.23 MEMORY CARD DIRECTORY



Card Initial Screen

```
CARD ?_
1:LOAD   2:SAVE
3:VERIFY
4:INF.
```

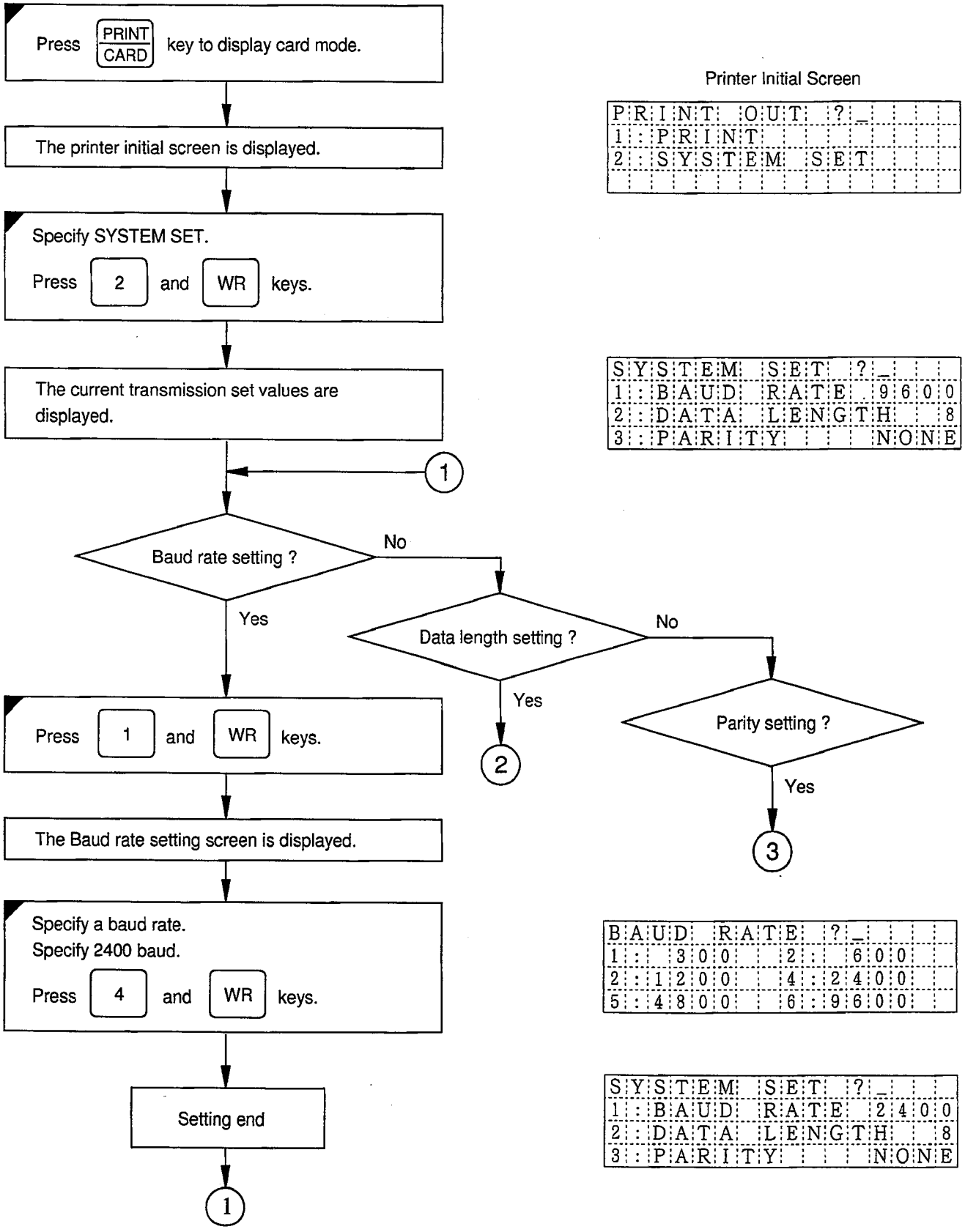
Directory Display Screen

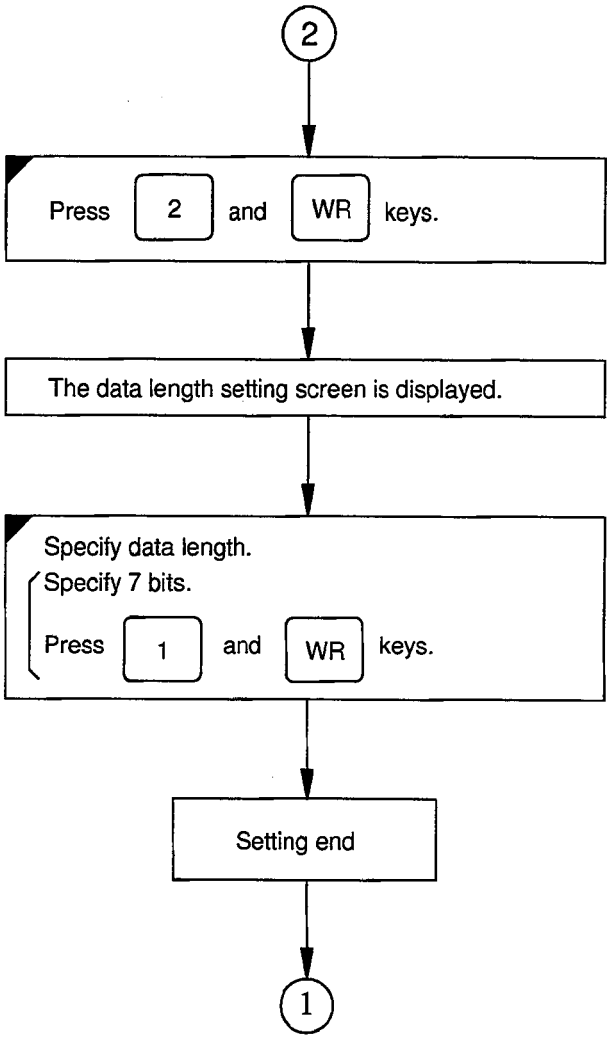
```
CARD INF.  F#1-#4
F#1 (Pr. Pg. Rg. T1)
F#2 (Pr.    Rg. T1)
F#3 (Pr. Pg.    T1)
```

```
CARD INF.  F#1-#4
F#4 (Pr. Pg.    T1)
```

5.24 PRINT-OUT

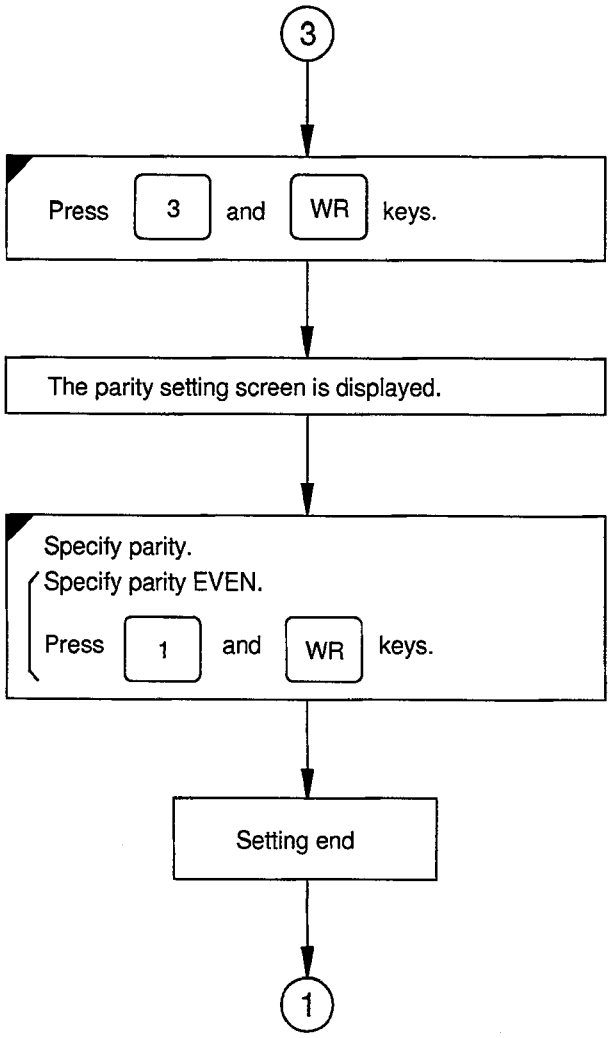
5.24.1 Transmission Conditions Setting





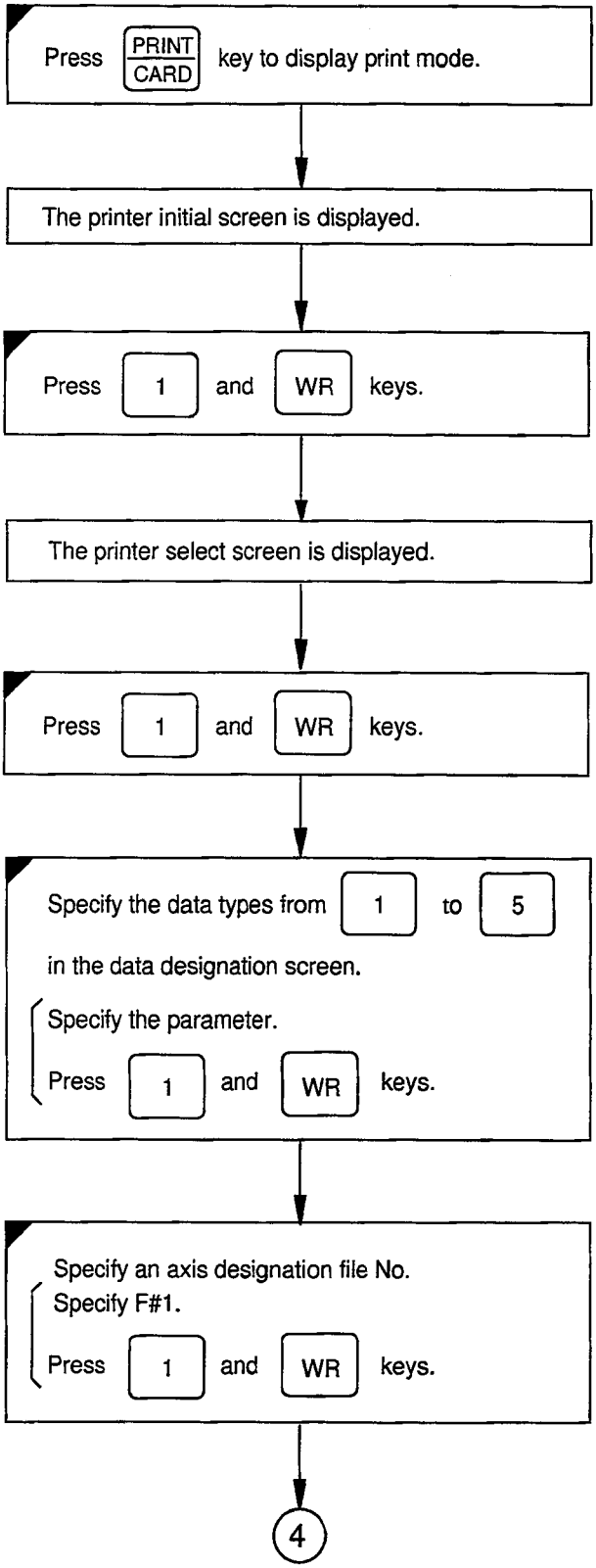

```
DATA LENGTH ?_
1:7bit
2:8bit
```

```
SYSTEM SET ?_
1:BAUD RATE 9600
2:DATA LENGTH 7
3:PARITY NONE
```




```
PARITY ?_
1:EVEN
2:ODD
3:NONE
```

```
SYSTEM SET ?_
1:BAUD RATE 9600
2:DATA LENGTH 8
3:PARITY EVEN
```



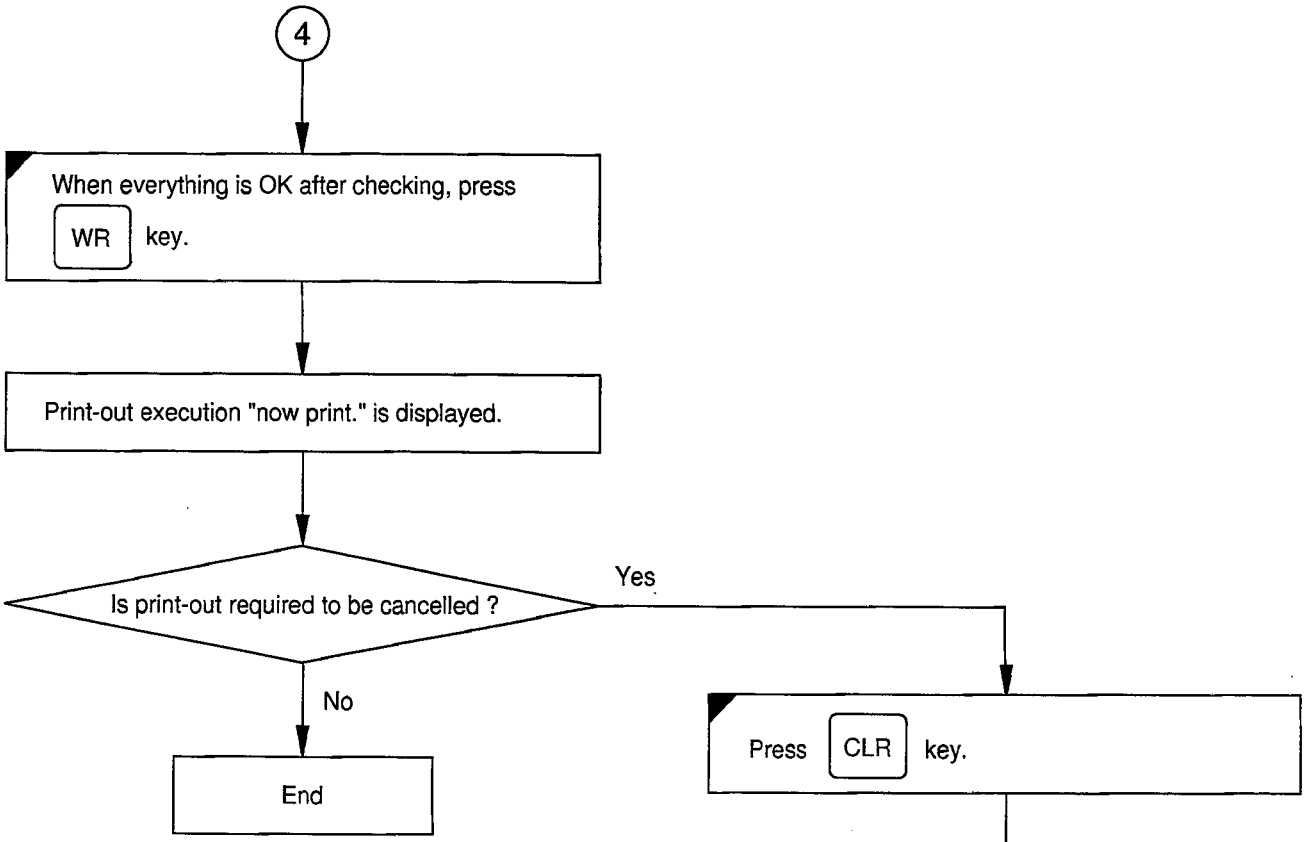
Printer Initial Screen

```
PRINT OUT ?_
1:PRINT
2:SYSTEM SET
```

```
PRINT?_
1:<-CARD
2:<-MPFD
```

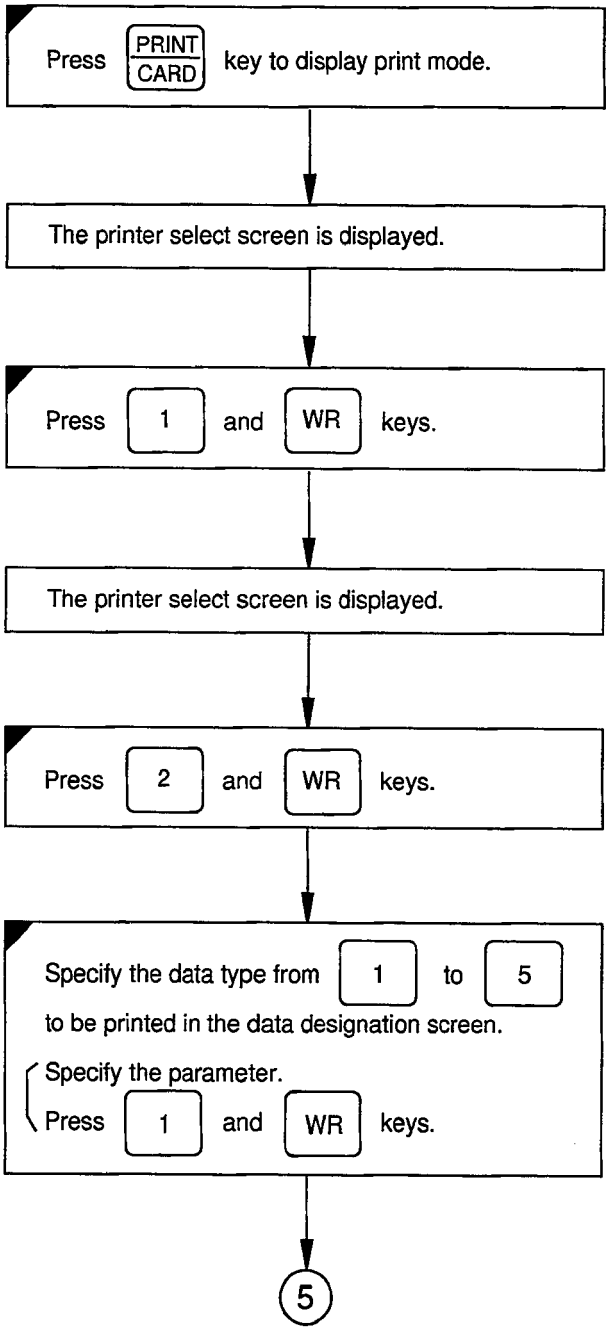
```
PRINT<-CARD ?_
1:PRM    2:PROG
3:REG    4:TOOL
5:ALL
```

```
PRINT<-CARD
F#   PRM ALL
```




```
PRINT<-CARD
F#1    PRM ALL
       end.
```

5.24.3 Motionpack Contents Print-out



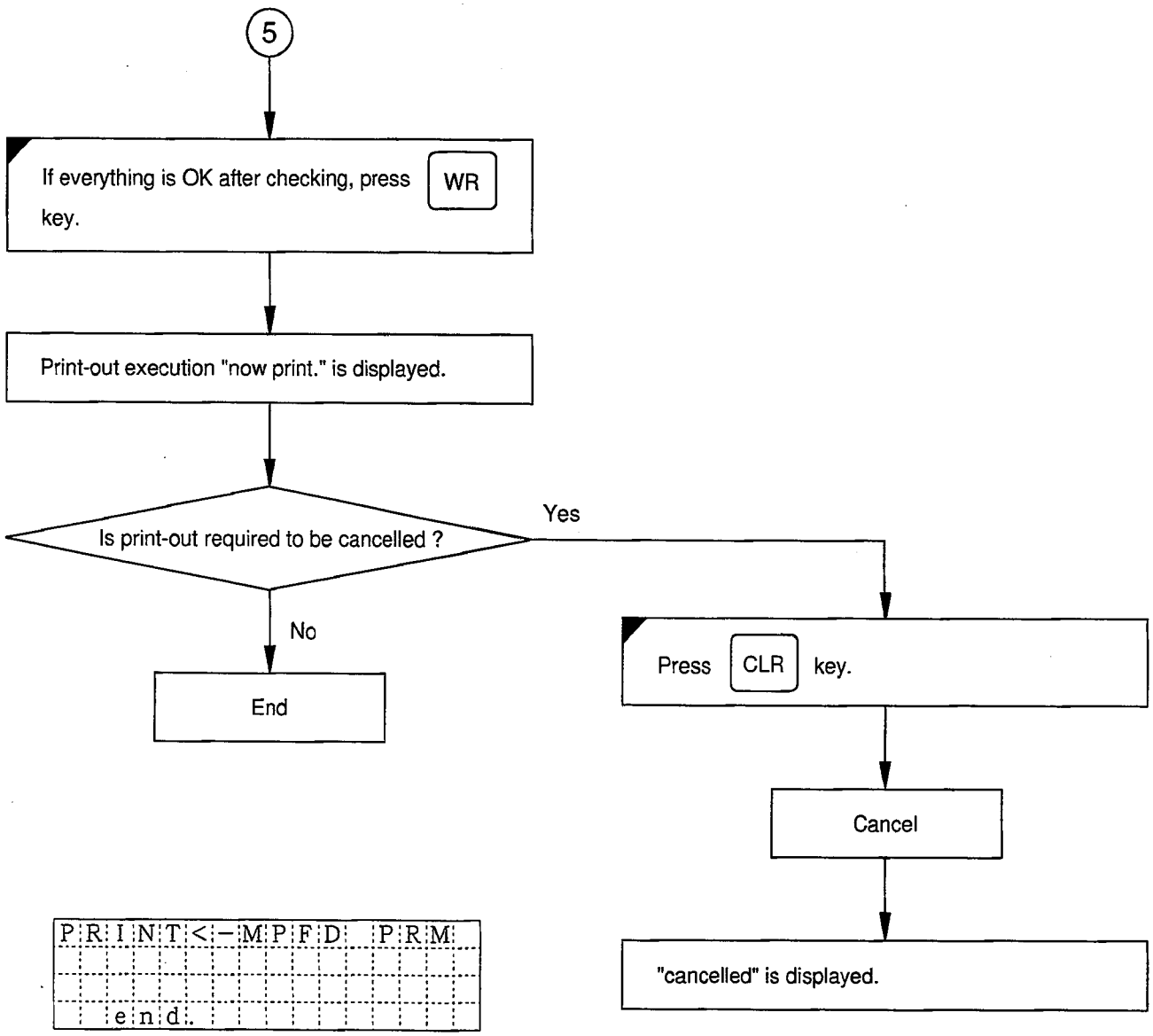
Printer Initial Screen

```
PRINT OUT ?_
1:PRINT
2:SYSTEM SET
```

```
PRINT ?_
1:<-CARD
2:<-MPFD
```

```
PRINT<-MPFD ?_
1:PRM    2:PROG
3:REG    4:TOOL
5:ALL
```

```
PRINT<-MPFD PRM
ok?_
```


5
If everything is OK after checking, press WR key.
Print-out execution "now print." is displayed.
Is print-out required to be cancelled ?
Yes
No
End
Press CLR key.
Cancel
"cancelled" is displayed.
PRINT<-MPFD PRM
end.

5.25 RUN STATUS TABLE

Press RUN/STAT key to display RUN status mode.

(A)

Run status is displayed.
(1) Mode
EDIT
AUTO
HANDLE
(2) Executed coordinate system
T □
(3) Block No. under execution
N □□□
(4) Current position
POS = (Reference position of coordinate system under execution)
(5) Speed
FEED = Command speed
(6) Waiting status (Refer to Table 5.1 "Wait Status Display List")
(7) Alarm
When an alarm occurs, "ALM" is indicated by blinking. No alarm occurs when there is no indication.

Press ↓ key.

The program that is currently executed is displayed. If there is no program under execution, "NOT (sp) START" is displayed.

(8)

(8)

Press ↑ key.

(A)

Run Status Display

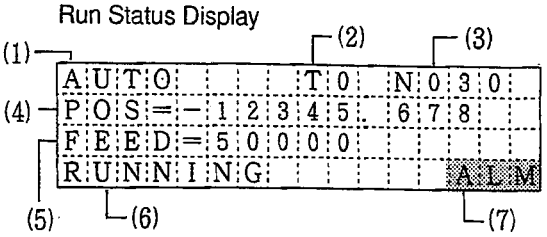
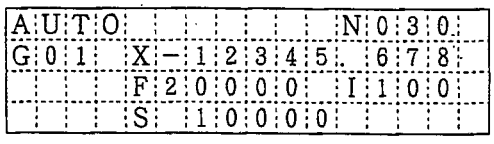
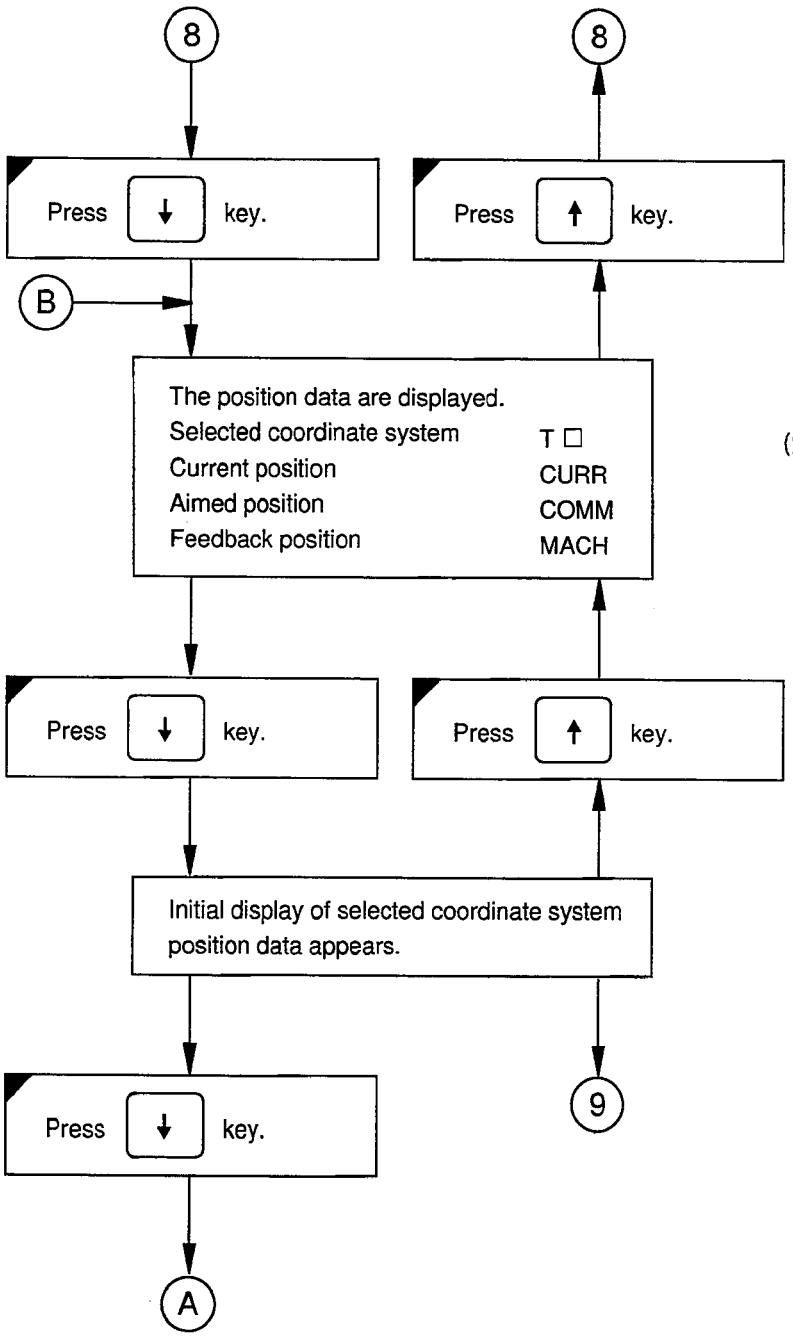


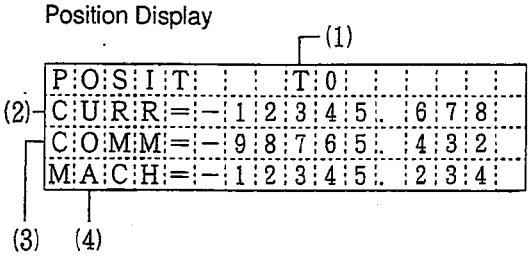
Table 5.1 Wait Status Display List

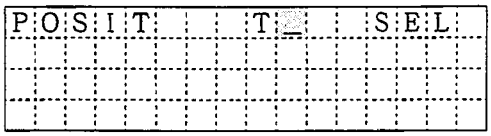
No.	PP Display Message	Wait Status	Contents
1	Non Auto	Wait for auto mode	Mode is not set to auto mode.
2	Not Start	Wait for starting operation	Memory operation has not started. (PGST signal has not been input)
3	Feed Hold	Wait for restarting operation	Memory operation has not beeen executed due to some errors*.(* ex. PGST signal has been turned OFF.)
4	Position-ing	Executing positioning instruction	Executing positioning instructions (G01, G05, G06, G34 and G35).
5	Wait Time-up	Executing Wait Time-up instruction	Executing time counting by G04 Wait Time-up instruction.
6	Wait Inpost	Wait for in position	Waiting for machine to come into the in position range (Pr 36).
7	Wait M-Fin	Wait for M-fin signal	Waiting for confirm signal (M-Fin) for M signal output (M50 to M58) to be turned ON.
8	Wait V-Coin	Wait for spindle speed coin-cidence	To spindle control functions (M03, M04 and M05) command, waiting for speed coincidence (V coin) and speed zero (V_{ZERO}) signals input.
9	Running	Executing program	Executing program commands other than the ones indicated above.

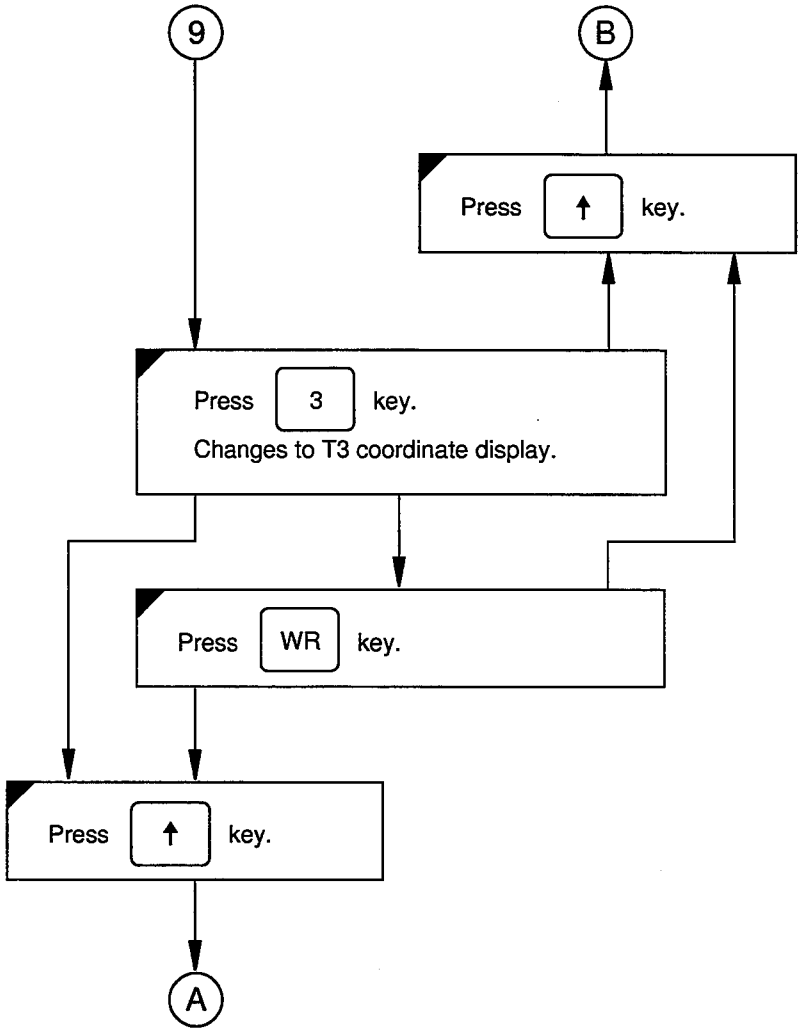




Position Display







P	O	S	I	T			T	3			S	E	L

P	O	S	I	T			T	3			S	E	L
C	U	R	R	=	−	1	2	3	4	5	6	7	8
C	O	M	M	=	−	9	8	7	6	5	4	3	2
M	A	C	H	=	−	1	2	3	4	5	2	3	4

Press RUN/STAT key to enter the status display mode.

The status screen is displayed.

```
STATUS ?_
1:I/O      2:ALM
3:ERROR    PULSE
```

Press 1 and WR keys.

The I/O mode screen is displayed.

```
I/O ?_
1:DISP
2:HIST
3:HIST CLR
```

Press 1 and WR keys.

I/O status is displayed.

Change the page by pressing ↓ or ↑ key.

I/O Display

```
I/O DISP
 #4000 1001 0110
 #4001 1000 1110
 #4002 0001 0001
```

From #4000 to #4449 : Input signals
From #4500 : Output signals

Press 2 and WR keys.

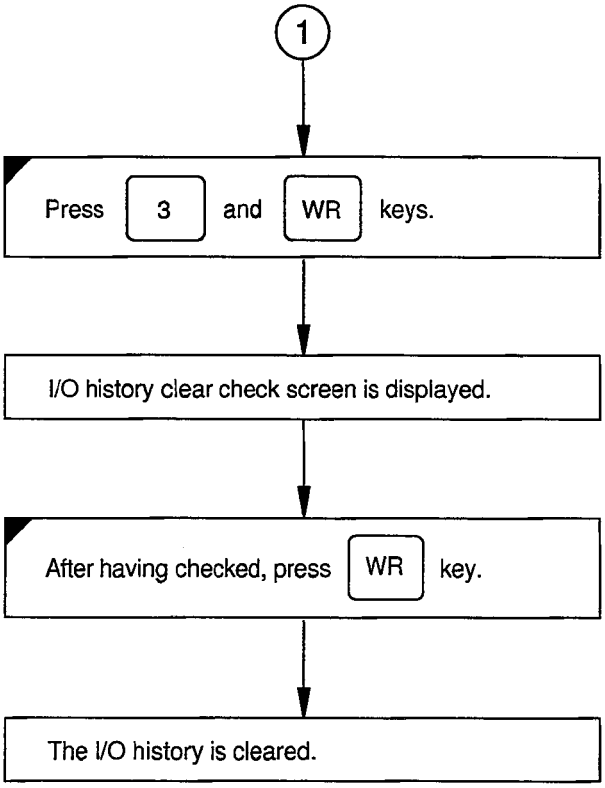
I/O history is displayed.

Change the page by pressing ↓ or ↑ key.

```
I/O HIST      1/4
AUTO          ON
JOG           ON
J SPD         ON
```

(Displays the history of 100 input signal status changes)

(1)




```
I/O HIST CLR
Yes:WR/No:CLR
ok?_
```

```
I/O HIST CLR
end.
```

5.27 STATUS SCREEN (ALM, ALM HISTORY, ALM HISTORY CLEAR)

Press RUN/STAT key to enter the status display mode.

The status screen is displayed.

```
STATUS ?_
1:I/O      2:ALM
3:ERROR    PULSE
```

Press 2 and WR keys.

The alarm mode screen is displayed.

```
ALARM ?_
1:DISP
2:HIST
3:HIST CLR
```

Press 1 and WR keys.

Alarm message is displayed.

Alarm Message Display

```
ALARM DISP
  NONE
```

Press 2 and WR keys.

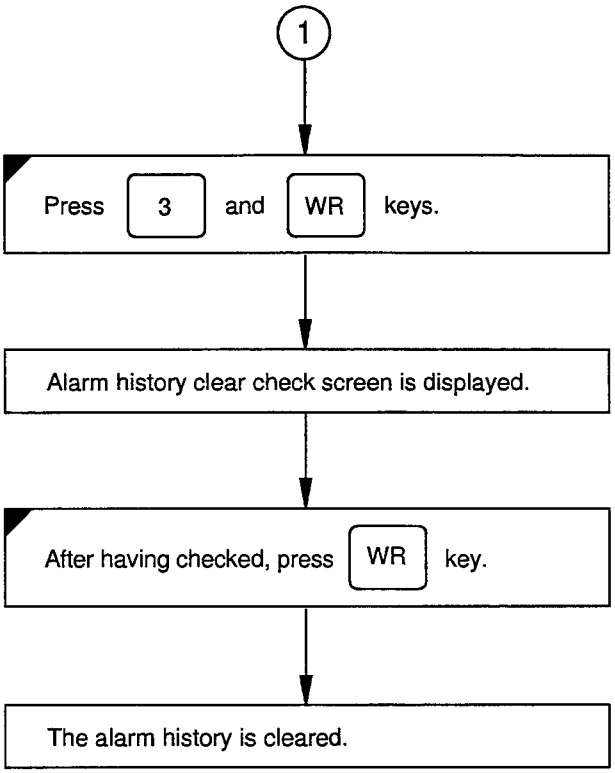
Alarm history is displayed.

Change the page by pressing ↓ or ↑ key.

```
ALARM HIST      1/1
  NONE
```

(Displays the history of 100 alarms)

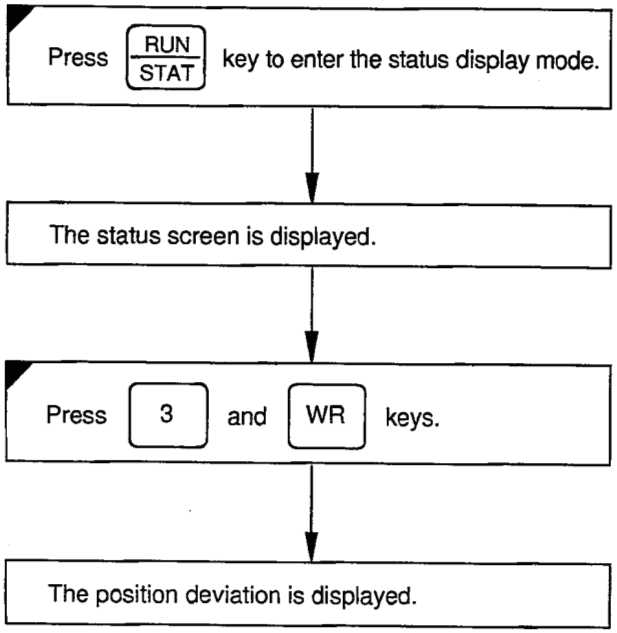
(1)




```
ALARM HIST CLR
Yes:WR/No:CLR
ok?_
```

```
ALARM HIST CLR
end.
```

5.28 STATUS DISPLAY (ERROR PULSE)

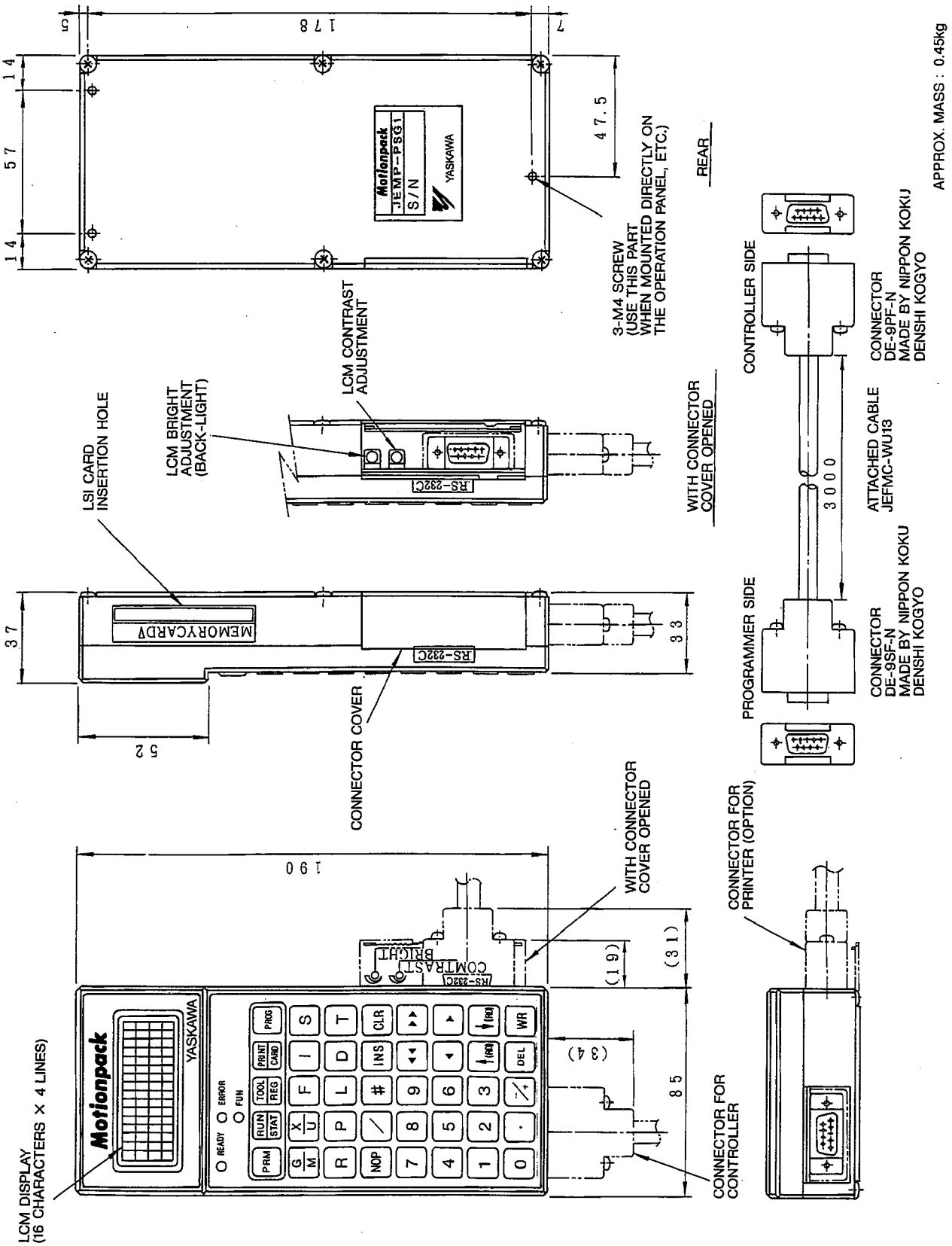



```
STATUS ?_
1:I/O    2:ALM
3:ERROR  PULSE
```

Position Deviation Display

```
ERROR PULSE
RULSE=12345. 678
```

6 EXTERNAL DIMENSIONS



MOTIONPACK-SG1

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