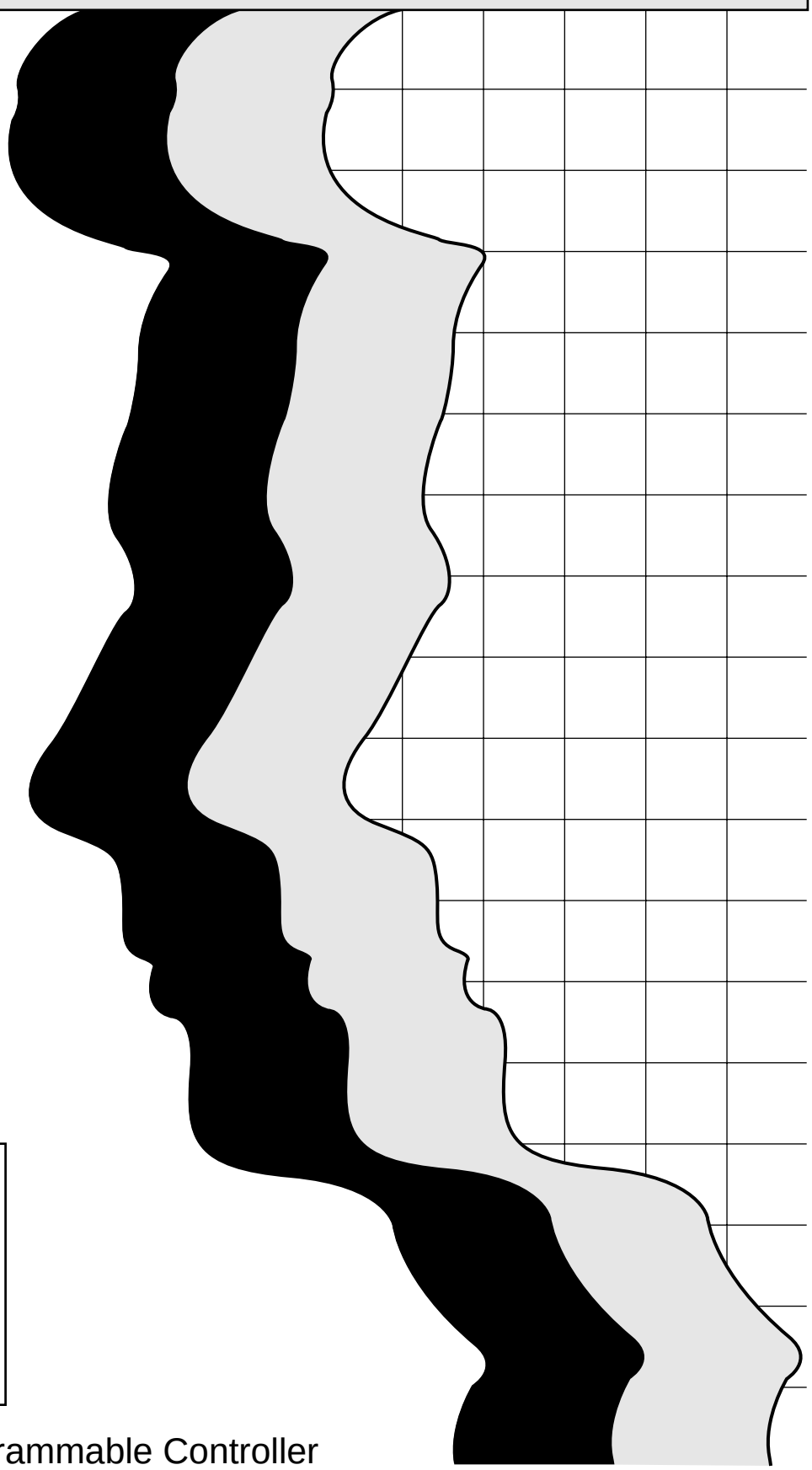
MITSUBISHI

PID System type SW0GHP-A81PC

Operating Manual



MELSEC

Mitsubishi Programmable Controller

● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

When using Mitsubishi equipment, thoroughly read this manual and the associated manuals introduced in this manual.

Also pay careful attention to safety and handle the module properly. These precautions apply only to Mitsubishi equipment. Refer to the CPU module user's manual for a description of the PC system safety precautions.

These ● SAFETY PRECAUTIONS ● classify the safety precautions into two categories: "DANGER" and "CAUTION".

⚠ DANGER	**Procedures which may lead to a dangerous condition and cause death or serious injury if not carried out properly.**
⚠ CAUTION	**Procedures which may lead to a dangerous condition and cause superficial to medium injury, or physical damage only, if not carried out properly.**

Depending on circumstances, procedures indicated by ⚠ CAUTION may also be linked to serious results.

In any case, it is important to follow the directions for usage.

Store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

[DESIGN PRECAUTIONS]

⚠ DANGER

- Install a safety circuit external to the PC that keeps the entire system safe even when there are problems with the external power supply or the PC module. Otherwise, trouble could result from erroneous output or erroneous operation.
  (1) Outside the PC, construct mechanical damage preventing interlock circuits such as emergency stop, protective circuits, positioning upper and lower limits switches and interlocking forward /reverse operations.
  (2) When the PC detects the following problems, it will stop calculation and turn off all output.
    - The power supply module has over current protection equipment and over voltage protection equipment.
    - The PC CPUs self-diagnostic functions, such as the watchdog timer error, detect problems. In addition, all output will be turned on when there are problems that the PC CPU cannot detect, such as in the I/O controller. Build a fail safe circuit exterior to the PC that will make sure the equipment operates safely at such times. See Section 8.1 of this user's manual for example fail safe circuits.

    See this user's manual for example fail safe circuits.
  (3) Output could be left on or off when there is trouble in the outputs module relay or transistor. So build an external monitoring circuit that will monitor any single outputs that could cause serious trouble.
- When overcurrent which exceeds the rating or caused by short-circuited load flows in the output module for a long time, it may cause smoke or fire. To prevent this, configure an external safety circuit, such as fuse.
- Build a circuit that turns on the external power supply when the PC main module power is turned on. If the external power supply is turned on first, it could result in erroneous output or erroneous operation.
- When there are communication problems with the data link, the communication problem station will enter the following condition.
  Build an interlock circuit into the PC program that will make sure the system operates safely by using the communication state information. Not doing so could result in erroneous output or erroneous operation.
  (1) For the data link data, the data prior to the communication error will be held.
  (2) The MELSECNET (II,/B,/10) remote I/O station will turn all output off.
  (3) The MELSECNET/MINI-S3 remote I/O station will hold the output or turn all output off depending on the E.C. remote setting.

  Refer to the data link manuals regarding the method for setting the communication problem station and the operation status when there are communication problem.
- When configuring a system, do not leave any slots vacant on the base. Should there be any vacant slots, always use a blank cover (A1SG60) or dummy module (A1SG62).
  When the extension base A1S52B, A1S55B or A1S58B is used, attach the dustproof cover supplied with the product to the module installed in slot 0.
  If the cover is not attached, the module's internal parts may be dispersed when a short-circuit test is performed or overcurrent/overvoltage is accidentally applied to the external I/O area.

⚠ CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other. They should be installed 100 mm (3.94 inch) or more from each other. Not doing so could result in noise that would cause erroneous operation.

[DESIGN PRECAUTIONS]

⚠ CAUTION

- When controlling items like lamp load, heater or solenoid valve using an output module, large current (approximately ten times greater than that present in normal circumstances) may flow when the output is turned OFF→ON. Take measures such as replacing the module with one having sufficient rated current.

[INSTALLATION PRECAUTIONS]

⚠ DANGER

- Use the PC in an environment that meets the general specifications contained in this manual. Using this PC in an environment outside the range of the general specifications could result in electric shock, fire, erroneous operation, and damage to or deterioration of the product.
- Install so that the pegs on the bottom of the module fit securely into the base unit peg holes, and use the specified torque to tighten the module's fixing screws. Not installing the module correctly could result in erroneous operation, damage, or pieces of the product falling.
- Tightening the screws too far may cause damages to the screws and/or the module, resulting in fallout, short circuits, or malfunction.
- When installing more cables, be sure that the base unit and the module connectors are installed correctly. After installation, check them for looseness. Poor connections could result in erroneous input and erroneous output.
- Correctly connect the memory cassette installation connector to the memory cassette. After installation, be sure that the connection is not loose. A poor connection could result in erroneous operation.
- Do not directly touch the module's conductive parts or electronic components. Doing so could cause erroneous operation or damage of the module.

[WIRING PRECAUTIONS]

⚠ DANGER

- Completely turn off the external power supply when installing or placing wiring. Not completely turning off all power could result in electric shock or damage to the product.
- When turning on the power supply or operating the module after installation or wiring work, be sure that the module's terminal covers are correctly attached. Not attaching the terminal cover could result in electric shock.

⚠ CAUTION

- Be sure to ground the FG terminals and LG terminals to the protective ground conductor. Not doing so could result in electric shock or erroneous operation.
- When wiring in the PC, be sure that it is done correctly by checking the product's rated voltage and the terminal layout. Connecting a power supply that is different from the rating or incorrectly wiring the product could result in fire or damage.

[WIRING PRECAUTIONS]

⚠ CAUTION

- Do not connect multiple power supply modules in parallel. Doing so could cause overheating, fire or damage to the power supply module. If the terminal screws are too tight, it may cause falling, short circuit or erroneous operation due to damage of the screws or module.
- Tighten the terminal screws with the specified torque. If the terminal screws are loose, it could result in short circuits, fire, or erroneous operation.
- Tightening the terminal screws too far may cause damages to the screws and/or the module, resulting in fallout, short circuits, or malfunction.
- Be sure there are no foreign substances such as sawdust or wiring debris inside the module. Such debris could cause fires, damage, or erroneous operation.
- External connections shall be crimped or pressure welded with the specified tools, or correctly soldered. For information regarding the crimping and pressure welding tools, see the I/O module's user's manual. Imperfect connections could result in short circuit, fires, or erroneous operation.

[STARTUP AND MAINTENANCE PRECAUTIONS]

⚠ DANGER

- Do not touch the terminals while power is on. Doing so could cause shock or erroneous operation.
- Correctly connect the battery. Also, do not charge, disassemble, heat, place in fire, short circuit, or solder the battery. Mishandling of battery can cause overheating or cracks which could result in injury and fires.
- Switch all phases of the external power supply off when cleaning the module or tightening the terminal screws. Not doing so could result in electric shock. If the screws are too tight, it may cause falling, short circuit or erroneous operation due to damage of the screws or modules.
- Tightening the screws too far may cause damages to the screws and/or the module, resulting in fallout, short circuits, or malfunction.

⚠ CAUTION

- The online operations conducted for the CPU module being operated, connecting the peripheral device (especially, when changing data or operation status), shall be conducted after the manual has been carefully read and a sufficient check of safety has been conducted. Operation mistakes could cause damage or trouble of the module.
- Do not disassemble or modify the modules. Doing so could cause trouble, erroneous operation, injury, or fire.
- Switch all phases of the external power supply off before mounting or removing the module. If you do not switch off the external power supply, it will cause failure or malfunction of the module.

[DISPOSAL PRECAUTIONS]

⚠ CAUTION

- When disposing of this product, treat it as industrial waste.

REVISIONS

※The manual number is given on the bottom left of the back cover.

Print Date	Manual number	Revision
Sep., 1988	IB (NA) 66167-A	First edition

INTRODUCTION

Thank you for choosing the Mitsubishi MELSEC-A Series of General Purpose Programmable Controllers. Please read this manual carefully so that the equipment is used to its optimum. A copy of this manual should be forwarded to the end User.

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1. INTRODUCTION

This manual gives operating information on the SW0GHP-A81PC (referred to as "A81PC") system disk which is loaded in the A6GPP/A6HGP/A6PHP (referred to as "GPP") for use with the A81CPU only.

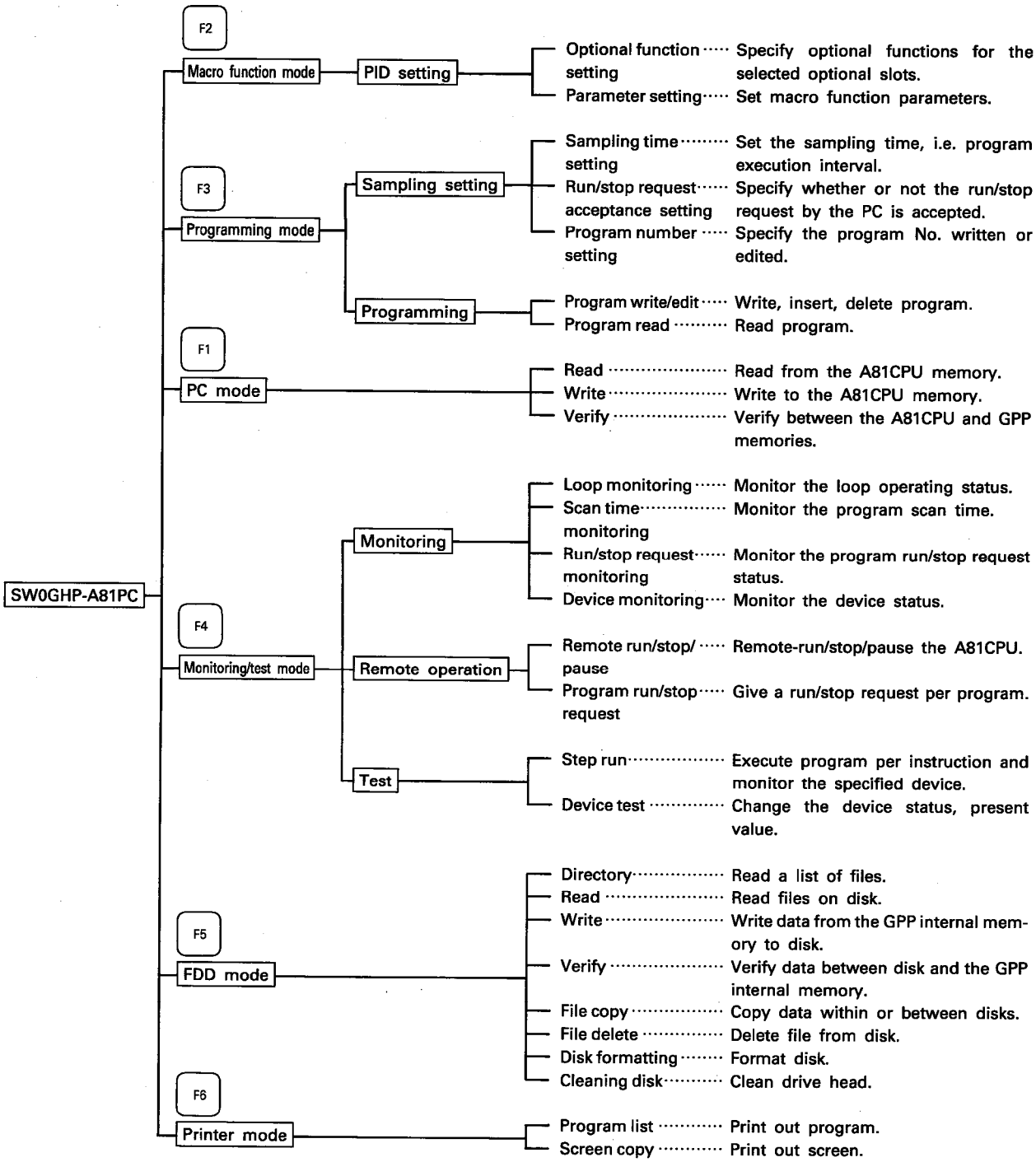
The A81PC has many functions, e.g. program write, macro function setting, communication with the A81CPU, FDD and print out.

For more information on the terms, names, etc. in this manual, see the A81CPU User's Manual and Programming Manual.

The main functions of the A81PC are as follows:

- Allows programs to be written and parameters to be set in online mode.
- Allows programs and parameters to be transferred between the GPP and A81CPU.
- Allows programs and parameters to be transferred between the GPP and disk.
- Allows the A81CPU operating status to be monitored and the A81CPU to be tested and step-run.
- Allows programs to be printed out and the screen to be copied.

1.1 SW0GHP-A81PC Functions



Differences between the GPP and HGP/PHP operations

Item \ Peripheral	GPP	HGP/PHP
File copy between disks	Allowed	Disallowed
Batch file copy between disks	Allowed	Allowed

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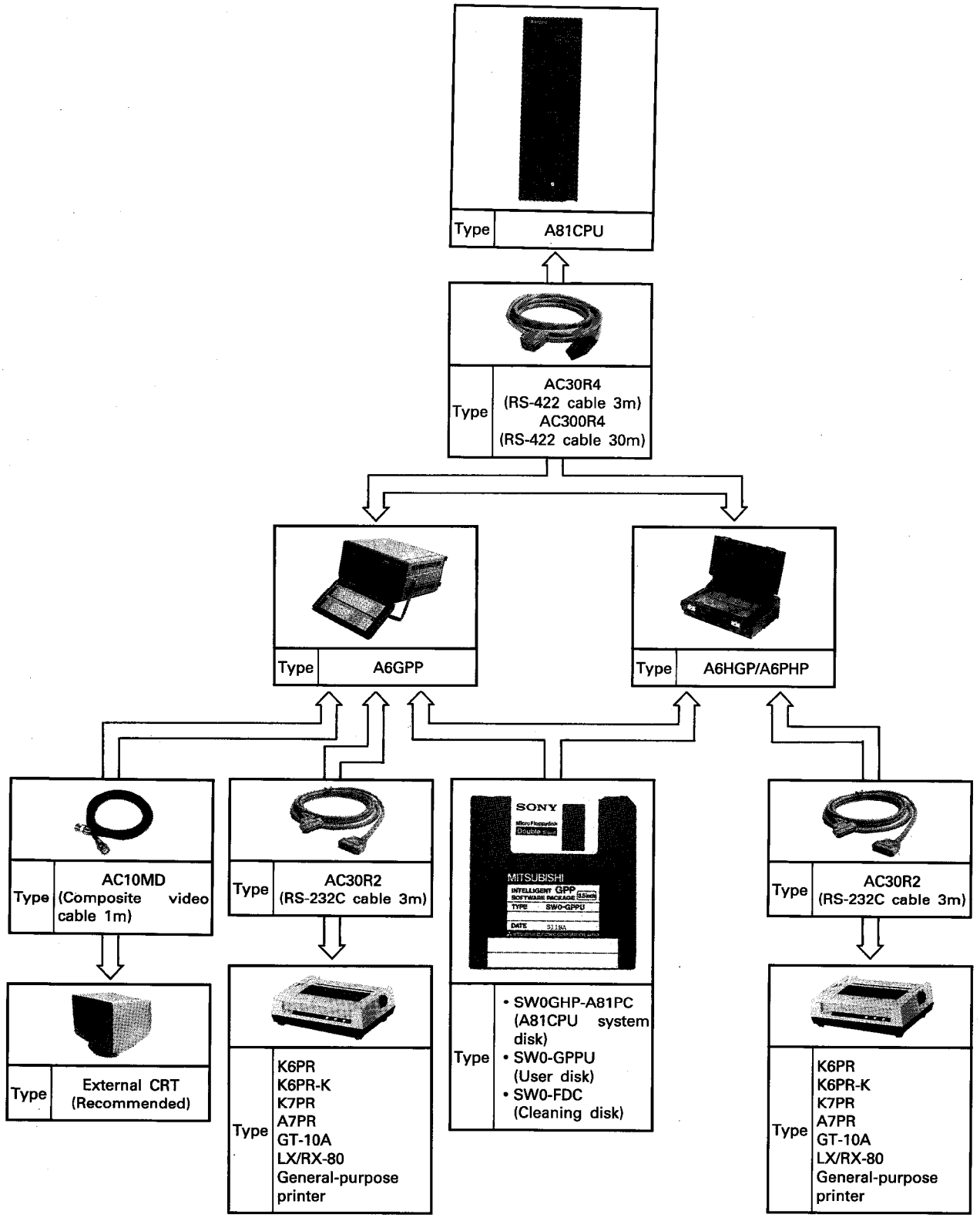
2. SYSTEM CONFIGURATION

2.1 System Configuration (SW0GHP-A81PC + GPP/HGP/PHP)

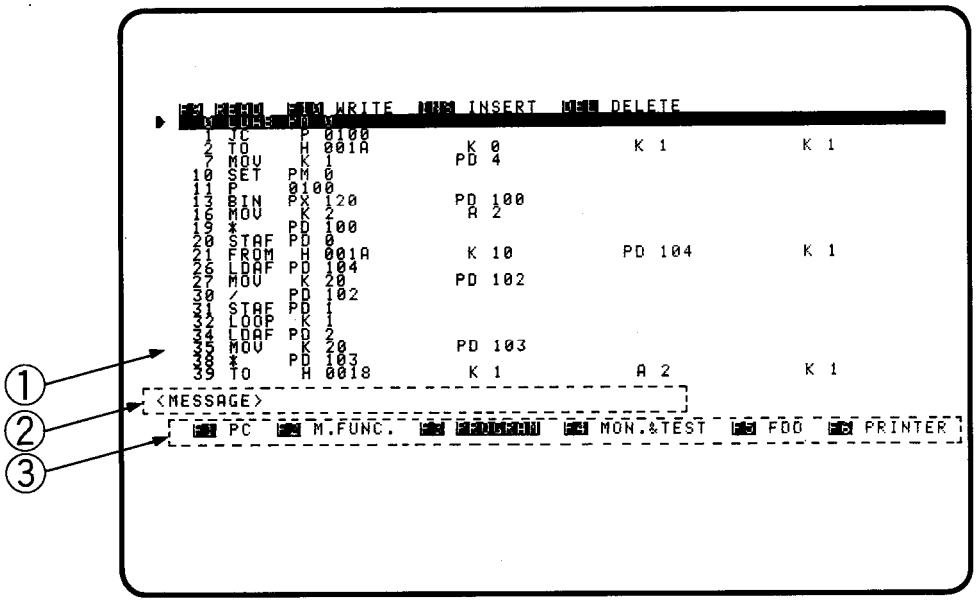


POINT

The A6KB keyboard cannot be used.
The ROM function is not available.

3. GUIDE TO USING THIS MANUAL

3.1 Screen Display



1) General data and operating instruction area
   Displays data entered, read and monitored and operating procedure, etc.

2) Message area
   (1) Displays a message corresponding to the key pressed or data entered.
   (2) "MESSAGE" is always indicated in this area.

3) Mode area
   (1) Highlights the current mode.
   (2) Any mode is highlighted after its select menu is displayed on the screen.

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3.2 Key Functions

Key	Function			Remarks
	Name	Description		
F1	PC mode	Makes communication between the A81CPU and GPP.		F1 to F6 are valid except during: (1) Data transfer and verify between the GPP and the A81CPU in PC mode (2) Data transfer and verify between the GPP and disk in FDD mode (3) Print out execution and pause in printer mode.
F2	Macro function mode	Sets optional functions and parameters for PID operation.		
F3	Programming mode	Writes/edits program, sets the sampling time, and specifies whether or not a run/stop request by the PC is accepted.		
F4	Monitoring/test mode	Allows loop, device and program run/stop status monitoring, step run, device test, etc.		
F5	FDD mode	Transfers and verifies data between user disk and GPP internal memory.		
F6	Printer mode	Prints out program, specifies the printer for screen copy.		
CAN	Cancel	Returns to the preceding screen.		
HOME CLEAR	Home clear	Clears data entered (before CR pressed) and message.		
BREAK	Break	PC mode	Stops data transfer and verify between the GPP and A81CPU.	BREAK is only valid during: (1) Data transfer and verify between the GPP and the A81CPU in PC mode (2) Monitoring in monitoring/test mode. (3) Print out in printer mode.
		Monitoring/ test mode	Stops or resumes A81CPU monitoring.	
		Printer mode	Stops or terminates print out.	
COPY	Copy	Prints out the current display screen.		It is necessary to set the printer in advance.

REMARKS

The MELSAP keyboard is only valid.

3.3 Key Input Operations

(1) [P] at the head of any device may be omitted.

(Example):

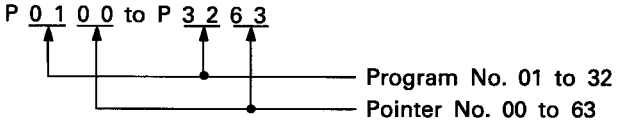
Key input	Indication
[P] [D]	→ PD
[D]	→ PD

(2) [P], [X], [Y], [M], [D] and [T] in upper and lower cases are valid for entering devices.
Uppercase characters are displayed on the screen.

(3) The following keys are valid for entering device numbers:

Device	Valid Keys	Remarks
PX PY	[0] to [9], [A] to [F]	3 hexadecimal digits Zero not suppressed
PM PD PT	[0] to [9]	4 decimal digits Zero suppressed

(4) Specify the pointer (P) number at the head step of the subroutine called by the CALL instruction as shown below. The pointer number may be set between 0100 and 3263.



In program write/edit mode, the first two digits (i.e. program number) of the pointer number may be omitted. By entering the last two digits and pressing [CR], the full pointer No. is automatically displayed on the screen.

(Example): To set the pointer No. to P0100 during writing program 1

Key input	Indication
[P] [0] [1] [0] [0]	→ P0100
[P] [0] [0]	→ P0100

(5) Data may be treated by any floating device in the following range:
Exponent format (6 significant digits)

(6) Key input range for writing a constant to the floating device

• K = decimal (10 significant digits. A decimal point may be used.)

−9999999999 to +9999999999
Decimal point used
9999.99999

10 digits (Decimal point included in the number of digits)

When a constant is written to the peripheral memory as input data, the first four digits are only valid and the rest are written and displayed as 0.

(Example): Key input → Value stored
32768 → 32760
999999 → 999900

• H = hexadecimal (4 significant digits)
8000 to FFFF (−32768 to −1)
0 to 7FFF (0 to −32767)

3.4 Guide to Mode Explanation Pages

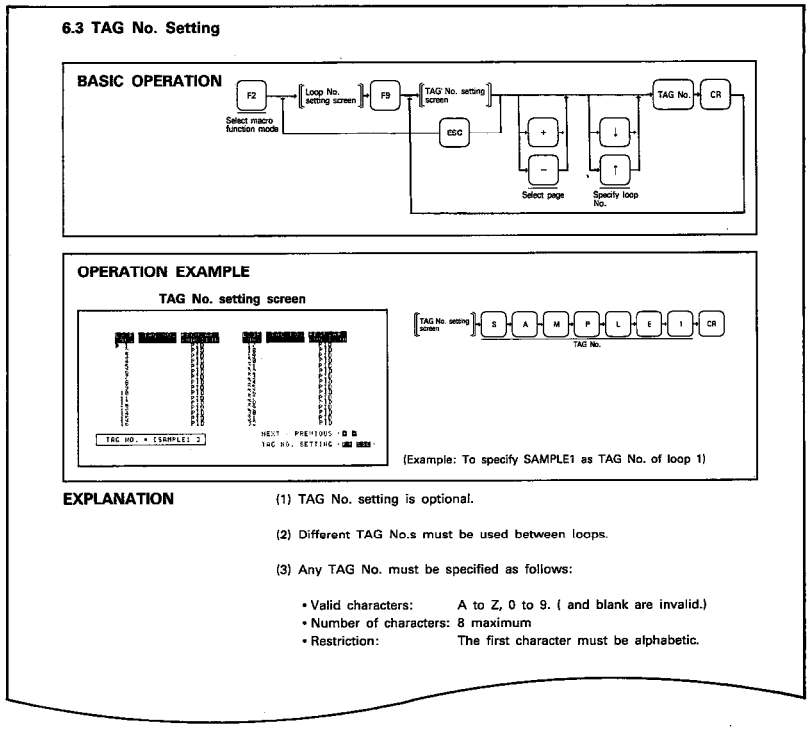
Chapter 6 and subsequent sections give mode descriptions. Each section uses the same format as shown below.

Section number and title
Gives general description.

Gives basic operation.

Keying-in example and screen indication

Gives detailed explanation. Always read prior to operation.



Brackets [ ] in BASIC OPERATION and OPERATION EXAMPLE indicates that the bracketed operation has been or will be explained in other sections.

The screen in double brackets [[ ]] is displayed after the corresponding key operation is performed.
The screen shown in OPERATION EXAMPLE is basically the one displayed immediately before the setting is complete.

3.5 Error Indication and Screen Switching

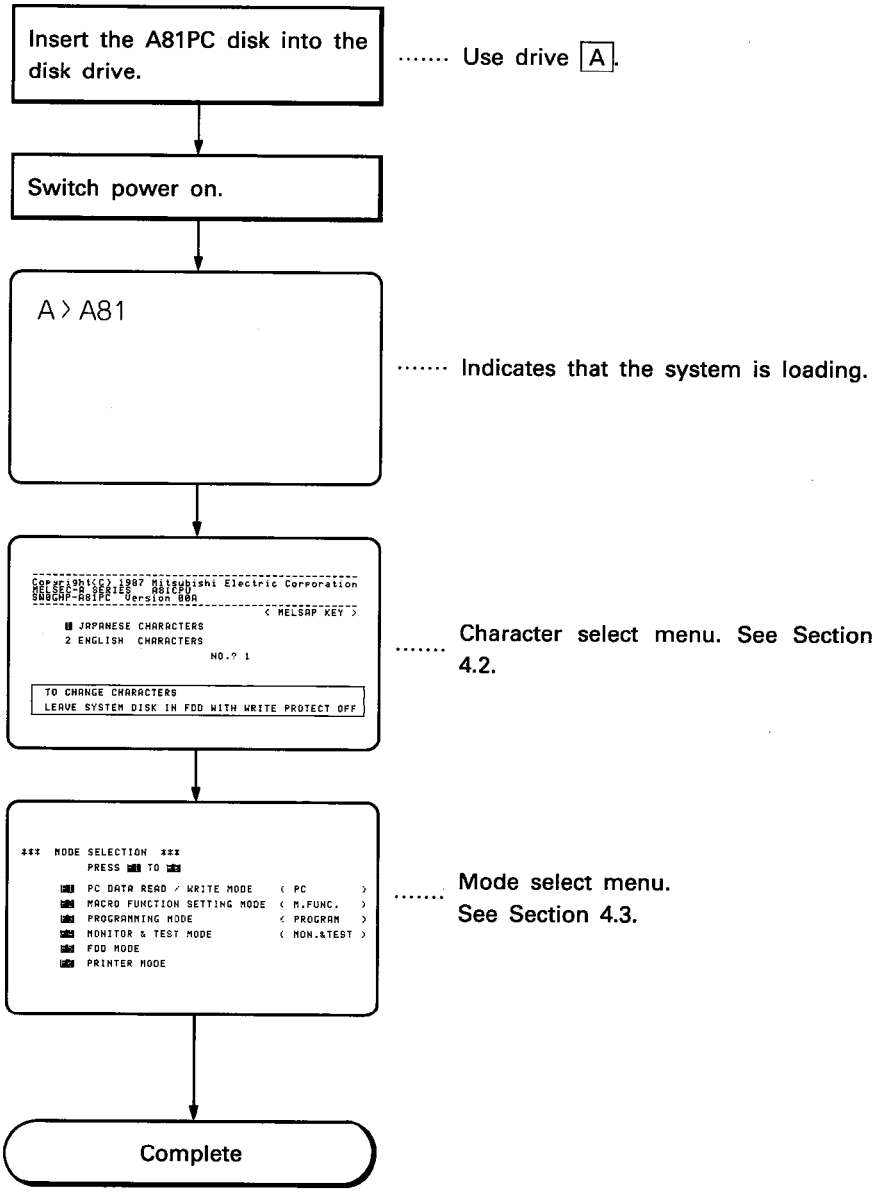
(1) "OPERATOR ERROR" indicates a mis-operation and "SETTING ERROR" a mis-setting. In this case, the cursor flickers at the data entry location.

(2) See the second section of each chapter "General Operation" to selectthe required screen.

(3) Press the corresponding function key (F1 to F6) to display the initial menu of the required mode.

4. SYSTEM START-UP PROCEDURE

4.1 GPP Start-Up Procedure



POINT

Note that when the system is booted with the A81PC in drive [B], the A6GPP automatically regards drive [B] as [A] and drive [A] as [B].

4.2 Selecting the Character Set

The Japanese or English character set may be selected for special characters for use as file comments during write to disk. The character set chosen is used independently of the keyboard model. The relation between the keyboard models and character sets is indicated below.

Japanese keyboard model	¥ ¦ _	¥ ¦ _ + SHIFT	∧ ~ ^	∧ ~ ^ + SHIFT	@ ` ゛	@ ` ゛ + SHIFT	[¦ ｒ ｏ	[¦ ｒ ｏ + SHIFT	] ¦ ⅃ ⅄	] ¦ ⅃ ⅄ + SHIFT
English keyboard model	` ¦ ÖÖ	` ¦ ÖÖ + SHIFT	∧∧ ~ βÜ	∧∧ ~ βÜ + SHIFT	@ § ¨ ` ` Ë	@ § ¨ ` ` Ë + SHIFT	[¦ ÄÄ	[¦ ÄÄ + SHIFT	] ¦ ÜÄ	] ¦ ÜÄ + SHIFT
Japanese character set chosen	¥	¦	∧	~	@	`	[	{	]	}
English character set chosen	¦	＼	~	∧	`	@	{	[	}	]

(Example): " ¦ " is displayed by pressing ¥ ¦ _ when the GPP is a Japanese model and the English character set chosen.

- Default characters are called from the A81PC and highlighted on the character select menu.
- Press CR to use the default characters and proceed to the mode select menu.
- Any character may be changed in the following procedure:

Set the A81PC write protect tab to OK. ..... Returns to the initial menu with error message "WRITE PROTECT" if the operation is continued with the tab remaining at NO.

↓

Insert the A81PC into drive.

↓

Enter the character number changed.

↓ CR

Press Y to change. ..... Press "N" to return to the initial menu.

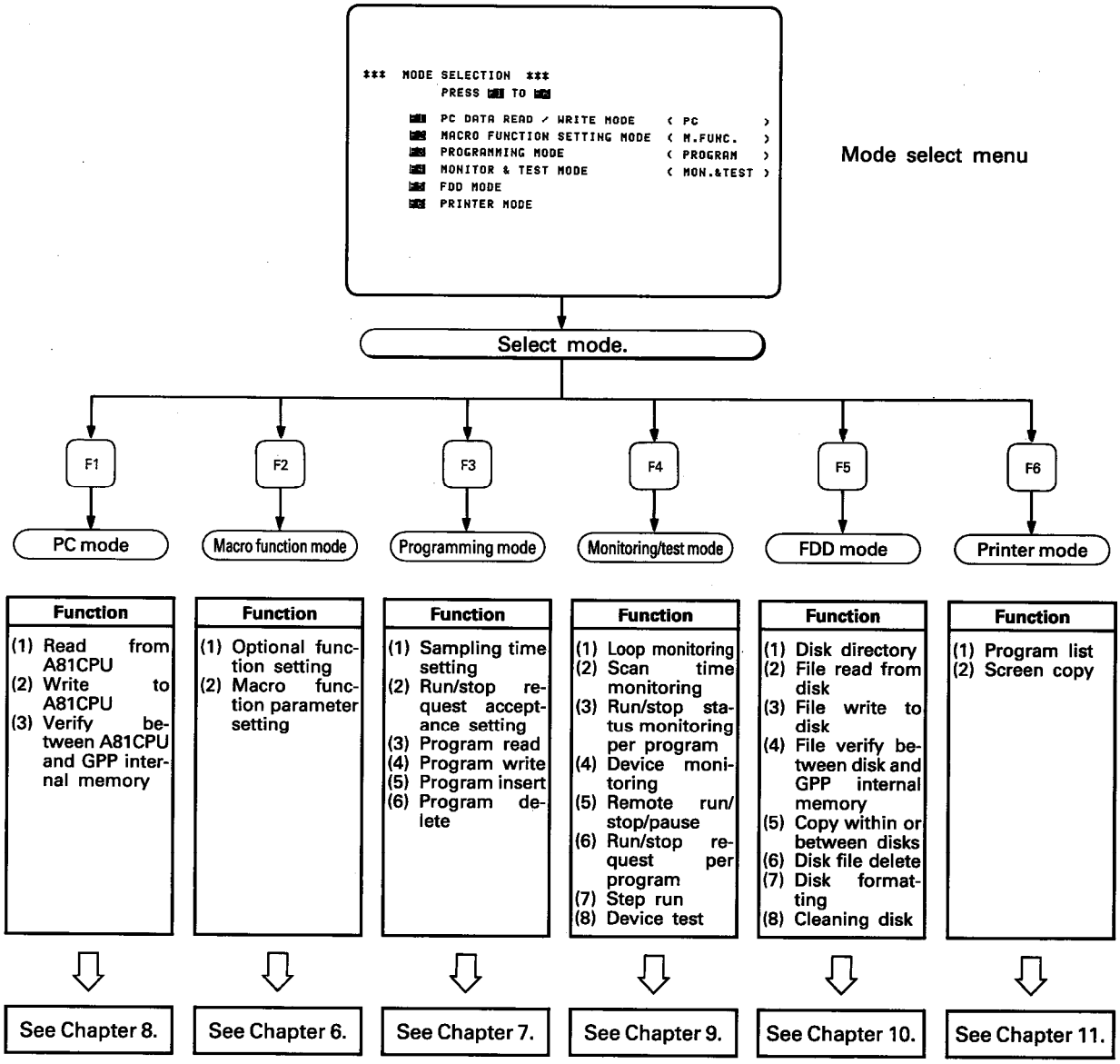
↓ CR

The new character is written to the A81PC. ..... Defaults to the new character from the next system start-up and on.

↓

Set the write protect tab to NO.

4.3 Mode Selection



Any mode key is valid in other than the following states:

(1) PC mode
During data transfer and verify between the GPP and A81CPU.
(2) FDD mode
During data transfer and verify between the GPP and disk.
(3) Printer mode
During print out execution and pause.

5. OPERATING PROCEDURES

5.1 Writing a New Program

5.1.1 Setting macro functions

1) Select macro function mode ····· [F2]
2) Specify TAG No. for loop ····· [F9] → (See Section 6.3.)
3) Specify loop No. ····· [ESC] → (See Section 6.4.)
4) Select optional slot ····· (See Section 6.5.1.)
5) Select optional function ····· (See Section 6.5.2.)
6) Set parameters ····· [ESC] → (see Section 6.5.3.)
7) Return to mode select menu ····· [F2] → [CAN]

5.1.2 Writing program

1) Select programming mode ····· [F3]
2) Select program read/write function [2] → [CR]
3) Specify program No. ····· (See Section 7.5.1.)
4) Write program ····· [F10] → (See Section 7.5.3.)
5) Return to mode select menu ····· [F3] → [CAN]

5.1.3 Specifying sampling time, run/stop request acceptance

1) Select programming mode ····· [F3]
2) Select sampling time, run/stop request acceptance setting function ··· [1] → [CR]
3) Specify sampling time, run/stop request acceptance ····· (See Section 7.4.)
4) Return to mode select menu ····· [F3] → [CAN]

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5.2 Editing the Program

5.2.1 Changing macro functions

(1) Changing TAG No.

1) Select macro function mode ····· [F2]
2) Change TAG No. ····· [F9] → (See Section 6.3.)
3) Return to mode select menu ····· [F2] → [CAN]

(2) Changing optional function

1) Select macro function mode ····· [F2]
2) Specify loop No. ····· (See Section 6.4.)
3) Select optional slot ····· (See Section 6.5.1.)
4) Change optional function ····· (See Section 6.5.2.)
5) Return to mode select menu ····· [F2] → [CAN]

(3) Changing parameters

1) Select macro function mode ····· [F2]
2) Specify loop No. ····· (See Section 6.4.)
3) Change parameters ····· [ESC] → (see Section 6.5.3.)
4) Return to mode select menu ····· [F2] → [CAN]

5.2.2 Editing program

1) Select programming mode ····· [F3]
2) Select program read/write function ···· [2] → [CR]
3) Specify program No. ····· (See Section 7.5.1.)
4) Read program ····· [F9] → (See Section 7.5.2.)
5) Write program ····· [F10] → (See Section 7.5.3.)
   Insert program ····· [INS] → (See Section 7.5.4.)
   Delete program ····· [DEL] → (See Section 7.5.5.)
6) Return to mode select menu ····· [F3] → [CAN]

5.2.3 Changing sampling time, run/stop request acceptance

1) Select programming mode ····· [F3]
2) Select sampling time, run/stop request acceptance setting function ··· [1] → [CR]
3) Change sampling time, run/stop request acceptance setting ····· (See Section 7.4.)
4) Return to mode select menu ····· [F3] → [CAN]

5.3 Storing Program onto Disk

5.3.1 Storing program from A81CPU onto disk

1) Select PC mode ····· [F1]
2) Select A81CPU read function ····· (See Section 8.3.)
3) Read ····· [Y] → [CR]
4) Select A81CPU verify function ····· (See Section 8.3.)
5) Verify ····· [Y] → [CR]
6) Select FDD mode ····· [F5]
7) Select disk write function ····· [3] → [CR]
8) Write onto disk ····· (See Section 10.6.)
9) Select disk verify function ····· [CAN] → [4] → [CR]
10) Verify with disk ····· (See Section 10.7.)
11) Return to mode select menu ····· [F5] → [CAN]

5.3.2 Storing program from GPP internal memory onto disk

1) Select FDD mode ····· [F5]
2) Select disk write function ····· [3] → [CR]
3) Write onto disk ····· (See Section 10.6.)
4) Select disk verify function ····· [CAN] → [4] → [CR]
5) Verify with disk ····· (See Section 10.7.)
6) Return to mode select menu ····· [F5] → [CAN]

5.4 Reading Program from Disk

1) Select FDD mode ····· [F5]
2) Select disk read function ····· [2] → [CR]
3) Read from disk ····· (See Section 10.5.)
4) Select disk verify function ····· [CAN] → [4] → [CR]
5) Verify with disk ····· (See Section 10.7.)
6) Return to mode select menu ····· [F5] → [CAN]

5.5 Writing Program to A81CPU

5.5.1 Writing program from disk to A81CPU

1) Select FDD mode ····· F5
2) Select disk read function ····· 2 → CR
3) Read from disk ····· (See Section 10.5.)
4) Select disk verify function ····· CAN → 4 → CR
5) Verify with disk ····· (See Section 10.7.)
6) Select PC mode ····· F1
7) Select A81CPU write function ····· (See Section 8.3.)
8) Write ····· Y → CR
9) Select A81CPU verify function ····· (See Section 8.3.)
10) Verify ····· Y → CR
11) Return to mode select menu ····· F1 → CAN

5.5.2 Writing program from GPP internal memory onto disk

1) Select PC mode ····· F1
2) Select A81CPU write function ····· (See Section 8.3.)
3) Write ····· Y → CR
4) Select A81CPU verify function ····· (See Section 8.3.)
5) Verify ····· Y → CR
6) Return to mode select menu ····· F1 → CAN

5.6 Reading Program from A81CPU

1) Select PC mode ····· F1
2) Select A81CPU read function ····· (See Section 8.3.)
3) Read ····· Y → CR
4) Select A81CPU verify function ····· (See Section 8.3.)
5) Verify ····· Y → CR
6) Return to mode select menu ····· F1 → CAN

5.7 Debugging Program

5.7.1 Loop monitoring

1) Select monitoring/test mode ····· F4
2) Select loop monitoring function····· 1 → CR
3) Execute loop monitoring····· (See Section 9.4.)
4) Return to mode select menu····· F4 → CAN

5.7.2 Monitoring scan time, program run/stop status

1) Select monitoring/test mode ····· F4
2) Select scan time, remote run/stop function····· 2 → CR
3) Execute scan time, run/stop monitoring····· (Started by selecting the function.)
4) Return to mode select menu····· F4 → CAN

5.7.3 Monitoring devices

1) Select monitoring/test mode ····· F4
2) Select PC device monitoring/test function····· 4 → CR
3) Execute device monitoring····· (See Section 9.9.1.)
4) Return to mode select menu····· F4 → CAN

5.7.4 Testing device

1) Select monitoring/test mode ····· F4
2) Select PC device monitoring/test function····· 4 → CR
3) Execute device test ····· (See Section 9.9.2.)
4) Return to mode select menu····· F4 → CAN

5.7.5 Step run

1) Select monitoring/test mode ····· F4
2) Select step run function····· 3 → CR
3) Enter devices monitored····· (See Section 9.8.1.)
4) Specify program No., break point, loop count ····· (See Section 9.8.2.)
5) Execute step run····· CR →·····→ CR
6) Return to mode select menu····· F4 → CAN

5.7.6 A81CPU remote run/stop

1) Select monitoring/test mode ····· F4
2) Select scan time, remote run/stop function ····· 2 → CR
3) Execute remote run/stop/pause ····· F9 → (See Section 9.6.)
4) Return to mode select menu ····· F4 → CAN

5.7.7 Program run/stop request

1) Select monitoring/test mode ····· F4
2) Select scan time, remote run/stop function ····· 2 → CR
3) Request program run/stop ····· F10 → (See Section 9.7.)
4) Return to mode select menu ····· F4 → CAN

5.8 Print Out

5.8.1 Printing out A81CPU program

1) Select PC mode ····· F1
2) Select A81CPU read function ····· (See Section 8.3.)
3) Read ····· Y → CR
4) Select A81CPU verify function ····· (See Section 8.3.)
5) Verify ····· Y → CR
6) Select printer mode ····· F6
7) Select printer select function ····· 1 → CR
8) Select printer ····· (See Section 11.4.)

K7PR selected → 9) General-purpose printer selected → 11)
A7PR selected → 10) K6PR, K6PR-K, GT-10A, LX-80/RX-80 selected → 12)

9) Set K7PR ····· (See Section 11.4.1.)
10) Set A7PR ····· (See Section 11.4.2.)
11) Set general-purpose printer ····· (See Section 11.4.4.)
12) Set print out data ····· (See Section 11.5.1.)
13) Set page ····· (See Section 11.5.2.)
14) Print out ····· Y → CR
15) Return to mode select menu ····· F6 → CAN

5.8.2 Printing out program on disk

1) Select FDD mode ····· F5
2) Select disk read function ····· 2 → CR
3) Read from disk ····· (See Section 10.5.)
4) Select disk verify function ····· CAN → 4 → CR
5) Verify with disk ····· (See Section 10.7.)
6) Select printer mode ····· F6
7) Select printer select function ····· 1 → CR
8) Select printer ····· (See Section 11.4.)

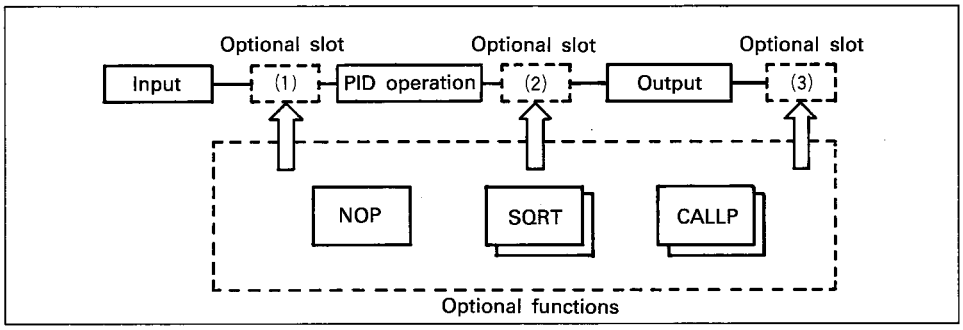
K7PR selected → 9) General-purpose printer selected → 11)
A7PR selected → 10) K6PR, K6PR-K, GT-10A, LX-80/RX-80 selected → 12)

9) Set K7PR ····· (See Section 11.4.1.)
10) Set A7PR ····· (See Section 11.4.2.)
11) Set general-purpose printer ····· (See Section 11.4.4.)
12) Specify print out data ····· (See Section 11.5.1.)
13) Specify page ····· (See Section 11.5.2.)
14) Execute print out ····· Y → CR
15) Return to mode select menu ····· F6 → CAN

6. MACRO FUNCTION MODE

Used to specify the TAG No., optional functions and parameters for each loop.

6.1 Macro Function Mode Functions

Item	Description
TAG No. setting	Specify a TAG No. for each loop used. Loop ····· Each macro function is represented as a loop and all macro function settings are controlled by using the loop No.s. TAG No. ····· Control number assigned to each loop.
Optional function setting	Set an optional function to an optional slot selected.  NOP ····· Stands for no operation and indicates that no function exists in the optional slot. SQRT ····· Square root extraction operation for use with differential pressure linearlization, etc. CALL ····· Subroutine call. When control cannot be achieved by SQRT only, call a user-written program.
Parameter setting	Read the parameter default values required for PID control and correct/change the parameters in accordance with the control per loop.

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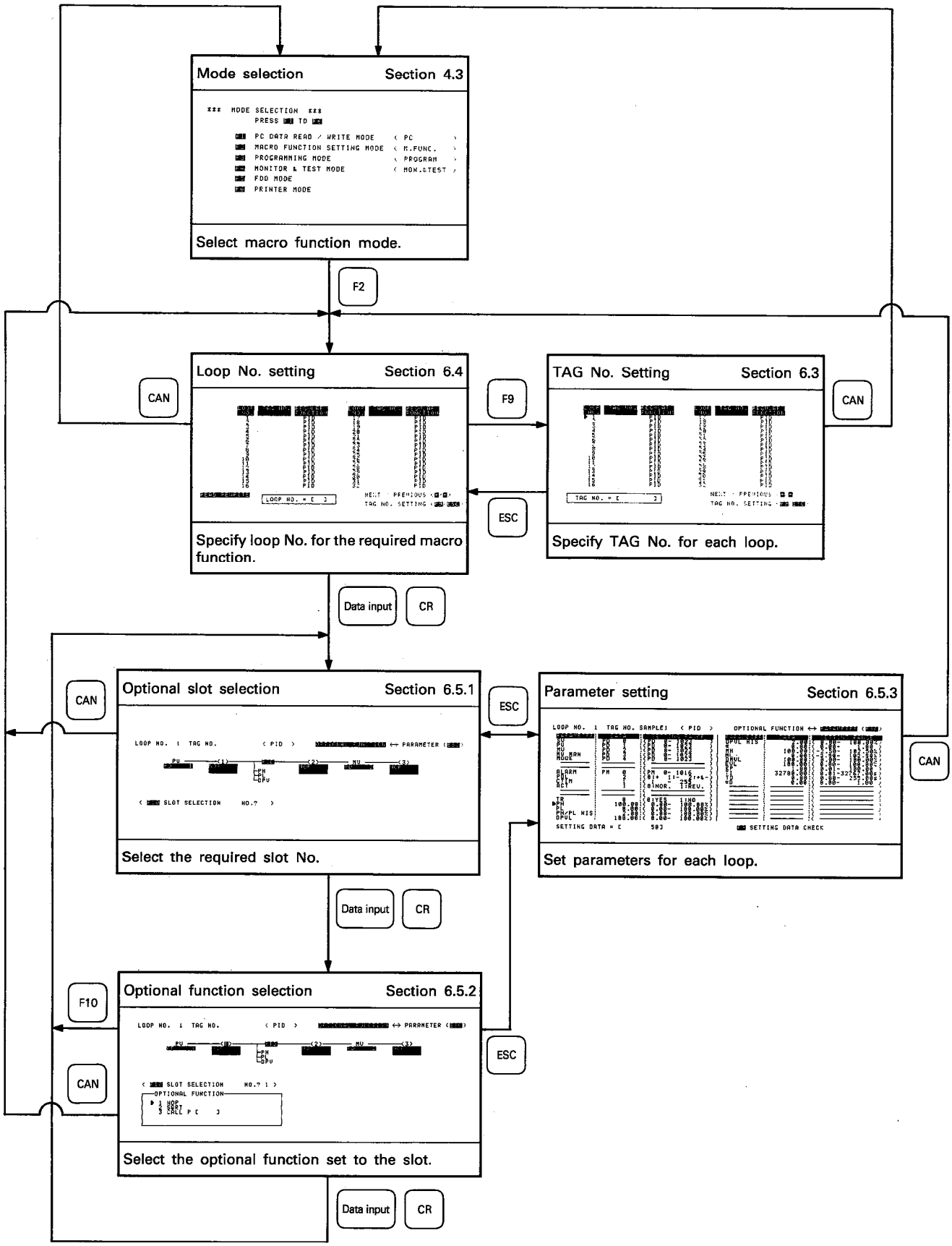
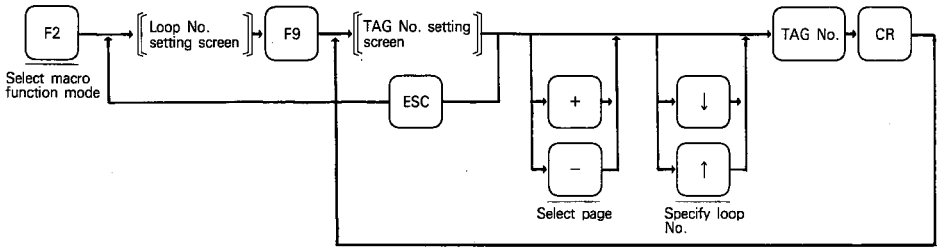
6.2 General Operation



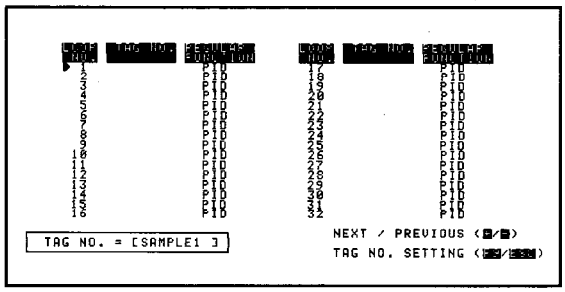
6.3 TAG No. Setting

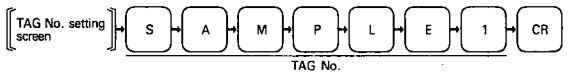
BASIC OPERATION



OPERATION EXAMPLE

TAG No. setting screen





(Example: To specify SAMPLE1 as TAG No. of loop 1)

EXPLANATION

(1) TAG No. setting is optional.

(2) Different TAG No.s must be used between loops.

(3) Any TAG No. must be specified as follows:

- Valid characters: A to Z, 0 to 9. (and blank are invalid.)
- Number of characters: 8 maximum
- Restriction: The first character must be alphabetic.

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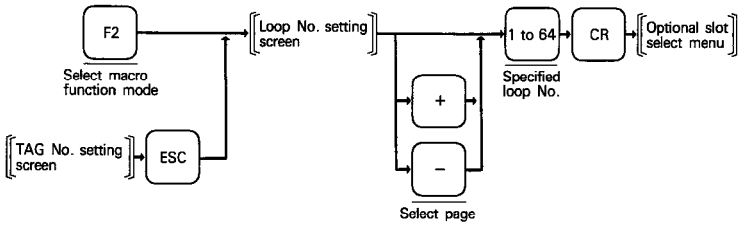
6.4 Loop No. Setting

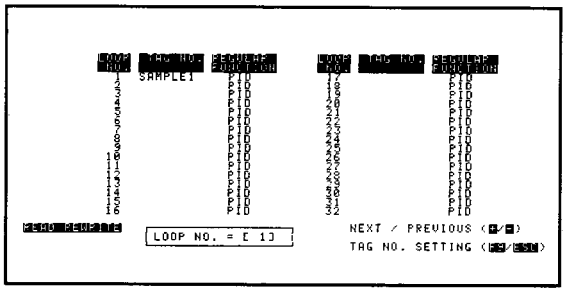
Macro functions are referred to as loops. When setting any optional function, parameters, etc., the required macro function must be specified by the corresponding loop No.

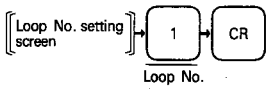
BASIC OPERATION



OPERATION EXAMPLE

Loop No. setting screen





(Example: To specify loop 1)

EXPLANATION

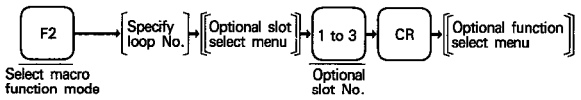
(1) The loop No. must be specified to set any macro function data for the required loop.

(2) The loop No. may be specified between 1 and 64.

6.5 PID Setting

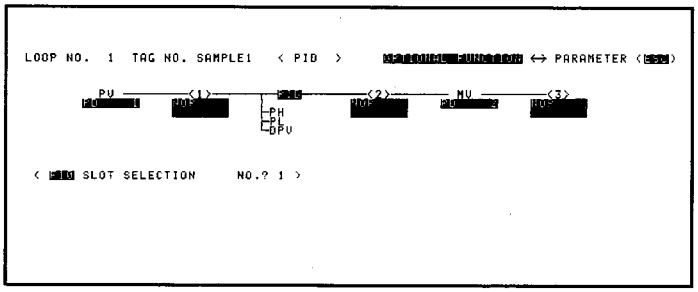
6.5.1 Optional slot selection

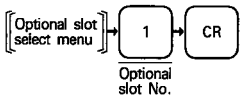
BASIC OPERATION



OPERATION EXAMPLE

Optional slot select menu





(Example: To select optional slot 1)

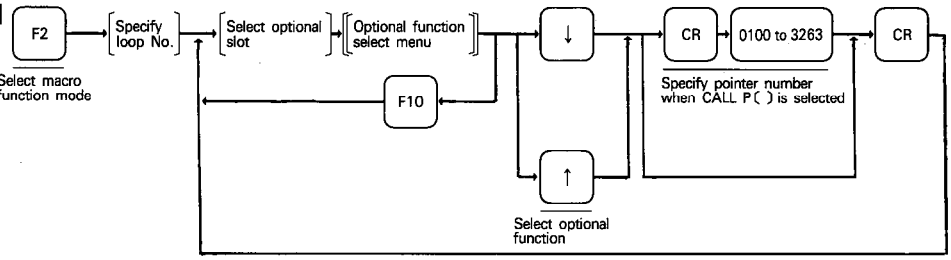
EXPLANATION

(1) Select any of the three optional slots when the corresponding optional function must be set to that slot.

(2) The slot No. may be selected between 1 and 3.

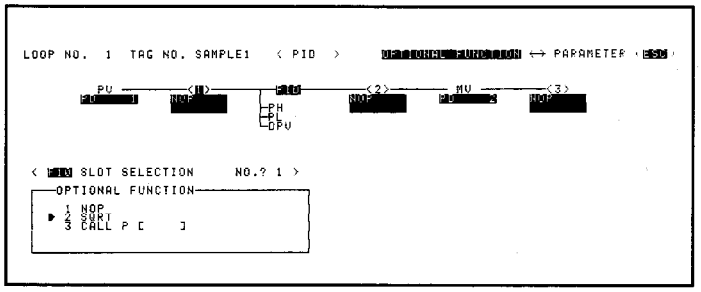
6.5.2 Optional function selection

BASIC OPERATION



OPERATION EXAMPLE

Optional function select menu



[Optional function select menu] → ↓ → CR

Specify SQRT

EXPLANATION

(1) Each slot defaults to NOP.

(2) When "CALLP" is selected, pressing CR moves the cursor to the pointer No. setting area. Specify the pointer No. between 0100 and 3263.

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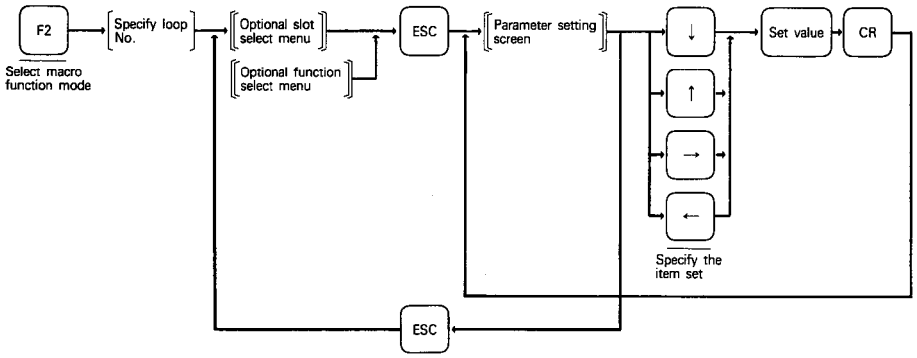
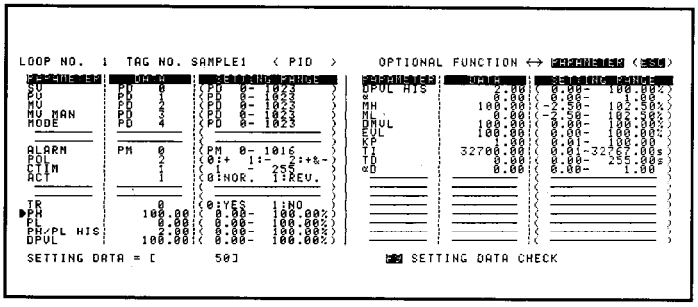
6.5.3 Parameter setting

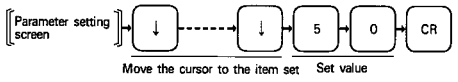
BASIC OPERATION



OPERATION EXAMPLE

Parameter setting screen





(Example: To set the process value high limit alarm PH to 50%)

EXPLANATION

(1) Any parameter must be set within the "SETTING RANGE."

(2) A device No. is only required to set a device.

(Example): To set PD10 to MV

Key input	Indication
1 0	P D 1 0

(3) A constant must be set as follows:

- Valid characters: 0 to 9, ・, +, − ··· "+" is indicated as blank.
- Number of digits: 8 maximum ····· Includes a decimal point but not a "−" sign.
- Number of digits after a decimal point: 2 maximum

(4) The allowed parameter ranges are shown on the next page.

Parameter setting ranges

No.	Abbreviation	Description	Setting Range
1	SV	Device for storing set value	PD0 to 1023
2	PV	Device for storing process value	PD0 to 1023
3	MV	Device for storing manipulated value	PD0 to 1023
4	MV MAN	Device for storing manual manipulated value	PD0 to 1023
5	MODE	Device for storing mode selected	PD0 to 1023
6			
7			
8	ALARM	Alarm-triggered device	PM0 to 1016
9	POL	PV change rate check direction	0 : +, 1 : −, 2 : + & −
10	CTIM	PV change rate check duration	1 to 255
11	ACT	Operation action selection	0 : Forward action, 1 : Reverse action
12	PRG No.	Program No. with which a loop is used	1 to 32
13			
14	TR	Tracking specification	0 : Yes, 1 : No
15			
16			
17	PH	High limit alarm set value	0.00 to 100.00%
18	PL	Low limit alarm set value	0.00 to 100.00%
19	PH/PL HIS	High/low limit alarm hysteresis value	0.00 to 100.00%
20	DPVL	PV change rate alarm set value	0.00 to 100.00%
21	DPVL HIS	PV change rate check hysteresis value	0.00 to 100.00%
22	α	Filter coefficient	0.00 to 1.00
23	MH	MV high limit	−2.50 to 102.50%
24	ML	MV low limit	−2.50 to 102.50%
25	DMVL	MV change rate alarm set value	0.00 to 100.00%
26	EVL	Excessive error alarm set value	0.00 to 100.00%
27	KP	Proportional gain	0.01 to 100.00
28	TI	Integral time	0.01 to 32767.00s
29	TD	Derivative time	0.00 to 255.00s
30	αD	Derivative gain	0.00 to 1.00
31			
32			
33			
34			
35			
36			

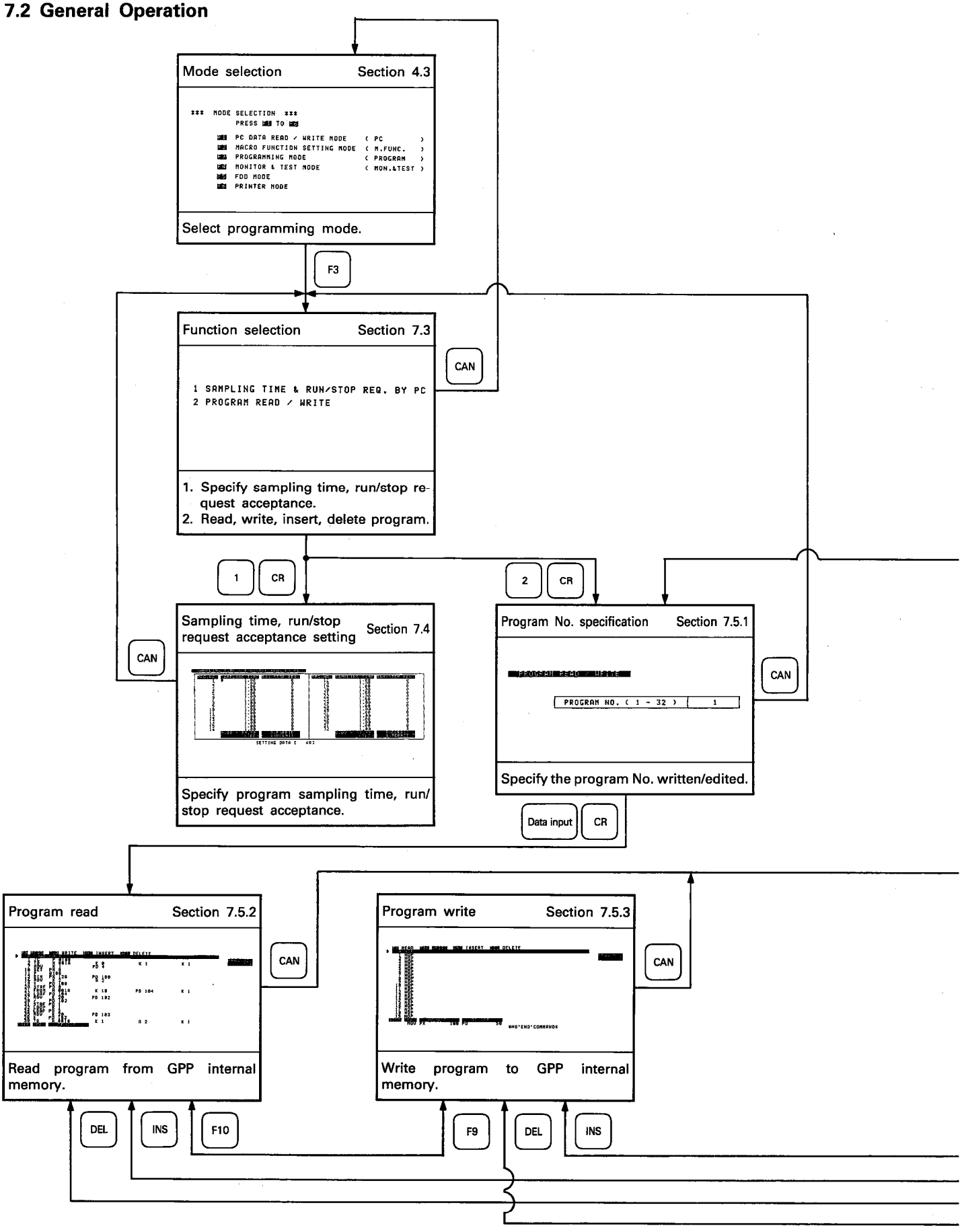
7. PROGRAMMING MODE

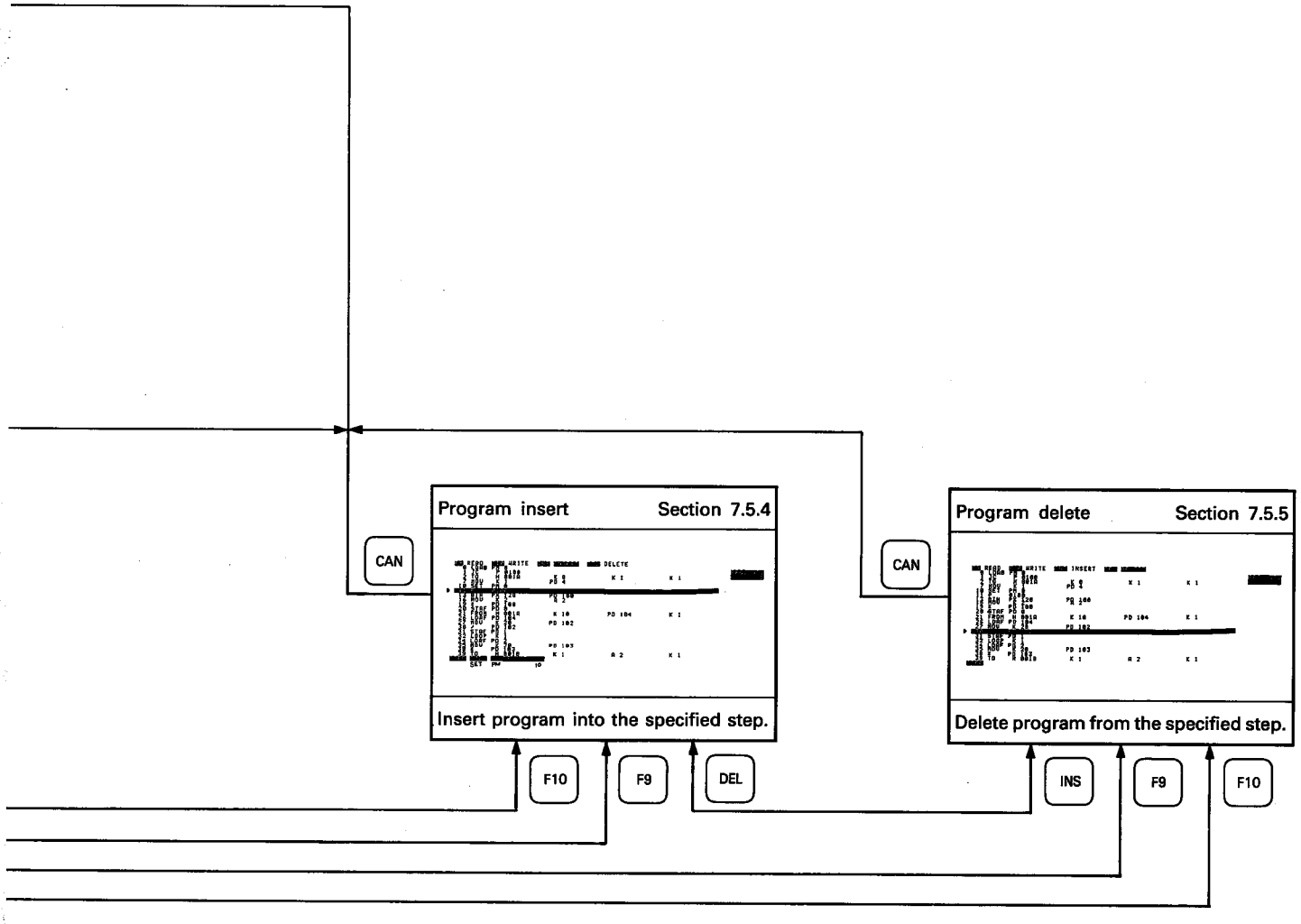
Used to read, write, insert, delete programs, and specify the sampling time and run/stop request acceptance.

7.1 Programming Mode Functions

Item	Description
Read	Reads a specified program from the GPP internal memory. 1) Read by the specified step No. 2) Read by the specified instruction (+ device) 3) Read by the specified device
Write	Writes the specified program to the GPP internal memory. 1) Write to the specified step 2) Batch write of NOPs
Insert	Inserts a program to the specified step.
Delete	Deletes a program from the specified step.
Sampling time setting	Sets the sampling time for a program. Sampling time ····· Indicates the operation interval of input data.
Run/stop request acceptance setting	Specify whether or not the run/stop request by the PC CPU is accepted per program.

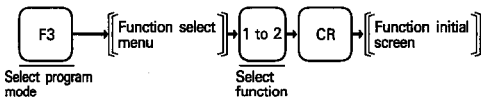
7.2 General Operation




Program insert
Section 7.5.4
Insert program into the specified step.
Program delete
Section 7.5.5
Delete program from the specified step.
CAN
CAN
F10
F9
DEL
INS
F9
F10

7.3 Function Selection

BASIC OPERATION

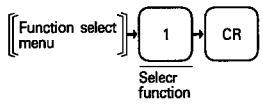


OPERATION EXAMPLE

```
1 SAMPLING TIME & RUN/STOP REQ. BY PC
2 PROGRAM READ / WRITE




                                NO.? 1
```



(Example: To select the sampling time & run/stop request acceptance function)

EXPLANATION

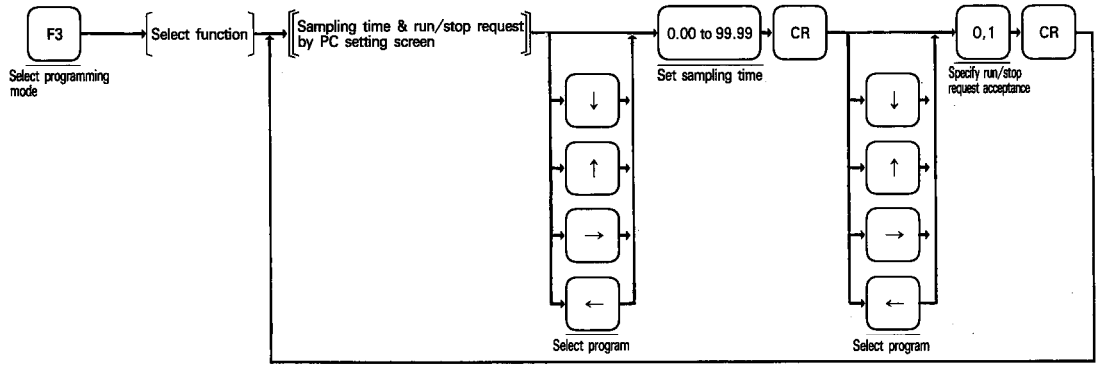
(1) Select either of the following functions:

1. SAMPLING TIME & RUN/STOP REQ. BY PC ····· Specifies program sampling time, whether the run/stop request by PC CPU is accepted or not.

2. PROGRAM READ/WRITE ····· Writes/edits program.

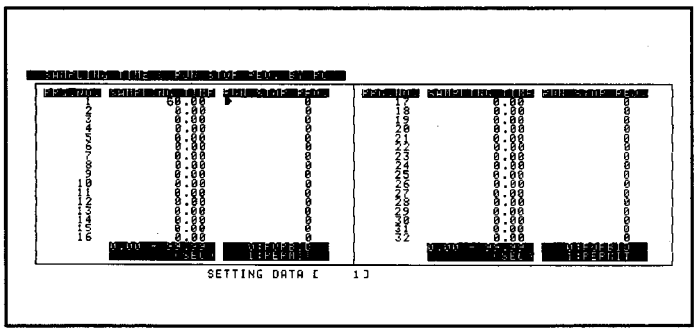
7.4 Setting Sampling Time and Run/Stop Request Acceptance

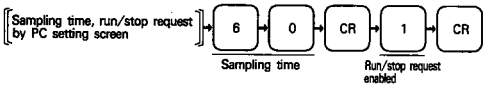
BASIC OPERATION



OPERATION EXAMPLE

Sampling time, run/stop request by PC setting screen





(Example: To set program 1 sampling time to 60 seconds and the run/stop request enabled.)

EXPLANATION

(1) Set the sampling time of each program between 0.00 and 99.99 seconds within 5 digits including a decimal point.

(2) The sampling time defaults to 0.00 second.
Any program is not processed if the default value is not changed. In this case, "RUN" is indicated during program run/stop status monitoring.

(3) Specify whether the run/stop request by the PC CPU is enabled or disabled.

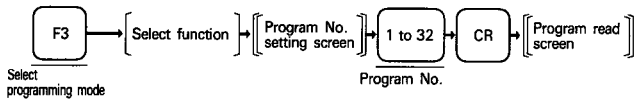
0: Forbid
1: Permit

7.5 Writing and Editing Programs

7.5.1 Specifying program No.

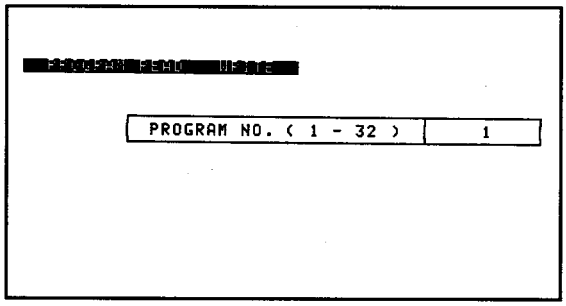
Any program may be written or edited by specifying the program No.

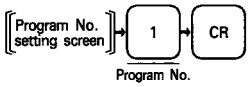
BASIC OPERATION



OPERATION EXAMPLE

Program No. setting screen





(Example: To specify program 1)

EXPLANATION

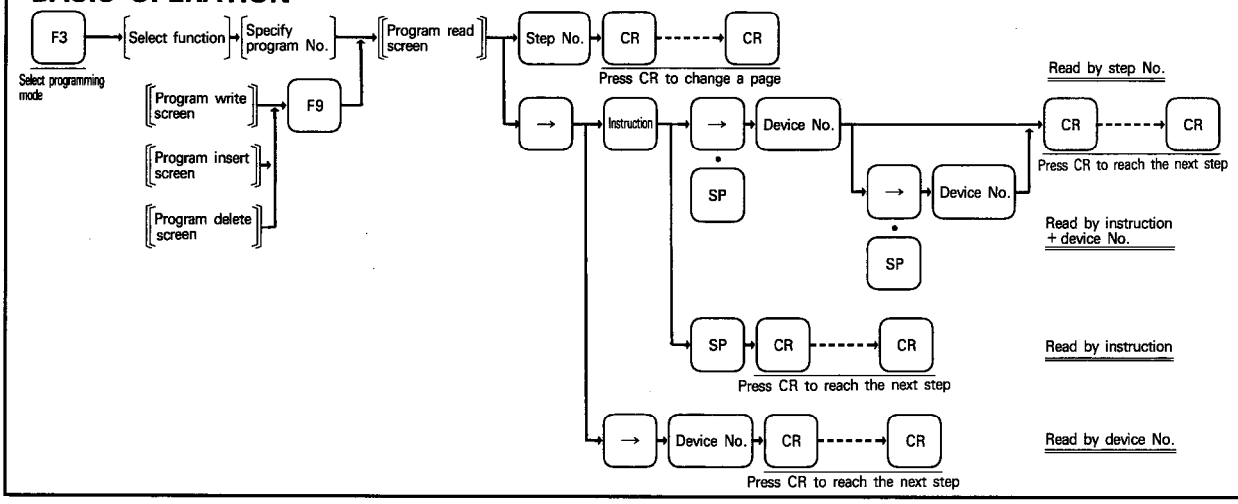
(1) Specify the program No. between 1 and 32.

(2) A maximum of 32 programs may be written.

7.5.2 Reading program

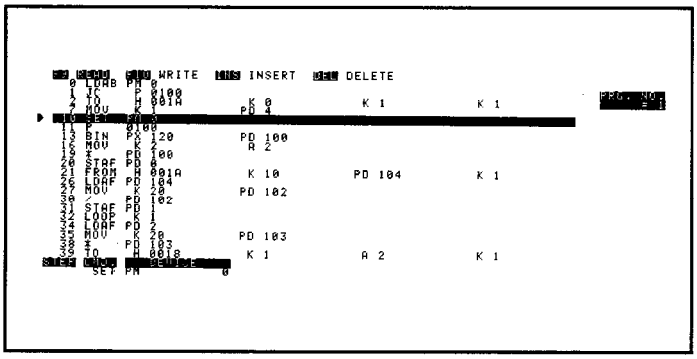
Reads the specified program from the GPP internal memory in a list format.

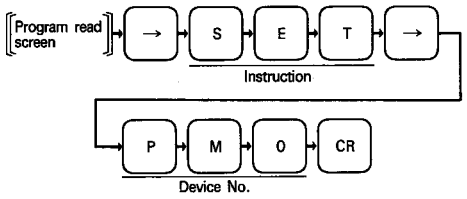
BASIC OPERATION



OPERATION EXAMPLE

Program read screen





(Example: To search for a step with the SET PM0 instruction)

EXPLANATION

(1) A program may be read by any of the following methods:

- Specified step No.
- Specified instruction + device No.
- Specified instruction
- Specified device No.

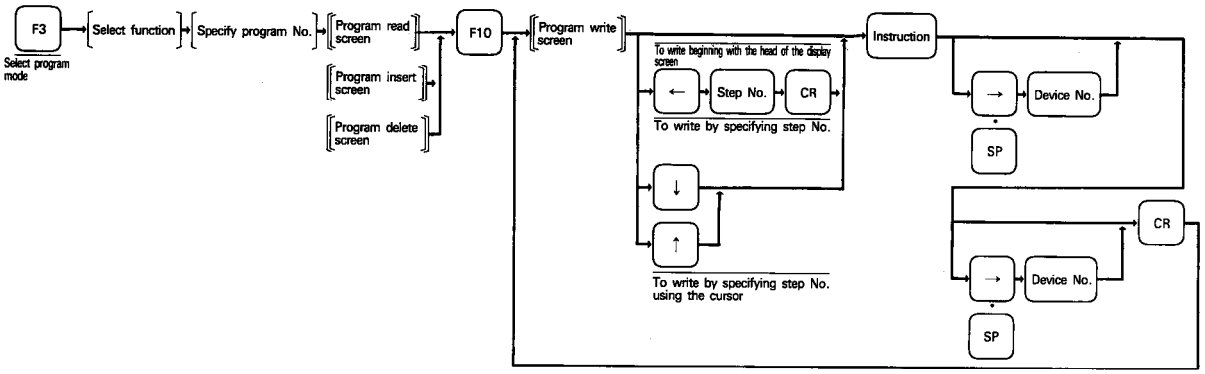
(2) When a program is read by using a step No., a total of 20 lines are displayed with the specified step number in the middle.
If the specified step is within 10th lines from step 0, 20 lines are displayed beginning with step 0.

(3) Press [↓], [↑] to move the cursor. Press [↑] at the screen top or [↓] at the bottom to scroll up or down the display screen.

7.5.3 Writing program

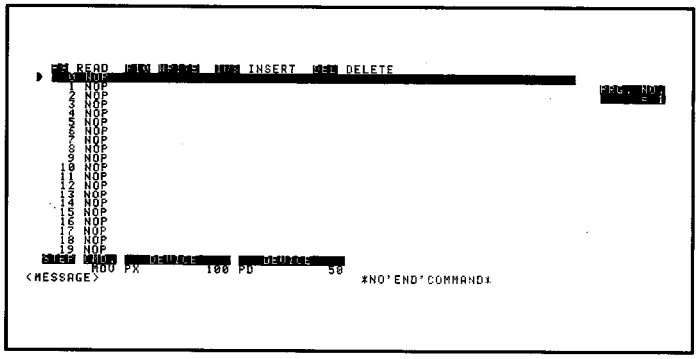
Writes program to the GPP internal memory.

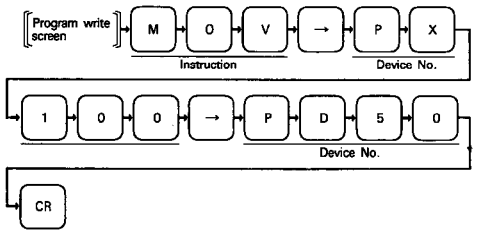
BASIC OPERATION



OPERATION EXAMPLE

Program write screen





(Example: To write MOV PX100 PD50 to step 0)

EXPLANATION

(1) The END instruction must be written at the final step to indicate the program end.

(2) Any of the 20 instructions displayed on the screen may be read to the setting area in the following procedure:

1) Move the cursor to the required step.

2) Press [HOME CLEAR] to clear the data from the "CMD." and "DEVICE" areas.

3) Press [CR] to read the step at the cursor to the setting area.

(3) A batch of NOPs can be written in the following procedure:

1) Move the cursor to the first NOP write step.

2) Enter the following data to the setting area:

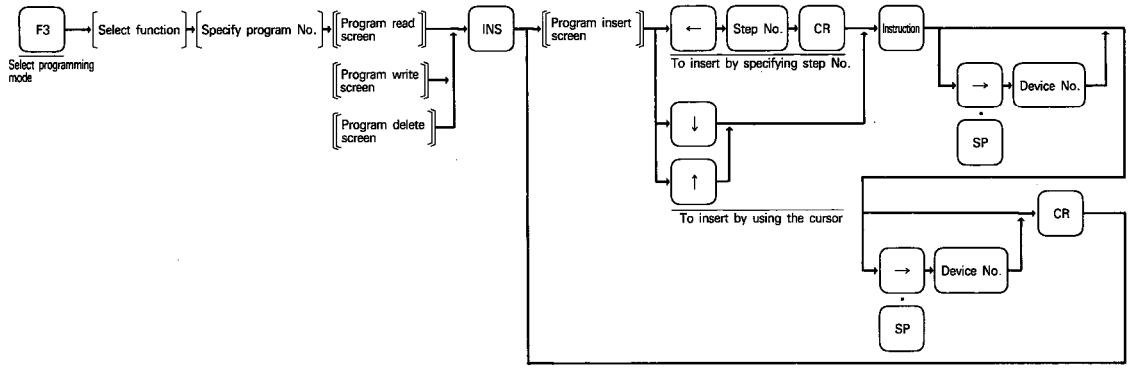
CMD area → DEVICE area

[N] [O] [P] → [K] [Final step No.] → [CR]

7.5.4 Inserting program

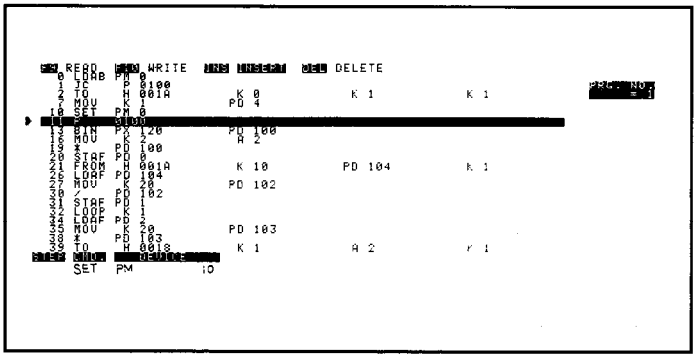
Inserts an instruction into the program in the GPP internal memory.

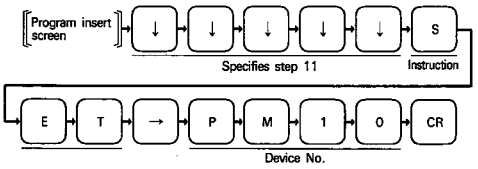
BASIC OPERATION



OPERATION EXAMPLE

Program insert screen





(Example: To insert SET PM10 between steps 10 and 11)

EXPLANATION

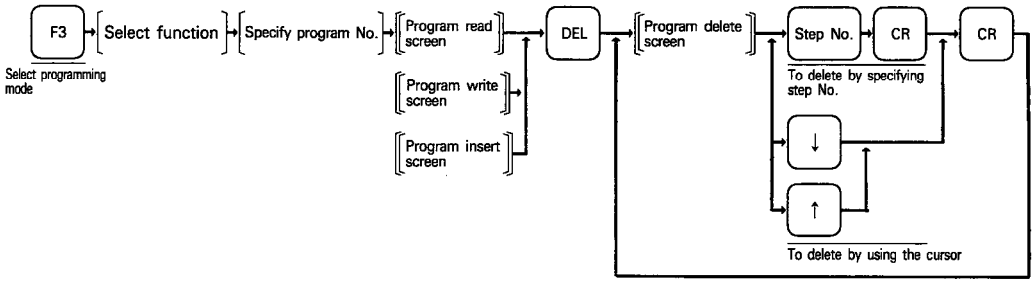
(1) The specified instruction is inserted before the specified step.

(2) Any instruction at the last step will be erased if the number of steps exceeds 249 by inserting an instruction.

7.5.5 Deleting program

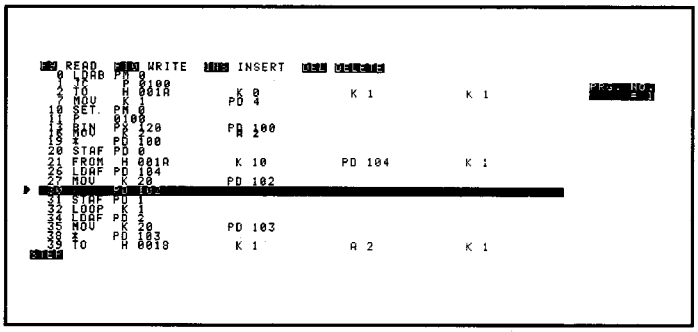
Deletes the specified program from the GPP internal memory.

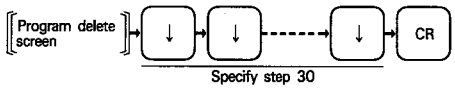
BASIC OPERATION



OPERATION EXAMPLE

Program delete screen





(Example: To delete / PD102 at step 30)

EXPLANATION

(1) Instructions after the step deleted are shifted up.

(2) NOP is written to step 249 each time an instruction is deleted.

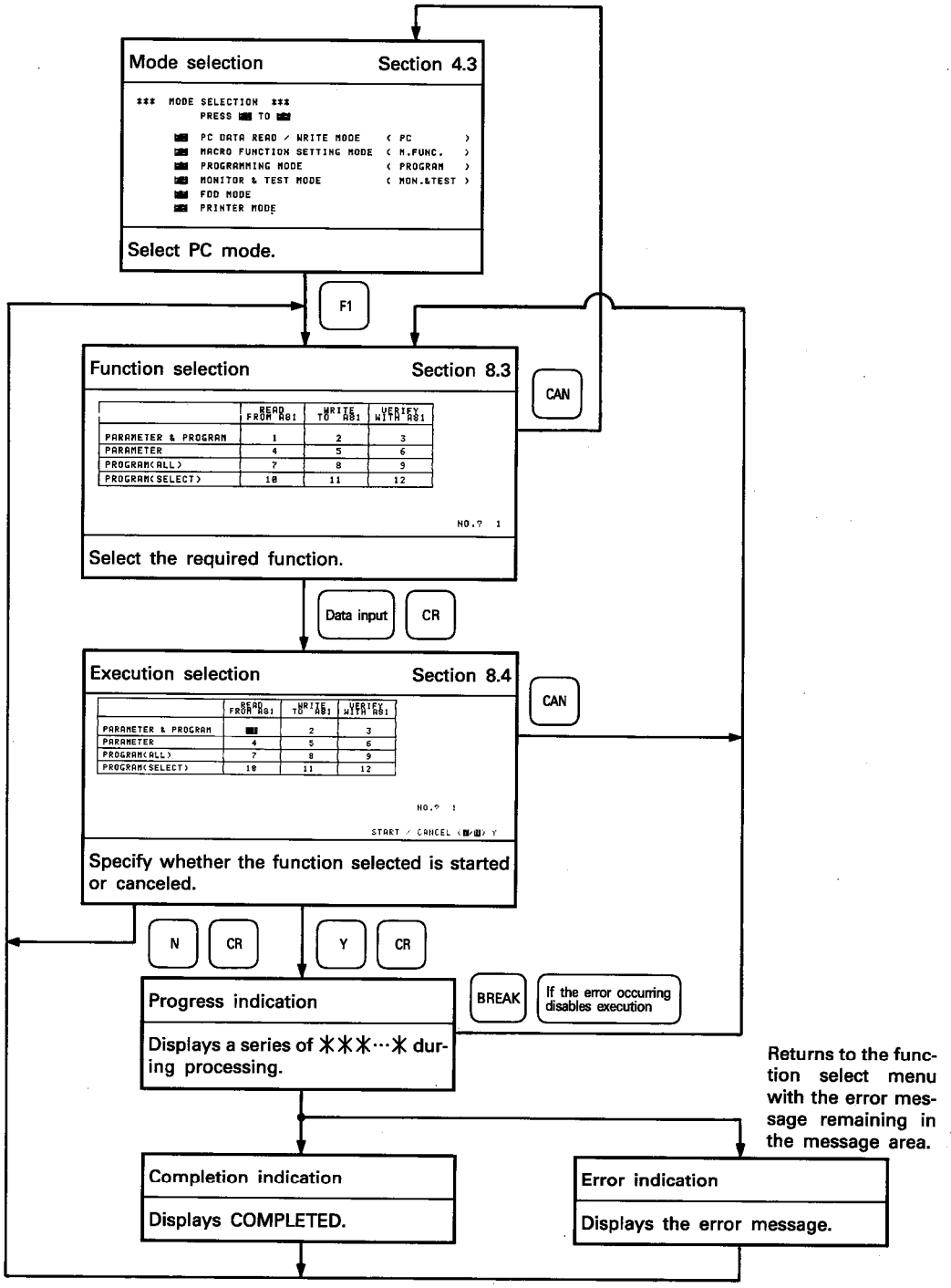
8. PC MODE

Used to read, write and verify parameters and programs between the A81CPU and GPP internal memory.

8.1 PC Mode Functions

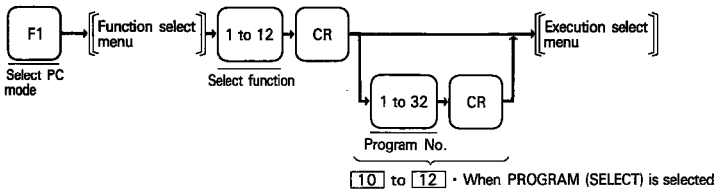
Item	Description
Read	Reads parameters and programs from the A81CPU to the GPP internal memory.
Write	Writes parameters and programs from the GPP internal memory to the A81CPU.
Verify	Verifies parameters and programs between the A81CPU and GPP internal memory.

8.2 General Operation



8.3 Function Selection

BASIC OPERATION

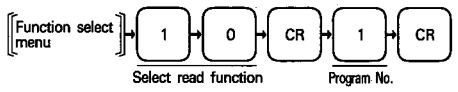


OPERATION EXAMPLE

Function select menu

	READ FROM A81	WRITE TO A81	VERIFY WITH A81
PARAMETER & PROGRAM	1	2	3
PARAMETER	4	5	6
PROGRAM(ALL)	7	8	9
PROGRAM(SELECT)	10	11	12

NO.? 1



(Example: To read program 1 from the A81CPU)

EXPLANATION

(1) The following functions are available:

- READ FROM A81 ····· Read from the A81CPU to the GPP internal memory
- WRITE TO A81 ····· Write from the GPP internal memory to the A81CPU
- VERIFY WITH A81 ····· Verify between the A81CPU and GPP internal memory

(2) Any of the following data types may be processed by the above functions:

- PARAMETER & PROGRAM
  - Read ····· Reads all programs and parameters from the A81CPU.
  - Write ····· Writes all programs and parameters from the GPP to the A81CPU.
  - Verify ····· Verifies all programs and parameters between the GPP and the A81CPU.

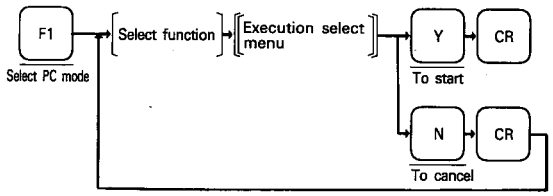
- PARAMETER
  - Read ····· Reads all parameters from the A81CPU.
  - Write ····· Writes all parameters from the GPP.
  - Verify ····· Verifies all parameters between the GPP and the A81CPU.

- PROGRAM (ALL)
  - Read ····· Reads all programs from the A81CPU.
  - Write ····· Writes all programs from the GPP.
  - Verify ····· Verifies all programs between the GPP and the A81CPU.

- PROGRAM (SELECT)
  - Read ····· Reads the specified program from the A81CPU.
  - Write ····· Writes the specified program from the GPP.
  - Verify ····· Verifies the specified program between the GPP and the A81CPU.

8.4 Read, Write, Verify with A81CPU

BASIC OPERATION



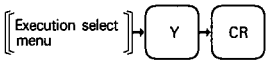
OPERATION EXAMPLE

Execution select menu

	READ FROM A81	WRITE TO A81	VERIFY WITH A81
PARAMETER & PROGRAM	■	2	3
PARAMETER	4	5	6
PROGRAM(ALL)	7	8	9
PROGRAM(SELECT)	10	11	12

NO.? 1

START / CANCEL (■/■) Y



(Example: To execute the function selected)

EXPLANATION

(1) Press [Y], [CR] to start processing. A series of ✳✳✳···✳ is displayed on the left bottom of the screen to indicate that the processing is being executed. One ✳ represents 1K byte. The rightmost ✳ flickers during progress and disappears every time 1K byte has been processed.

(2) The message "COMPLETED" indicates that the process is complete without fault and the screen returns to the function select menu.

(3) When the 11th error occurs during verify, the first 10 error messages are displayed, verify is stopped, and the screen returns to the function select menu.

(4) When the number of verify errors is within 10, verify is executed until "COMPLETED" is displayed and the screen returns to the function select menu.

8

IB (NA) 66167-A

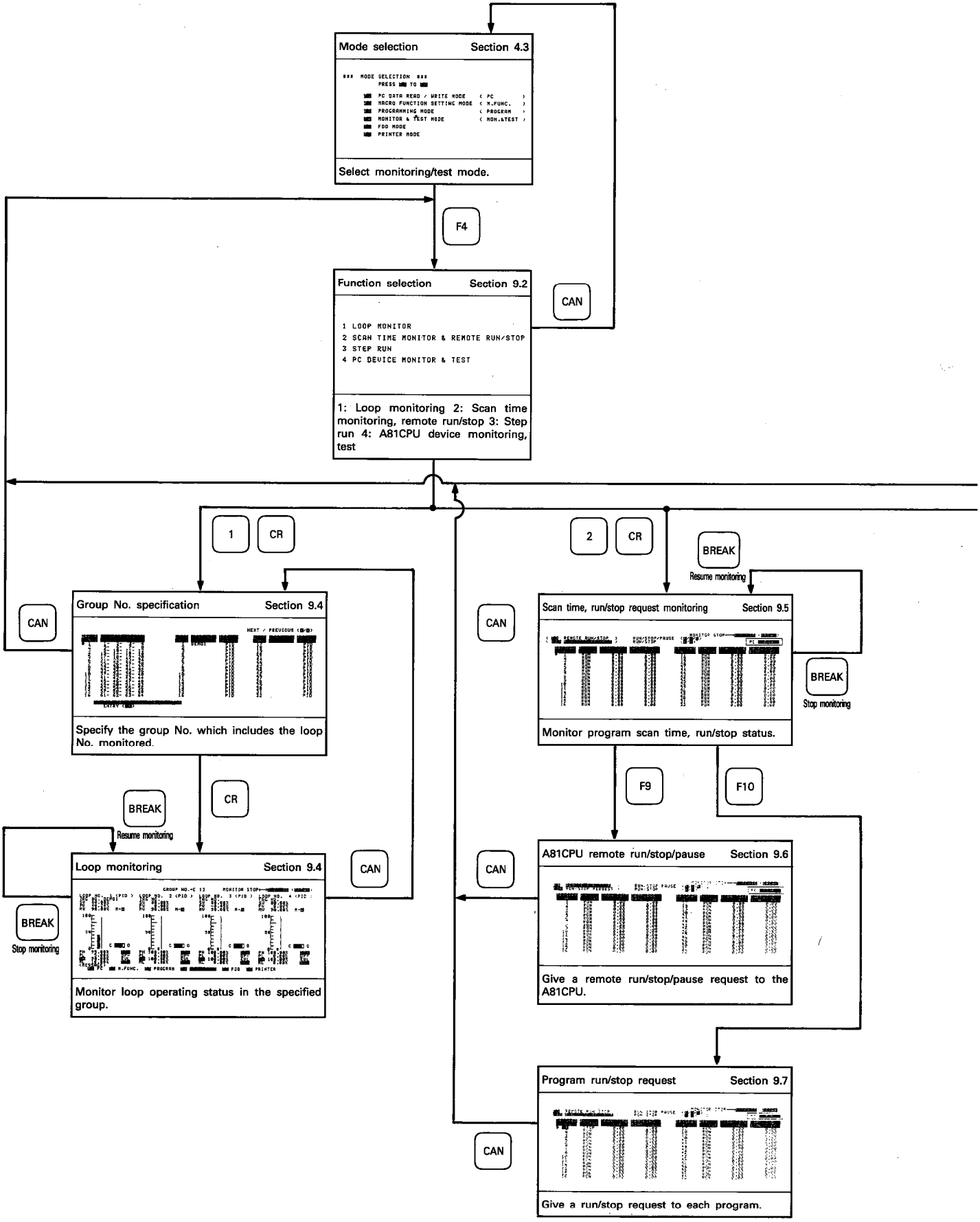
9. MONITORING/TEST MODE

Used to monitor the A81CPU operating status, perform step run, and change the device present values.

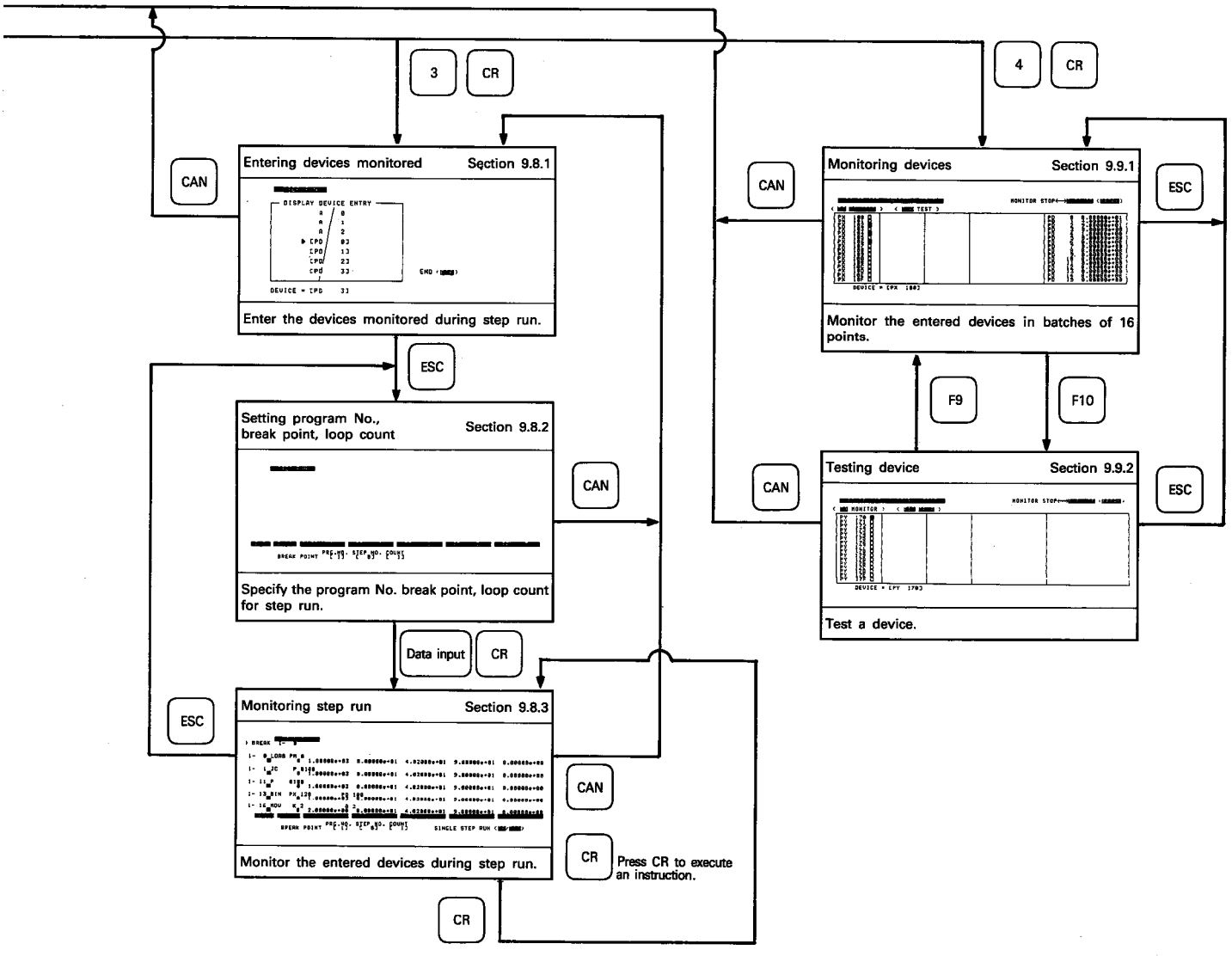
9.1 Monitoring/Test Mode Functions

Item	Description
Loop monitoring	Displays loop monitoring status in a graph format with various alarm and limit values.
Scan time, run/stop status monitoring Remote run/stop	Allows monitoring of program scan time, run/stop request status. Allows remote run/stop/pause of the A81CPU or run/stop request per program.
Step run	Allows step run in any mode of the A81CPU in accordance with the program No., break point and loop count specified. Entering devices monitored allows the specified device statuses to be monitored per step run.
Device monitoring, test	Specified devices are monitored in batches of 16 points. A specified device can be tested.

9.2 General Operation

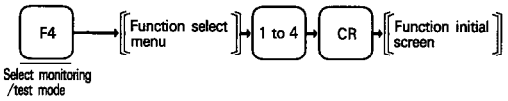


IB (NA) 66167-A


3
CR
4
CR
CAN
Entering devices monitored
Section 9.8.1
Enter the devices monitored during step run.
CAN
Monitoring devices
Section 9.9.1
ESC
Monitor the entered devices in batches of 16 points.
ESC
Setting program No., break point, loop count
Section 9.8.2
Specify the program No. break point, loop count for step run.
CAN
F9
F10
CAN
Testing device
Section 9.9.2
ESC
Test a device.
Data input
CR
ESC
Monitoring step run
Section 9.8.3
Monitor the entered devices during step run.
CAN
CR
Press CR to execute an instruction.
CR

9.3 Function Selection

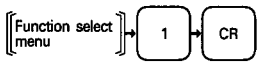
BASIC OPERATION



OPERATION EXAMPLE

Function select menu

```
1 LOOP MONITOR
2 SCAN TIME MONITOR & REMOTE RUN/STOP
3 STEP RUN
4 PC DEVICE MONITOR & TEST
```



(Example: To specify loop monitoring)

EXPLANATION

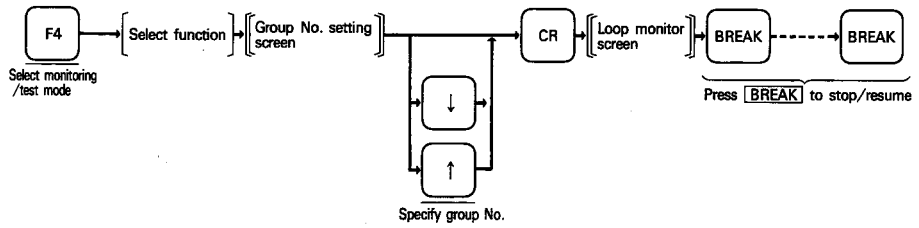
(1) Select the required function.

1. LOOP MONITOR ····· Monitors loop operating status.
2. SCAN TIME MONITOR & REMOTE RUN/STOP ····· Monitors program scant time, run/stop request status.
3. STEP RUN ····· Step-runs the A81CPU.
4. PC DEVICE MONITOR & TEST ····· Monitors, tests the A81CPU devices.

9.4 Loop Monitoring

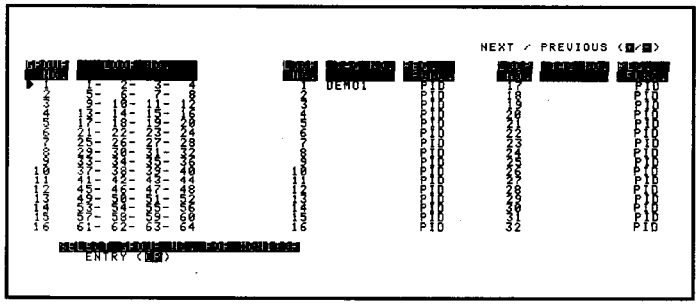
Specify the group No. which includes the loop monitored. The four loops in the specified group are monitored.

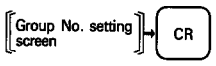
BASIC OPERATION



OPERATION EXAMPLE

Group No. setting screen





(Example: To specify the monitoring of loop 1)

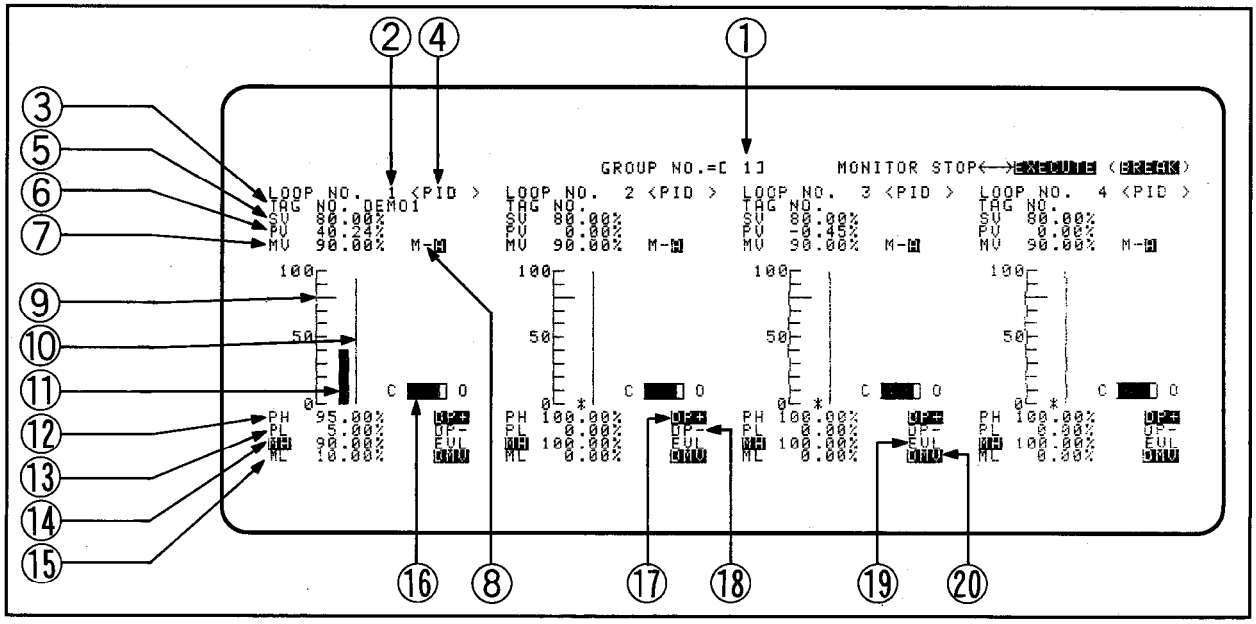
EXPLANATION

(1) Four loops in the specified group are monitored.

(2) The four groups in each group are predefined.

(3) Loops in different groups cannot be monitored at the same time.

(4) A loop monitoring display screen is shown on the next page.



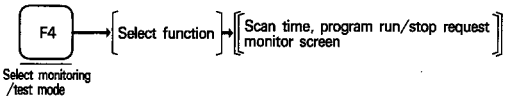
Item	Description
①	Indicates a group No. (1 to 8).
②	Indicates a loop No. (1 to 32).
③	Indicates a TAG No.
④	Indicates a function name.
⑤	Indicates the set value as a %.
⑥	Indicates the process value as a %.
⑦	Indicates the manipulated value as a %.
⑧	Indicates operation mode. M = manual, A = automatic
⑨	"—" indicates the set value as a %.
⑩	The vertical line indicates the alarm set value range of the process value.
⑪	The bar graph indicates the process value as a %.
⑫	Indicates the high alarm set value of the process value as a %.
⑬	Indicates the low alarm set value of the process value as a %.
⑭	Indicates the high limit of the process value as a %.
⑮	Indicates the low limit of the process value as a %.
⑯	The horizontal bar indicates the process value as a %. C = 0%, O = 100%.
⑰	Highlighted when the PV change rate high alarm limit is reached.
⑱	Highlighted when the PV change rate low alarm limit is reached.
⑲	Highlighted when excessive error alarm occurs.
⑳	Highlighted when MV change rate alarm occurs.

REMARKS

"✳" is indicated at the 0% or 100% position when the process and manipulated values fall below 0% or exceed 100%, respectively.

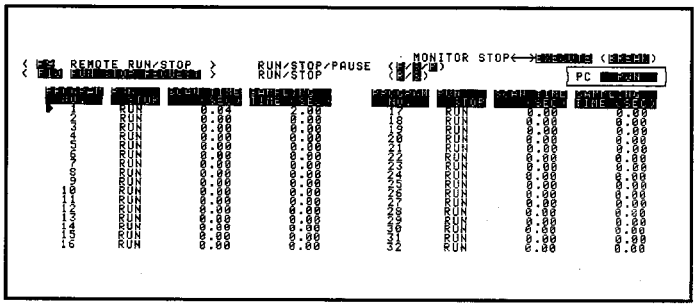
9.5 Monitoring Scan Time, Program Run/Stop Request

BASIC OPERATION



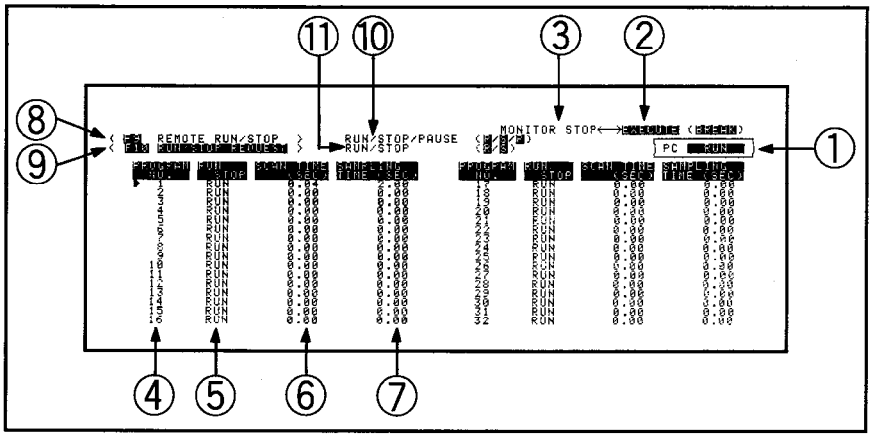
OPERATION EXAMPLE

Scan time, program run/stop request monitor screen



EXPLANATION

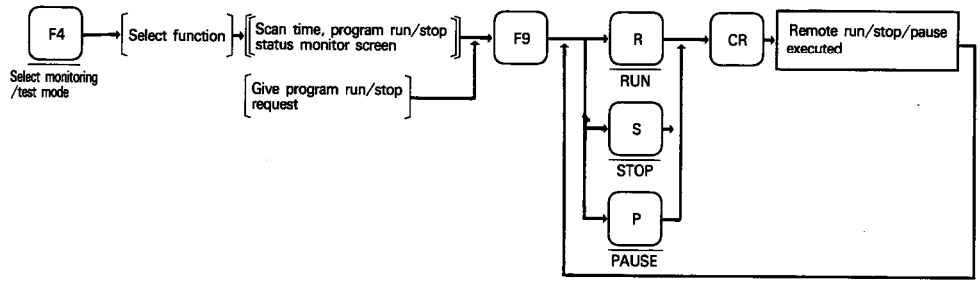
(1) A program is executed and the "NOP" processing time is indicated as scan time if the END instruction does not exist at step 0 of an unused program, the sampling time is "0.01" second or more, and the STOP request is not given.



Item	Description	Item	Description
①	Indicates the A81CPU run/stop status.	⑦	Indicates the sampling time.
②	Highlights "EXECUTE" during monitoring.	⑧	Highlighted when the A81CPU remote run/stop request is given.
③	Highlights "MONITOR STOP" during monitoring stop.	⑨	Highlighted when the program run/stop request is given.
④	Indicates a program No.	⑩	A81CPU remote run/stop request setting area
⑤	Indicates the program run/stop request status.	⑪	Program run/stop request setting area
⑥	Indicates the scan time.		

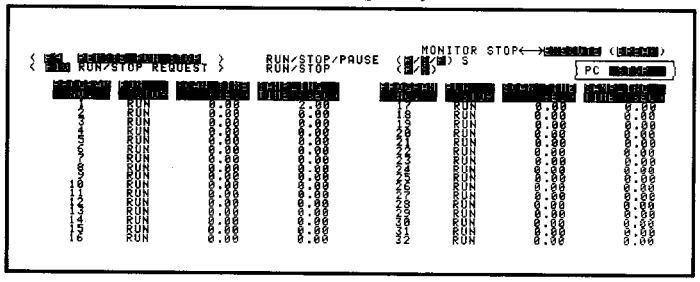
9.6 A81CPU Remote Run/Stop/Pause

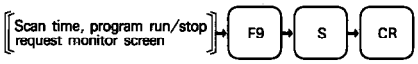
BASIC OPERATION



OPERATION EXAMPLE

Scan time, program run/stop request monitor screen





(Example: To remote-stop the A81CPU)

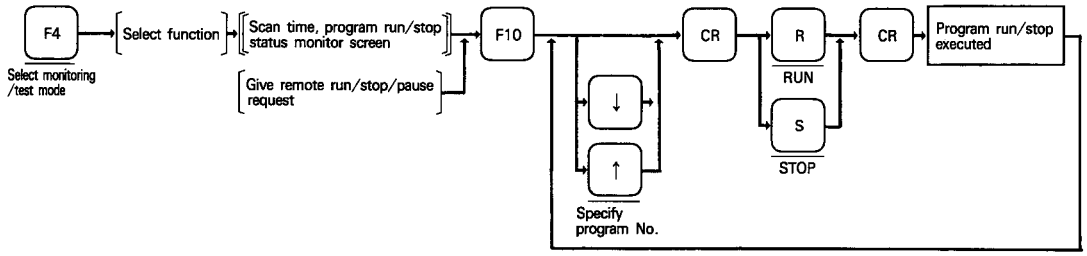
EXPLANATION

(1) The operation mode can be changed to any of run, stop and pause from the GPP during run of the A81CPU.

(2) Any remote operation mode is canceled by resetting the A81CPU with the RUN key switch at STOP.

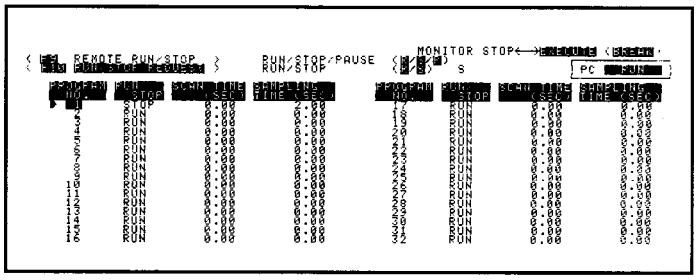
9.7 Program Run/Stop Request

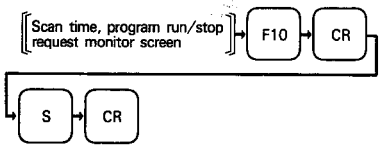
BASIC OPERATION



OPERATION EXAMPLE

Scan time, program run/stop request monitor screen





(Example: To stop program 1)

EXPLANATION

(1) Allows a program run/stop request to be given from the GPP to the A81CPU during run.

(2) A run/stop request is canceled by resetting the A81CPU with the RUN key switch at STOP.

(3) A run/stop request may be given from a PC CPU on a higher level or from a computer connected to the computer link module.

(4) A stop request given from any of the GPP, PC CPU and computer immediately stops the specified program.

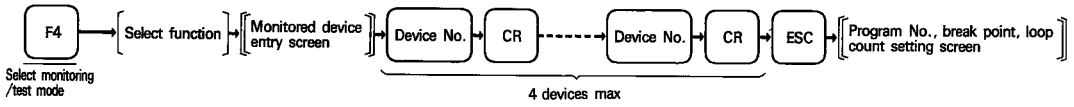
(5) A run request cannot run the specified program if a stop request is left given from any of the GPP, PC CPU and computer and the run request is given from other than the module which has given the stop command. A run request must be given from the module which has given a stop request.

(6) PY output remains on if a currently running program is stopped by a program stop request.

9.8 Step Run

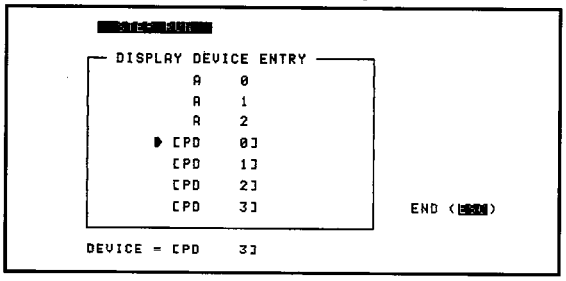
9.8.1 Entering devices monitored

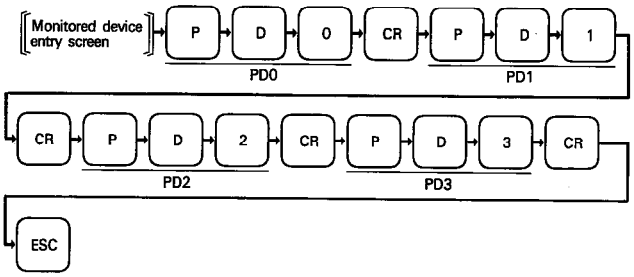
BASIC OPERATION



OPERATION EXAMPLE

Monitored device entry screen





(Example: To enter PD0-PD3 as devices monitored)

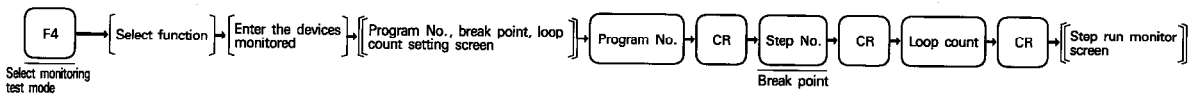
EXPLANATION

(1) A maximum of four devices other than A0 to A2 can be entered as devices monitored during step run.

(2) A0, A1 and A2 are monitored continuously and need not be entered.

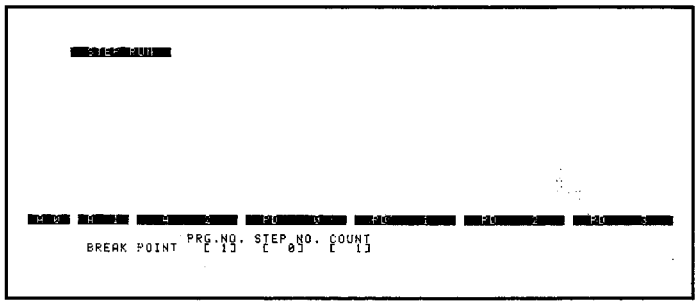
9.8.2 Setting program No., break point, loop count

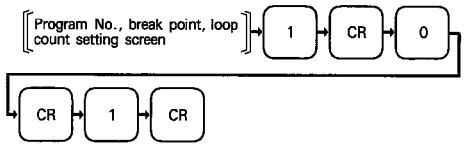
BASIC OPERATION



OPERATION EXAMPLE

Program No., break point, loop count setting screen





(Example: To specify step run starting at step 0 after one loop of program 1 is executed.)

EXPLANATION

(1) A break occurs immediately before the instruction at the specified step No. One instruction is executed each time CR is pressed.

(2) The head step No. must be specified to cause a break at the specified step.

(Example):

STEP	CMD	DEVICE			
0	LDAB	PM0			
1	JC	P0100			
2	TO	H001A	K0	K1	K1
7	MOV	K1	PD4		

Step 2 must be specified to cause a break before TO H001A K0 K1 K1. A break does not occur if any of steps 3 to 6 is specified.

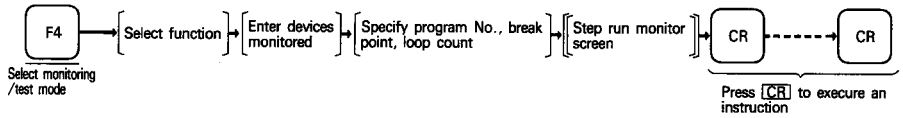
(3) A break occurs at the break point after the program is executed from step 0 to END by the specified number of loops. The number of loops may be specified between 1 and 255.

(4) If step run is executed for a program using two or more program areas (i.e. exceeding 250 steps), the program No. and step No. specified must be within program area 1. Program area 2 is only executed if any No. in program area 2 is specified.

(5) To change the step No., move the cursor to the "BREAK POINT" area by pressing [ESC].

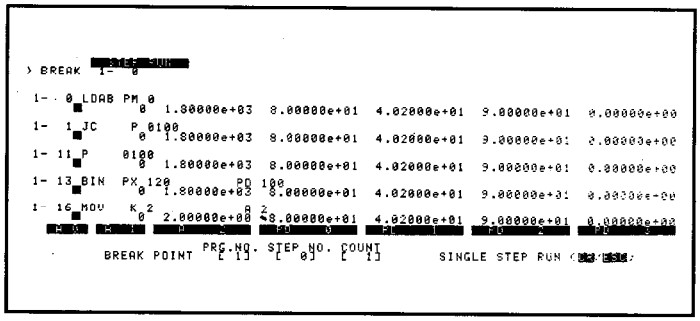
9.8.3 Monitoring step run

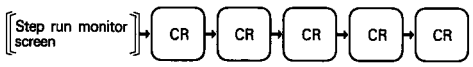
BASIC OPERATION



OPERATION EXAMPLE

Step run monitor screen





(Example: To perform step run to step 16)

EXPLANATION

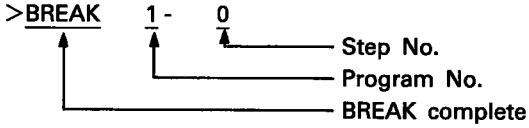
(1) Step run is executed in any of run, stop and pause modes.

(2) When the specified program is step-run during run, the other programs stop after they are executed to the END instruction.

(3) Either of the following operations is performed after the specified program is step-run to the END instruction, depending on whether or not the sampling time has been reached:
- Sampling time reached ····· Step run is started from step 0 by pressing CR.
- Sampling time not reached ····· Step run is not started by pressing CR until the sampling time is reached.

(4) The timer and sampling timer time during step run.

(5) Operation mode is switched to step run by pressing CR after specifying the program No., break point and loop count. A break occurs immediately before the specified step after the specified program is executed by the specified number of loops.
The following message is displayed as soon as the break occurs.



(6) After the break message is displayed, one instruction is executed every time CR is pressed to indicate the states of the entered devices in the format below:

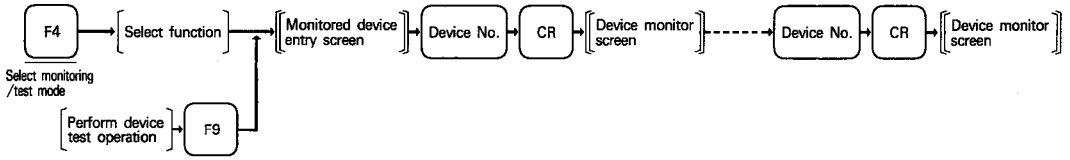
A0 PX ON-□ PY OFF-■ PM	A1 5-digit decimal PD9000 to 9511 (−32768 to 32767) PT	A2 6 significant digits in exponent form PD0 to 1023 (±2.70000 x 10^{-20} to ±9.20000 x 10^{18})

(7) Step run is canceled by pressing BREAK, CAN.

9.9 Monitoring, Testing Devices

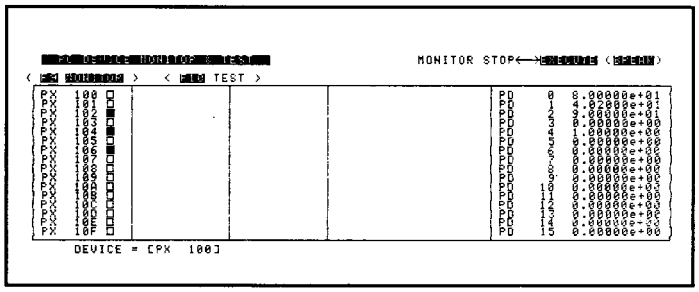
9.9.1 Monitoring devices

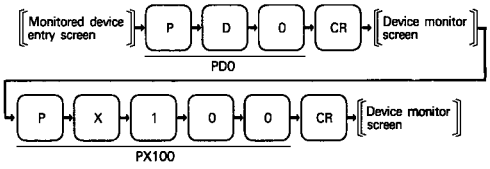
BASIC OPERATION



OPERATION EXAMPLE

Device monitor screen





(Example: To monitor PD0 to 15, PX100 to 10F)

EXPLANATION

(1) 16 devices are monitored in blocks beginning with the device specified.

(2) The monitor screen configuration is as follows:

1	1	1	2	3
16 points	16 points	16 points	16 points	16 points

1: For PX, PY, PM
2: For PT
3: For PD

(3) Devices monitored are displayed in the following format:

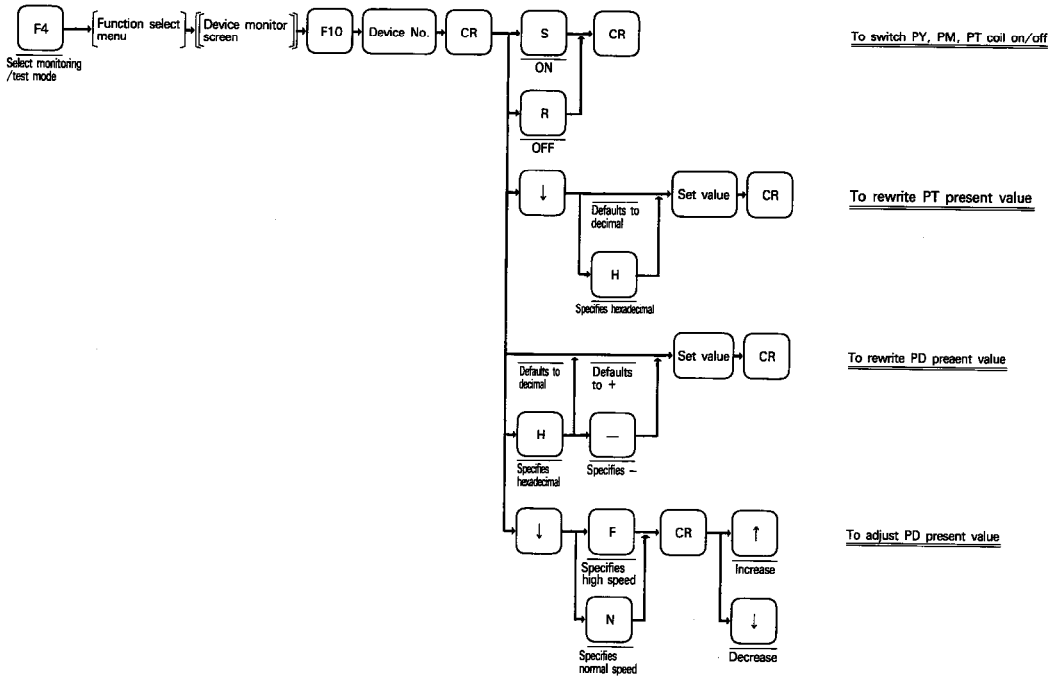
	5-digit decimal	6 significant digits in exponent form
PX ON-□ PY OFF-■ PM	PD9000 ~ 9511 (−32768 to 32767) PT PC	PD0~1023 (±2.70000 x 10^{-20} to ±9.20000 x 10^{18})

(4) PX20 (PC ready) must be on to monitor PX/PY between the PC CPU and A81CPU.
If PX20 is switched off during monitoring, all PXs are switched off and PYs remain as they are.
PD9000 to 9511 and PM9000 to 9511 in the buffer memory can be monitored independently of PX20 ON/OFF status.

(5) The monitor screen is cleared by pressing [ESC].

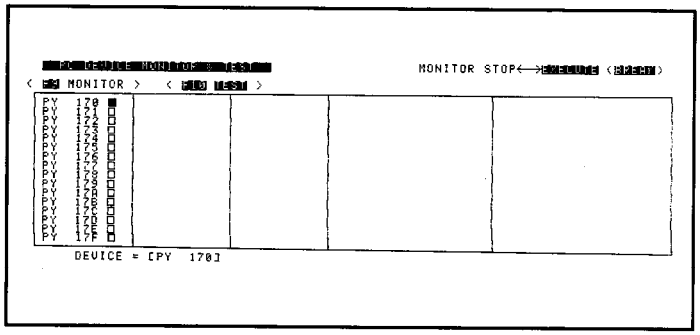
9.9.2 Testing device

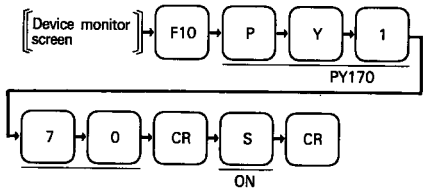
BASIC OPERATION



OPERATION EXAMPLE

Device monitor screen





(Example: To switch on PY170)

EXPLANATION

(1) Allows PY, PM, PT coils to be switched on/off and PT, PD present values to be changed. PX cannot be tested.

(2) Present values may be changed within the following range:

Device	K	H
PD0 to 1023	−9999000000 to 9999000000	0 to FFFF
Other than PD0 to 1023	−32768 to 32767	0 to FFFF

(3) Present values of PD0 to 1023 may only be adjusted.

(4) Present value adjustment cannot be made in stop or pause mode of the A81CPU.

10. FDD MODE

Used to transfer data between disk in GPP drive and the GPP internal memory.

10.1 FDD Mode Functions and File Name

10.1.1 FDD mode functions

Item	Description
Directory	Lists file names, sector numbers and comments on disk. Either of the following may be selected: 1) A list of file names, sector numbers, comments 2) File names only (at higher processing speed) *may be used in file definition as a "wild card."
Read	Reads the specified file from disk to the GPP internal memory. A file may either be specified by a system name or a directory No.
Write	Writes parameters and program from the GPP internal memory onto disk. Parameters and program may either be specified by a system name or a directory No.
Verify	Verifies the specified file data between disk and GPP internal memory. Data may either be specified by a system name or a directory No.
Copy	Copies the specified file data within or between disks. Data must be specified by a system name. When the HGP/PHP is used file data is only copied in batches. When the GPP is used, either of the following copying methods may be selected: 1) File copy by specifying a system name ····· GPP 2) Batch copy of file data on disk ····· GPP/HGP/PHP
Delete	Deletes the specified file from disk. The file may either be specified by a system name or a directory No.
Formatting	Formats user disk (SW0-GPPU).
Cleaning disk	Cleans the specified drive head.

10.1.2 File name

(1) A file name is necessary to access data on the disk.

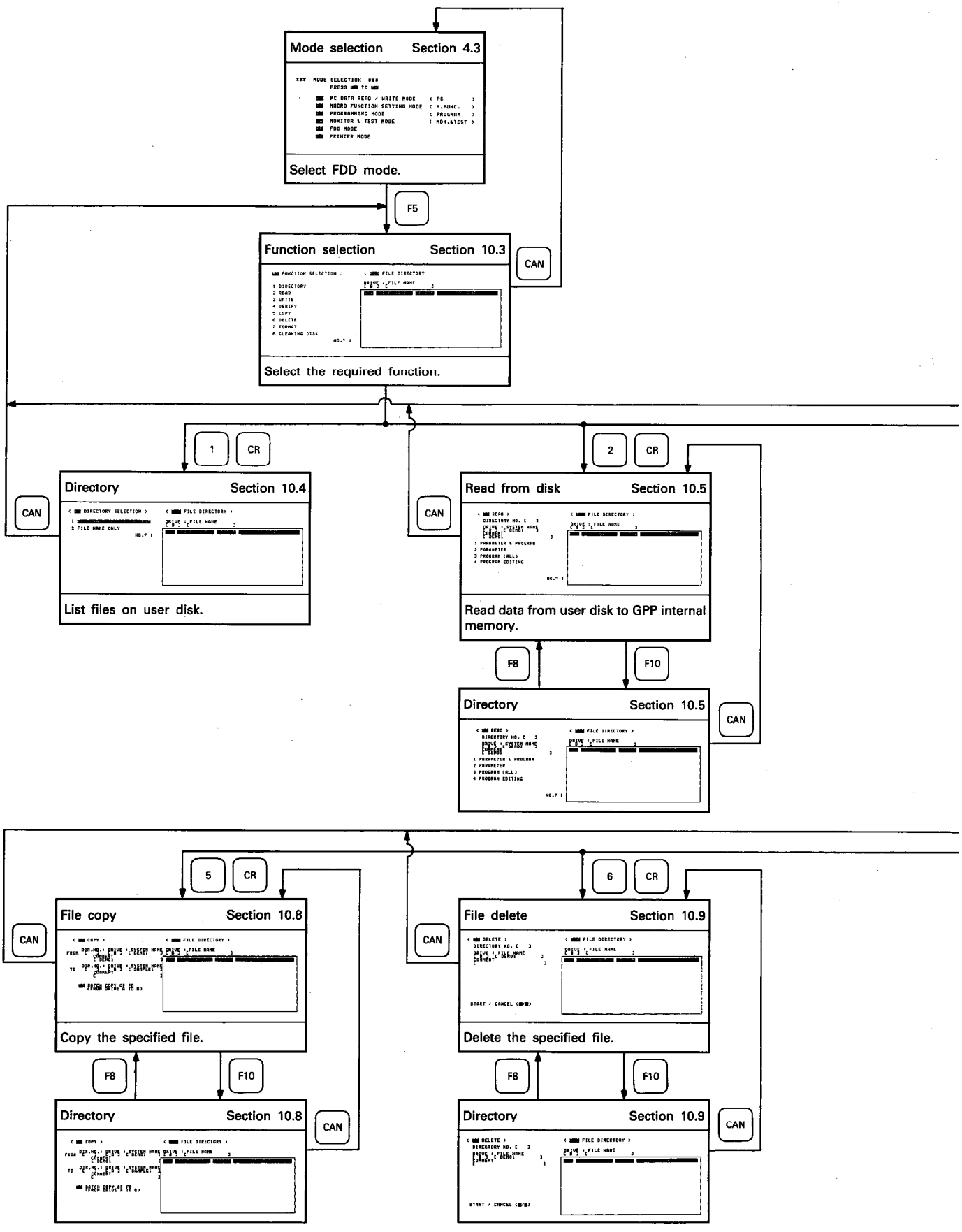
(2) Structure ⇨ [System name] . [Identifier]

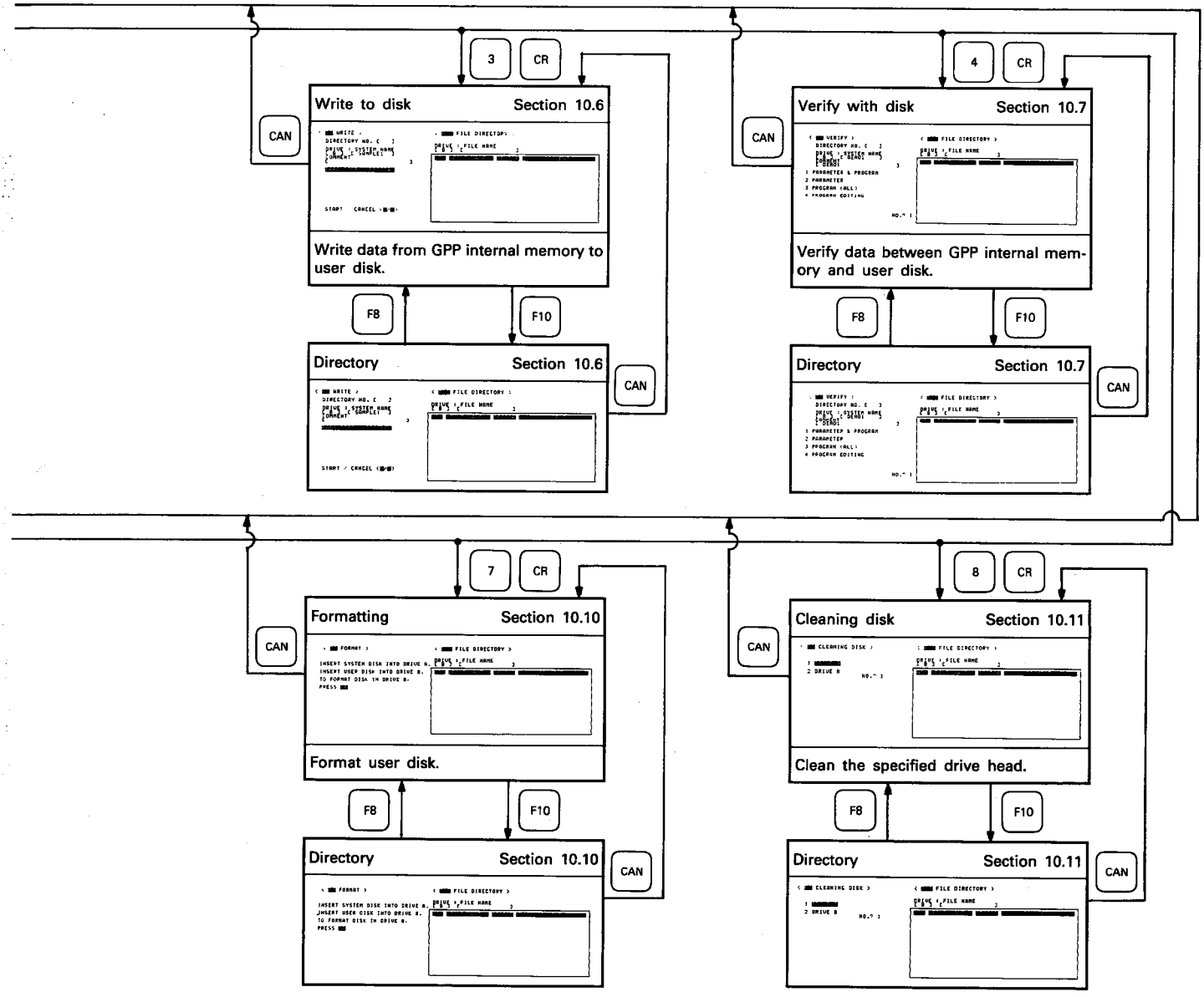
(3) The system name is set by the user, and alphanumeric characters and the - (minus) key are valid. A maximum of eight characters can be entered with the first character always being alphabetic. (Space cannot be used.)

(4) The identifier indicates the file data type and is automatically added to the system name.

Identifier	Description
P81	Parameter
P81	Program
P81	Parameters + program

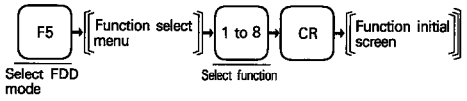
10.2 General Operation




3
CR
Write to disk
Section 10.6
CAN
Write data from GPP internal memory to user disk.
F8
F10
Directory
Section 10.6
CAN
4
CR
Verify with disk
Section 10.7
CAN
Verify data between GPP internal memory and user disk.
F8
F10
Directory
Section 10.7
CAN
7
CR
Formatting
Section 10.10
CAN
Format user disk.
F8
F10
Directory
Section 10.10
CAN
8
CR
Cleaning disk
Section 10.11
CAN
Clean the specified drive head.
F8
F10
Directory
Section 10.11
CAN

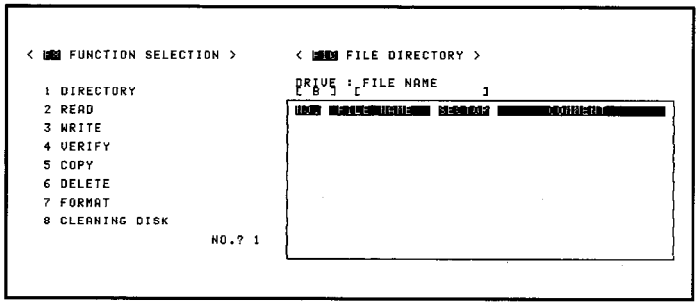
10.3 Function Selection

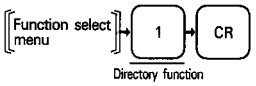
BASIC OPERATION



OPERATION EXAMPLE

Function select menu





(Example: To select the directory function)

EXPLANATION

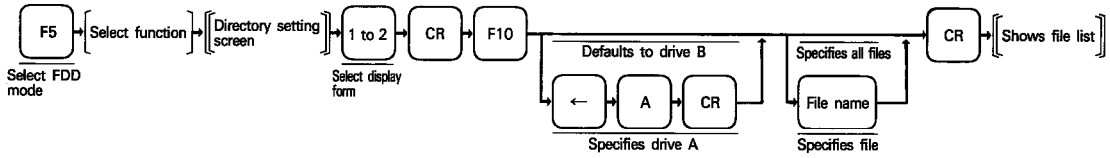
(1) Select the required function:

1. DIRECTORY ····· Lists files on use disk.
2. READ ····· Reads data from user disk to the GPP internal memory.
3. WRITE ····· Writes data from the GPP internal memory to user disk.
4. VERIFY ····· Verifies data between the GPP internal memory and user disk.
5. COPY ····· Copies the specified file within or between disks.
6. DELETE ····· Deletes the specified file.
7. FORMAT ····· Formats user disk.
8. CLEANING DISK ····· Cleans the specified drive head.

10.4 Directory

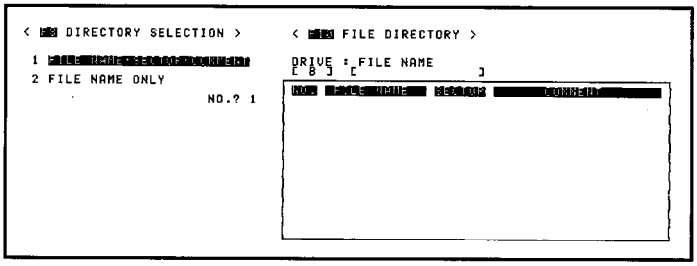
Lists files on disk.

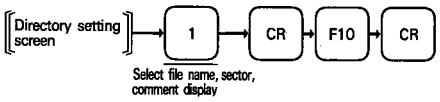
BASIC OPERATION



OPERATION EXAMPLE

Directory setting screen





(Example: To specify all files on disk in drive B to be displayed with names, sector numbers and comments)

EXPLANATION

(1) Either of the following forms may be specified:

1 FILE NAME, SECTOR, COMMENT
2 FILE NAME ONLY

The selected form is valid for subsequent directory operation.

(2) "System name. Identifier" should be specified to display the specified file.

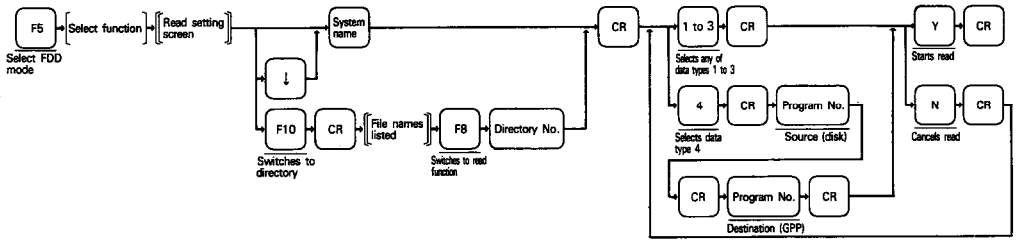
(3) "✳" may be used in file definitions as a "wild card."
All files are displayed by specifying "✳.✳".

(4) Identifier "P81" is automatically added to the system name when the program and parameters written by using the A81PC are written onto user disk.

10.5 Read from Disk

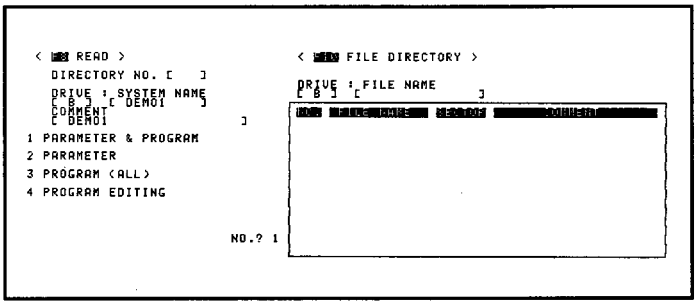
Reads the specified file from disk to the GPP internal memory. The file may either be specified by a system name or a directory No.

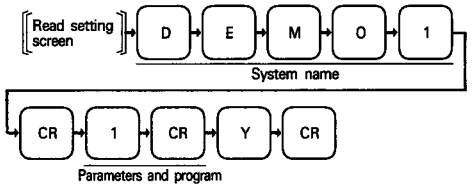
BASIC OPERATION



OPERATION EXAMPLE

Read setting screen





(Example: To read parameters and program of system name DEMO1)

EXPLANATION

(1) Any file may be read from disk by specifying a system name or a directory No.

(2) Press F10 to switch to the directory function and press CR to display the directory No.s and file names of all files.

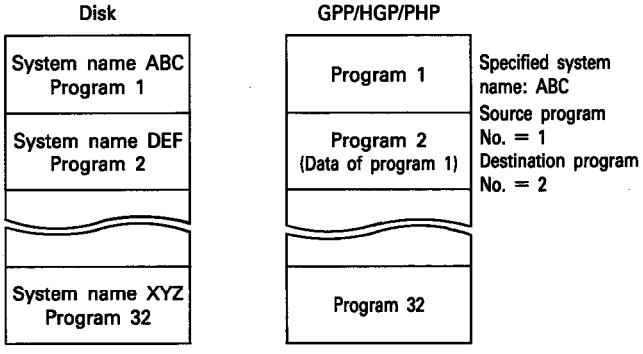
(3) Any of the following data types may be selected:

Select Item	Macro Function Parameters	Sampling Time Run/Stop Request	Program
1 PARAMETER & PROGRAM	○	○	○
2 PARAMETER	○		
3 PROGRAM (ALL)		○	○
4 PROGRAM EDITING		Specified No. only	Specified No. only

*: ○ indicates that all data is read from disk.

(4) PROGRAM EDITING indicates that the source program may be read from disk to the GPP internal memory with an optional program number.

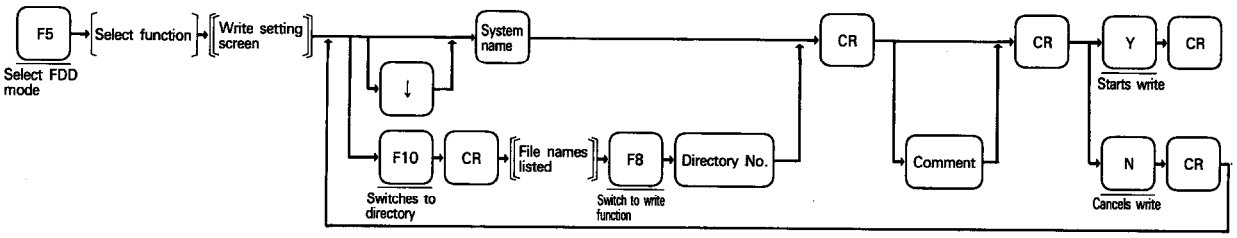
(Example):



10.6 Write to Disk

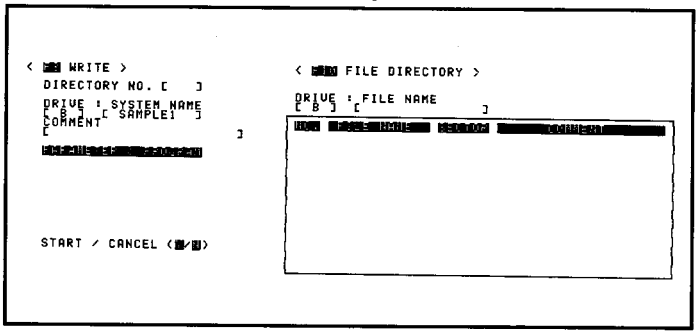
Writes the program and parameters from the GPP internal memory to disk. The program and parameters may either be specified by a system name or a directory No.

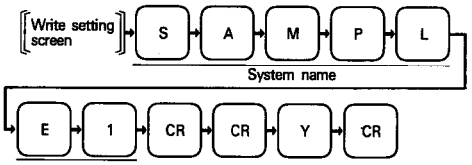
BASIC OPERATION



OPERATION EXAMPLE

Write setting screen





(Example: To write parameters and program from GPP to disk as system name SAMPLE1)

EXPLANATION

(1) Any parameters and program may be written from the GPP to disk by specifying a system name or a directory No.

(2) A directory No. may only be used with the file existing on disk. A new file cannot be written onto disk by specifying a directory No.

(3) The system name must be specified as follows:

- Valid characters ..... A to Z, 0 to 9, - (hyphen)
- Number of characters ..... 8 max.

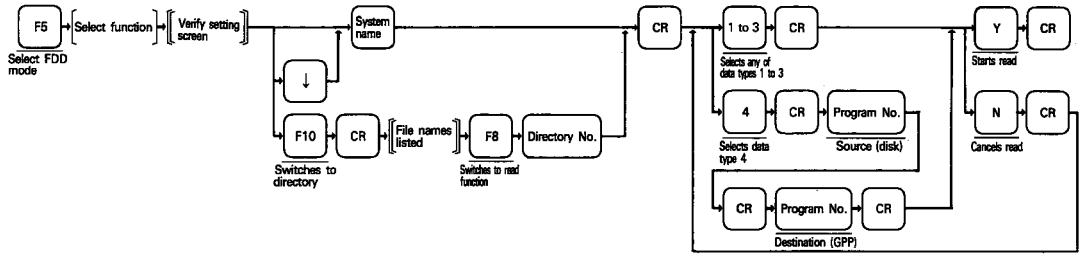
(4) The comment must be specified as follows:

- Valid characters ..... All characters other than "kana" (Japanese characters)
- Number of characters ..... 20 max.

10.7 Verify with Disk

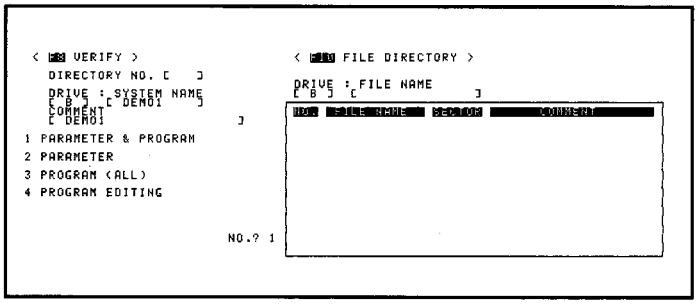
Compares the specified file between disk and the GPP internal memory. The file may either be specified by a system name or a directory No.

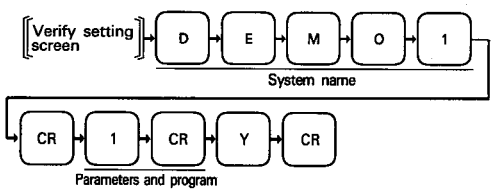
BASIC OPERATION



OPERATION EXAMPLE

Verify setting screen





(Example: To verify parameters and program of system name DEMO1 between disk and GPP internal memory)

EXPLANATION

(1) Any file may be verified by specifying a system name or a directory No.

(2) Any of the following data types may be selected:

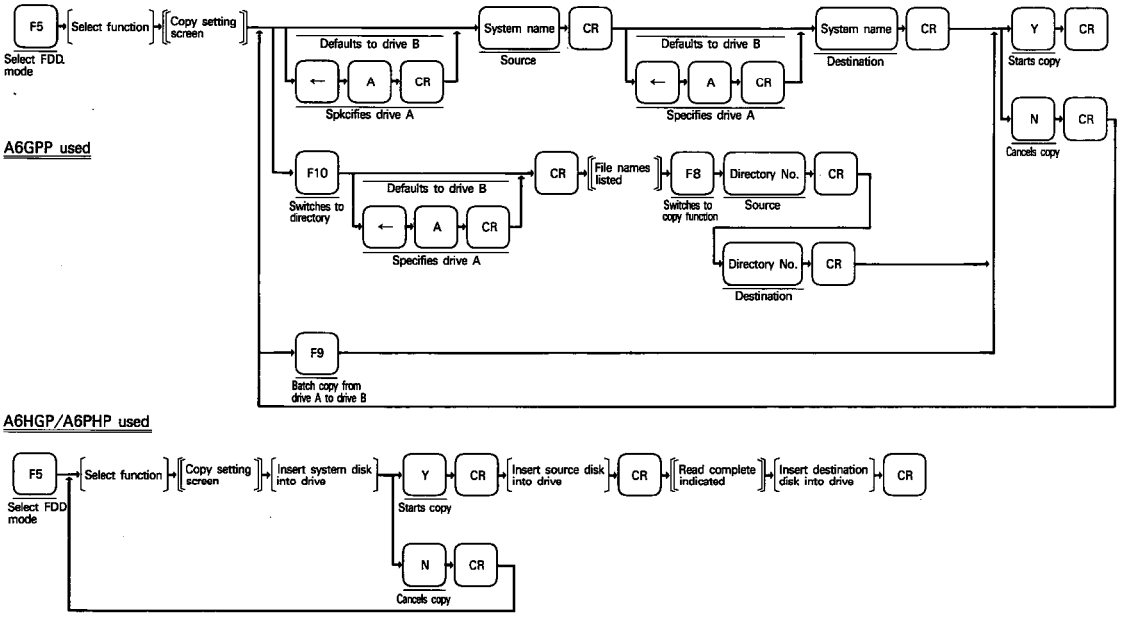
Select Item	Macro Function Parameters	Sampling Time Run/Stop Request	Program
1 PARAMETER & PROGRAM	○	○	○
2 PARAMETER	○		
3 PROGRAM (ALL)		○	○
4 PROGRAM EDITING		Specified No. only	Specified No. only

(3) "4 PROGRAM EDITING" must be selected for verify if that data type has been selected for read from disk.

10.8 File Copy

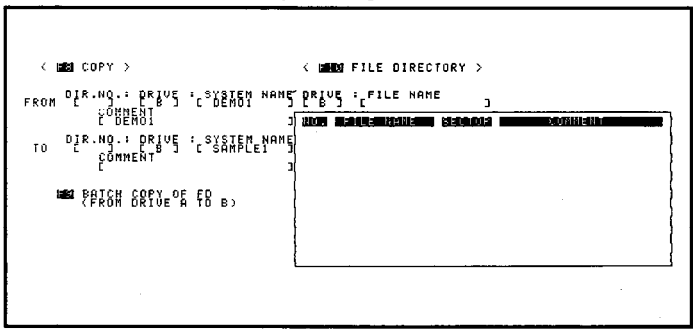
Copies the specified file within or between disks.

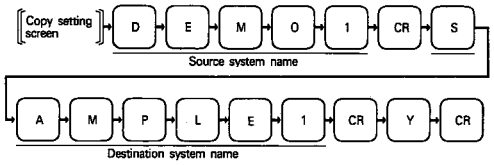
BASIC OPERATION



OPERATION EXAMPLE

Copy setting screen





(Example: To copy the file of system name DEMO1 within disk in drive B as system name SAMPLE1.)

EXPLANATION

(1) When the A6GPP is used, all files may be copied in batches or any file may be copied by specifying a system name or a directory No.

(2) When the A6HGP/A6PHP is used, files may only be copied in batches.

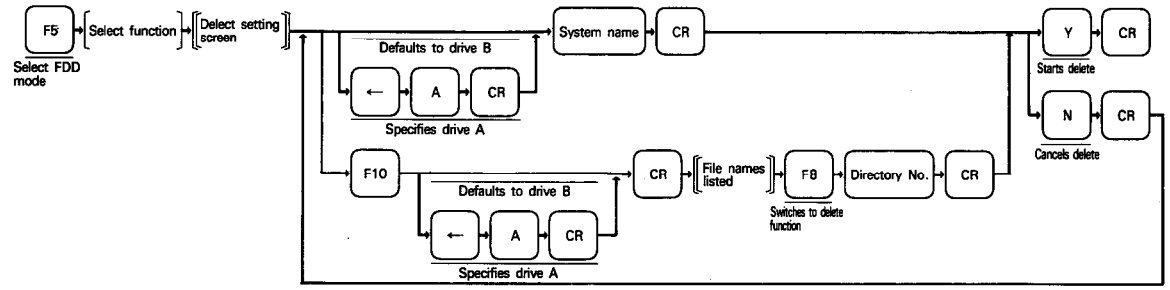
(3) A directory No. may only be used with the file existing on disk. A new file cannot be copied to disk by specifying a directory No.

(4) The system cannot be started up by any disk containing the copied A81PC data. The system must be started up by the A81PC supplied by Mitsubishi.

10.9 Deleting File from Disk

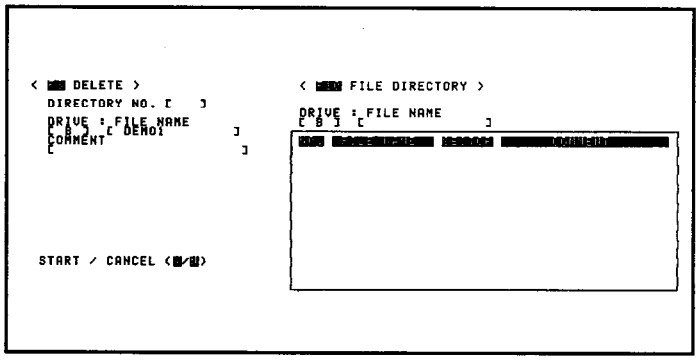
Deletes the specified file from disk. The file may either be specified by a system name or a directory No.

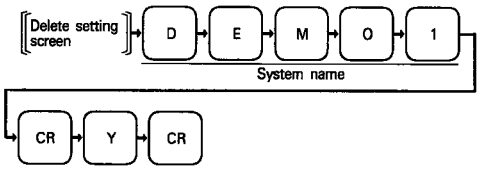
BASIC OPERATION



OPERATION EXAMPLE

Delete setting screen





(Example: To delete the file of system name DEMO1 from disk in drive B)

EXPLANATION

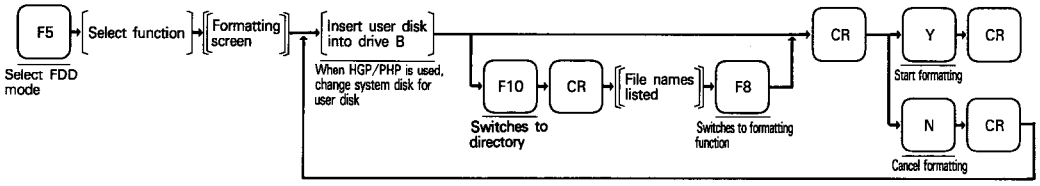
(1) Any file may be deleted by specifying a system name or a directory No.

(2) The delete function may be used to secure an area for a new file when the memory area on disk is full.

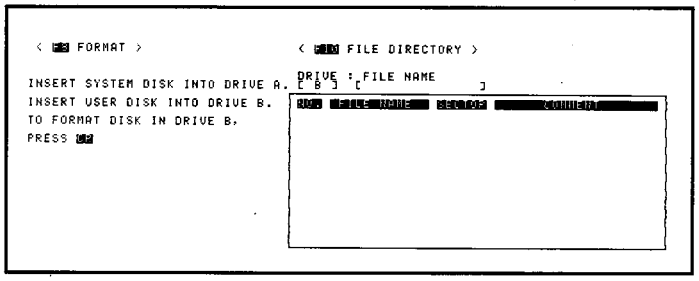
(3) "✳" may be used in file definitions as a "wild card."
All files are deleted by specifying "✳.✳".

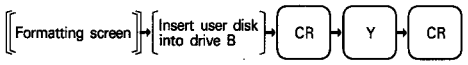
10.10 Formatting Disk

BASIC OPERATION



OPERATION EXAMPLE





(Example: To format user disk in drive B)

EXPLANATION

(1) Any unformatted disk cannot be used as user disk.

(2) The SW0-GPPU (factory formatted) need not be formatted.

(3) All files on disk will be cleared by formatting.

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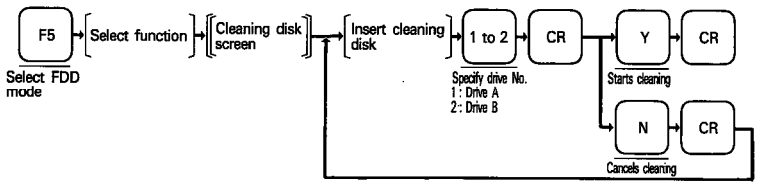
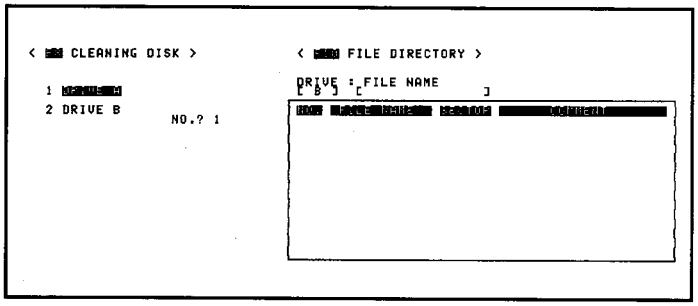
10.11 Cleaning Disk

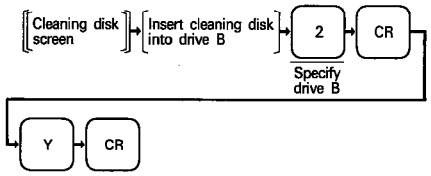
BASIC OPERATION



OPERATION EXAMPLE

Cleaning disk screen





(Example: To clean drive B head.)

EXPLANATION

(1) Allows the specified drive head to be cleaned by the cleaning disk (SW0-FDC).

(2) The heads should be cleaned every three months but must not be cleaned more than four times a month.

(3) Frequent read errors may have been caused by a dirty head. In this case; clean the head but do not clean more than five times. If the error still persists, the drive or disk may be faulty.

(4) Cleaning disk life is approx. one hour (30 times).

IMPORTANT

The SW0-FDC cleaning disk must be used with the GPP. Other disks must not be used.

11. PRINTER MODE

Used to print out programs and screen hard copies by the external printer connected with the GPP's RS-232C interface.

11.1 Printer Mode Functions

Item	Description
Printer setting	Set printer data, e.g. printer type connected, baud rate, paper length.
Print out data setting	Set print out data, e.g. program No., page printed out.
Screen copy	Print out GPP screen hard copy. Hard copies may be printed out in any mode and function selected.

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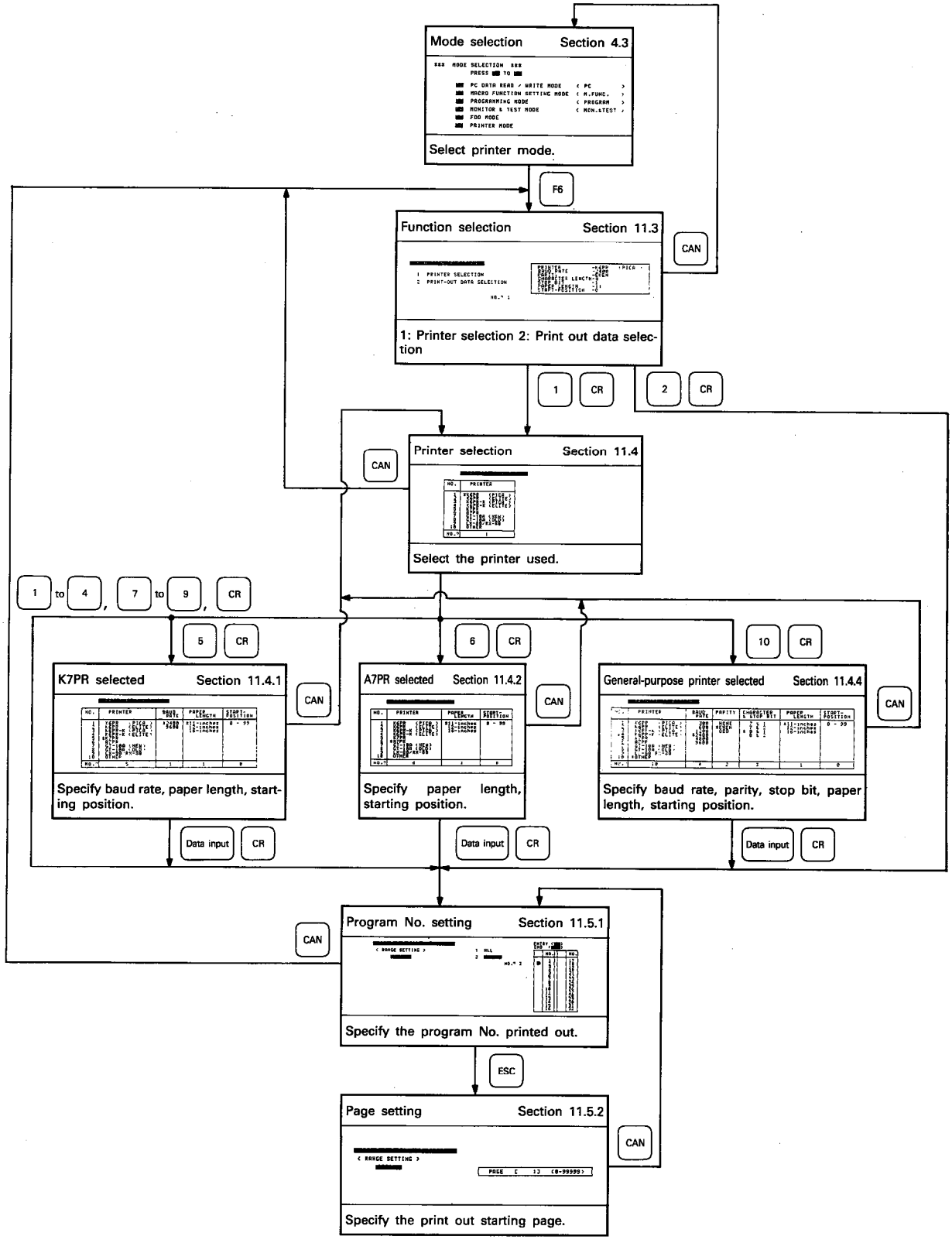
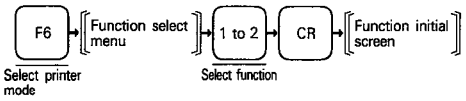
11.2 General Operation

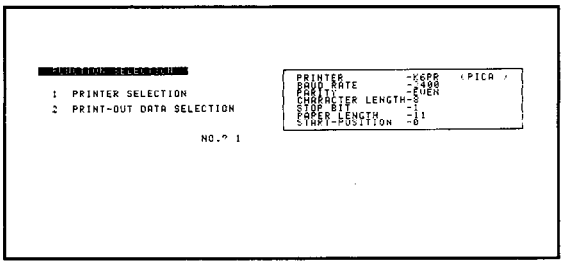


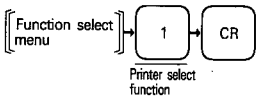
11.3 Function Selection

BASIC OPERATION



OPERATION EXAMPLE





(Example: To select the printer select function.)

EXPLANATION

(1) Select the required function.

1. PRINTER SELECTION ····· Specify the printer type used, baud rate, paper length, etc.
2. PRINT-OUT DATA SELECTION ····· Specify the program No. printed out, starting page, etc.

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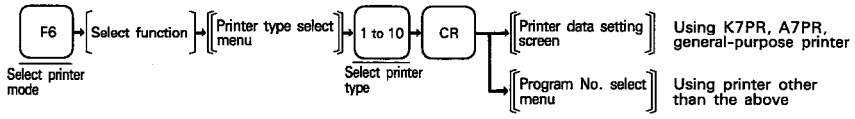
11.4 Printer Selection

BASIC OPERATION

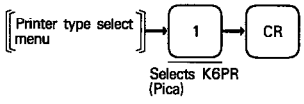


OPERATION EXAMPLE

Printer type select menu

PRINTER SELECTION

NO.	PRINTER
1	*K6PR (PICA)
2	K6PR (ELITE)
3	K6PR-K (PICA)
4	K6PR-K (ELITE)
5	K7PR
6	A7PR
7	GT-10A (NEW)
8	GT-10A (OLD)
9	LX-80/RX-80
10	OTHER
NO.?	1



(Example: To select the K6PR (Pica).)

EXPLANATION

(1) Pica or elite may be selected for the K6PR and K6PR-K. They differ in printing width as follows:
Pica: Approx. 200mm
Elite: Approx. 170mm

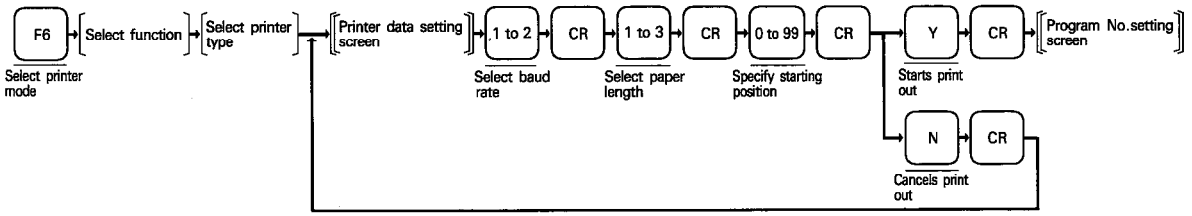
(2) "10 OTHER" must be selected to use a general-purpose printer.

(3) "8 GT-10A (OLD)" must be selected to use the GT-10.

11

11.4.1 Setting the K7PR

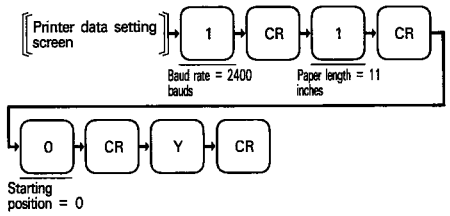
BASIC OPERATION



OPERATION EXAMPLE

Printer data setting screen

NO.	PRINTER	BAUD RATE	PAPER LENGTH	START-POSITION
1	K6PR (PICA)	*2400	*11-inches	0 - 99
2	K6PR (ELITE)	9600	12-inches	
3	K6PR-K (PICA)		16-inches	
4	K6PR-K (ELITE)			
5	*K7PR			
6	A7PR			
7	CT-10A (NEW)			
8	CT-10A (OLD)			
9	LX-80/RX-80			
10	OTHER			
NO.?	5	1	1	0



(Example: To set the baud rate to 2400, paper length to 11 inches, and starting position to 0.)

EXPLANATION

(1) The baud rate should be specified in accordance with the printer used.

1: 2400 bauds
2: 9600 bauds

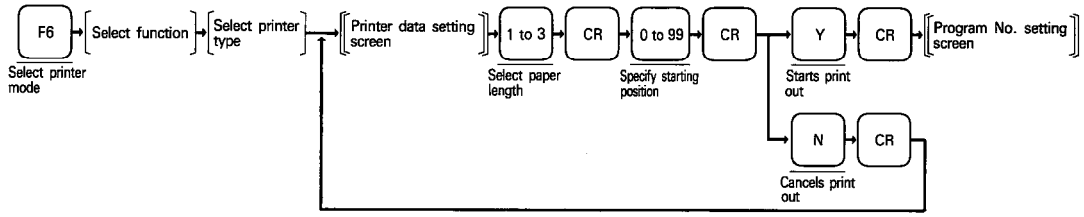
(2) The paper length should be specified in accordance with the paper used.

1: 11 inches, 66 lines printed
2: 12 inches, 72 lines printed
3: 16 inches, 96 lines printed

(3) The starting position may be specified between 0 and 99.
The starting position defines the number of characters between the left end and the first character from left to right, i.e. 0 = left end, 99 = center.
Data output from the GPP is 80 characters per line.
If the starting position is set to 60 on the printer which is valid for 130 characters per line, 80 plus 60 equals 140 and the excess of 10 characters are printed out in the same line or at the head of the next line.

11.4.2 Setting the A7PR

BASIC OPERATION

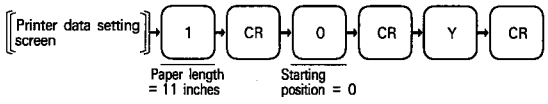


OPERATION EXAMPLE

Printer data setting screen

PRINTER SELECTION

NO.	PRINTER	PAPER LENGTH	START-POSITION
1	K6PR (PICA)	*11-inches	0 - 99
2	K6PR (ELITE)	12-inches	
3	K6PR-K (PICA)	16-inches	
4	K6PR-K (ELITE)		
5	K7PR		
6	*A7PR		
7	GT-10A (NEW)		
8	GT-10A (OLD)		
9	LX-80/RX-80		
10	OTHER		
NO.?	6	1	0



(Example: To set the paper length to 11 inches, and starting position to 0.)

EXPLANATION

(1) The paper length should be specified in accordance with the paper used:

1: 11 inches, 66 lines printed
2: 12 inches, 72 lines printed
3: 16 inches, 96 lines printed

(2) The starting position may be specified between 0 and 99.
The starting position defines the number of characters between the left end and the first character from left to right, i.e. 0 = left end, 99 = center.
Data output from the GPP is 80 characters per line.
If the starting position is set to 60 on the printer which is valid for 130 characters per line, 80 plus 60 equals 140 and the excess of 10 characters are printed out in the same line or at the head of the next line.

11.4.3 Setting the K6PR, K6PR-K, GT-10A, LX/RX-80

(1) It is not necessary to set printer data.

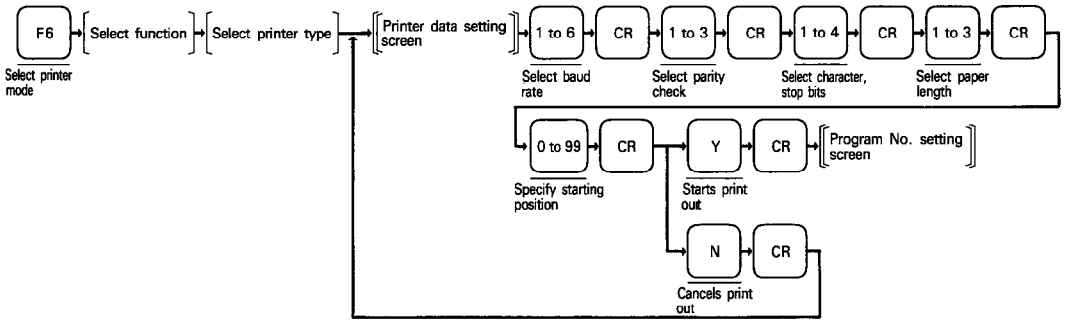
(2) 11 inch long paper should be used.

(3) Printer mode defaults to the following values:

Printer Type	K6PR (Pica)
Baud rate	2400 bauds
Parity check bit	Even parity
Data length	8 bits
Stop bit	1 bit
Paper length	11 inches
Starting position	0
Page No.	0

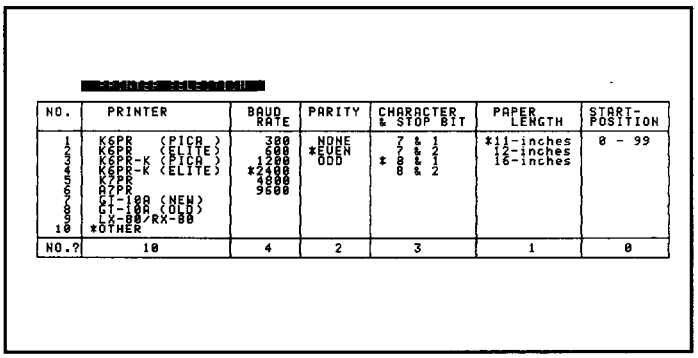
11.4.4 Setting the general-purpose printer

BASIC OPERATION

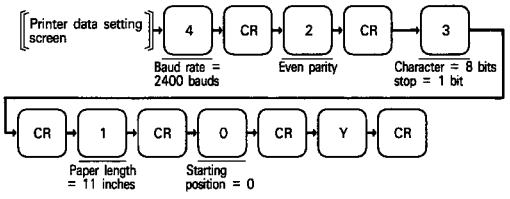


OPERATION EXAMPLE

Printer data setting screen



NO.	PRINTER	BAUD RATE	PARITY	CHARACTER & STOP BIT	PAPER LENGTH	START-POSITION
1	K6PR (PICA)	300	NONE	7 & 1	*11-inches	0 - 99
2	K6PR (ELITE)	600	*EVEN	7 & 2	12-inches	
3	K6PR-K (PICA)	1200	ODD	* 8 & 1	16-inches	
4	K6PR-K (ELITE)	*2400		8 & 2		
5	A7PR	4800				
6	A7PR	9600				
7	GT-10A (NEW)					
8	GT-10A (OLD)					
9	LX-80/RX-80					
10	*OTHER					
NO.?	10	4	2	3	1	0



(Example: To set the baud rate = 2400, parity check = even parity, character bit = 8 bits, stop bit = 1 bit, paper length = 11 inches, and starting position = 0 using a general-purpose printer.)

EXPLANATION

(1) The baud rate should be specified in accordance with the printer used:

1: 300 bauds 2: 600 bauds 3: 1200 bauds 4: 2400 bauds 5: 4800 bauds 6: 9600 bauds

(2) The parity check should be specified in accordance with the printer used:

1: No check 2: Even parity 3: Odd parity

(3) The character and stop bits should be specified in accordance with the printer used:

1: 7 bits & 1 bit 2: 7 bits & 2 bits 3: 8 bits & 1 bit 4: 8 bits & 2 bits

(4) The paper length should be specified in accordance with the paper used:

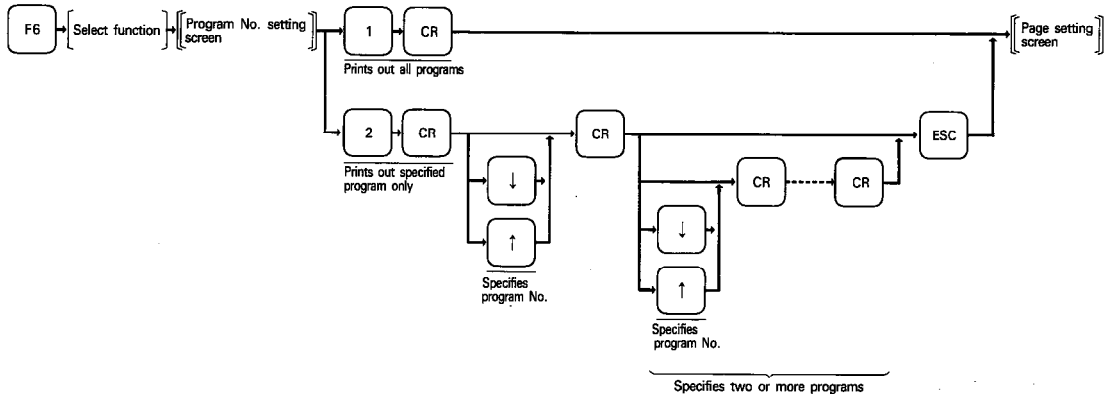
1: 11 inches 2: 12 inches 3: 16 inches

(5) The starting position may be specified between 0 and 99.
The starting position defines the number of characters between the left end and the first character from left to right, i.e. 0 = left end, 99 = center.
Data output from the GPP is 80 characters per line.
If the starting position is set to 60 on the printer which is valid for 130 characters per line, 80 plus 60 equals 140 and the excess of 10 characters are printed out in the same line or at the head of the next line.

11.5 Setting Print Out Data

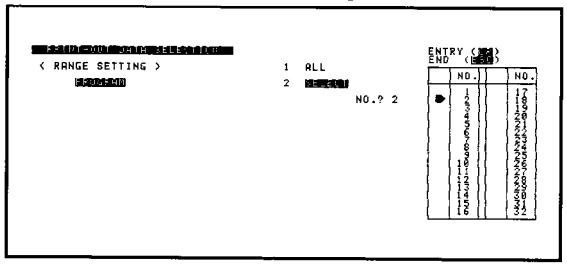
11.5.1 Setting program No.

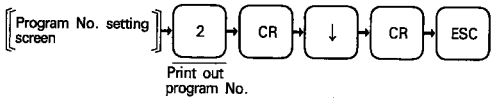
BASIC OPERATION



OPERATION EXAMPLE

Program No. setting screen





(Example: To print out program 2)

EXPLANATION

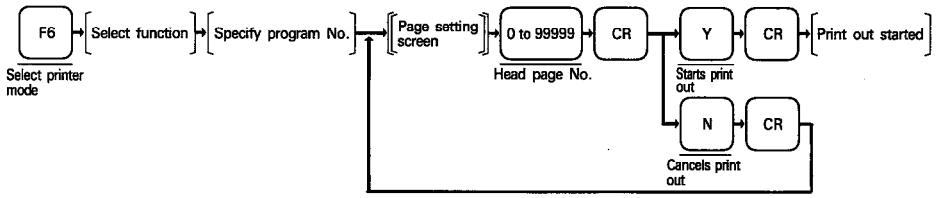
(1) Prints out all programs or the specified program stored in the GPP internal memory.

(2) Parameters cannot be printed out.

11.5.2 Page setting

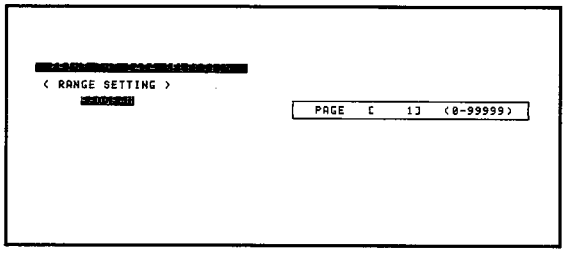
Specifies the head page printed out.

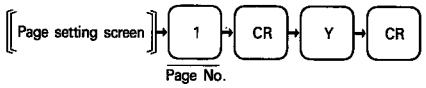
BASIC OPERATION



OPERATION EXAMPLE

Page setting screen





(Example: To set the head page No. to 1)

EXPLANATION

(1) The specified page number is printed out on the first paper.

(2) The page number is incremented by 1 every time a new page is printed out.

(3) Press BREAK to stop print out. The message "CONTINUE(CR)/TERMINATE(BREAK)" is then displayed.
Press CR to resume print out from where it stopped. Press BREAK to terminate print out and return to the program No. setting screen.

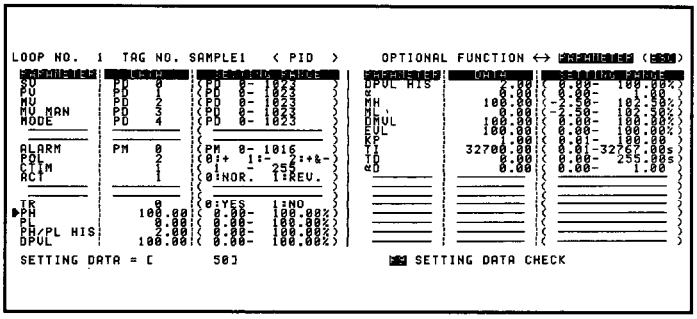
11.6 Screen Copy

BASIC OPERATION

[Select printer type] → [Set printer data] → (COPY)

OPERATION EXAMPLE

Screen printed out



COPY

EXPLANATION

(1) Before starting screen copy, the printer type and printer data should be specified in accordance with the printer used.

(2) The above setting is not required for the K6PR.

(3) The screen copy function is not available for the GT-10A (new, old) and general-purpose printer.

(4) When a monitor screen is copied, pressing COPY stops monitoring and initiates print out. When print out is complete, monitoring is automatically resumed.

12. MESSAGE LISTS

Error messages and confirmation messages are displayed in the message area of the screen.

12.1 Error Message List

When any of the following error messages is displayed, take the corresponding corrective action before proceeding to the next operation.

Mode	Number	Display	Description	Corrective Action
Common	1	OPERATOR ERROR	Misoperation.	Perform operation in accordance with Basic Operation.
	2	SETTING ERROR	Data has been set outside the allowed range.	Set data within the allowed range.
PC mode	1	CONNECTION ERROR	The module connected is not the A81CPU.	Connect with the A81CPU.
	2	COMMUNICATION ERROR	• Communication error with the A81CPU. • The module connected is not the A81CPU. • Connection fault with the A81CPU.	Check connection and cable.
	3	WRITE IN FORBIDDEN	Data has been written with the GPP WRITE IN CPU key switch in FORBID position.	Set the WRITE IN CPU switch to PERMIT.
	4	MEMORY PROTECT	The A81CPU memory protect switch is in ON position.	Set the memory protect switch to OFF.
	5	MORE THAN 10 ERRORS	More than 10 errors have occurred during data verify.	Correct the errors.
	6	PC IS RUNNING	Data has been written with the A81CPU RUN/STOP switch in RUN position.	Set the RUN/STOP switch to STOP or PAUSE.
	7	TIME CHECK OVER	The A81CPU does not give a reply.	Check connection and cable.
Macro function mode	1	TAG NO. ERROR	The TAG No. specified is invalid. (The first character is not alphabetic. The number includes a blank.)	Specify a valid TAG No.
	2	TAG NO. ALREADY USED	The TAG No. specified is already used in the other loop.	Change the TAG No.
Programming mode	1	DEVICE NO. ERROR	The device No. specified is invalid.	Specify a valid device No.
	2	COMMAND ERROR	The instruction specified is invalid. {The instruction specified does not exist. Wrong combination of instruction and device. Wrong combination of device and constant.}	Specify a valid instruction.
	3	STEP NO. ERROR	The step No. specified is outside the range 0 to 249.	Specify the step No. between 0 and 249.
	4	NOT FOUND	The instruction or device searched cannot be found.	
	5	IDENTICAL LABEL	The pointer No. specified is already used.	Specify the other pointer No.
	6	PROGRAM TOO LARGE	The program has exceeded 249 steps.	Reduce the number of steps.
Monitoring/ test mode	1	CONNECTION ERROR	The module connected is not the A81CPU.	Connect with the A81CPU.
	2	COMMUNICATION ERROR	• Communication error with the A81CPU. • The module connected is not the A81CPU. • Connection fault with the A81CPU.	Check connection and cable.
	3	WRITE IN FORBIDDEN	Data has been written with the GPP's WRITE IN CPU key switch in FORBID position.	Set the WRITE IN CPU switch to PERMIT.
	4	TIME CHECK OVER	The A81CPU does not give a reply.	Change the A81CPU.
	5	CAN'T SET REMOTE R/S/P WITH GPP	The A81CPU has been remote-stopped from the module other than the GPP (computer).	Cancel the remote stop.
FDD mode	1	FILE NAME ERROR	An invalid file name has been specified.	Specify a valid file name.
	2	FILE MISSING	The specified file name is not found on disk.	Specify a valid file name.
	3	SETTING ERROR	The file cannot be found by the specified directory No.	Specify a valid directory No.
	4	FLOPPY DISK ERROR	No disk in accessed drive. Disk fault.	Insert disk. Change disk.
	5	SYSTEM NAME ERROR	An invalid system name has been specified. (The first character is not alphabetic. The system name includes a character other than alphanumeric characters and minus. The system name includes a blank.)	Specify a valid system name.
	6	SYSTEM NAME ALREADY USED	The system name specified already exists on disk.	Change the system name where necessary.
	7	WRITE PROTECT	The write protect switch is in NO position.	Set the write protect switch to OK.

Mode	Number	Display	Description	Corrective Action
FDD mode	8	WRITE-IN ERROR	Remaining disk capacity is too small, data cannot be written. (Displayed during write)	Change disk. Delete unnecessary file on disk.
	9	MEMORY CAPACITY EXCEEDED	Disk file capacity has been exceeded. (The number of files written on disk is 128 max.)	Change disk. Delete unnecessary file on disk.
	10	READ OUT ERROR	Data cannot be read from disk.	Clean the drive head.
	11	VERIFY ERROR	Data unmatched.	Check data.
	12	SYSTEM DISK ERROR	An invalid system disk has been used to start up the system.	Check the system disk. A maker-supplied system disk must be used.
	13	FLOPPY DISK FORMAT ERROR	Formatting error. (Faulty disk)	Change disk.
Printer mode	1	CHECK "PRINTER"	Printer power is off. SEL button is off. Cable connection fault.	Check the printer.
System start-up	1	SYSTEM DISK ERROR	An invalid system disk has been used to start up the system.	Check the system disk. A maker-supplied system disk must be used.

12.2 Confirmation Message List

Mode	Number	Display	Description
Common	1	EXECUTED	Indicates that the process is being executed.
	2	COMPLETED	Indicates that the process is complete without fault.
PC mode	1	STOP	Indicates that data read, write or verify has been stopped by the [BREAK] key.
Programming mode	1	COMPLETED ✳ STEP NO.S CHANGED	Indicates that any step No. has changed during program write, insert, delete.
Printer mode	1	STOP	Indicates that print out has been stopped by pressing [BREAK]. Press [CR] to resume. Press [BREAK] to terminate.

APPENDICES

Appendix 1 Processing Time List

(1) A81CPU (RS-422 specifications: baud rate = 4800 bauds, data length = 8 bits, odd parity, stop bit = 1 bit)

Data Communicated	Number of Bytes	Processing Time (S)		
		Read	Write	Verify
Parameters + program	41K	111.0	232.0	113.0

(2) Floppy disk

Data Communicated	Number of Bytes	Processing Time (S)				
		Read	Write	Verify	Copy	Format
Parameters + program	41K	7.6	18.0	11.0	29.0	—
Parameters	9K	3.5	—	5.0	—	—
Programs (All)	32K	7.0	—	9.0	—	—
Program (One)	1K	2.9	—	3.0	—	—
Format	—	—	—	—	—	67.0

(3) Printer

1) A7PR

Processing Mode		Processing Time (S)
List	Pica	10/page

2) K6PR

Processing Mode		Processing Time (S)
List	Pica	30/page
	Elite	43/page

APP

IB (NA) 66167-A

Appendix 2 1) Printer output codes

When "JAPANESE CHARACTER" is selected, the following characters are output from the GPP to the printer (other than the GT-10A) in accordance with the JIS code specifications.

HEX

Line / Column	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	'	p			SP	—				
1			｜	1	A	Q	a	q			○					
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			'	7	G	W	g	w								
8	BS		(	8	H	X	h	x								
9	HT		)	9	I	Y	i	y								
A	LF		*	:	J	Z	j	z								
B		ESC	+	;	K	[	k	{								
C			・	<	L	¥	l	｜								
D	CR		—	=	M	]	m	}								
E	SO		○	>	N	^	n	—								
F	SI		/	?	O	-	o	DEL								

JIS code specifications

APP

2) GT-10A printer output codes

The following codes are output from the GPP to the GT-10A.

Line / Column	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		P	SP	0					NUL		!	←	SP	p		
1	A	Q		1							#		a	q		SP
2	B	R		2						DC2	$	SP	b	r		SP
3	C	S		3							%	SP	c	s		SP
4	D	T		4						DC4	&	SP	d	t		SP
5	E	U		5							(	SP	e	u		SP
6	F	V		6							)	SP	f	v		SP
7	G	W		7					BEL		*	SP	g	w		SP
8	H	X		8					BS		~	SP	h	x		SP
9	I	Y		9							/	SP	i	y		SP
A	J	Z							LF		<	SP	j	z		SP
B	K								VT	ESC	>	SP	k			SP
C	L								FF		=	SP	l			SP
D	M								CR		:	SP	m			SP
E	N								SO		;	SP	n	SP		SP
F	O			?					SI		→	SP	o	SP		SP

GTT-10A code specifications

REMARKS

In the above table, the "shaded" codes cannot be used with the GT-10A (old).
Print out symbols are different between the GT-10A (old) and GT-10A (new) as shown below:

GT-10A (NEW)	GT-10A (OLD)
*	×
/	|
>	]
<	[
→	←

REMARKS

The old and new GT-10As can be differentiated by the name plate on the rear side of the GT-10A. "GT-10A" indicates the old type and "GT-10A 1" the new type.

APP

IMPORTANT

The components on the printed circuit boards will be damaged by static electricity, so avoid handling them directly. If it is necessary to handle them take the following precautions.

(1) Ground human body and work bench.

(2) Do not touch the conductive areas of the printed circuit board and its electrical parts with any non-grounded tools etc.

Under no circumstances will Mitsubishi Electric be liable or responsible for any consequential damage that may arise as a result of the installation or use of this equipment.

All examples and diagrams shown in this manual are intended only as an aid to understanding the text, not to guarantee operation. Mitsubishi Electric will accept no responsibility for actual use of the product based on these illustrative examples.

Owing to the very great variety in possible applications of this equipment, you must satisfy yourself as to its suitability for your specific application.

PID System type SW0GHP-A81PC

Operating Manual

MODEL	SW0GHP-A81PCE-OPERATION
MODEL CODE	13J713
IB(NA)66167-A(8809)MEE	

MITSUBISHI ELECTRIC CORPORATION

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