MITSUBISHI

PROGRAMMABLE CONTROLLER

MELSEC-A

Operating Manual

Intelligent communication module type AD51E (SW0C-AD51P)

MITSUBISHI ELECTRIC

REVISIONS

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

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CONTENTS

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.

1. INTRODUCTION

This manual gives instructions on the use of the SW0C-AD51PE software package used to program the AD51E intelligent communication unit. Hardware information on the AD51E is available in the AD51E User's Manual.
The SW0C-AD51PE system software will run on the A6GPP (Graphic Programming Panel, referred to as GPP) and on the A6HGP (Handy Graphic Programmer, referred to as HGP). This manual also includes information on using the VT-220 terminal with the AD51E.

Function \ I/O Console		GPP	HGP	General-Purpose I/O Console	Remarks
Multitask start		O	O	O	
Multitask setting		O	O	O	
BASIC programming		O	O	O	
GPP mode	Write from AD51 onto disk	O	O	—	
	Write from disk to AD51	O	O	—	
	Verify between AD51 and disk	O	O	—	
	Write from disk to ROM	O	—	—	
	Write from ROM to disk	O	—	—	
	Verify between disk and ROM	O	—	—	
	Directory of disk file names	O	O	—	
	Delete file names from disk	O	O	—	
	ROM erase check	O	—	—	
Date and time setting		O	O	O	

O : Available

2. AD51E PERIPHERALS

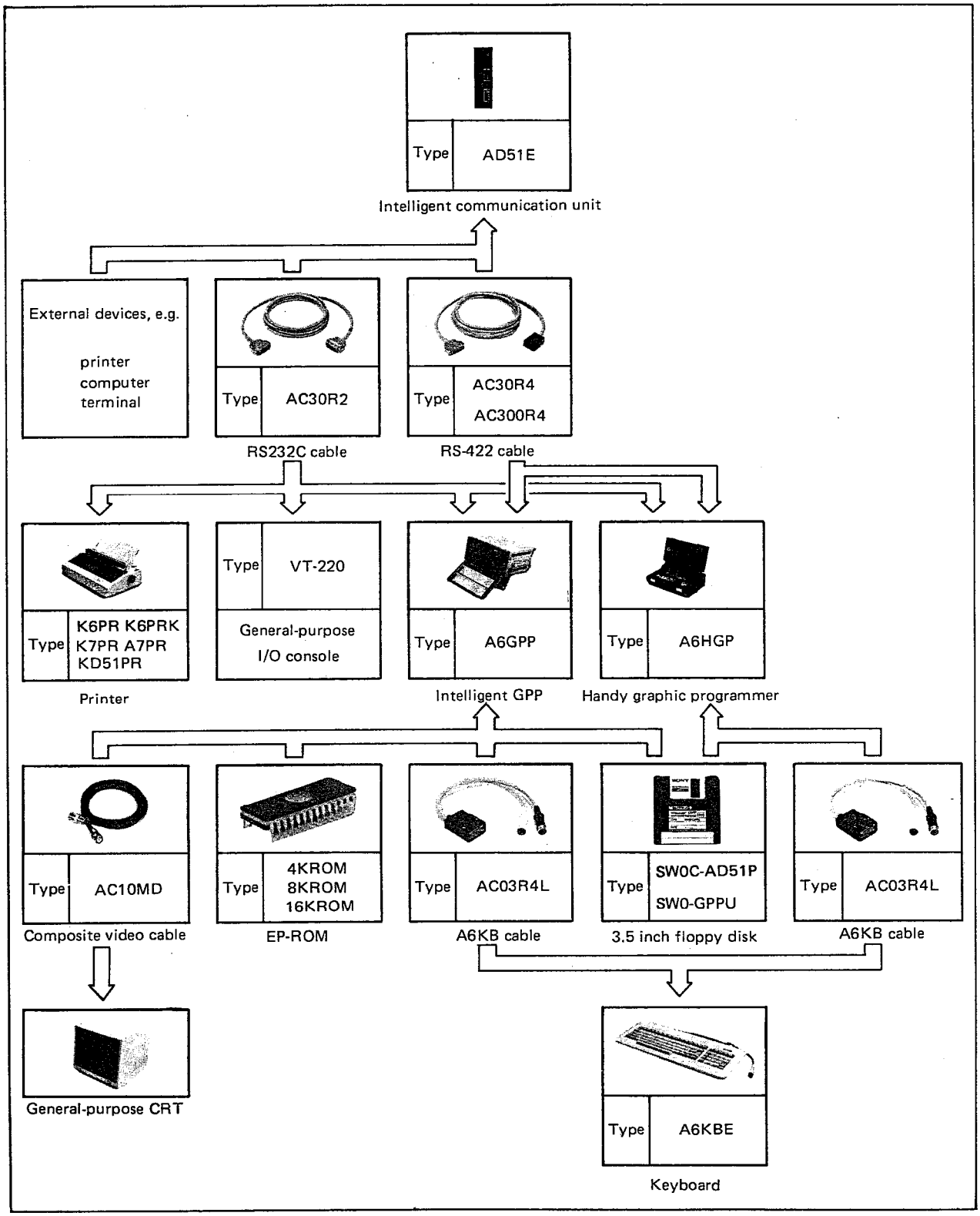


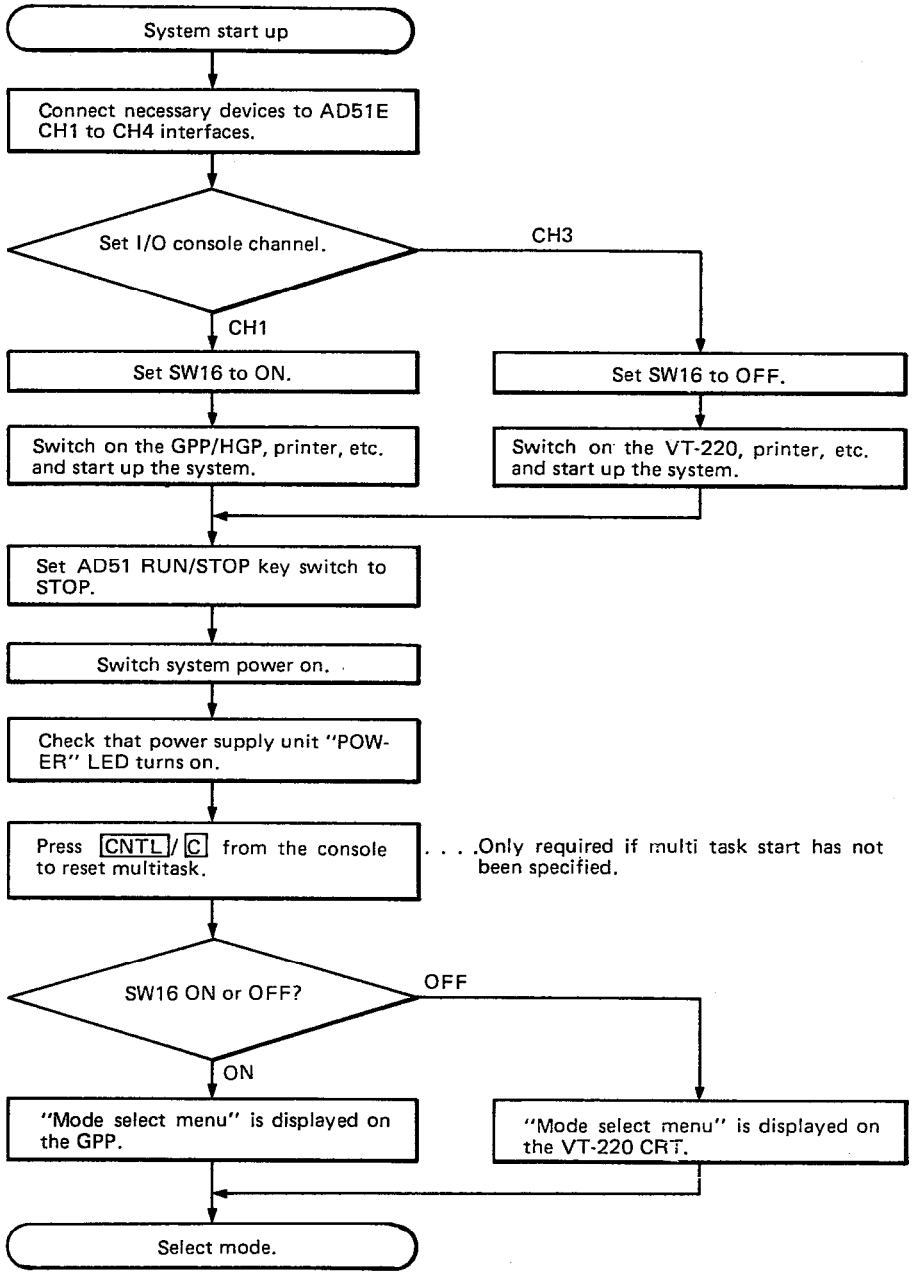
Fig. 2.1 Peripherals

POINT

Set the console switch as appropriate.

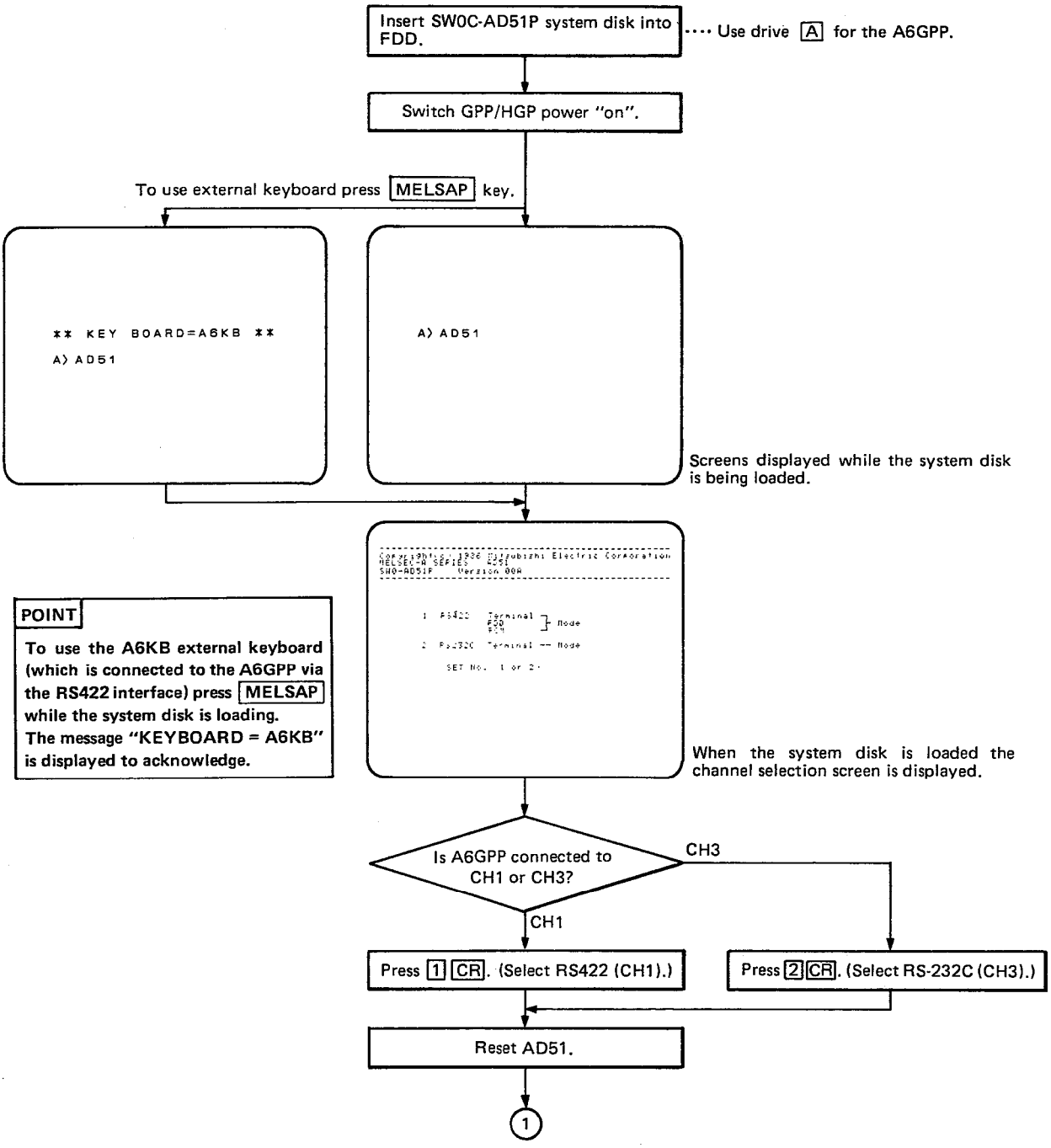
3. SYSTEM START-UP

3.1 Starting Procedure



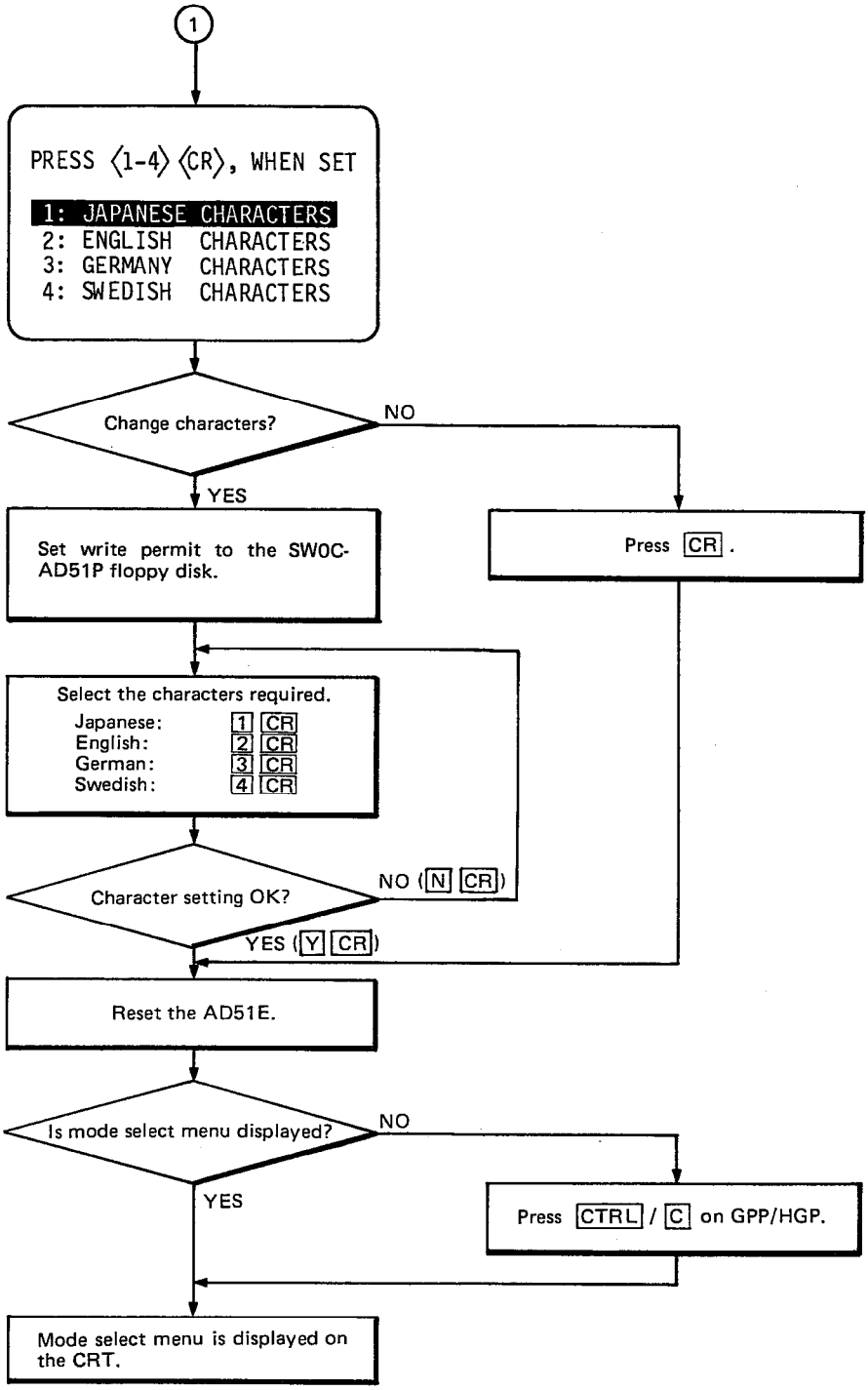
3.2 GPP/HGP Start-Up Procedure

The SW0C-AD51P will boot on either the A6GPP or the A6HGP. The following indicates the start-up procedure for both.



POINT

To use the A6KB external keyboard (which is connected to the A6GPP via the RS422 interface) press [MELSAP] while the system disk is loading. The message "KEYBOARD = A6KB" is displayed to acknowledge.



POINT

(1) Selecting the characters required defines the character codes used in the GPP/HGP. For character code details, see the AD51E User's Manual Appendix 2.

(2) SW0C-AD51P defaults to Japanese characters. Defining new characters automatically re-writes the character setting to the system disk. The write protect must therefore be off.

POINT

(1) Note that if the system is booted with the SW0C-AD51P system disk inserted in FDD [B], the A6GPP operates regarding FDD [B] as [A] and FDD [A] as [B].

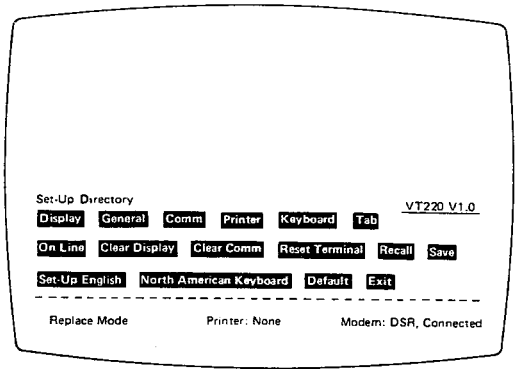
(2) The AD51 does not need to be reset (marked *) if the AD51 power has been turned on after the system disk has been loaded.

(3) There is a few seconds time delay between completing the initial settings and the mode selection menu appearing.

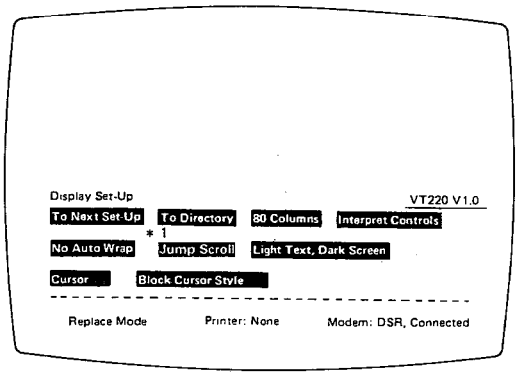
3.3 VT220 Set-Up Directory

The set up procedure is as follows:

Set-Up Directory

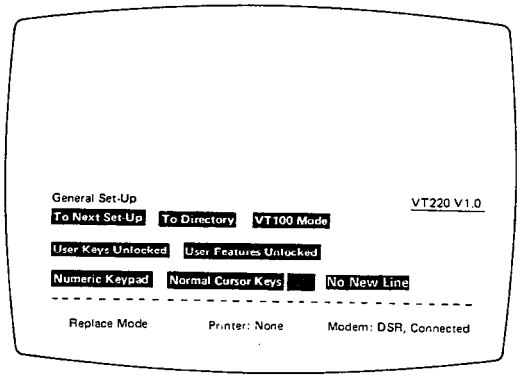


Display Set-Up

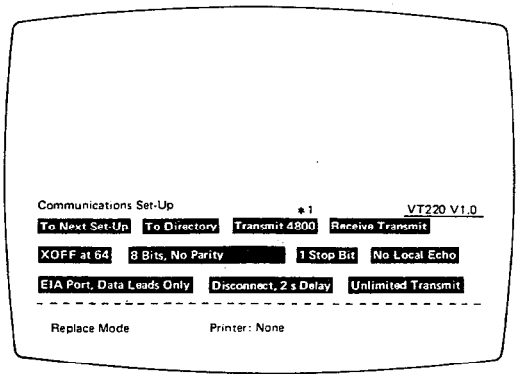


*1: *Do not set smooth scroll*

General Set-Up

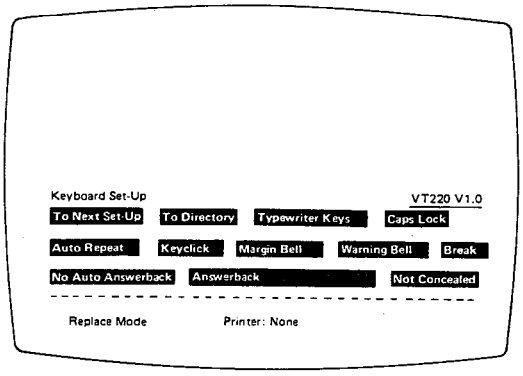


Communications Set-Up

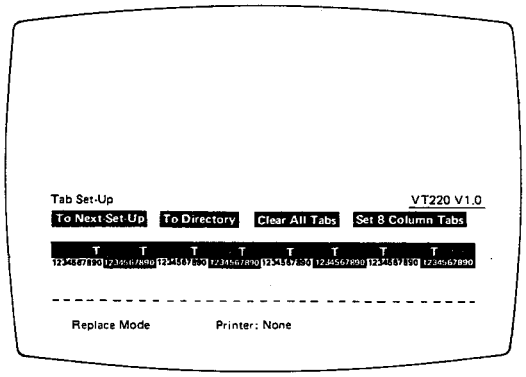


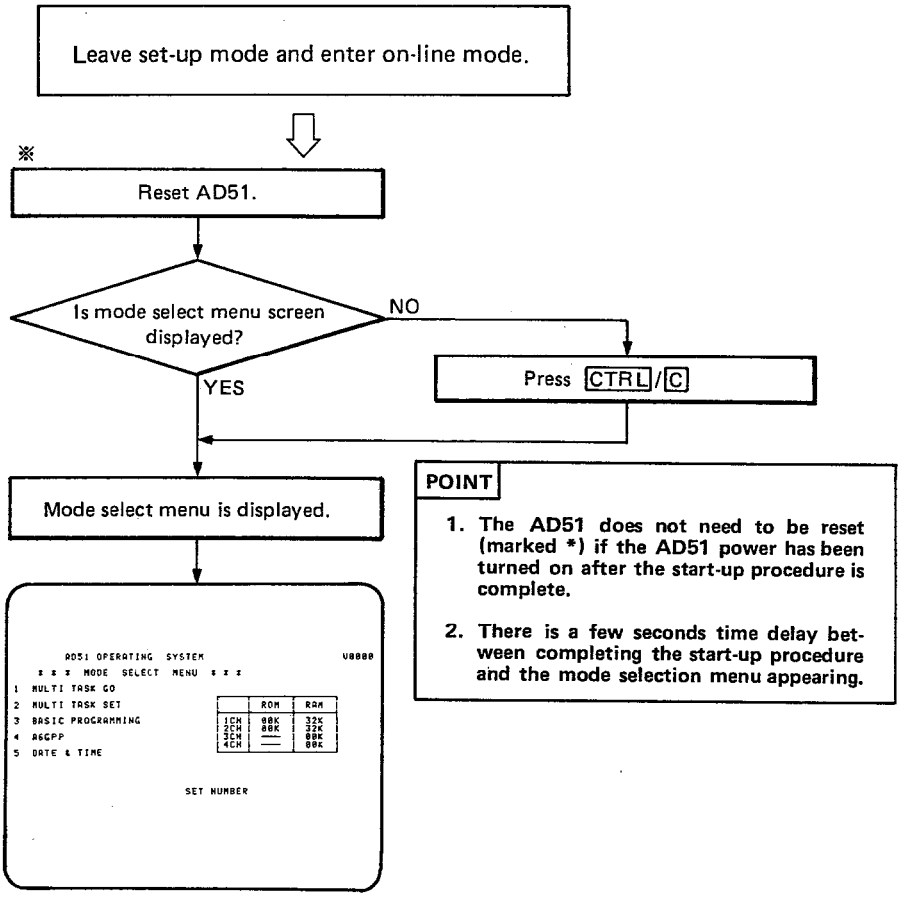
*1: *Either 4800 or 9600 may be set.*

Keyboard Set-Up



Tab Set-Up





POINT

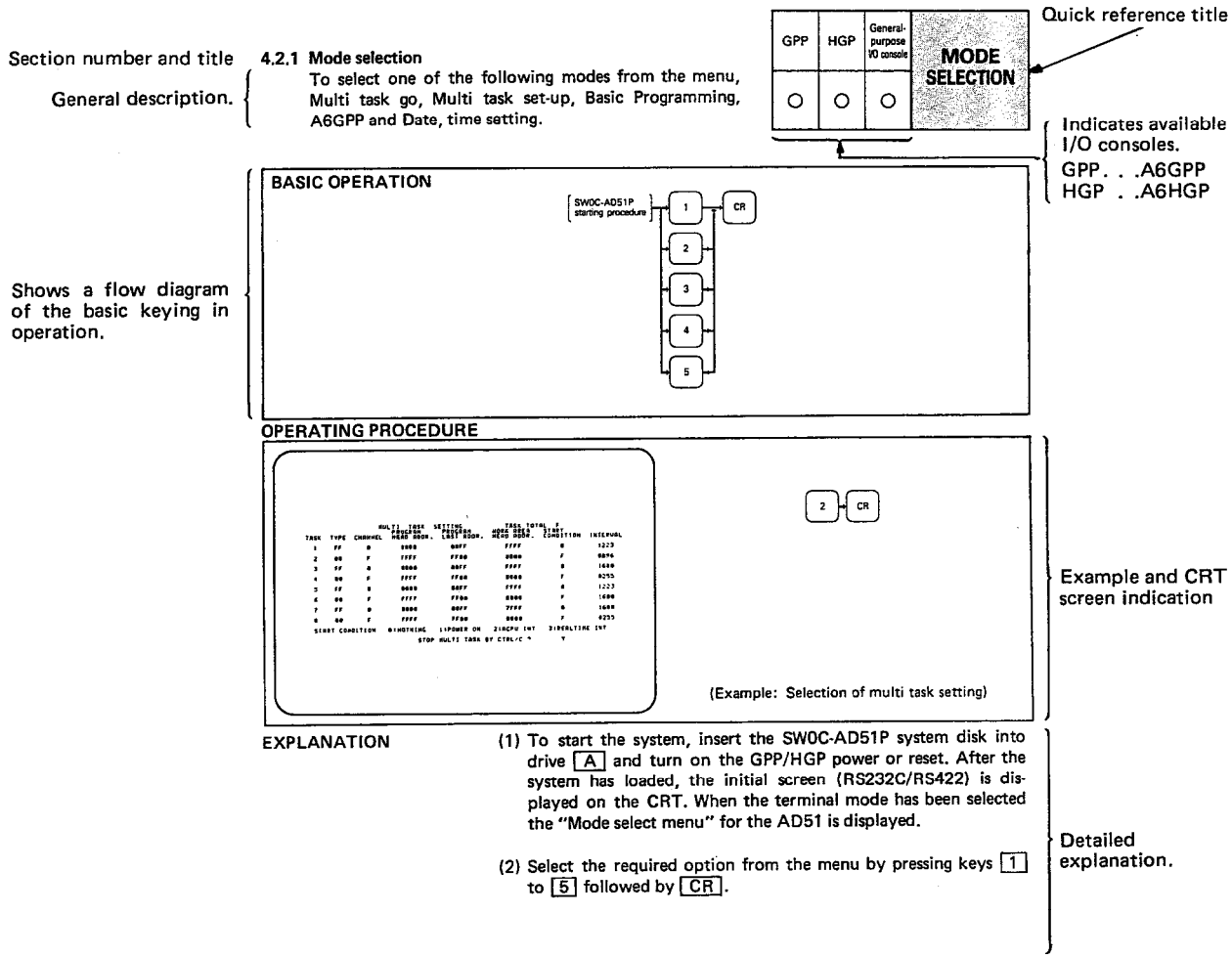
1. The AD51 does not need to be reset (marked *) if the AD51 power has been turned on after the start-up procedure is complete.
2. There is a few seconds time delay between completing the start-up procedure and the mode selection menu appearing.

4. OPERATING PROCEDURE

4.1 General Information

4.1.1 Guide to Sections 4.2 to 4.6

Sections 4.2 to 4.6 use the format below.



4.1.2 Keyboard information

(1) VT220 keys

In this manual keys are specified as labelled on the GPP/HGP keyboard. Equivalents for the VT220 are shown in the table below:

GPP/HGP	VT220
[CR]	[RETURN]
[CTRL] / [C] or [BREAK]	[CTRL] / [C]

REMARKS

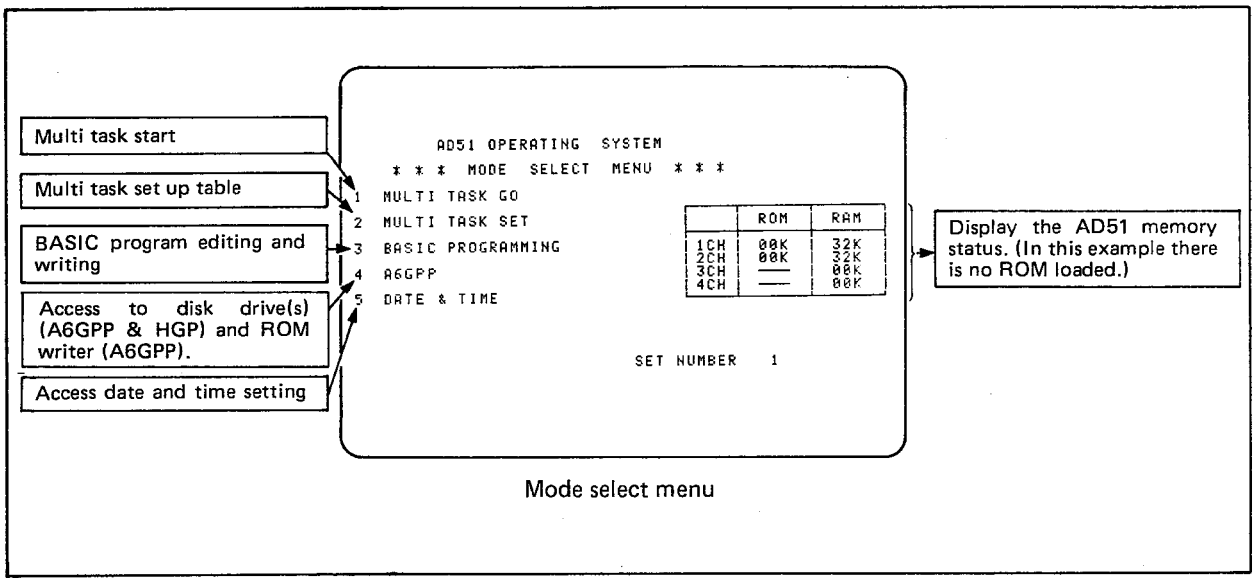
The key codes for the [BREAK] and [CTRL] / [C] keys are the same (03H) in the GPP/HGP.

(2) The functions of the keys during menu selection are as follows.

Valid Key	Application
[0] to [9] [A] to [F]	Data input
[Y], [N]	Keys valid only in multi task setting mode. Sets validity of [CTRL] / [C] key input.
[CR] (for A6GPP) [RETURN] (for VT220)	Data input
[ESC]	Returns to the first operation on the screen.
[DEL]	Moves the cursor 1 digit backward in a 2 or more digit data.
[SP]	Moves the cursor 1 digit forward in a 2 or more digit data.

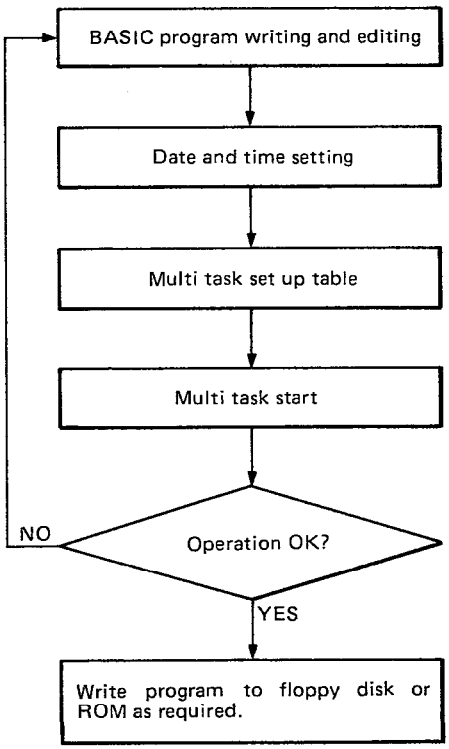
4.2 Mode Selection

(1) Mode select menu



Mode select menu

(2) Generally these functions will be called as follows:

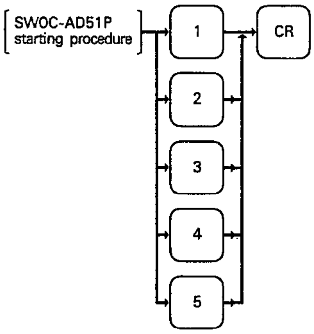


4.2.1 Mode selection

To select one of the following modes from the menu, Multi task go, Multi task set-up, Basic Programming, A6GPP and Date, time setting.

GPP	HGP	General-purpose I/O console	MODE SELECTION
○	○	○	

BASIC OPERATION



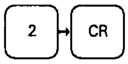
OPERATING PROCEDURE

MULTI TASK SETTING TASK TOTAL F

TASK	TYPE	CHANNEL	PROGRAM HEAD ADDR.	PROGRAM LAST ADDR.	WORK AREA HEAD ADDR.	START CONDITION	INTERVAL
1	FF	0	8000	00FF	FFFF	0	1223
2	00	F	FFFF	FF00	8000	F	0896
3	FF	0	0000	00FF	FFFF	0	1600
4	00	F	FFFF	FF00	8000	F	0255
5	FF	0	0000	00FF	FFFF	0	1223
6	00	F	FFFF	FF00	8000	F	1600
7	FF	0	0000	00FF	7FFF	0	1600
8	00	F	FFFF	FF00	0000	F	0255

START CONDITION 0:NOTHING 1:POWER ON 2:ACPU INT 3:REALTIME INT

STOP MULTI TASK BY CTRL/C ? Y



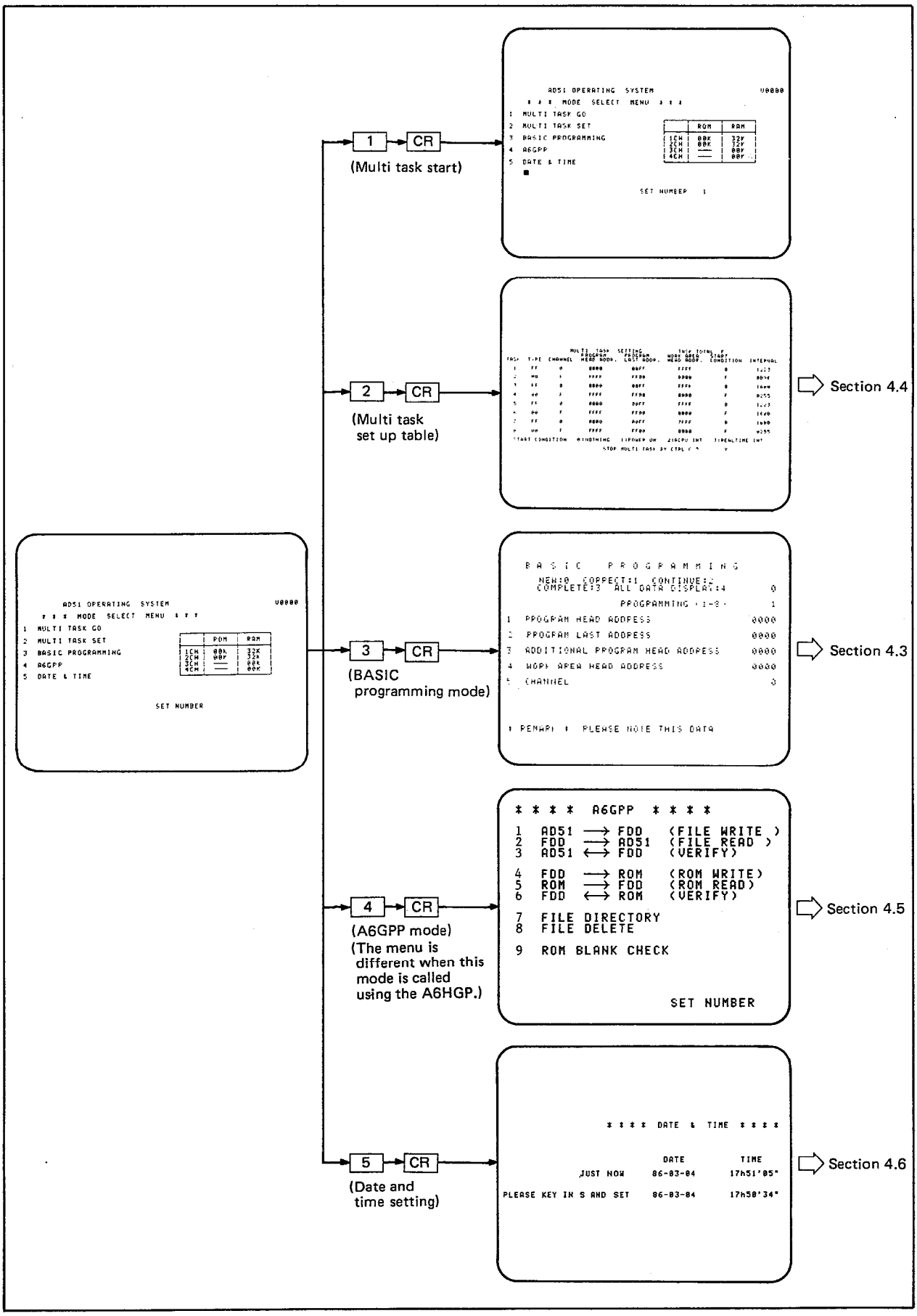
(Example: Selection of multi task setting)

EXPLANATION

(1) To start the system, insert the SWOC-AD51P system disk into drive [A] and turn on the GPP/HGP power or reset. After the system has loaded, the initial screen (RS232C/RS422) is displayed on the CRT. When the terminal mode has been selected the "Mode select menu" for the AD51 is displayed.

(2) Select the required option from the menu by pressing keys [1] to [5] followed by [CR].

(3) Selection from the mode menu will call further menus as below:



4.3 BASIC Program Address Setting

This operation is used to set the program addresses and to enter BASIC programming mode.

4.3.1 New address writing

GPP	HGP	General-purpose I/O console	BASIC PROGRAM CORRECTION
○	○	○	

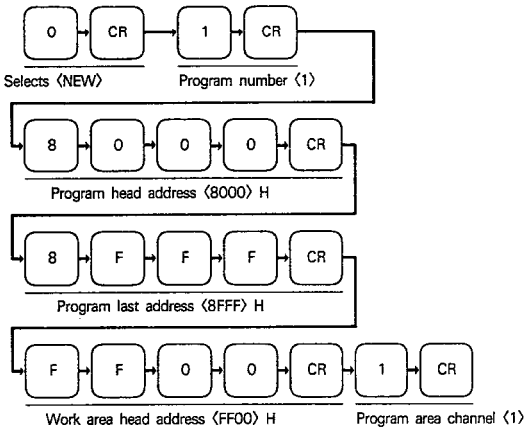
BASIC OPERATION

[Select BASIC programming mode] → [0] → [CR] → [Set programming address data] → [Set printer parameters] → [Write BASIC program]

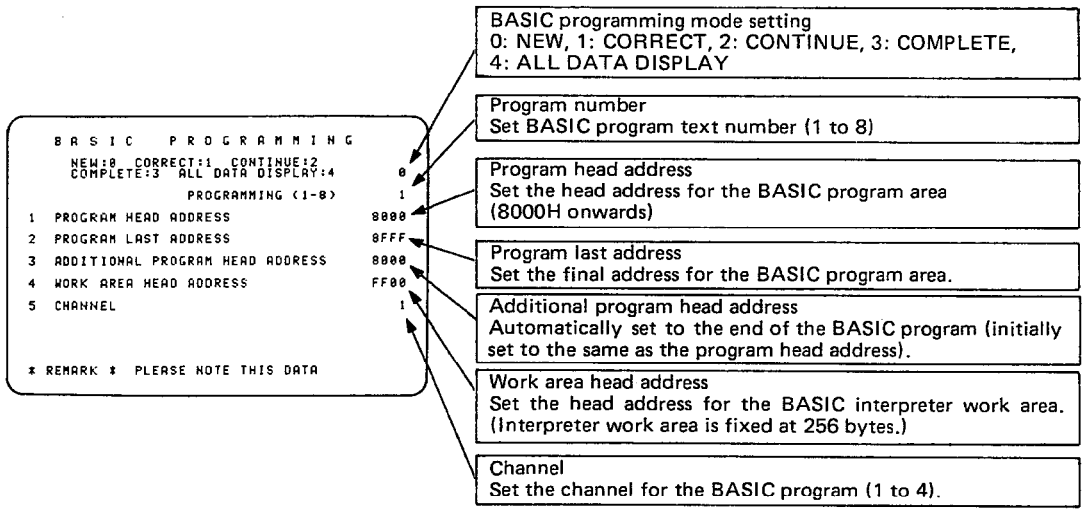
OPERATION PROCEDURE 1 (BASIC Program Address Data Screen)

```
    B A S I C    P R O G R A M M I N G
      NEW:0  CORRECT:1  CONTINUE:2
      COMPLETE:3  ALL DATA DISPLAY:4          0
                    PROGRAMMING (1-8)         1
1   PROGRAM HEAD ADDRESS                   8000
2   PROGRAM LAST ADDRESS                   8FFF
3   ADDITIONAL PROGRAM HEAD ADDRESS        8000
4   WORK AREA HEAD ADDRESS                 FF00
5   CHANNEL                                   1


* REMARK *  PLEASE NOTE THIS DATA
```



EXPLANATION (1) Select BASIC programming mode to display the following screen.



REMARKS

Any existing program address data is displayed each time this menu is called.

(2) New program address data is set in the following order:
[PROGRAMMING MODE (0: NEW)] → [PROGRAM NUMBER] → [PROGRAM HEAD ADDRESS] → [PROGRAM LAST ADDRESS] → [WORK AREA HEAD ADDRESS] → [CHANNEL]

(a) [PROGRAMMING MODE]

After entering programming mode, select the required option from the menu using keys [0] to [4] and [CR].

(b) [PROGRAM NUMBER]

Select the program task number using keys [1] to [8] and press [CR].

(c) [PROGRAM HEAD ADDRESS]

Enter the program head address as a four digit hexadecimal number greater than 8000H and press [CR].

(d) [PROGRAM LAST ADDRESS]

Enter the program last address (as above) and press [CR].

(e) [WORK AREA HEAD ADDRESS]

Enter the BASIC interpreter work area head address (as above). This address must be less than or equal to FF00H and the 2 least significant digits must be 00. 256 bytes are required for the work area. Press [CR] after entering the address.

(f) [CHANNEL]

Enter the channel number [1] to [4] in which the program will be stored. This must be set with reference to whether ROM is used or not, consult the AD51E User's Manual. Press [CR] after entering the channel number.

POINT

(1) Any addresses or settings outside the specified ranges will call error message "CANNOT SET."

(2) Set the program head address, program last address, and work area head address such that:

8000H ≦ program head address
< program last address < work area head address
≦ FF00H

(3) The work area head address must be set in the RAM area.

(4) When NEW has been selected, "3. ADDITIONAL PROGRAM HEAD ADDRESS" cannot be set. The additional program head address value is automatically set to the same as the program head address value.

OPERATING PROCEDURE 2 (Connected Printer Setting)

```
                PRINTER  SETTING  FOR LLIST,LPRINT
1.  NOTHING              <0>          BAUD RATE     PARITY       DATA BITS
                                                                & STOP BITS
    K6PR                 <1>            1  300     0 NOTHING      0 7&1
    K7PR                 <2>            2  600     1 EVEN         1 7&2
                                        3 1200     2 ODD          2 8&1
    K6PR-K               <3>            4 2400                    3 8&2
                                        5 4800
    A7PR                 <4>            6 9600
    OTHERS               <5>     5

2.  RS232C      CH3      <1>
    RS232C      CH4      <2>     2  412
```

5 → CR → 2 → CR → 4 → 1 → 2 → CR

〈OTHERS〉. 〈CH4〉. 〈2400 bauds, even parity, data 8 bits, stop bit 1〉.

EXPLANATION

(1) After completing the program address data, proceed to setting the printer. The following information is required; printer type, connected channel number, baud rate, parity, data bit, and stop bit.

(a) Printer type

Defaults to OTHERS. Select the printer required using keys [0] to [5] and press [CR].

- Select [0] "NOTHING" if a printer is not required and proceed to BASIC program writing.

(b) Connected channel number

Defaults to RS232C CH4. Select the channel required using keys [1] or [2] as indicated on the menu and press [CR]. The screen will now change to BASIC programming if printer selections [1] to [4] have been made or to interface data setting if printer selection [5] has been made.

(c) Baud rate, parity, data bit, stop bit

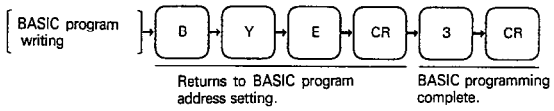
This data is required if printer selection [5] has been made only.
After the channel number has been specified and [CR] pressed, three digits are displayed indicating the selections from the interface data menus. These may be changed as required using keys [1] to [6].

POINT

The message "CANNOT SET" is given if data is set outside the specified ranges.

OPERATING PROCEDURE 3

```
OK
>AUTO
 100 REM  "SAMPLE"
 110 FOR I=0 TO 10
 120 LOCATE I,I*2
 130 PRINT "MELSEC-A AD51"
 140 NEXT I
 150 END
 160
OK
>BYE
```



EXPLANATION

(1) After setting the printer, the screen is prepared for BASIC program writing.
Details of the BASIC used are given in the GPC-BASIC Handbooks.

(2) After BASIC program writing, press [B] [Y] [E], [CR] and the CRT returns to the BASIC program address data screen.

(3) To leave BASIC program writing mode select [3], "COMPLETE" on the BASIC programming mode menu.

(4) See Section 5 for error messages applicable to this section:

Error Message
CANNOT SET
DATA [ ] SET ERROR

POINT

(1) The message "ROM OR MEMORY PROTECT AREA ! PLEASE DO NOT CORRECT PROGRAM" indicates that the memory in the specified channel cannot be corrected (i.e. it is on EPROM or is write protected). The memory protect can be overridden by switching the protect switch to off, in this case the message is still displayed.
The channel should be changed to RAM if the area is ROM.
Attempting to edit or clear a program stored on ROM or in a memory protect area will have no effect on the program and will only change the additional program head address. The program cannot be read.

(2) Always keep a record of the program address data.

(3) To terminate the BASIC editor type in [B] [Y] [E] , [C] [CR] .

4.3.2 Correct

Editing of the BASIC program and correction of program address data and printer setting.

GPP	HGP	General-purpose I/O console	BASIC PROGRAM CONTINUE
○	○	○	

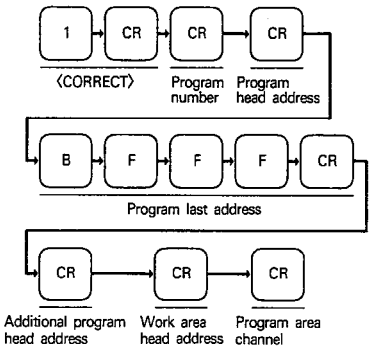
BASIC OPERATION

[BASIC programming mode] → [1] → [CR] → [Correct program address data] → [Correct printer data] → [Correct BASIC program]

OPERATION PROCEDURE 1 (Changing Program Address Data)

```
    B A S I C    P R O G R A M M I N G
      NEW:0  CORRECT:1  CONTINUE:2
      COMPLETE:3  ALL DATA DISPLAY:4          1
                    PROGRAMMING (1-8)         1
  1  PROGRAM HEAD ADDRESS                   8000
  2  PROGRAM LAST ADDRESS                   BFFF
  3  ADDITIONAL PROGRAM HEAD ADDRESS        8044
  4  WORK AREA HEAD ADDRESS                 FF00
  5  CHANNEL                                   1


  * REMARK *  PLEASE NOTE THIS DATA
```



EXPLANATION

(1) Select 1, "CORRECT," from the BASIC programming mode menu and proceed as in Section 4.3. In this case the data displayed is that of the program specified, this data may be changed as required. Press [CR] to move between address settings.

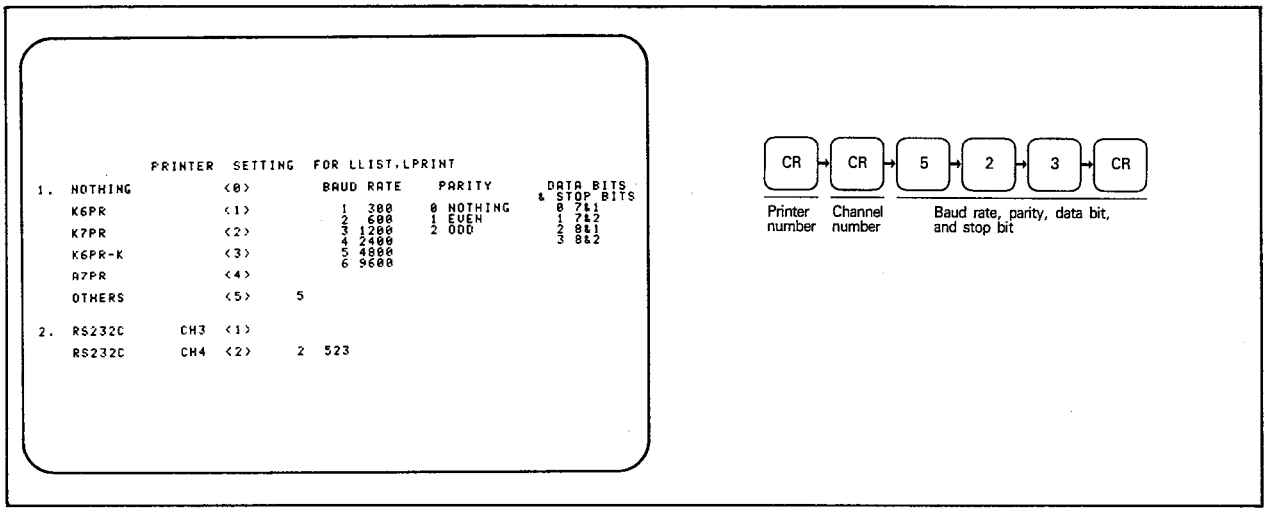
(2) Pressing [ESC] during this function will move the cursor back to the first line.

POINT

The additional program head address can be corrected providing the following conditions are met:

8000H ≦ program head address
< additional program head address
< program last address ≦ work area head address

OPERATING PROCEDURE 2 (Changing Printer Data)

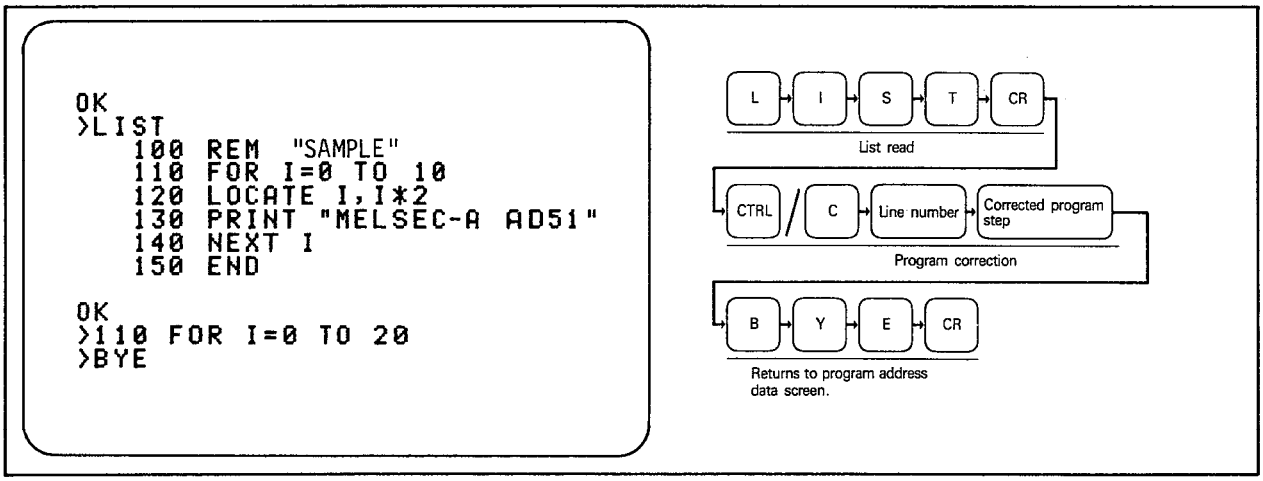


EXPLANATION

(1) After setting the channel number and pressing [CR] the printer menu is displayed. Move between data entries by pressing [CR] and correct data as necessary.

(2) Pressing [ESC] during this function will move the cursor back to the printer selection area.

OPERATING PROCEDURE 3 (BASIC Program Editing)



EXPLANATION

(1) The command LIST lists 20 lines of program, press [CR] to continue. Press [CTRL] / [C] to leave LIST.

(2) To correct a line of program, key in the line number followed by the new instruction and press [CR].

(3) The program may also be edited. Press [E] [D] [I] [T] [SP] [Line number] [CR], this displays the specified program line. Edit the program line as described in the "GPC-BASIC Handbooks." Press [CR] to leave EDIT.

(4) Type [B] [Y] [E], [CR] to leave the BASIC editor and return to the BASIC programming mode menu.

(5) Select 3, "COMPLETE," on the BASIC programming mode menu to return to the mode select menu.

POINT

(1) The message "ROM OR MEMORY PROTECT AREA ! PLEASE DO NOT CORRECT PROGRAM" indicates that the memory in the specified channel cannot be corrected (i.e. it is on EPROM or is write protected). The memory protect can be overridden by switching the protect switch to off, in this case the message is still displayed.
The channel should be changed to RAM if the area is ROM.
Attempting to edit or clear a program stored on ROM or in a memory protect area will have no effect on the program and will only change the additional program head address. The program cannot be read.

(2) After editing a program always use the RUN command.

(3) Always keep a record of the program address data.

(6) See Section 5 for error codes applicable to this section:

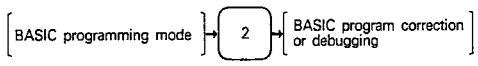
Error Message
CANNOT SET
DATA [ ]SET ERROR

4.3.3 Continue

Correction and debugging of existing programs.

GPP	HGP	General-purpose I/O console	BASIC PROGRAM CREATING
○	○	○	

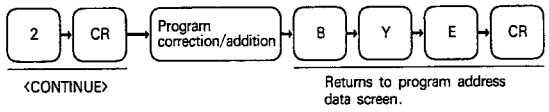
BASIC OPERATION



OPERATION PROCEDURE

```
OK
>LIST
    100 REM  "SAMPLE"
    110 FOR I=0 TO 20
    120 LOCATE I,I*2
    130 PRINT "MELSEC-A AD51"
    140 NEXT I
    150 END

OK
>110 FOR I=0 TO 15
>BYE
```



EXPLANATION

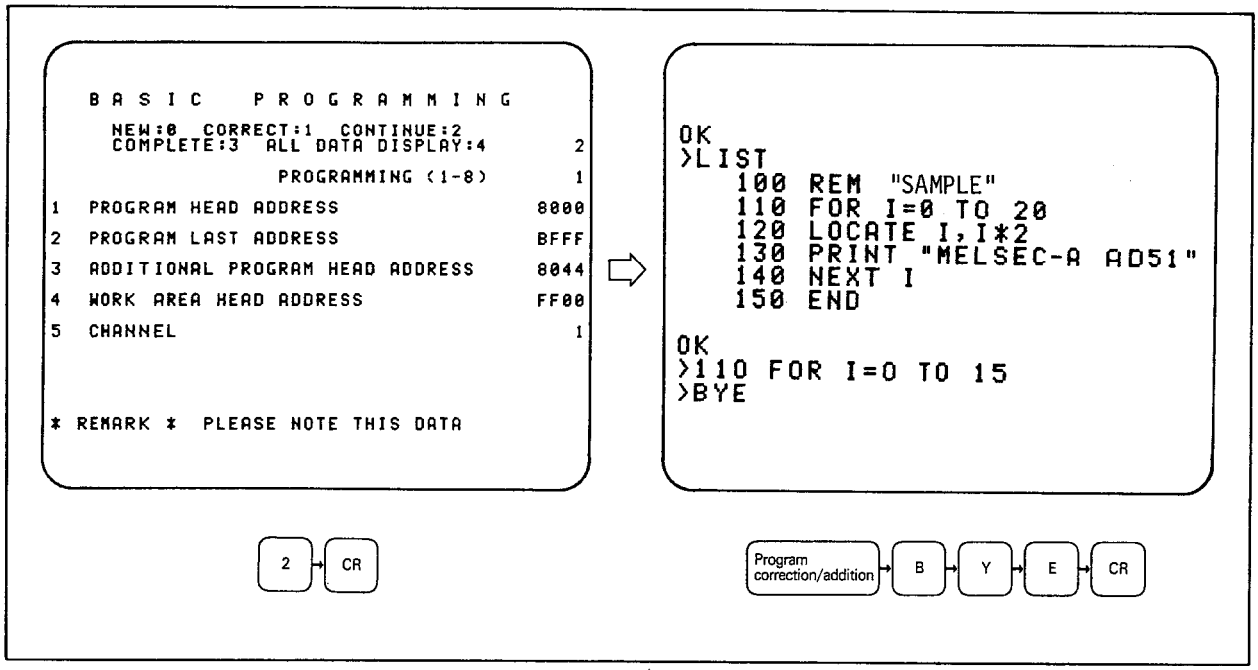
(1) Selecting 2, "CONTINUE" on the program address data screen skips the address settings and printer settings and proceeds immediately to the BASIC editor screen.

(2) Press [B] [Y] [E] [CR] to return to the program address data screen.

(3) See Section 5 for error codes applicable to this section:

Error Message
CANNOT SET
DATA [ ] SET ERROR

(4) Display screen sequence is as shown below.



POINT

(1) The message "ROM OR MEMORY PROTECT AREA / PLEASE DO NOT CORRECT PROGRAM" indicates that the memory in the specified channel cannot be corrected (i.e. it is on EPROM or is write protected). The memory protect can be overridden by switching the protect switch to off, in this case the message is still displayed.
The channel should be changed to RAM if the area is ROM.
Attempting to edit or clear a program stored on ROM or in a memory protect area will have no effect on the program and will only change the additional program head address. The program cannot be read.

(2) After editing a program always use the RUN command.

(3) Always keep a record of the program address data.

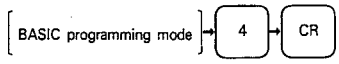
(5) Select 3, "COMPLETE," on the BASIC programming mode menu to return to the mode select menu.

4.3.4 All data display mode

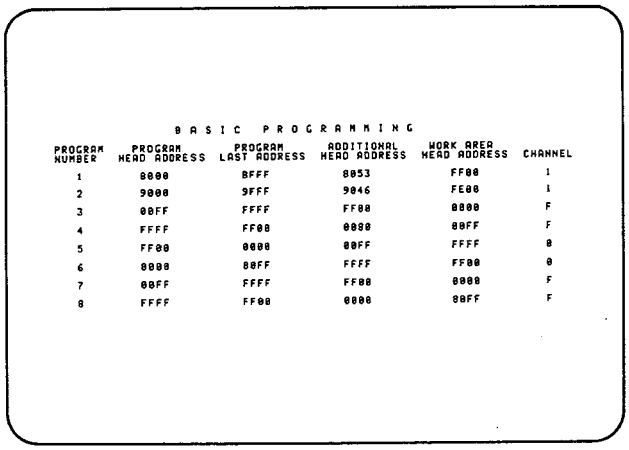
Presents a table of all the program address data as stored in the AD51.

GPP	HGP	General-purpose I/O console	BASIC PROGRAM ALL DATA DISPLAY
○	○	○	

BASIC OPERATION

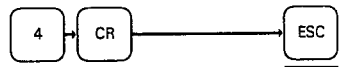


OPERATION PROCEDURE



B A S I C P R O G R A M M I N G

PROGRAM NUMBER	PROGRAM HEAD ADDRESS	PROGRAM LAST ADDRESS	ADDITIONAL HEAD ADDRESS	WORK AREA HEAD ADDRESS	CHANNEL
1	0000	8FFF	8053	FF00	1
2	9000	9FFF	9046	FE00	1
3	00FF	FFFF	FF00	0000	F
4	FFFF	FF00	0000	00FF	F
5	FF00	0000	00FF	FFFF	0
6	0000	00FF	FFFF	FF00	0
7	00FF	FFFF	FF00	0000	F
8	FFFF	FF00	0000	00FF	F



All data display mode

Returns to program address data screen.

EXPLANATION

(1) This mode allows all the program address data to be viewed simultaneously.

(2) Data written for program numbers which have not been set-up can be ignored as it will not be used for multitasking.

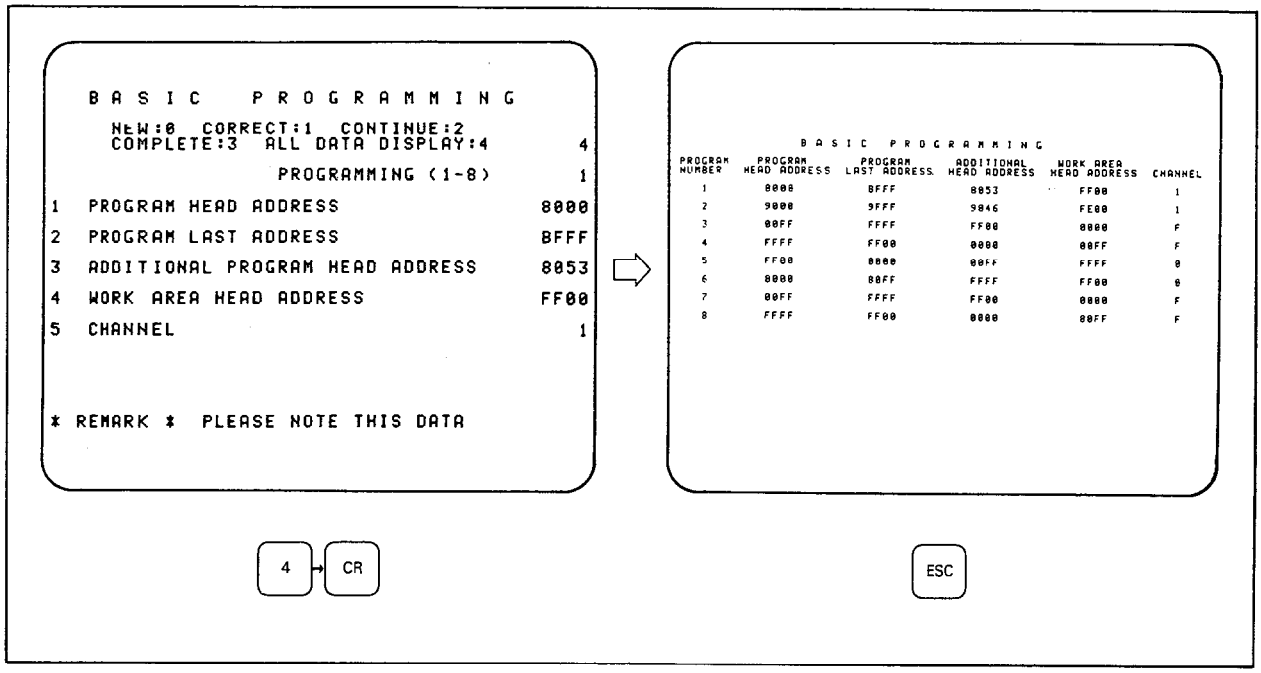
(3) Press [ESC] to return to the program address data screen.

(4) Select 3, "COMPLETE," on the BASIC programming mode menu to return to the mode select menu.

(5) See Section 5 for error codes applicable to this section.

Error Message
CANNOT SET
DATA [ ] SET ERROR

(6) Display screen sequence is as shown below.



4.4 Multi Task Setting

Setting the operating data required for multi tasking.

GPP	HGP	General-purpose I/O console	MULTI TASK SETTING
○	○	○	

BASIC OPERATION

[BASIC programming mode] → [Multi task setting] → [Set printer parameter]

OPERATION PROCEDURE

MULTI TASK SETTING TASK TOTAL 2

TASK	TYPE	CHANNEL	PROGRAM HEAD ADDR.	PROGRAM LAST ADDR.	WORK AREA HEAD ADDR.	START CONDITION	INTERVAL
1	B1	1	8000	8044	FF00	3	0100
2	B2	1	9000	9046	FE00	1	0000
3	FF	0	0000	00FF	FFFF	0	1680
4	00	F	FFFF	FF00	0000	F	0255
5	FF	0	0000	00FF	FFFF	0	1223
6	00	F	FFFF	FF00	8000	F	1680
7	FF	0	0000	00FF	7FFF	0	1680
8	00	F	FFFF	FF00	0000	F	0255

START CONDITION 0:NOTHING 1:POWER ON 2:ACPU INT 3:REALTIME INT

STOP MULTI TASK BY CTRL/C ? Y

[2] → [CR] : Number of tasks ⟨2⟩
→ [B] → [1] → [CR] : Sets program number 1 to task 1.
→ [3] → [CR] : Sets start condition ⟨3⟩.
→ [0] → [1] → [0] → [0] → [CR] : Sets real time interruption period ⟨1⟩ second.
→ [B] → [2] → [CR] : Sets program number 2 to task 2.
→ [1] → [CR] : Sets start condition ⟨1⟩.
→ [Y] → [CR] : Sets validity of [CTRL]/[C] key.

EXPLANATION

(1) When multi task setting mode is selected, the following screen is displayed.

MULTI TASK SETTING TASK TOTAL 1

TASK	TYPE	CHANNEL	PROGRAM HEAD ADDR.	PROGRAM LAST ADDR.	WORK AREA HEAD ADDR.	START CONDITION	INTERVAL
1	B1	1	8000	8006	FF00	1	0000
2	00	F	9FBF	F000	0000	F	0896
3	FF	0	0000	00FF	3FDF	0	0712
4	00	F	BFFF	FF00	0000	F	0255
5	FF	0	0000	003F	BFFF	0	0859
6	00	F	DFBF	FF00	B000	F	1680
7	FF	0	0000	003F	3FFF	0	1680
8	00	F	EF5F	FF00	0000	F	0221

START CONDITION 0 NOTHING 1 POWER ON 2 ACPU INT 3 REALTIME INT

STOP MULTI TASK BY CTRL/C ? Y

- Set the number of tasks (1 to 8) (TASK TOTAL)
- Set program number from B1 through B8. (TYPE)
- Task start conditions (0 to 3) (START CONDITION)
- Set task start interval for start condition 3 (1 to 9999, units: 10ms) (INTERVAL)
- "PROGRAM LAST ADDR", i.e. "additional program head address" in program address data
- Set validity of [CTRL]/[C] key input. Y: valid, N: invalid. ([CTRL]/[C] stops multi tasking if set to valid)

(2) The data for multitask setting is input in the following order:
[TASK TOTAL] → [TYPE] → [START CONDITION] → [INTERVAL] → [STOP MULTI TASK CTRL/C?].

(a) [TASK TOTAL]

Set the number of tasks [1] to [8] and press [CR].
The cursor moves to TASK 1 TYPE column.
Set the number of tasks to 0 to return to the mode select menu.

(b) [TYPE]

This assigns program numbers to task numbers. Press [B] followed by the program number [1] to [8] followed by [CR]. This defines the execution priority of the programs during multitasking, the lower the task number, the higher its priority. (i.e. Task 1 has priority over Task 2)

(c) [START CONDITION]

The start condition for the task is selected from the menu at the bottom of the screen by keying in [0] to [3], [CR]. (Start conditions are also shown on the table below.)
If start condition [3] is specified an INTERVAL must also be set.

Setting Number	Start Condition
0	Task is not started.
1	Start at power on
2	Start at interruption from ACPU
3	Start at real time interruption

(d) [INTERVAL]

For start condition 3. Specify the real time interrupt interval. The value must be in the range 1 to 9999 (set in units of 10ms).

(e) Setting of TYPE, START CONDITION, (INTERVAL) is repeated for each of the tasks set in [TASK TOTAL] and when the table is complete, the cursor moves to STOP MULTI TASK BY CTRL/C?

(f) STOP MULTI TASK BY CTRL/C?

Sets the multi task STOP condition, if CTRL / C is required as a stop condition select Y (YES), CR otherwise select N , CR .
Multi tasking will stop and the screen change to the mode select menu when CTRL / C is pressed if it is set as valid as a stop condition.
When N has been selected, pressing CTRL / C with the AD51 key in the STOP position will return the screen to the mode select menu.

POINT

To receive code 03H via CH1 to 4 without stopping execution, set the multitask stop condition to "N".

(3) Press ESC to return the cursor to the TASK TOTAL area for resetting any data and step through the settings by pressing CR .

POINT

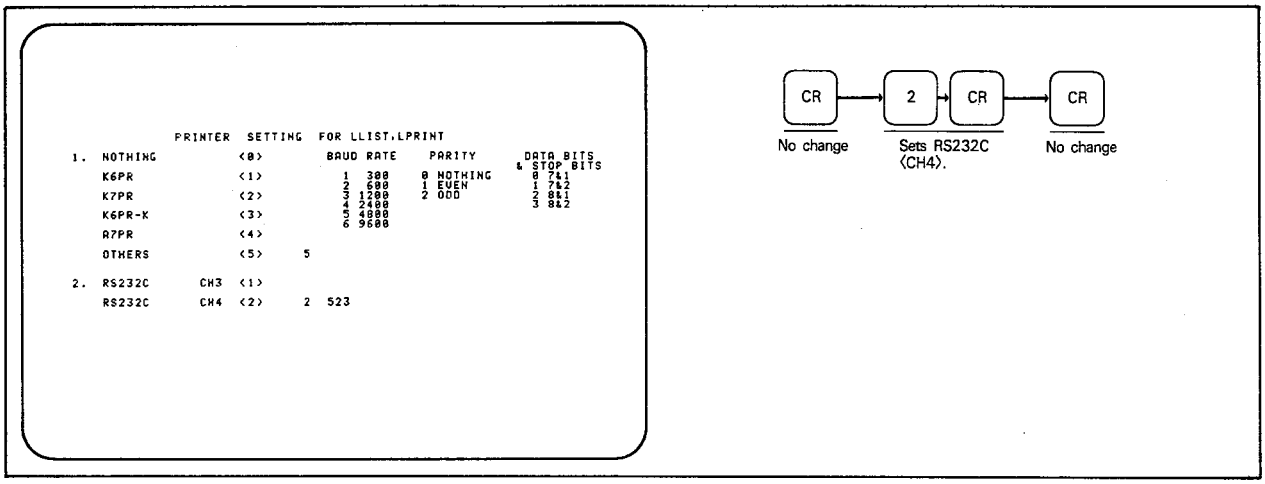
(1) The task number defines the execution priority of the program. Lower task numbers have higher priority. Task execution order may be re-arranged by changing the TYPE definitions.

(2) TYPE numbers cannot be repeated.

(3) The RUN/STOP key switch positions operate as follows:

Mode \ Key Switch Position		STOP	RUN
Multi tasking	CTRL/C defined as multi task stop condition	Program is not executed.	Program runs. CTRL/C stops execution.
	CTRL/C not a stop condition	Program is not executed.	Program runs.
After RUN in BASIC programming mode		Program is not executed.	Program runs. CTRL/C stops execution.

OPERATING PROCEDURE 2 (Printer Set-Up)



EXPLANATION

(1) After multi task data has been specified, the printer set-up screen is displayed.
Set the printer data as described on page 4-8.
Any previously entered data will be shown on the screen. If this data is still valid press CR until the mode select menu appears.

(2) See Section 5 for error codes applicable to this section:

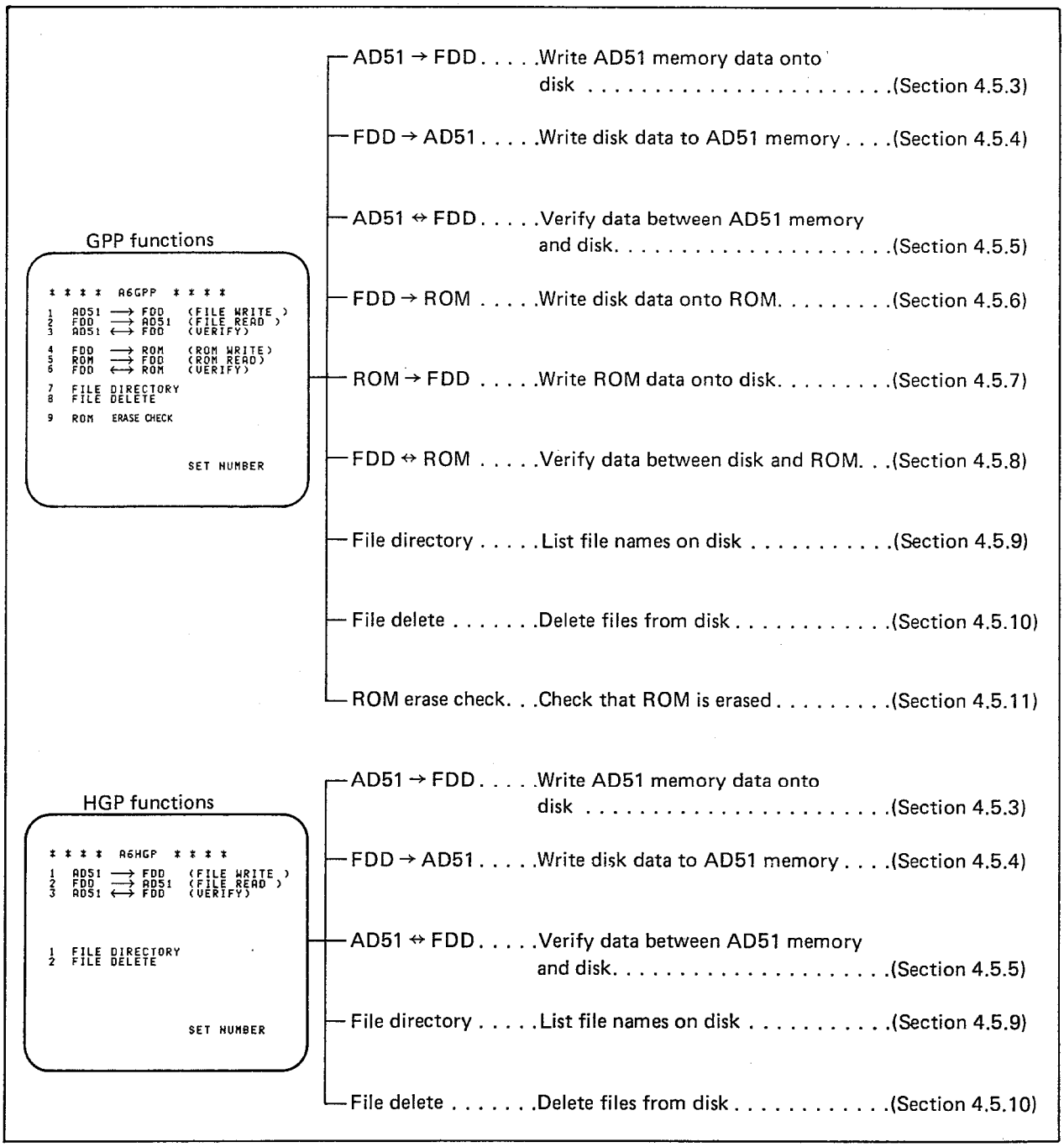
Error Message
ERROR

4.5 GPP Mode

GPP mode allows data to be written onto disk and ROM from the AD51 internal memory areas.
GPP mode is enabled by connecting the GPP or HGP to CH1 of the AD51. Operation with the HGP and GPP differ as follows:

(1) The HGP does not require drive setting, because it only has one drive.
(2) The HGP does not have a ROM writer function, so data cannot be written onto ROM.

4.5.1 GPP mode functions



4.5.2 Structure and contents of file name

(1) A file name is required to store data onto disk.

(2) Structure of file name

[System name] . [Identifier]

(3) The system name is set by the user. A maximum of 8 alphanumeric characters and — (minus) may be used, space is not valid. The first character must be a letter.

(4) The identifier defines the type of the file contents and is automatically added to the system name as follows:

Identifier	Description
PD5	Programming data area
CA5	User work area (6000H to 67FFH)
CH5	User memory area (channel 1 to 4) (8000H to FFFFH)
D25	Buffer memory area (0H to BFFH)
AL5	All areas

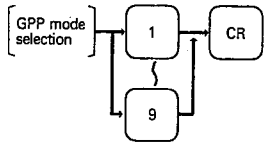
*: All areas includes the programming data area, user work area, user memory area, and buffer memory area.

4.5.3 Function selection

Selection of the required function from the A6GPP mode menu.

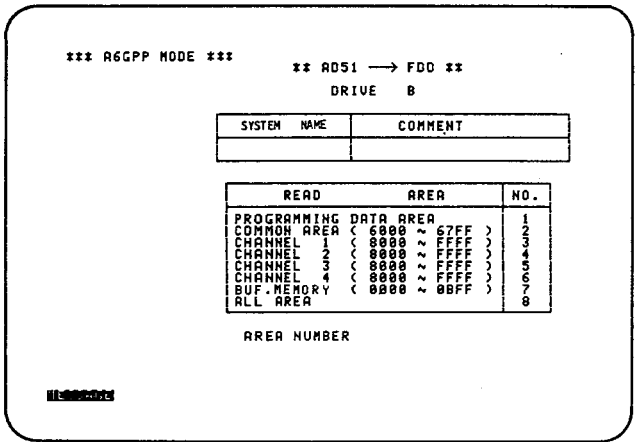
GPP	HGP	General-purpose I/O console	A6GPP FUNCTION SELECTION
○	○	×	

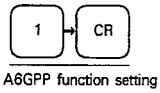
BASIC OPERATION



*: For the HGP, 1 to 3, 7 and 8 are valid.

OPERATION PROCEDURE



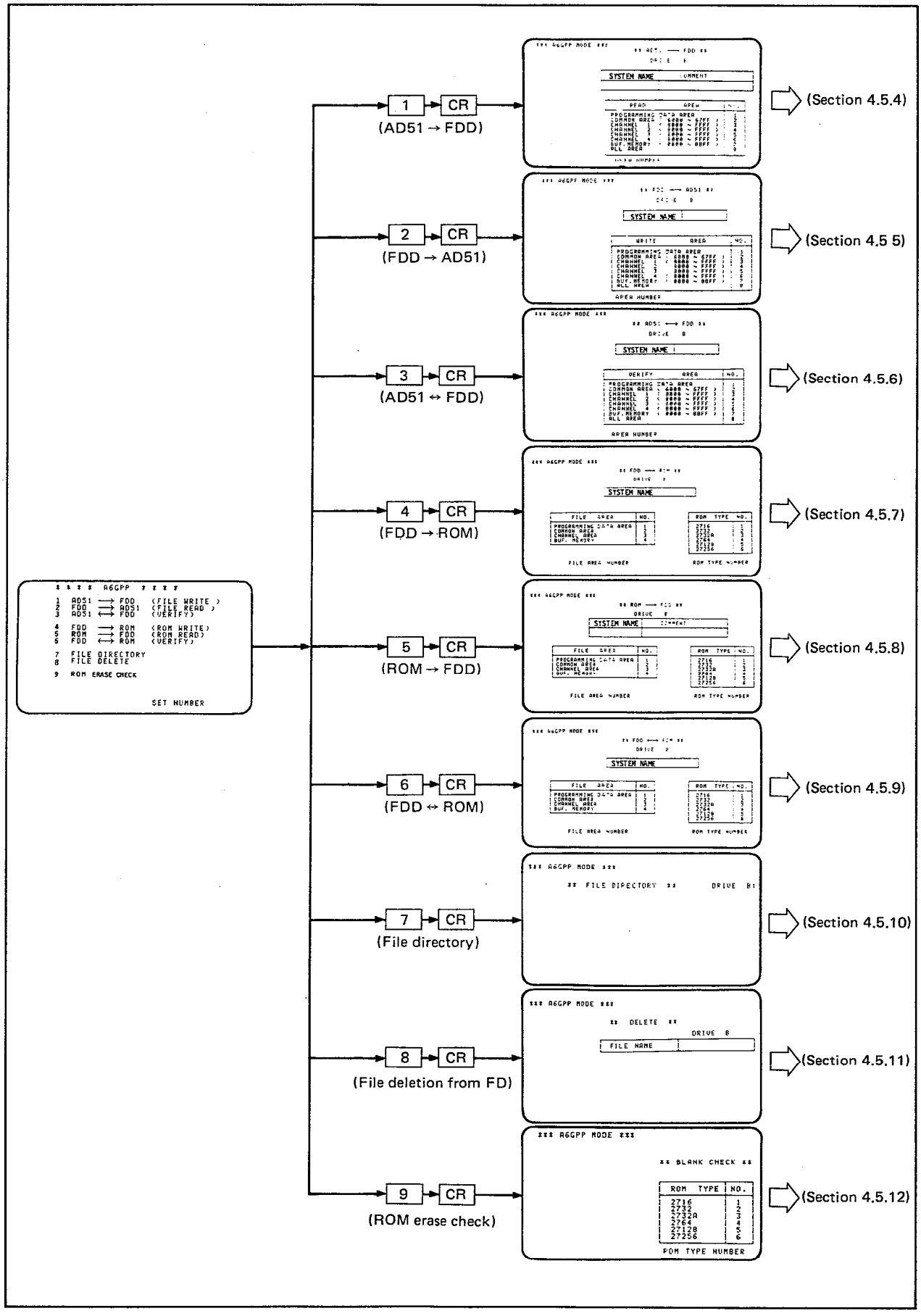


A6GPP function setting

EXPLANATION

(1) When using the GPP select options [1] to [9] then press [CR].
Options [4], [5] and [6] are not valid when using the HGP.

(2) The screen changes according to the selection as follows:

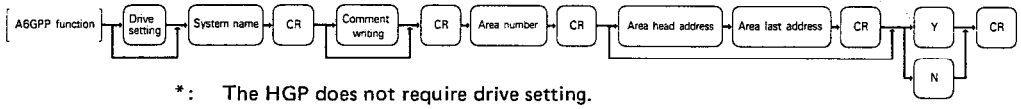


4.5.4 AD51 → FDD

Writes the contents of the AD51's internal memory area onto disk.

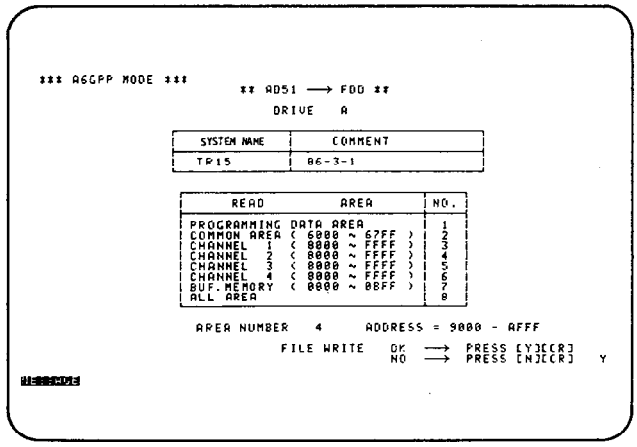
GPP	HGP	General-purpose I/O console	A6GPP AD51 → FDD
○	○	×	

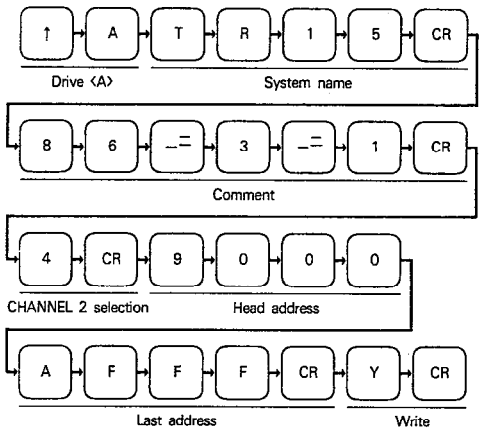
BASIC OPERATION



*: The HGP does not require drive setting.

OPERATION PROCEDURE





EXPLANATION

(1) Data is input in the following order.
[Drive specification] → [System name] → [Comment] → [Area number] → [Address] → [Write specification].

(2) To enter data press [CR] and the cursor moves to the next data item. (Not for drive setting)

(3) The drive setting defaults to "B". To change to "A", press [↑] and [A].

(4) A 20 character comment (alphanumeric, special, capital, upper-case, and lower-case characters) may be added to the file name. The comment is displayed next to the file name in the directory listing.
The comment may be omitted by pressing [CR].

(5) The address range must be specified for menu selections 2 to 7. The addresses are specified as 4 digit hexadecimals.

(6) Pressing [CAN] returns to the A6GPP mode select menu.

(7) During execution of the function a series of "✳" are displayed to indicate progress. One ✳ indicates 2000 bytes. The message "COMPLETED" indicates that the process has been completed without fault.

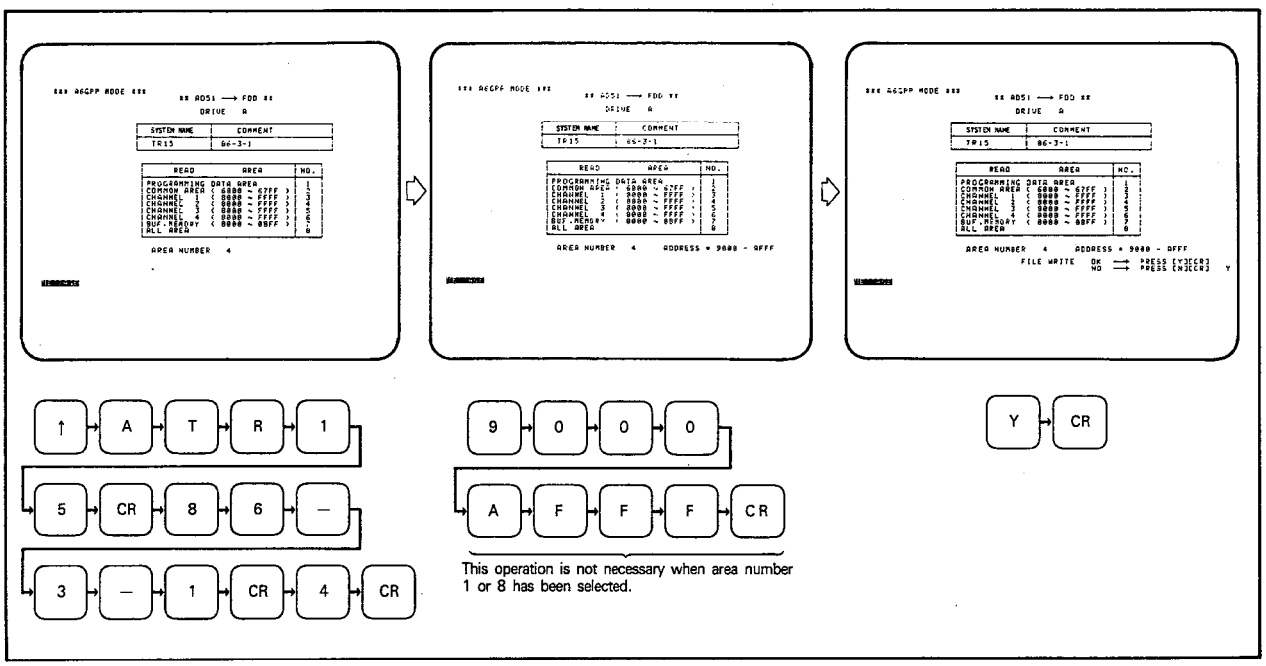
POINT

The message "DISK FULL" indicates that the disk capacity has been exceeded.

(8) See Section 5 for error codes applicable to this section:

Error Message
FLOPPY WRITE PROTECT
ADDRESS ERROR
FLOPPY ERROR
SYSTEM NAME ERROR
CANNOT USE KANA//
DISK FULL
IDENTICAL SYSTEM NAME
CANNOT SET

(9) The sequence of display screens is as shown below:

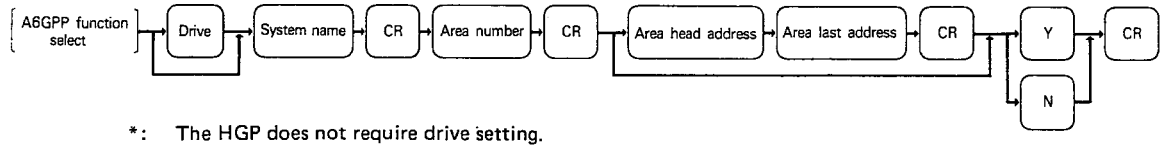


4.5.5 FDD → AD51

Reads data from disk to the AD51.

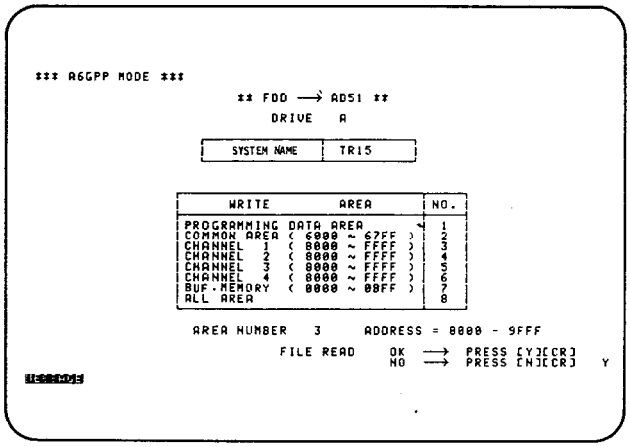
GPP	HGP	General-purpose I/O console	A6GPP FDD → AD51
○	○	×	

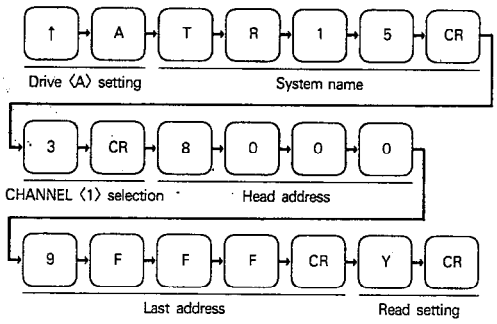
BASIC OPERATION



*: The HGP does not require drive setting.

OPERATION PROCEDURE





EXPLANATION

(1) To enter data press [CR] and the cursor moves to the next data item (not for drive setting).

(2) The drive setting defaults to "B". To change to "A" press [↑] and [A].

(3) The address range must be specified for menu selection 2 to 7. The addresses are specified as 4 digit hexadecimals.

(4) During execution of the function, a series of "✳" are displayed to indicate progress. One "✳" indicates 2000 bytes. The message "COMPLETED" indicates that the process has been completed without fault.

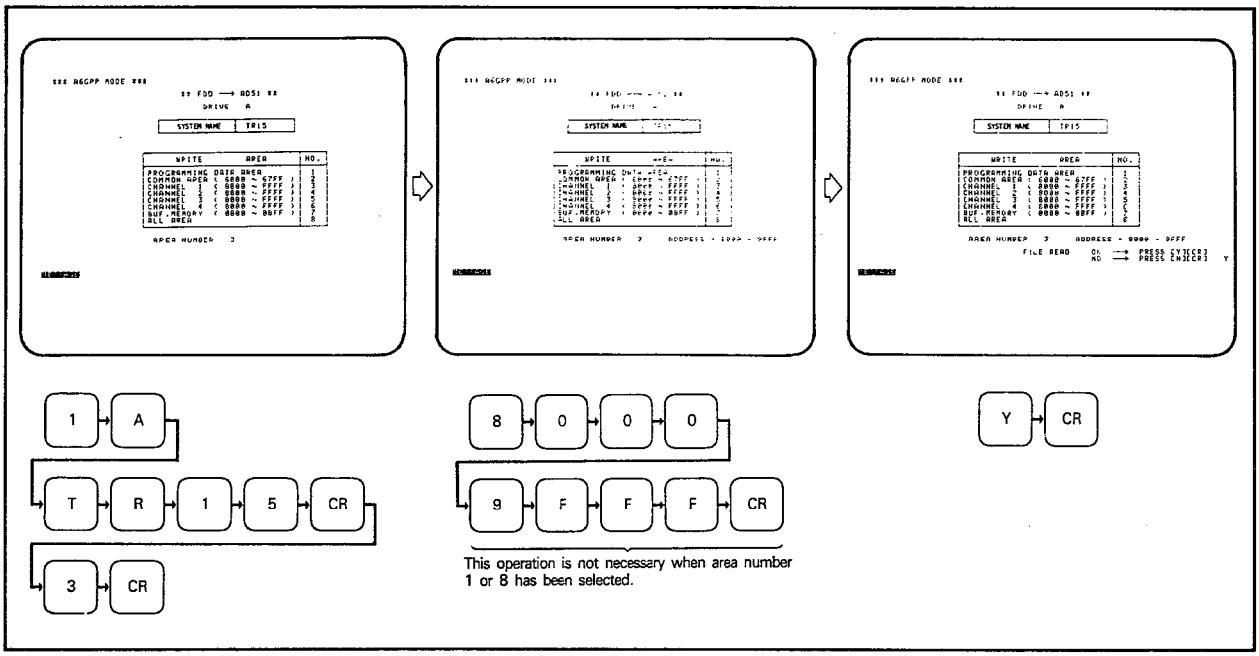
(5) The message "AD51 WRITE ERROR" indicates that the area specified is write protected or is ROM.

(6) Pressing [CAN] returns to the GPP mode select menu.

(7) See Section 5 for error codes applicable to this section:

Error Message
MEMORY NOTHING
ADDRESS ERROR
FLOPPY ERROR
SYSTEM NAME ERROR
NO FILE
CANNOT USE KANA//
AD51 WRITE ERROR

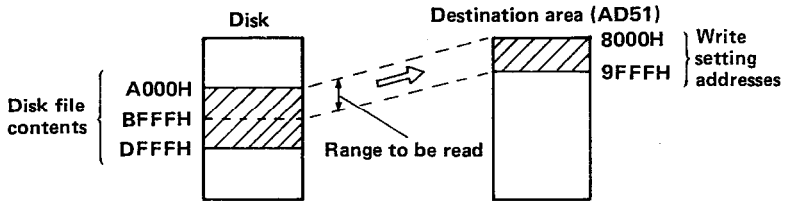
(8) The sequence of display screens is as shown below:



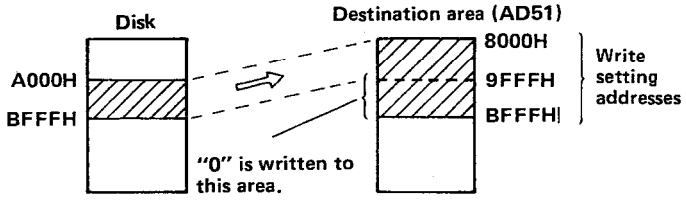
POINT

(1) Pressing CR during address setting (i.e. leaving the addresses empty) will read the file for the address settings made when the file was opened.

(2) The file contents will be transferred to the AD51 until the destination memory area is full. Subsequent file data cannot be transferred, see below:



(3) "0" is written to any spare destination memory area, see below:

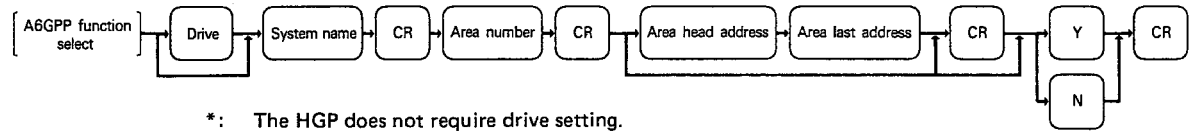


4.5.6 AD51 ⇔ FDD

Verifies AD51 data with disk data.

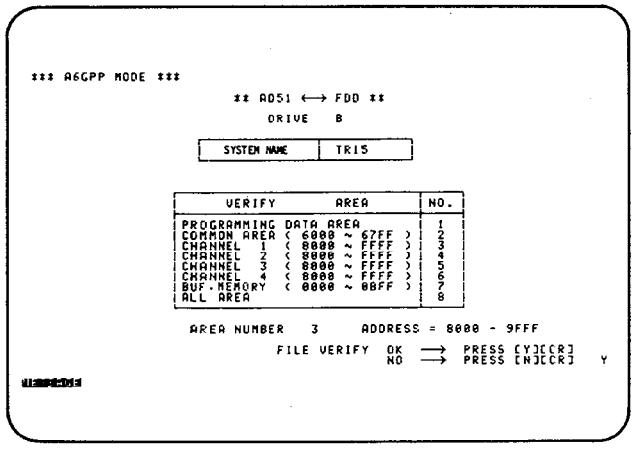
GPP	HGP	General-purpose I/O console	A6GPP AD51 → FDD
○	○	×	

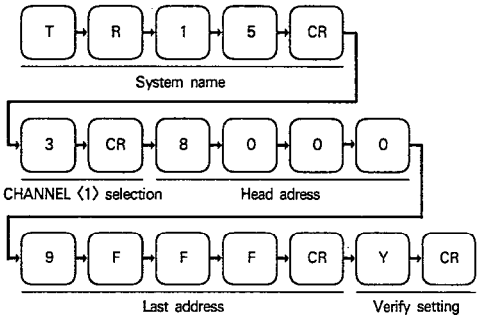
BASIC OPERATION



*: The HGP does not require drive setting.

OPERATION PROCEDURE





EXPLANATION

(1) Data is entered in the following order: [Drive specification] → [System name] → [Area number] → [Address] → [Verify specification].

(2) To enter data press [CR] and the cursor moves to the next data item (not for drive setting).

(3) The drive setting defaults to "B". To change to "A" press [↑] and [A].

(4) The address range must be specified for menu selection 2 to 7. The addresses are specified as 4 digit hexadecimals.

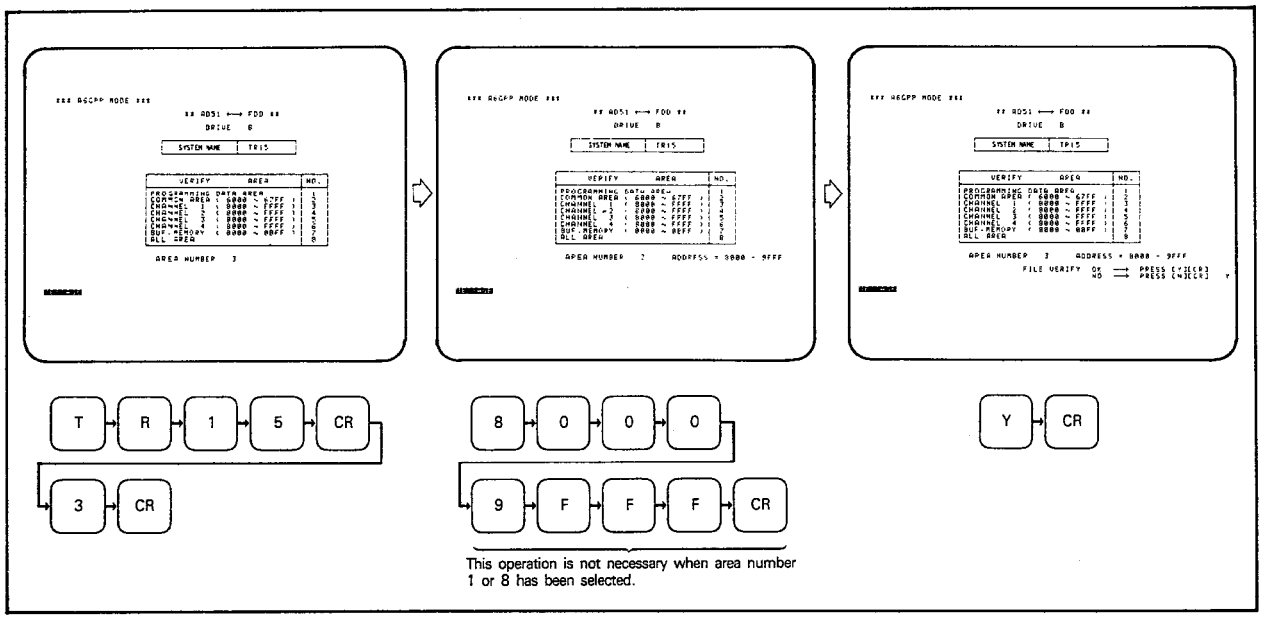
(5) During execution of the function, a series of "✳" are displayed to indicate progress. One "✳" indicates 2000 bytes. The message "COMPLETED" indicates that the process has been completed without fault. "VERIFY ERROR" indicates that the data is unmatched.

(6) Pressing [CAN] returns to the GPP mode select menu.

(7) See Section 5 for error codes applicable to this section:

Error Message
MEMORY NOTHING
ADDRESS ERROR
FLOPPY ERROR
SYSTEM NAME ERROR
NO FILE
CANNOT USE KANA!!
VERIFY ERROR
CANNOT SET

(8) The sequence of display screens is as shown below:

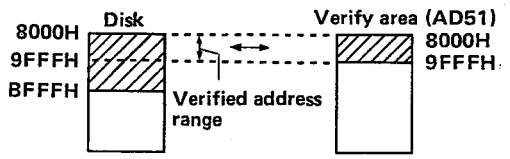


POINT

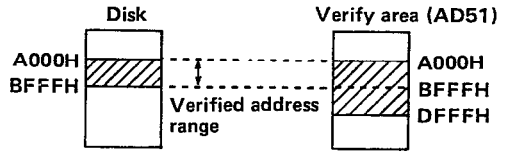
(1) Pressing [CR] during address setting (i.e. leaving the addresses empty) will verify the file for the address settings made when the file was opened.

(2) The file contents will be verified with the AD51 as far as possible. Subsequent data will be ignored, see below:

Disk file larger than AD51 file



Disk file smaller than AD51 file

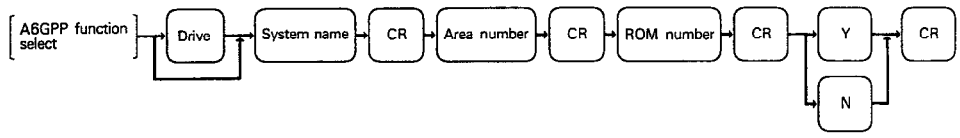


4.5.7 FDD → ROM

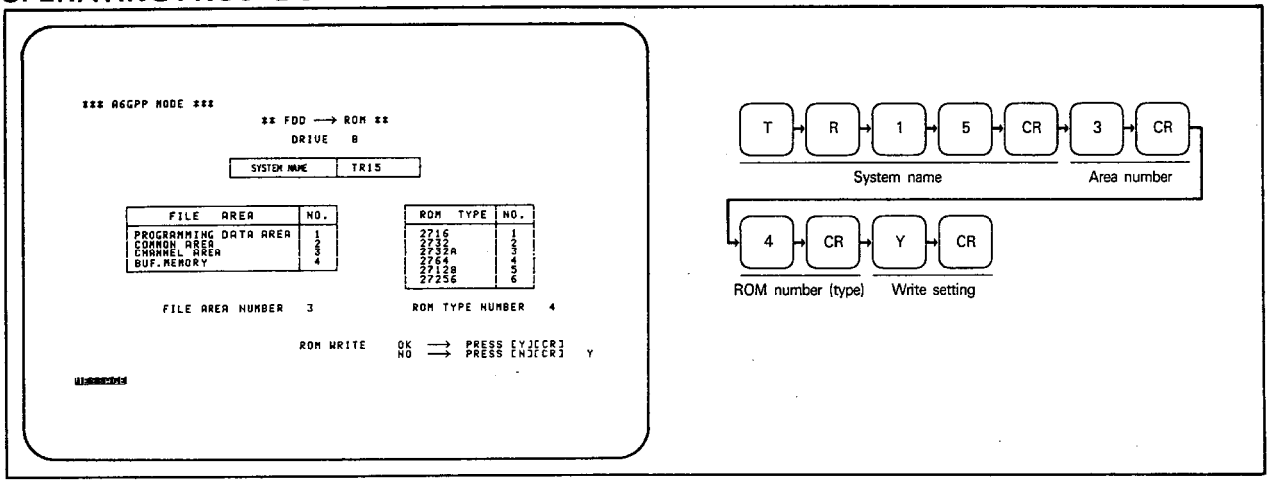
Writes data from disk to ROM.

GPP	HGP	General-purpose I/O console	A6GPP FDD ↔ ROM
○	×	×	

BASIC OPERATION



OPERATING PROCEDURE



EXPLANATION

(1) Data is entered in the following order: [Drive specification] → [System name] → [Area number] → [ROM number] → [Write specification].

(2) To enter data press [CR] and the cursor moves to the next data item (not for drive setting).

(3) The drive setting defaults to "B". To change to "A" press [↑] and [A].

(4) ROM capacities are given in the table below:

Memory Area / ROM type	Programming data	Common area	Channel area (CH1 to CH4)	Buffer memory area (3K bytes)
2716	79 bytes	2K bytes	32K bytes/ 1 channel	3K bytes
2732				
2732A				
2764				
27128				
27256				

(5) During execution of the function, a series of "✳" are displayed to indicate progress. One "✳" indicates 2000 bytes. The message "COMPLETED" indicates that the process has been completed without fault.

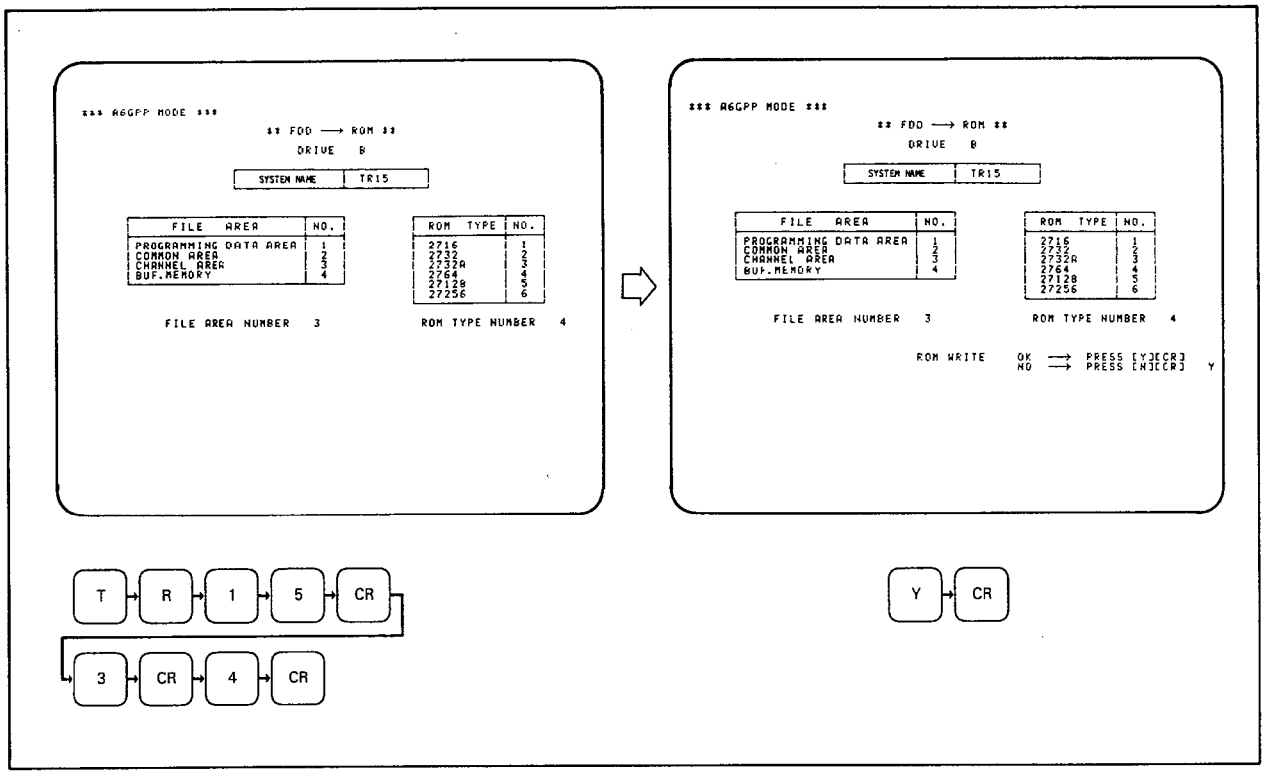
(6) The message "SIZE UNMATCH (ROM < FILE)" indicates that the ROM is too small for the specified data.

(7) Pressing [CAN] returns to the GPP mode select screen.

(8) See Section 5 for error codes applicable to this section:

Error Message
SYSTEM NAME ERROR
FLOPPY ERROR
NO FILE
CANNOT USE KANA//
ROM WRITE ERROR
SIZE UNMATCH (ROM < FILE)
CANNOT SET

(9) The sequence of display screens is as shown below:

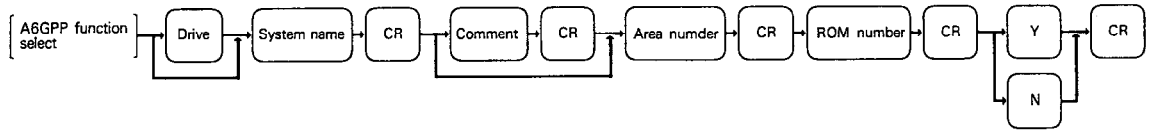


4.5.8 ROM → FDD

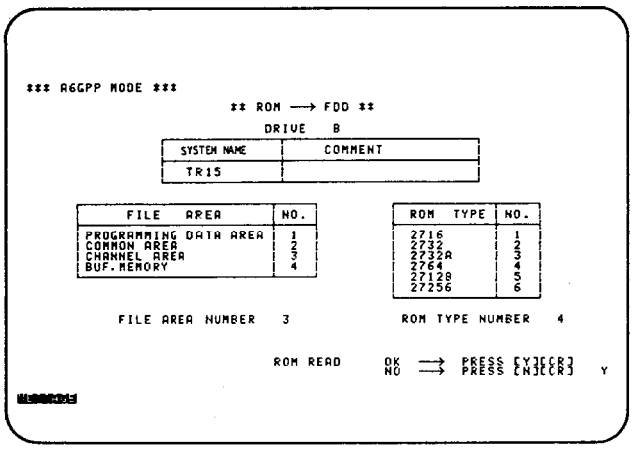
Reads data from ROM onto disk.

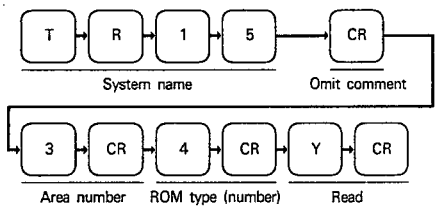
GPP	HGP	General-purpose I/O console	A6GPP ROM → FDD
○	×	×	

BASIC OPERATION



OPERATING PROCEDURE





EXPLANATION

(1) Data is entered in the following order: Drive specification → System name → Comment → Area number → ROM number → Read specification.

(2) To enter data press CR and the cursor moves to the next data item (not for drive setting).

(3) The drive setting defaults to "B". To change to "A" press ↑ and A.

(4) A 20 character comment (alphanumeric, special, capital, upper-case, and lower-case characters) may be added to the file name. The comment is displayed next to the file name in the directory listing.
The comment may be omitted by pressing CR.

(5) During execution of the function, a series of "✳" are displayed to indicate progress. One "✳" indicates 2000 bytes. The message "COMPLETED" indicates that the process has been completed without fault.

(6) Pressing [CAN] returns to the GPP mode select menu.

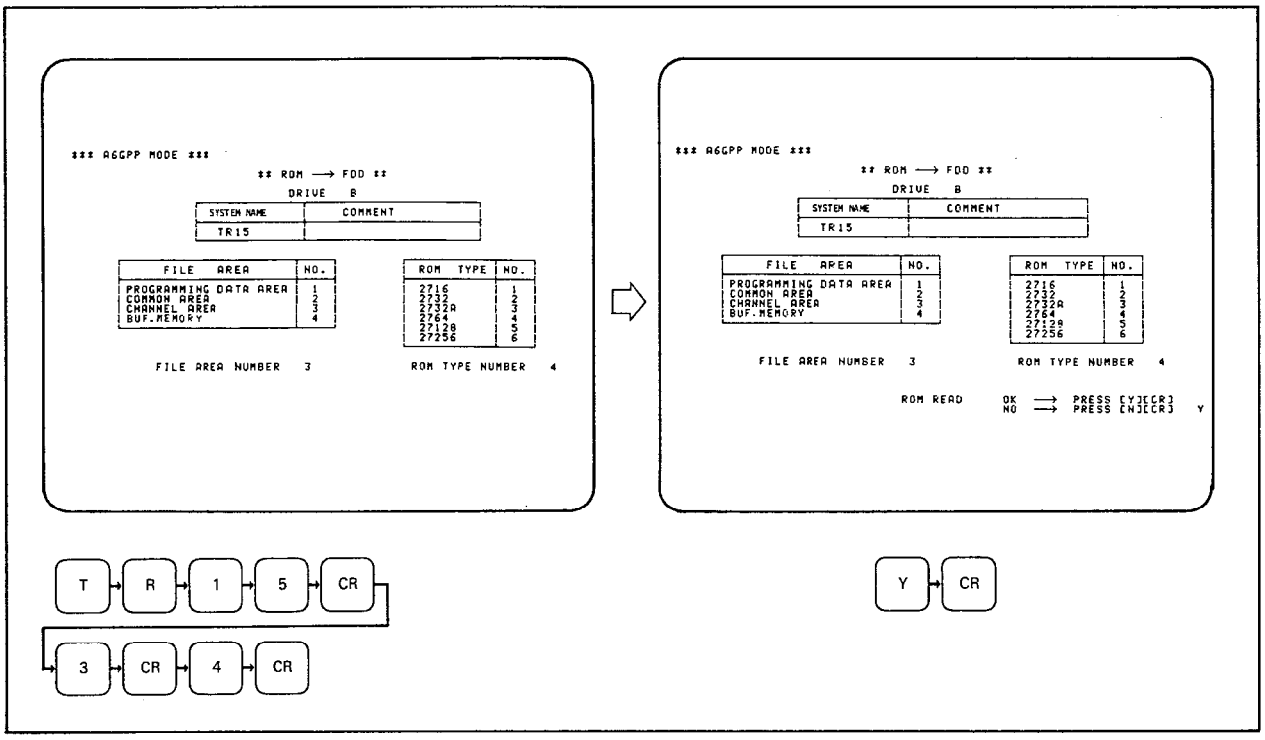
(7) Address ranges are automatically entered to the FD according to the ROM used. Addresses are given in the following table:

Memory Area / ROM Type	Programming data (79 bytes)	Common area (2K bytes)	Channel area (CH1 to CH4)	Buffer memory area (3K bytes)
2716	4F81H to 4FD0H	6000H to 67FFH	8000H to 87FFH	0000H to 03FFH
2732			8000H to 8FFFH	0000H to 07FFH
2732A			8000H to 8FFFH	0000H to 07FFH
2764			8000H to 9FFFH	0000H to 0BFFH
27128			8000H to BFFFH	0000H to 0BFFH
27256			8000H to FFFFH	0000H to 0BFFH

(8) See Section 5 for error codes applicable to this section:

Error Message
FLOPPY ERROR
FLOPPY WRITE PROTECT
SYSTEM NAME ERROR
CANNOT USE KANA!!
DISK FULL
IDENTICAL SYSTEM NAME
CANNOT SET

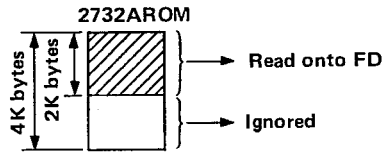
(9) The sequence of display screens is as shown below:



POINT

Any empty ROM areas are not read onto disk, if they are outside the specified memory area.

Example: Assume that the common area (2K bytes) is stored on a 2732A ROM:

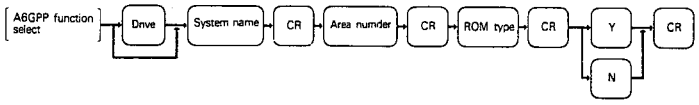


4.5.9 FDD ↔ ROM

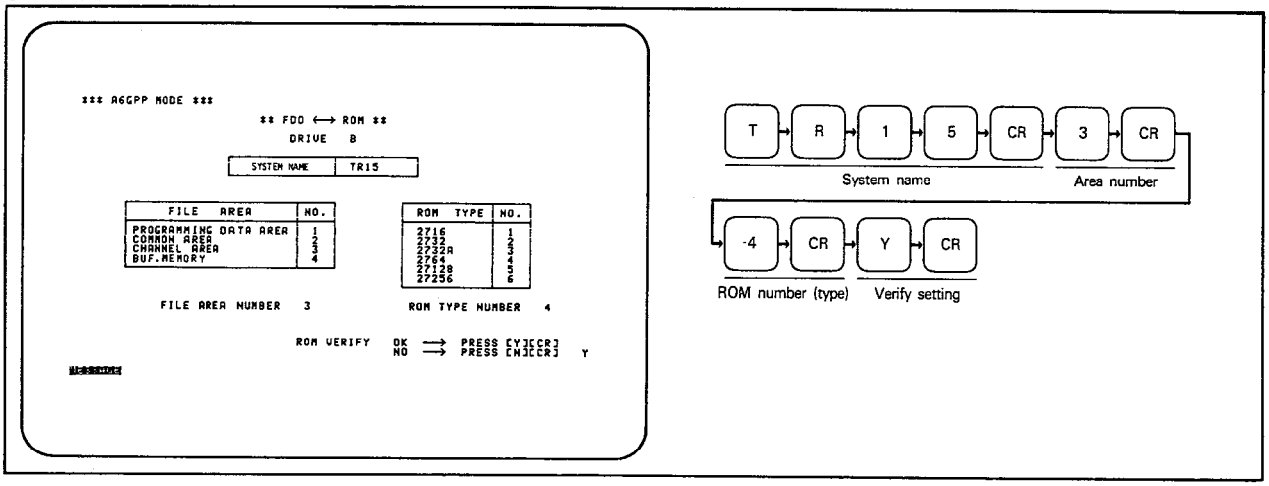
Verifies the specified memory area contents on FD with ROM data.

GPP	HGP	General-purpose I/O console	A6GPP FDD → ROM
○	×	×	

BASIC OPERATION



OPERATING PROCEDURE



EXPLANATION

(1) Data is entered in the following order: [Drive specification] → [System name] → [Area number] → [ROM number] → [Verify specification].

(2) To enter data press [CR] and the cursor moves to the next data item (not for drive setting).

(3) The drive setting defaults to "B". To change to "A" press [↑] and [A].

(4) During execution of the function, a series of "✳" are displayed to indicate progress. One "✳" indicates 2000 bytes. The message "COMPLETED" indicates that the process has been completed without fault.
"VERIFY ERROR" indicates that the data is unmatched.

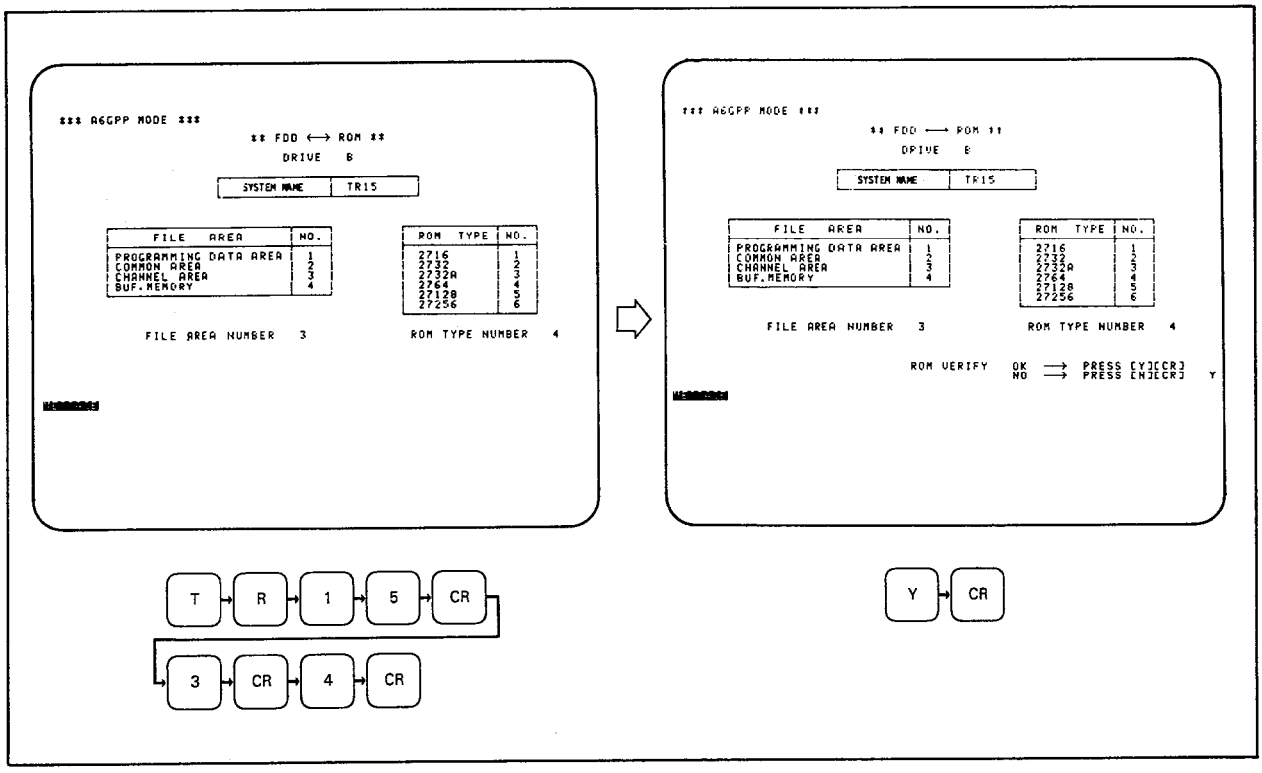
(5) The message "SIZE UNMATCH (ROM < FILE)" indicates that the ROM is too small for the specified data.

(6) Pressing [CAN] returns to the GPP mode select screen.

(7) See Section 5 for error codes applicable to this section:

Error Message
FLOPPY ERROR
SYSTEM NAME ERROR
NO FILE
CANNOT USE KANA!!
VERIFY ERROR
SIZE UNMATCH (ROM < FILE)
CANNOT SET

(8) The sequence of display screens is as shown below.

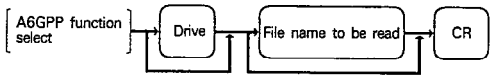


4.5.10 File directory

Lists the file names on the disk.

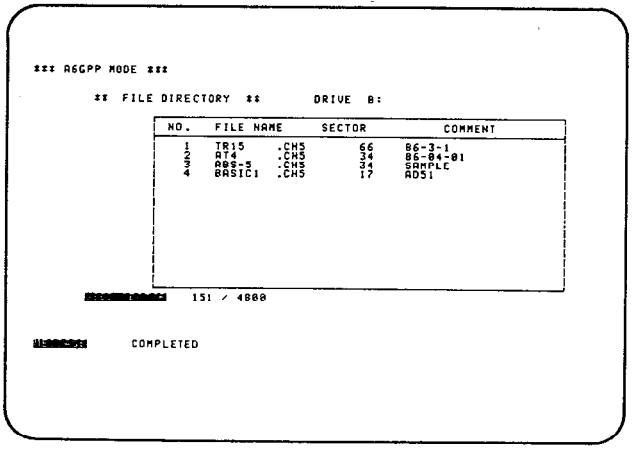
GPP	HGP	General-purpose I/O console	A6GPP FILE DIRECTORY
○	○	×	

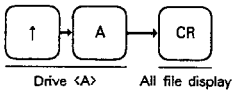
BASIC OPERATION



*: The HGP does not require drive setting.

OPERATION PROCEDURE





EXPLANATION

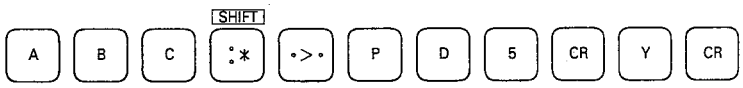
(1) To list all file names on the disk press [CR].

(2) The drive setting defaults to "B", to select "A" Press [←], [A].

(3) The display screen shows the first 15 lines, to read the next 15, press [CR]. The comment (where entered) is displayed next to the file name.

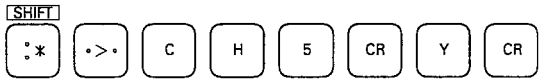
POINT

The directory may also be read by specifying a file name which includes "Wild cards" (i.e. ✳).
For example:
1)



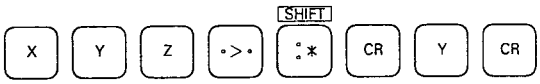
Reads all file names with first three characters "ABC" and identifier PD5.

2)



Reads all file names with identifier CH5.

3)



Reads all file names with system name "XYZ".

(4) Pressing CAN returns to the GPP mode select screen.

(5) See Section 5 for error codes applicable to this section:

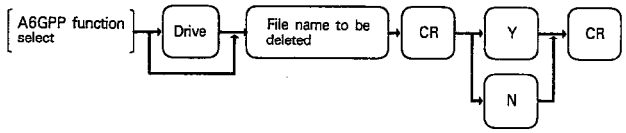
Error Message
FLOPPY ERROR
FILE NAME ERROR
NO FILE
CANNOT USE KANA!!
CANNOT SET

4.5.11 File delete

Deletes files from the disk.

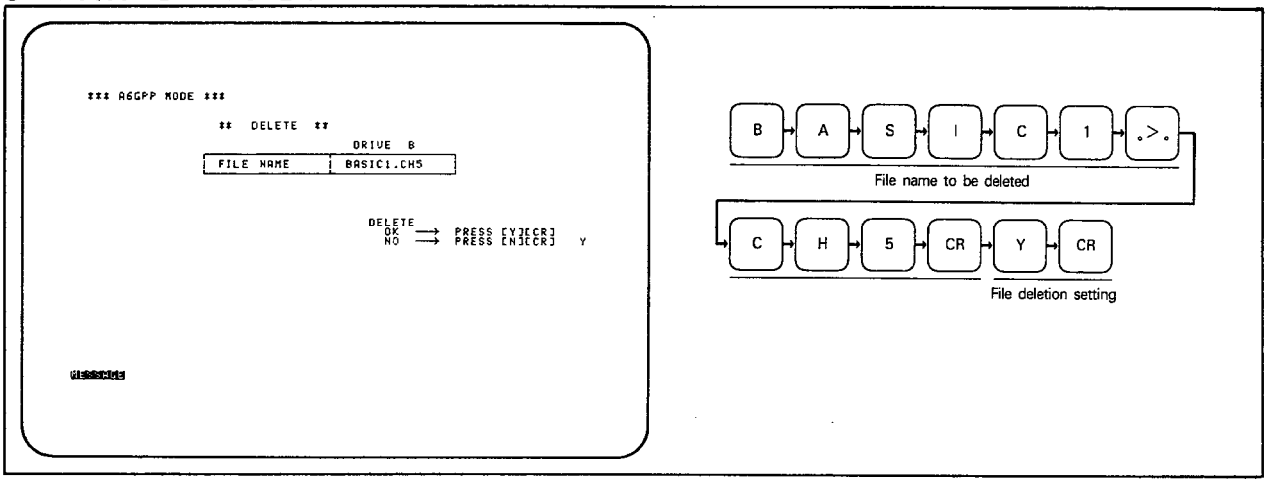
GPP	HGP	General-purpose I/O console	A6GPP FILE DELETION
○	○	×	

BASIC OPERATION



*: The HGP does not require drive setting.

OPERATING PROCEDURE



EXPLANATION

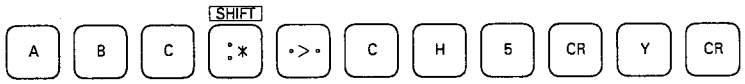
(1) Data is entered in the following order: [Drive specification] → [File name specification] → [File deletion specification].

(2) The drive setting defaults to "B". To change to "A" press [↑] and [A].

POINT

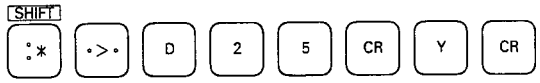
"Wild cards" (i.e. ✳) are allowed in file names for deletion. For example:

1)



Deletes all files with first 3 characters "ABC" and identifier PD5.

2)



Deletes all files with identifier "D25".

3)

Deletes all files with system name "LMN".

(4) Pressing CAN returns to the GPP mode select screen.

(5) See Section 5 for error codes applicable to this section:

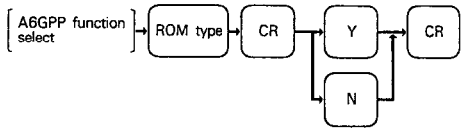
Error Message
FLOPPY ERROR
CANNOT SET
FILE NAME ERROR
NO FILE
CANNOT USE KANA//

4.5.12 ROM erase check

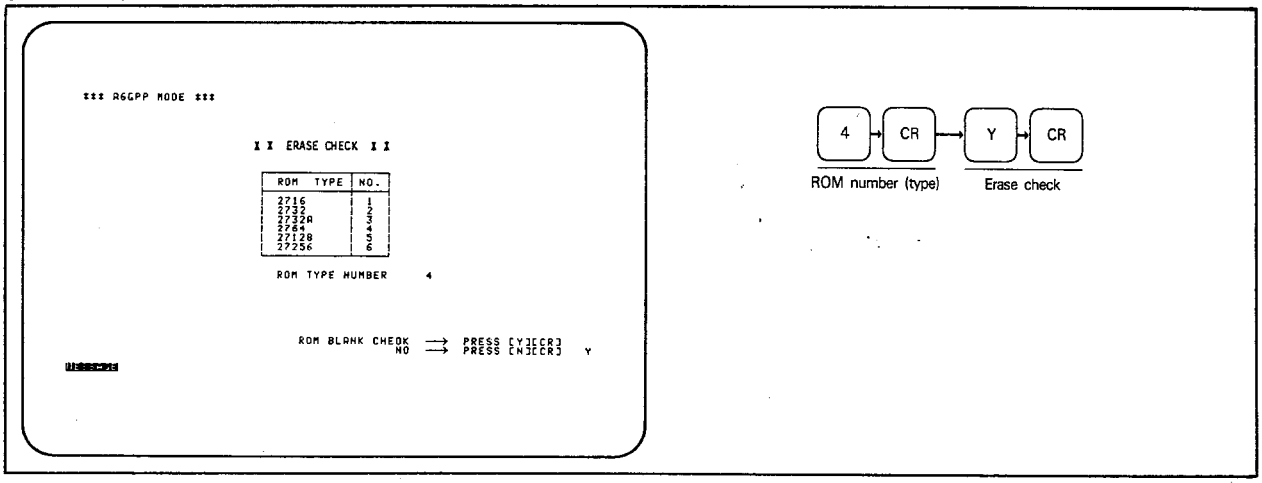
Checks whether the EPROM is blank.

GPP	HGP	General-purpose I/O console	A6GPP ROM ERASE CHECK
○	×	×	

BASIC OPERATION



OPERATING PROCEDURE



EXPLANATION

(1) Data is entered in the following order: [ROM number] → [Erase check specification].

(2) During execution of the function, a series of "*" are displayed to indicate progress. One "*" indicates 2000 bytes. The message "COMPLETED" indicates that the process has been completed without fault.

(3) The message "ROM ERASING ERROR" indicates that there is data on the ROM or that the ROM is faulty.

(4) Pressing [CAN] returns to the GPP mode select screen.

(5) See Section 5 for error codes applicable to this section:

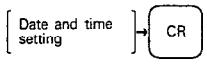
Error Message
ROM ERASING ERROR
CANNOT SET

4.6 Date and Time Setting

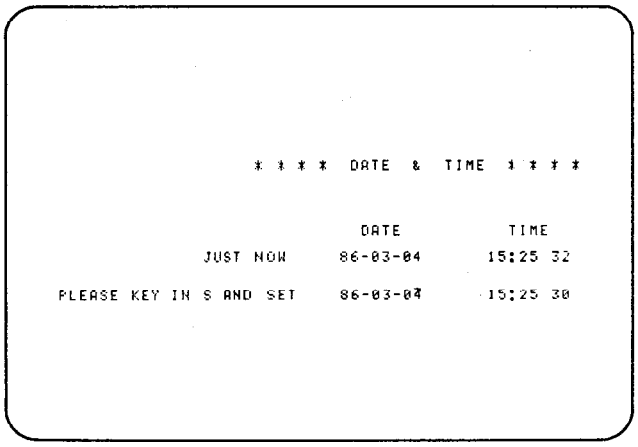
Sets the AD51 real time clock.

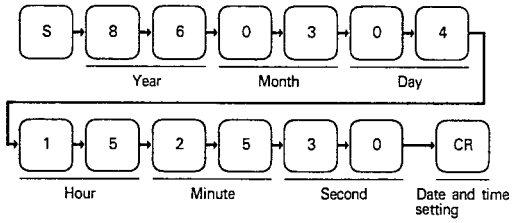
GPP	HGP	General-purpose I/O console	DATE AND TIME SETTING
○	○	○	

BASIC OPERATION



OPERATION PROCEDURE





EXPLANATION

(1) Data is entered in the following order: [S] → [Year] → [Month] → [Day] → [Hour] → [Minute] → [Second] → [CR].
All values must be set using two digits.

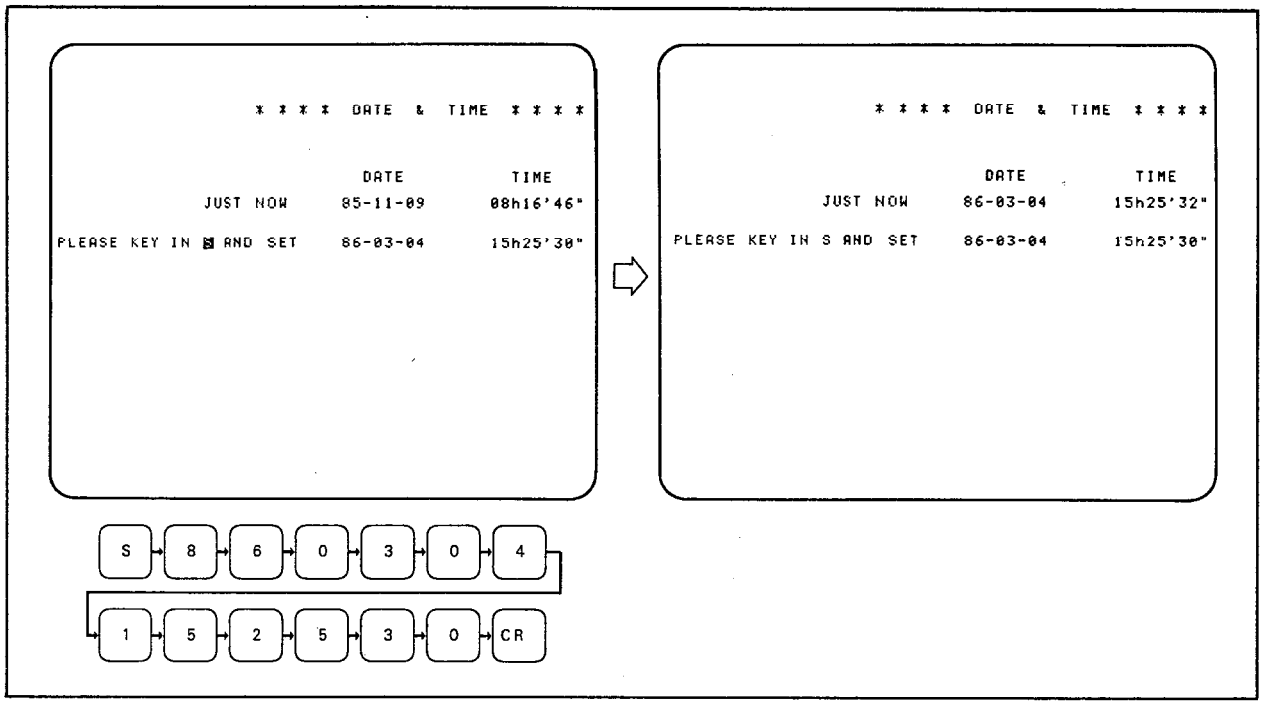
(2) Pressing [S] stops time monitoring and allows data entry. Pressing [CR] loads the new values into the clock and restarts the timer.

(3) See Section 5 for error codes applicable to this section.

Error Message
CANNOT SET

(4) Pressing [ESC] returns the screen to the mode select menu.

(5) The sequence of display screens is as shown below.



5. ERROR MESSAGES

The AD51E generates the following messages. For fault finding procedures, refer to the AD51E User's Manual.

Error Message	Display Screen	Description	Corrective Action
CANNOT SET	Mode select menu	1) Invalid number 2) "1" (MULTI TASK GO) has been pressed before multitask setting, or there is an error in the multitasking data.	1) Correct. 2) Set or correct multitask data.
	BASIC program address data screen	Invalid number	Correct.
	Date and time setting screen	Invalid value	Correct.
	GPP mode	1) GPP mode selected without connecting the GPP to CH1. 2) Invalid number	Correct.
MEMORY PROTECT ERROR	Mode select menu	System data area is memory protected.	Set the memory protect switch to OFF.
DATA ■ SET ERROR	BASIC program address data screen	Program data number "■" is wrong.	Correct.
	Printer setting screen	Printer data number "■" is wrong.	Correct.
ERROR	Multitask setting	Value above "ERROR" is wrong.	When ERROR is indicated below TYPE, START CONDITION, or INTERVAL, correct the value on the screen, checking the allowed range. For other addresses, return to BASIC programming mode and correct.
AD51 BUS ERROR	GPP mode	GPP inaccessible to AD51 buffer.	Try again, if the error persists it may be caused by too frequent accessing of AD51 buffer by the PC CPU. STOP the PC CPU.
AD51 COMMUNICATION ERROR		Communication error between AD51E and GPP	Check cable connection and start up again.
AD51 WRITE ERROR		Memory area is ROM or memory protected.	Select RAM area channel or reset memory protect.
ADDRESS ERROR		Address is outside the allowed range.	Correct.
CANNOT USE KANA!!		Japanese characters have been selected on the initial menu and have been used in a system name.	Re-select character set on initial menu and/or use alphanumeric characters for system names etc.
DISK FULL		Disk capacity exceeded.	Use new disk.
FILE NAME ERROR		Invalid file name for file directory or delete function.	Correct.
FLOPPY ERROR		1) No disk in accessed drive. 2) Disk is write protected. 3) Disk is defective.	1) Insert disk. 2) Set disk write protect tab to OK. 3) Change disk.
FLOPPY WRITE PROTECT		Disk is write protected.	Set disk write protect to tab to OK.
IDENTICAL NAME		The file name has already been used.	Change the file name.
MEMORY NOTHING		Empty memory area has been specified.	Correct the area number.
NO FILE		Specified file is not on disk.	Correct.
ROM ERASING ERROR		ROM has not been erased.	Erase ROM data or use a new ROM.

Error Message	Display Screen	Description	Corrective Action
ROM WRITE ERROR	GPP mode	1) ROM is wrongly loaded or is not loaded. 2) ROM is defective.	1) Check ROM. 2) Write several times. If data cannot be written, change ROM.
SIZE UNMATCH (ROM<FILE)		ROM capacity is smaller than file capacity.	Select appropriate ROM.
SYSTEM NAME ERROR		Invalid name has been specified. (The name includes non-alpha-numeric characters or blank or the first character is not alphabetic.)	Correct.
VERIFY ERROR		Data unmatched.	Correct.
STACK ERROR! AD51 STOP!	Multitask execution	Stack has been used which exceeds the set area.	Up to 10 levels of nesting are allowed when the GOSUB or FOR – NEXT instructions are used.
BTWF ERROR! AD51 STOP!		Task scheduling RAM data has been changed.	Check whether system memory has been accessed by the user program.
WAIT ERROR! AD51 STOP!			
AD51 STOP! TASK NO.		BASIC statement cannot be translated by the interpreter.	Correct BASIC program.
STOP COMMAND AD51 STOP! TASK NO.		STOP command executed.	Remove STOP command or change to END, GOTO, GOSUB, RETURN, ONGOTO or ONGOSUB command.
BREAK COMMAND AD51 STOP! TASK NO.		BREAK command executed.	Remove BREAK command.
TEXT END AD51 STOP! TASK NO.		BASIC program end is not END, GOTO, GOSUB, ONGOTO, ONGOSUB or RETURN command.	Correct.
WHAT?	BASIC programming mode	BASIC programming mode Illogical error detected in BASIC program. *1	Correct.
HOW?			
SORRY		Program area insufficient.	Expand.
ROM OR MEMORY PROTECT AREA! PLEASE DO NOT CORRECT PROGRAM		Program area is ROM or memory protected.	Alarm message *2

POINT

***1: "WHAT" and "HOW" are indicated when:**

1) **An undefined command is used;**
2) **A command description format is wrong;**
3) **A line number is not specified on the left of the GOTO, GOSUB, ONGOTO, or ONGOSUB command; and**
4) **The RETURN command is used without the GOSUB or ONGOSUB command.**

***2: When this message is indicated, do not correct the program. Correction corrupts BASIC program memory address data. The LIST, LLIST and BYE commands may be used when this message is displayed.**
Memory protection can be cancelled to correct a program.

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 satisty yourself as to its suitability for your specific application.

MODEL	AD51E-OPERATION-E
MODEL CODE	13J709

MITSUBISHI ELECTRIC CORPORATION

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