YASKAWA ELECTRIC

SIE-C815-14.9
DESCRIPTIVE INFORMATION

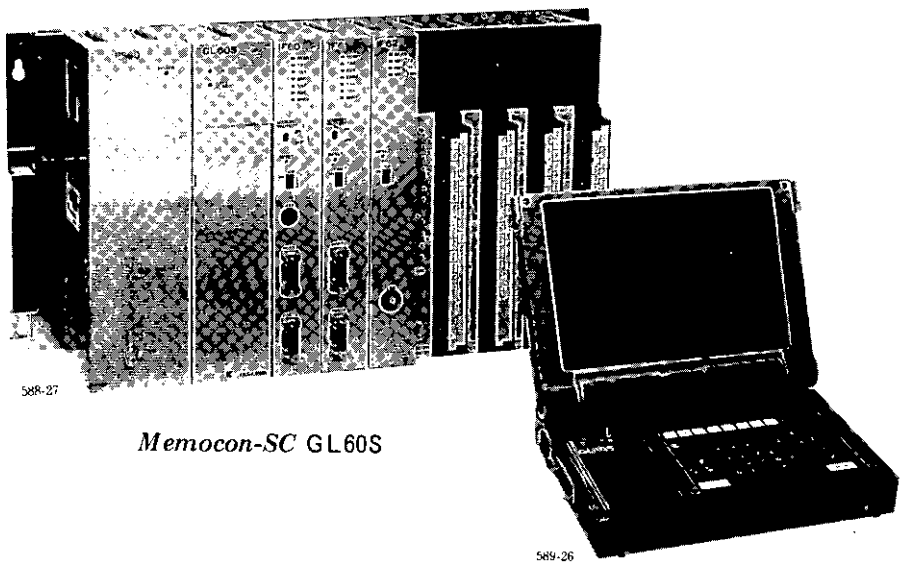
PROGRAMMABLE CONTROLLER
Memocon™-SC GL60S
USER'S MANUAL
P140 PROGRAMMING PANEL

The P140 programming panel is a high-performance portable programming panel incorporating a high-performance microprocessor (using MS-DOS* V2.11 for OS†), and is applicable to all the programmable controllers in the ***Memocon-SC*** series.

The P140 is a user-friendly man-machine interface featuring a large easy-to-read plasma display and two large capacity 3.5-inch floppy disk drives, using various system disks.

This manual summarizes basic functions and operation of the Yaskawa P140 programming panel. For additional information on ***Memocon-SC*** GL60S, refer to the following manuals.

- ***Memocon-SC*** GL60S User's Manual-NO.1
  Design and Maintenance (SIE-C815-14.1)



Memocon-SC GL60S

P140 Programming Panel

*MS-DOS: Trade mark of Microsoft Corp.
†OS: Operation System

NOTE :
1. Inquiries about the information in this manual should be directed to your YASKAWA representative.
2. No part of this manual may be reproduced without permission.

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1.1 P140 CONSTRUCTION

(1) EXTERNAL VIEW

(2) AC POWER SUPPLY CABLE

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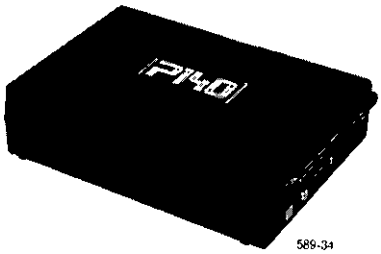
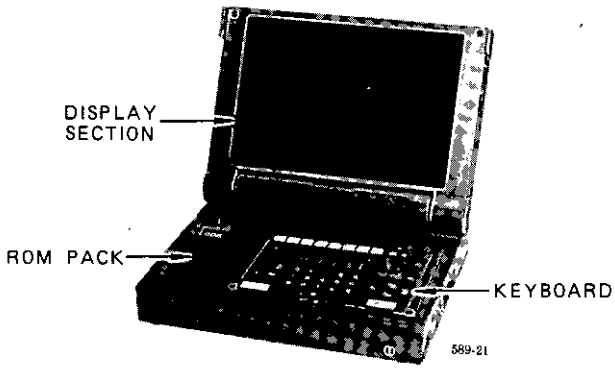
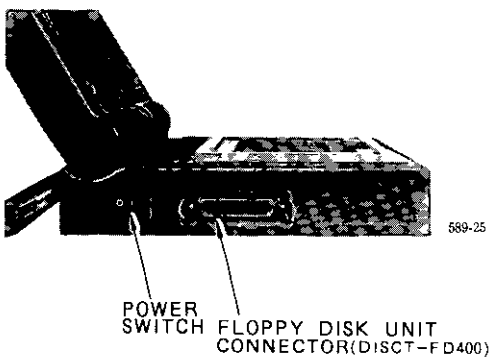


(4) WITH DISPLAY SECTION OPEN



(5) LEFT SIDE



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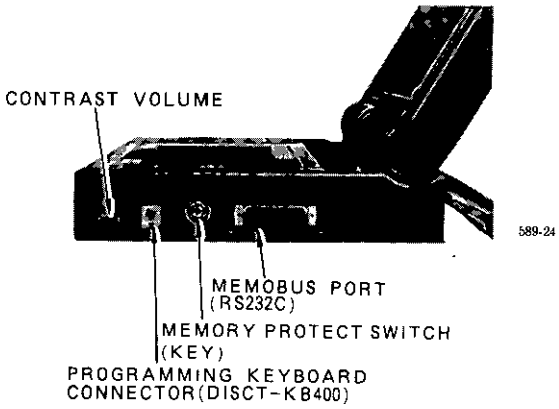


Fig. 1.1 P140 Construction

1.2 P140 DISPLAY DESIGN

1.2.1 SFC (Sequential Function Chart) Display

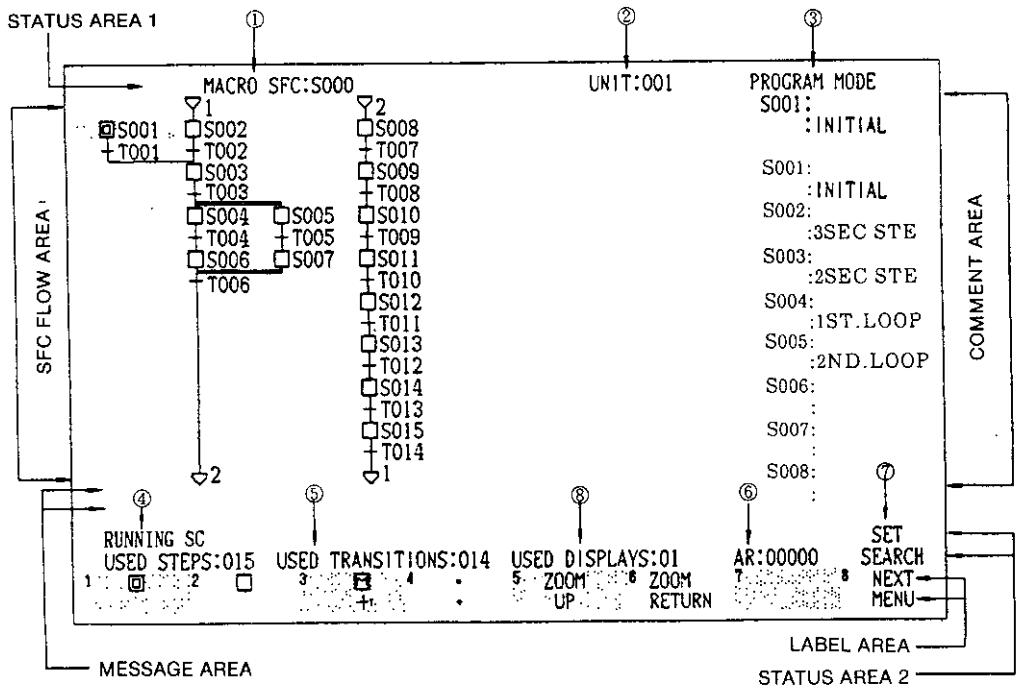


Fig. 1.2 SFC Display

(1) SFC FLOW AREA

In the area, SFC flow (only one macro SFC specified) stored in GL60S is displayed.

(2) COMMENT AREA

Comment area consists of a cursor monitor area (top position) and eight reference specified area. Comment input to step can be easily found in this area.

(3) MESSAGE AREA

Various messages for giving instructions to the operator and to indicate the operating state of P140, and various error messages are displayed here.

(4) LABEL AREA

The functions of the variable function keys [F1] through [F8] at the top of the keyboard are displayed here. ([F9] and [F10] are not used.)

(5) STATUS AREA

Displays the followintg 8 types of data.

① MACRO SFC: S□□□
Master Step No. of the macro SFC currently displayed.

② UNIT: □□□
The unit number of the attached GL60S.

③ □□□□□□□□ MODE
The operation mode:
- PROGRAM
- MONITOR

④ USED STEP: □□□
The number of steps used.

⑤ USED TRANSITION: □□□
The number of transitions used.

⑥ AR: □□□□□
The contents of the assembly register (AR) storing the values set by the keyboard are displayed.

⑦ SET SEARCH
The cursor is positioned in this section of the screen when search parameters are to be set.

⑧ USED DISPLAYS: □□
The number of displays used.

1.2.2 Ladder Diagram Display

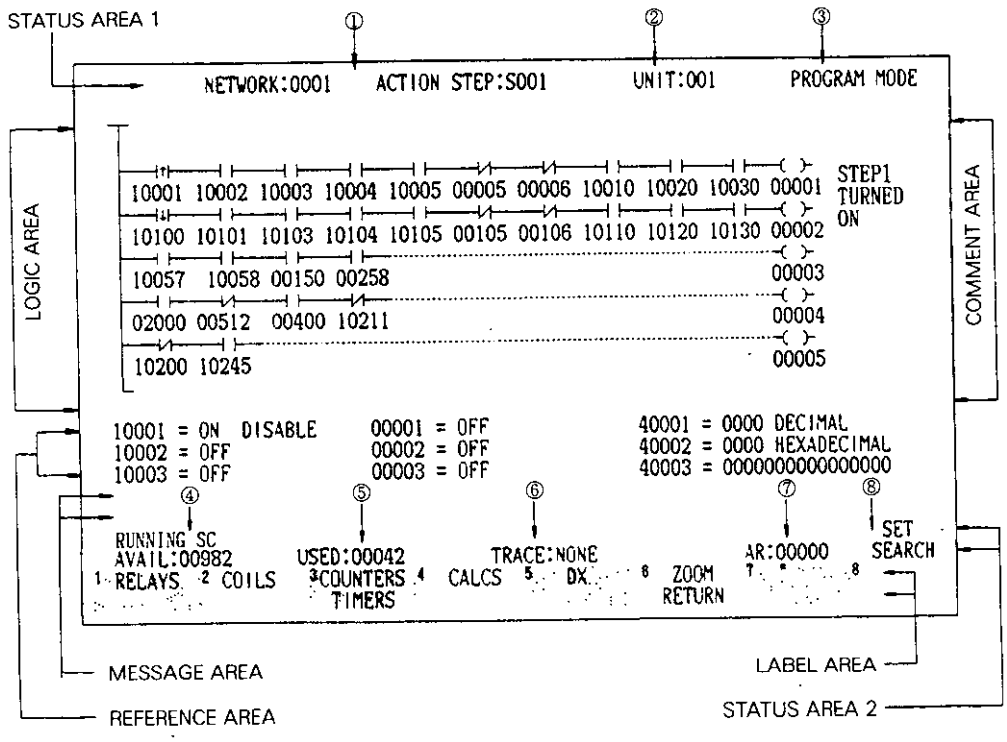


Fig. 1.3 Ladder Diagram Display

(1) LOGIC AREA

Displays network stored in GL60S memory. One specified network will be diplayed.

(2) REFERENCE AREA

Displays the status of discrete signal (coil and input relay) and contents of register in GL60S. Up to 9 (3 lines × 3 columns) status and contents are displayed.

By replacing the logic area with the expanding reference area or the expanding comment area, display of 51 max (17 lines × 3 columns) status and contents is available for the expanding reference area, and 27 max (9 lines × 3 columns) for the expanding comment area. To replace the area, refer to Table 1.1 for key functions.

(3) COMMENT AREA

Coil comment in use is automatically displayed in a network displayed (For only CPU module with expansion memory). (Option) Model: DDSCR-GL60S3

(4) MESSAGE AREA

Various messages for giving instructions to the operator and to indicate the operating state of P140, and various error messages are displayed here.

(5) LABEL AREA

The functions of the label keys [F1] through [F8] at the top of the keyboard are displayed here.

(6) STATUS AREA

Displays the following 8 types of data.

① NORMAL LADDER DIAGRAM (LADDER) ⟶ NETWORK: □□□□
LADDER SEG: □
ACTION DIAGRAM (ACTION) ⟶ NETWORK: □□□□
ACTION STEP: □□□
TRANSITION DIAGRAM (TRANSITION) ⟶ T□□□
SUBROUTINE DIAGRAM (SUBROUTINE) ⟶ NETWORK: □□□□
SUBROUTINE: □□□

② UNIT: □□□
The unit number of the attached GL60S.

③ □□□□□□□□MODE
The operation mode.

④ AVAIL: □□□□□
The total number of words of memory which have not been used and are still available.

⑤ USED: □□□□□
The total number of words of memory which have been used.

⑥ TRACE: □□□□
The number of networks currently in the trace stack.

⑦ AR: □□□□□
The contents of the assembly register (AR) storing the values set by the keyboard are displayed.

⑧ SET SEARCH
The cursor is positioned in this section of the screen when search parameters are to be set.

1.3 KEYBOARD

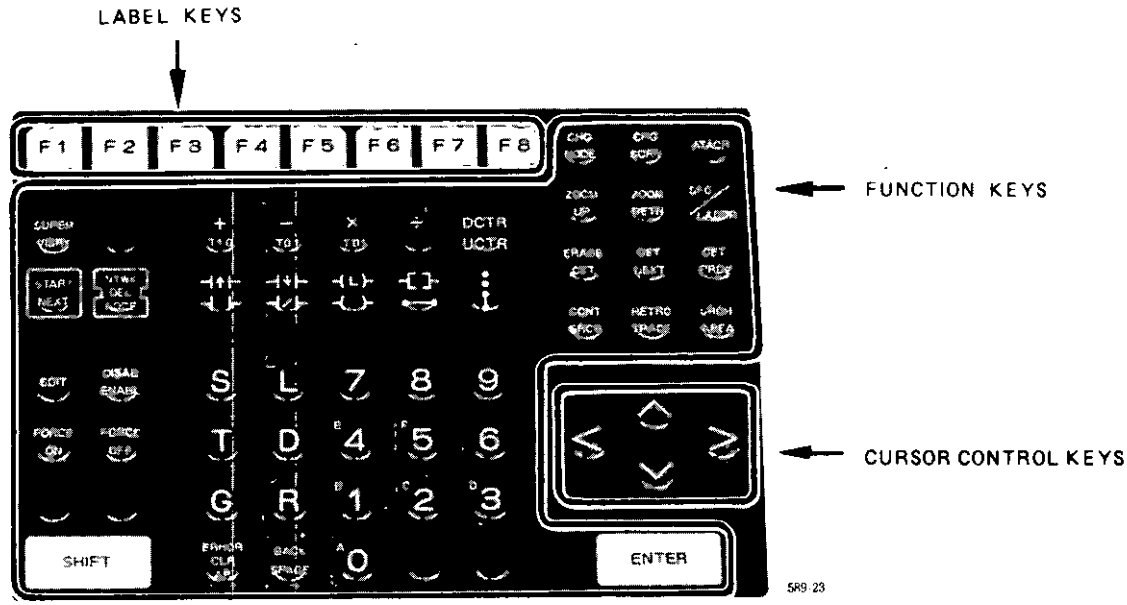


Fig. 1.4 Keyboard

(1) CURSOR CONTROL KEYS

∧	The cursor is shifted one position upward when this key is depressed.
∨	The cursor is shifted one position downward when this key is depressed.
<	The cursor is shifted one position leftward when this key is depressed.
>	The cursor is shifted one position rightward when this key is deperessed.

While these keys are kept deperessed, the cursor continuously moves.

(2) LABEL KEYS

F1 to F8 The functions of these eight keys are defined by the program, and are indicated by the labels in the display.

(3) FUNCTION KEYS

Table 1.1 Function List of Function keys

Key Designation	Function
SUPER VISRY	In the write-in mode and monitor mode, depressing this key calls up the display (main screen) for the supervisory functions (e.g., GL60S stop, start).
SHIFT + SUPER VISRY	Depressing these keys simultaneously causes the panel to make the initial display. This operation is required for mode change.
START NEXT	• On the logic screen A new network is inserted after the network displayed in the logic area. The power line and the cursor are displayed in the left part of the screen to start a new network. • On the SFC screen Depressing this key after zooming a macro step, which contains no expanded view, creates an expanded view of the macro step. The screen displays a macro entry and the cursor for creation of a new expanded view.
NTWK DEL NODE	• On the logic screen The node (element) at the cursor is deleted from the displayed network. A vertical shunt, if present, is also deleted. • On the SFC screen The node (element) at the cursor is deleted from the displayed SFC. A branch and a loop, if present, are also deleted.
SHIFT + NTWK DEL NODE	• On the logic screen The network displayed in the logic area is deleted, and the next network is automatically displayed. If the deleted network was the last in memory, the next to the last network is displayed. If these two keys are held down too long, a few networks may be deleted. (Use the label keys F7 (CONFIRM) and F8 (CANCEL) together with this function.) • On the SFC screen The SFC displayed in the SFC area is deleted, and the screen returns to the state before the SFC was stored. (Use the label keys F7 (CONFIRM) and F8 (CANCEL) together with this function.)
EDIT	The following edit functions are enabled : • On the logic screen Network expansion and compression in horizontal and vertical directions, network displacement, and network copying. • On the SFC screen Deletion of action circuits and transition condition circuits, SFC expansion and compression in horizontal and vertical directions, SFC displacement, and SFC copying.
RETRC TRACE	When the cursor is on a relay contact referencing a coil, the trace function causes the network that drives the referenced coil to be displayed. To access the trace function, depress this key. • When the cursor is on a register, the register content is displayed. • When the cursor is on a contact, ON/OFF status for input relay is displayed.
SHIFT + RETRC TRACE	The retrace function allows the user to return to the network that was displayed prior to performing a trace. To access the retrace function, depress these keys.

Table 1.1 Function List of Function keys (Cont'd)

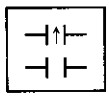
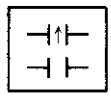
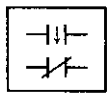
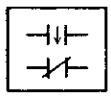
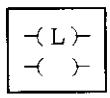
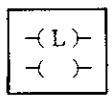
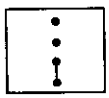
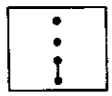
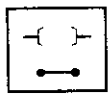
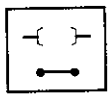
Key Designation	Function
CHG SCRN	Depressing this key switches the display mode. The logic and comment display screen is switched to the extended reference display screen.
SHIFT + CHG SCRN	The logic and extended reference display screen is switched to the comment display screen.
CONT SRCH	Depressing this key causes the panel to display the first network containing the complete or partial node specified in the search parameters or the SFC. This key must be depressed after each network or SFC is displayed in order to continue the search.
SHIFT + CONT SRCH	Depressing these keys simultaneously causes the panel to display the next network or the SFC, continuing the search. These keys must be depressed after each network or SFC is displayed in order to continue the search.
ATACH	Use this key to start conversation with the CPU. This key supports the same function as the label key (ATTACH).
SRCH AREA	Depressing this key moves the cursor to the search data area.
ERASE GET	Depressing this key with a network number or a reference number set in advance in AR displays the follows : • Specified network (when the cursor is in the logic area or in the SFC area) • Reference number (when the cursor is in the reference area)
SHIFT + ERASE GET	The network or reference indicated by the cursor will be erased from the screen when these keys are depressed simultaneously. The ERASE function affects the P140 panel screen only; it does not affect the memory of the attached controller.
GET NEXT	The network or reference following the one currently displayed on the screen is displayed by depressing this key. • When the cursor is in the logic area, next network is displayed. • When the cursor is in the reference area, next reference is displayed.
GET PREV	The network or reference before the one currently displayed on the screen is displayed by depressing this key. • When the cursor is in the logic area, previous network is displayed. • When the cursor is in the reference area, previous reference is displayed.
CHG NODE	This key is used when writing and altering networks, and when setting search data. Depressing this key changes the label area display to the function group select display.

Table 1.1 Function List of Function keys (Cont'd)

Key Designation	Function
SHIFT + ERROR CLR AR	Depressing this key deletes the error message displayed in the message area. Whenever an error message is displayed, first depress this key before executing the correct operations.
ERROR CLR AR	Depressing these keys simultaneously clears the assembly register (AR) to 0. These keys can be also erase error messages related to the AR.
ENTER	While the cursor is in the logic area or the SFC area, this key is used to store the AR content as the reference No. or the operand for the element indicated by the cursor. If nothing is in the cursor position, an element type and a vertical shunt (if any) must be specified beforehand. When the cursor is located at a hold register No. in the reference area, this key is used to store the AR content in that hold register.
BACK SPACE	This key is used to shift numerical data input to AR to the right by one character-width.
SHIFT	Similar to the shift key of a typewriter, this key is depressed simultaneously with another character key of the same color.
DISAB ENABL *	Depressing this key releases the disabled state of a contact or coil.
SHIFT + DISAB ENABL *	Depressing these keys at the same time places a contact or coil into the disabled state.
FORCE ON *	Depressing this key forcibly turns on a contact or coil in the disabled state.
FORCE OFF *	Depressing this key forcibly turns off a contact or coil in the disabled state.
ZOOM UP *	This key is used to change the display of an SFC step or transition symbol to an operating circuit or transition condition circuit. It is also used to change the display of a ladder subroutine symbol to a subroutine circuit.
ZOOM RETN *	This key is used to change the display of an SFC operating circuit or transition condition circuit to the corresponding step or transition symbol. It is also used to change the display of a subroutine circuit to the ladder subroutine symbol.
SFC / LADDR	Depressing this alternate key enables a change in the display of a ladder circuit to an SFC circuit, and vice versa.

* : The same set of label keys are provided on the CRT unit. Deciding which key of two identical keys to be used is not important.

Table 1.1 Function List of Function Keys (Cont'd)

Key Designation	Function
 *	Selects ⊣ ⊢ (NO contact) of relays.
SHIFT  *	Selects ⊣↑⊢ (transitional contact OFF to ON) of relays.
 *	Selects ⊣/⊢ (NC contact) of relays.
SHIFT  *	Selects ⊣↓⊢ (transitional contact ON to OFF) of relays.
 *	Selects -( )- (coil) of coil.
SHIFT  *	Selects -(L)- (latch coil) of coil.
 *	Selects vertical short ⋮ .
SHIFT  *	Selects vertical open ⋮ (vertical short clear).
 *	Selects horizontal short ⟷ . For horizontal short clear, use NTWK DEL NODE key.
SHIFT  *	Depressing this key selects a stepping coil -( )- .
+ T1.0 *	Depressing this key selects the one-second timer.
SHIFT + T1.0 *	Depressing this key selects addition from arithmetic operations.
− T0.1 *	Depressing this key selects the 0.1 second timer.
SHIFT − T0.1 *	Depressing this key selects subtraction from arithmetic operations.

* : The same set of label keys are provided on the CRT unit. Deciding which key of two identical keys to be used is not important.

Table 1.1 Function List of Function Keys (Cont'd)

Key Designation	Function
[× T.01] *	Depressing this key selects the millisecond timer.
[SHIFT] [× T.01] *	Depressing this key selects multiplication from arithmetic operations.
[SHIFT] [÷] *	Depressing this key selects division from arithmetic operations.
[DCTR UCTR] *	Depressing this key selects the up counter.
[SHIFT] [DCTR UCTR] *	Depressing this key selects the down counter.

* : The same set of label keys are provided on the CRT unit. Deciding which key of two identical keys to be used is not important.

2. P140 SPECIFICATIONS

2.1 BASIC SPECIFICATIONS

Table 2.1 Basic Specifications

Item	Specifications
Power Supply *	85 to 132 VAC, single phase, at 47.5 to 63 Hz.
Dissipated Power *	50 VA
Ambient Temperature †	+5 to +40℃
Storage Temperature †	−20 to +60℃
Humidity *	20 to 80% RH (non-condensing)
Atmosphere *	No inflammable or corrosive gases or no excessive dust.
Grounding *	Grounded via GL60S ground line with specified communication cable.
Dielectric Strengh †	1500 VAC for 1 minute
Insulation Resistance †	50 MΩ and above at 500 VDC

*Data measured with disk inserted in P140.
†Data measured with no disk inserted in P140.

2.2 PERFORMANCE SPECIFICATIONS

Table 2.2 Performance Specifications

Item		Specifications
Type		DISCT-P140-10
CPU		μPD70322 (8 MHz)
ROM		128 k bytes
Kanji ROM		JIS primary standard 2965 characters
Display Screen		Liquid crystal display, white, size 218 × 139 mm
Display Capability	Character Attribute	Reverse, blink
	Graphic Display	640 × 400 dots
Flat keyboard		61 keys
Floppy Disk Drive Interface		Connection to FDD unit (FD400)
Serial Interface		One RS-232C (MEMOBUS)
Programming Keyboard Interface		For connection of programming keyboard (KB400)
Memory Protect Key		For switching program/monitor modes
ROM Pack		Built-in system program (depends on the target model)
Dimensions in mm (in.)		330 (13) W × 84 (3.31) H × 305 (12) D
Approx Weight		3.5 kg

2.3 SPECIFICATIONS OF ROM PACK

The ROM pack is a memory module containing programming software for the target PC. Select a ROM pack depending on the target model.

(1) SPECIFICATIONS

Table 2.3 Specifications

Item	Specifications
Type No.	P60S-E001 Memocon-SC GL60S
Memory	ROM 512 kB, EEROM 2 kB

(2) HANDLING ROM PACK

① Do not touch the connector pins on the back of the ROM pack.
② Turn off the power before replacing the ROM pack.
③ Be sure the connector is fully inserted.

2.4 SPECIFICATIONS OF PROGRAMMING KEYBOARD

The programming keyboard is used for entering comments and saving file names, and for loading a user program to P140 using an FDD unit. This keyboard is also used for the ACGC 400 series.

Table 2.4 Specifications

Item	Specifications
Type No.	DISCT-KB400
Interface	Start-stop synchronization (960 baud/sec, 8-bit code with no parity bit)
Dimensions	460 (18.11) W × 36 (1.42) H × 167 (6.57) D in mm (in.)

2.5 SPECIFICATIONS OF FD400

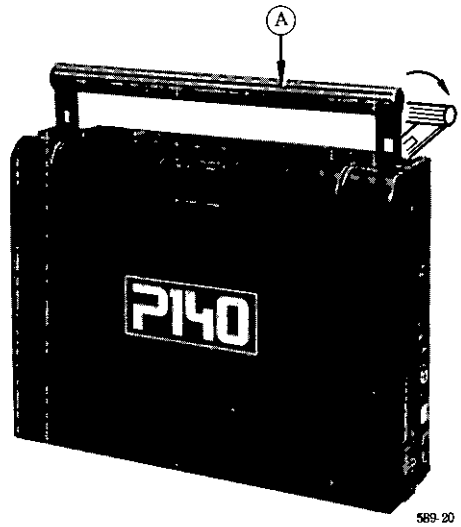
The FD400 is the external memory unit for the P140 and is used for loading and saving user programs.

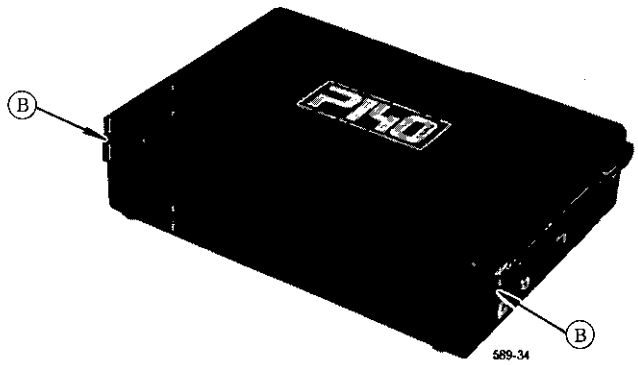
Table 2.5 Specifications

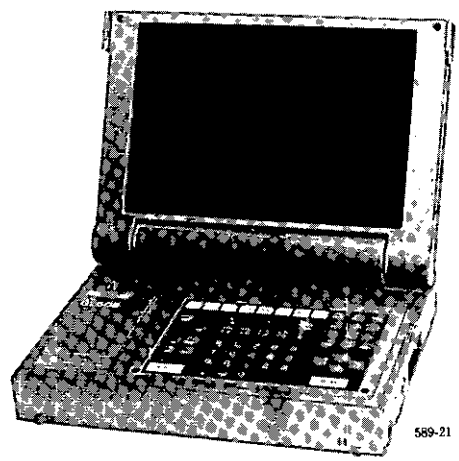
Item	Specifications
Type No.	DISCT-FD400
Drive	YD-686C
Medium	3.5 inch floppy disk (2DD/2HD)
Capacity	1.6 or 1.0 M byte (not formatted)
Format	MS-DOS
Dimensions	150 (5.91) W × 100 (3.94) H × 220 (8.66) D in mm (in.)
Approx Weight	2 kg

2.6 OPENING THE DISPLAY SECTION OF P140

1. Fold the handle Ⓐ and lock it on the bottom.
2. Pull Ⓑ toward you with both hands and lift the display section.
3. Open the display section until it is locked.







2.7 INSERTION AND REMOVAL OF ROM CASSETTE

2.7.1 ROM Cassette Insertion Procedures (➡)

(1) Position the bottom of ROM cassette to ROM cassette' receptacle and lay the cassette down (①).

(2) Press the top of ROM cassette by hand to insure proper insertion (②).

(3) Insertion is completed.

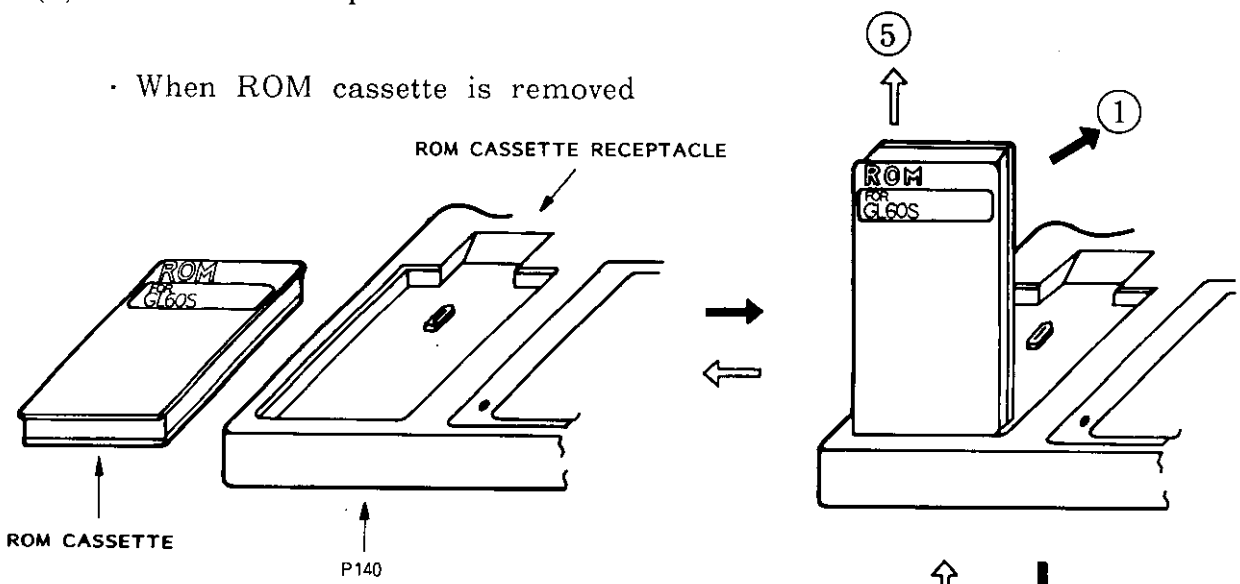
2.7.2 ROM Cassette Removal Procedures (⇨)

(1) Insert a finger under the ROM cassette ③ and lift it up (④).

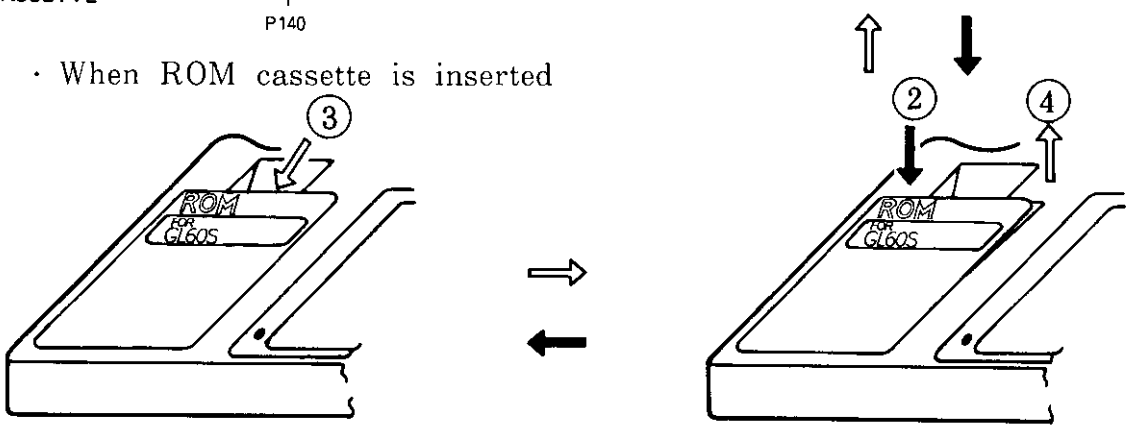
(2) Lift the cassette completely up (⑤).

(3) Removal is completed.

· When ROM cassette is removed



· When ROM cassette is inserted

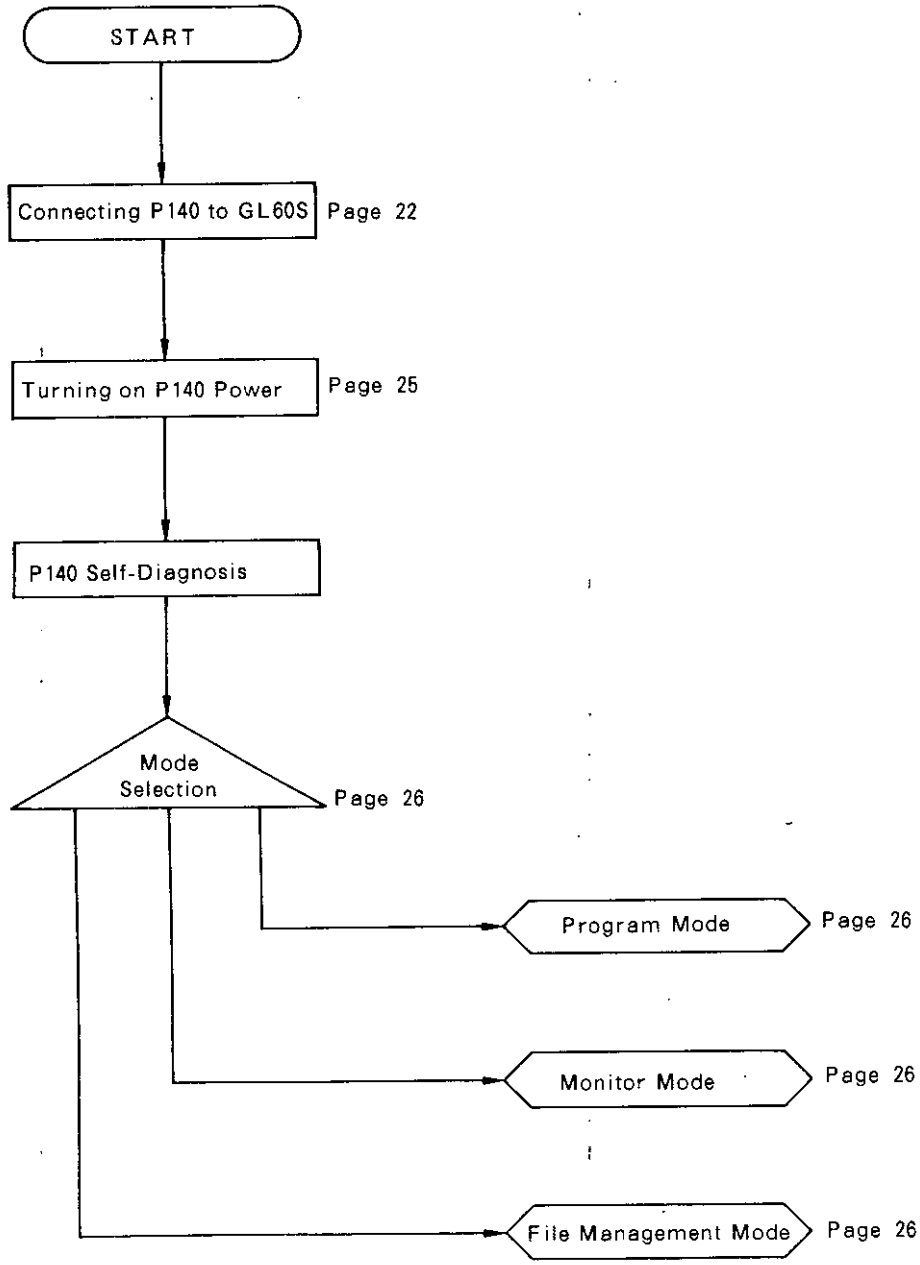


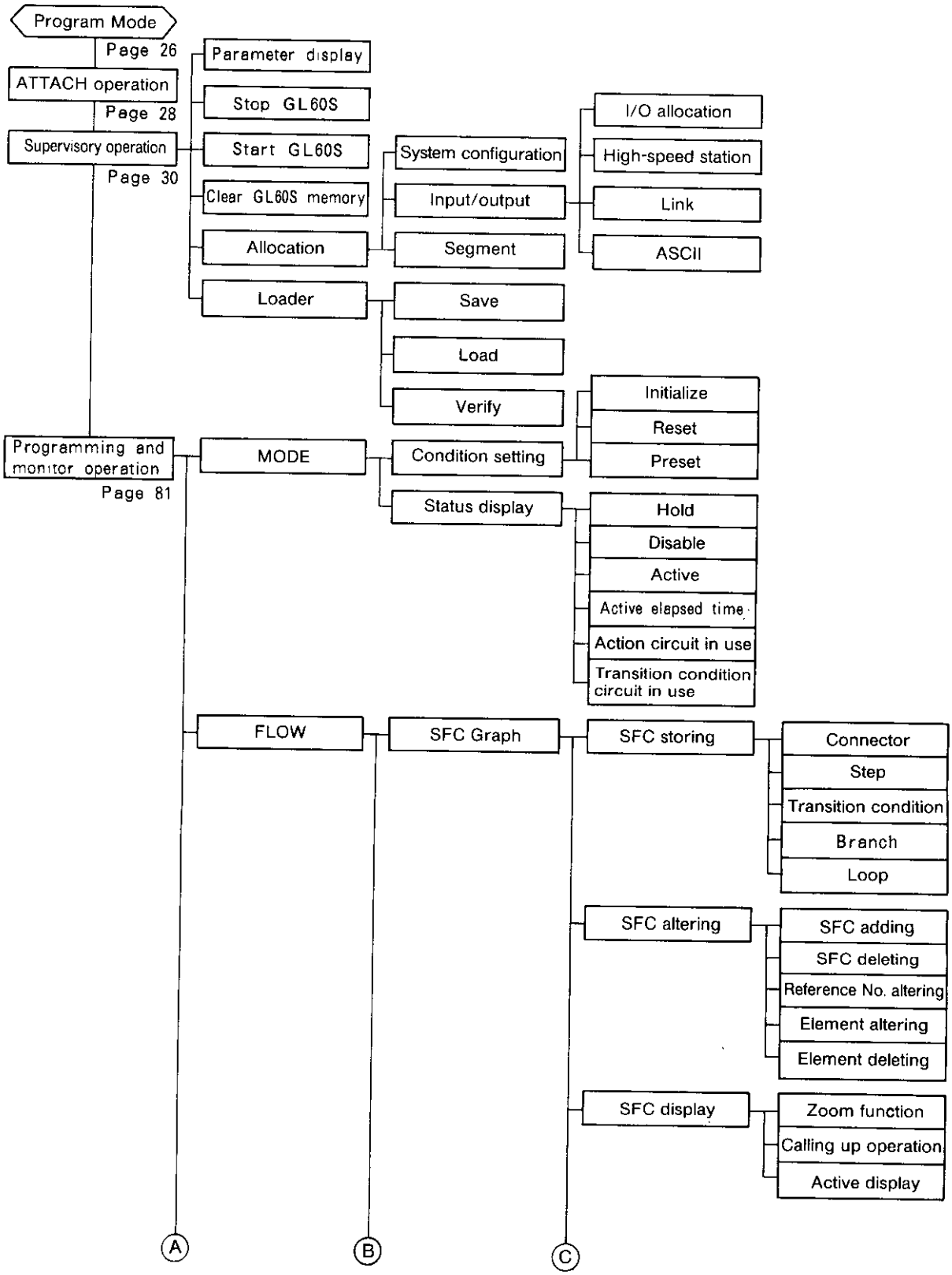
NOTE

· Turn off the power supply for insertion/removal of ROM cassette.
· Do not use metal for insertion/removal of ROM cassette.

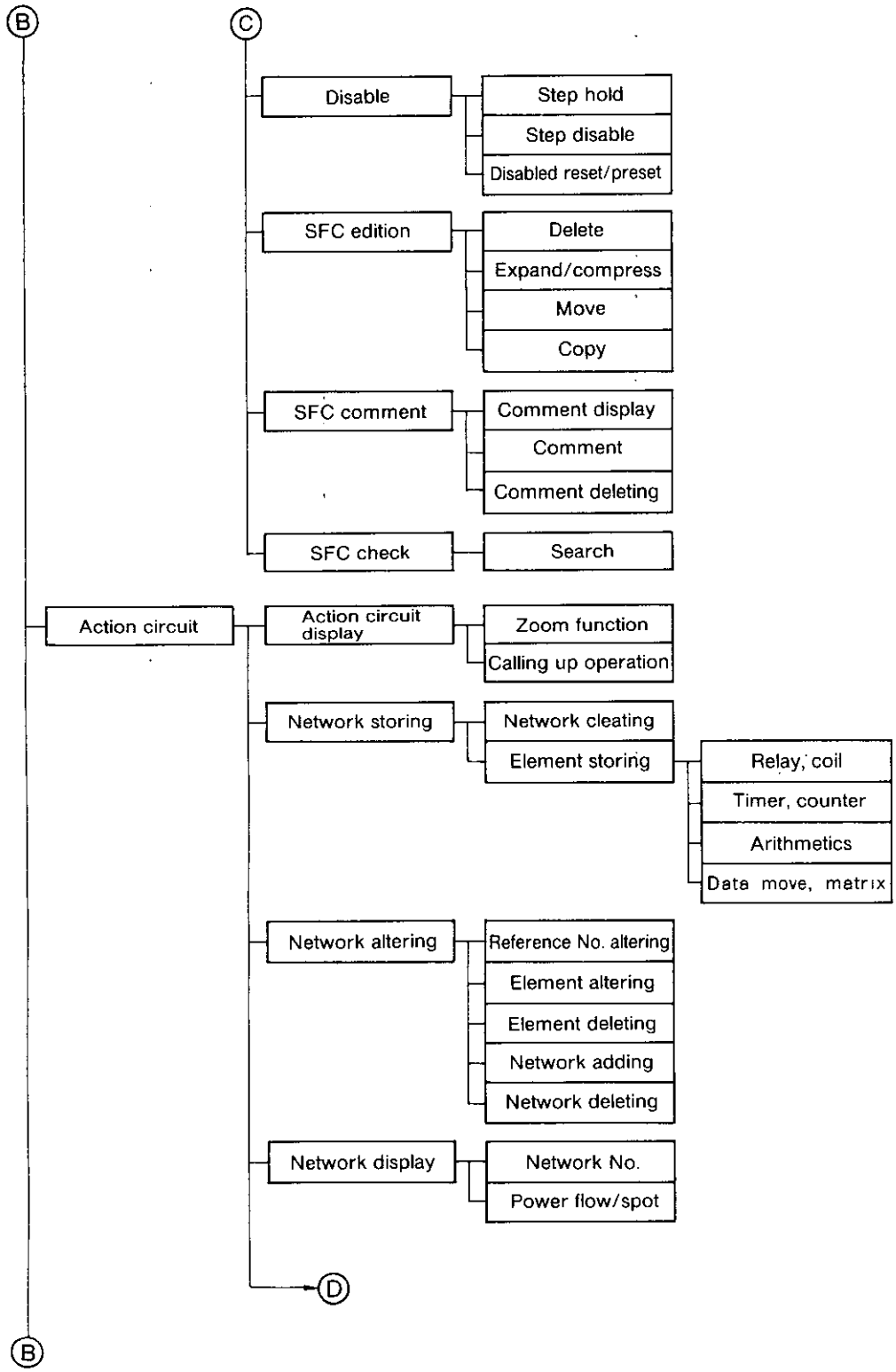
3. PROGRAMMING

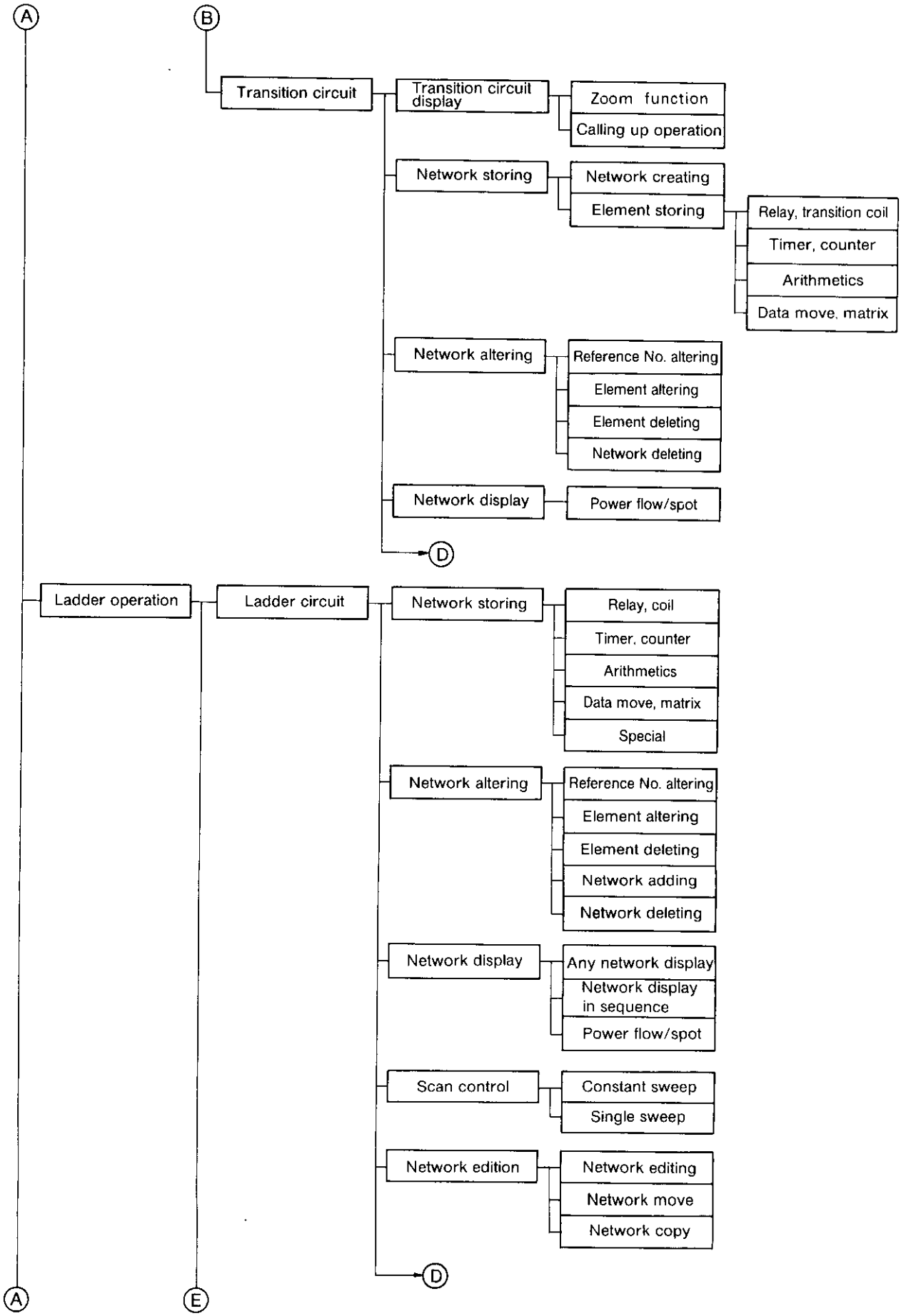
3.1 PROGRAMMING TREE



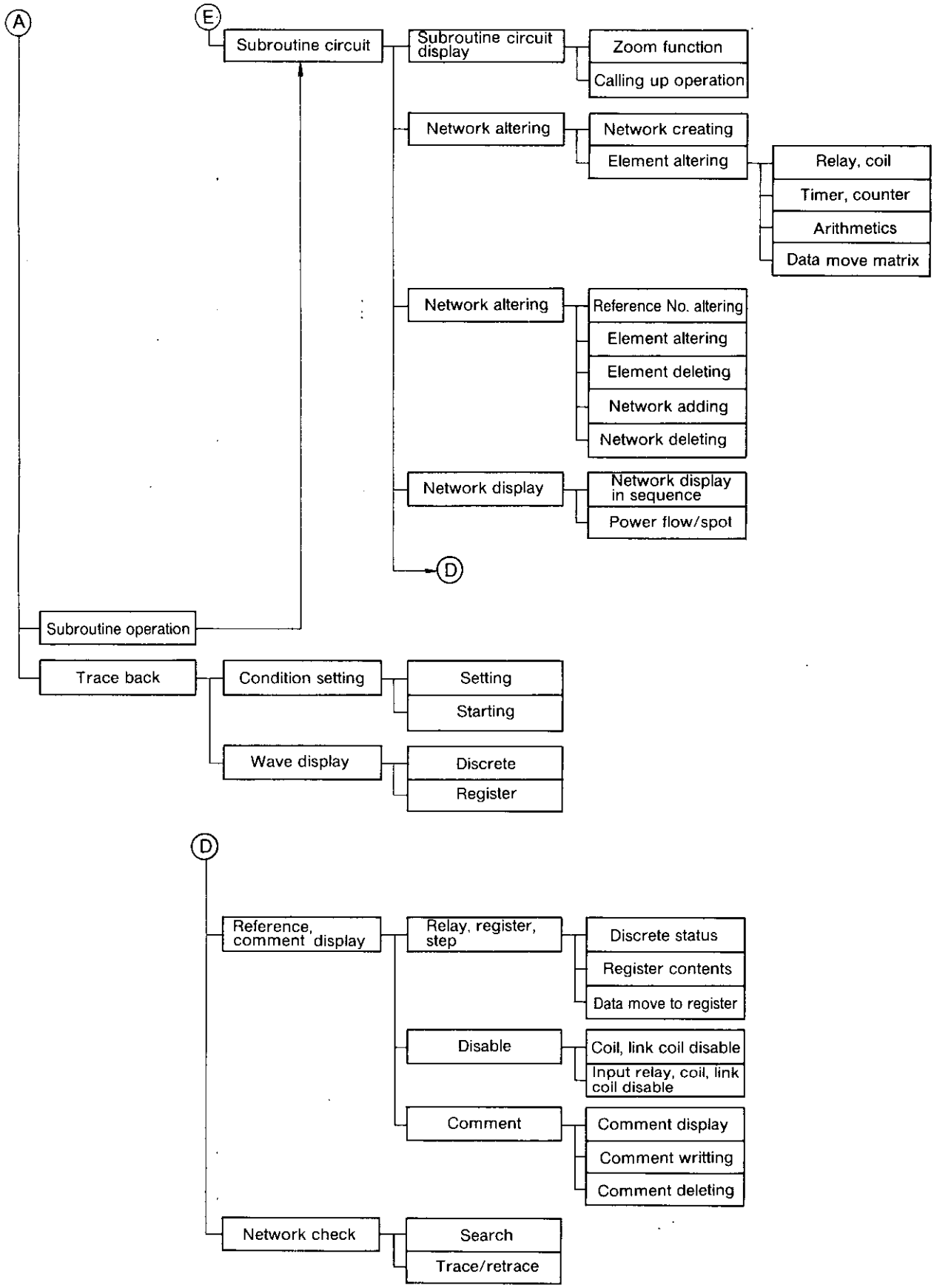

Program Mode
Page 26
ATTACH operation
Page 28
Supervisory operation
Page 30
Parameter display
Stop GL60S
Start GL60S
Clear GL60S memory
Allocation
Loader
System configuration
Input/output
Segment
I/O allocation
High-speed station
Link
ASCII
Save
Load
Verify
Programming and monitor operation
Page 81
MODE
Condition setting
Status display
Initialize
Reset
Preset
Hold
Disable
Active
Active elapsed time
Action circuit in use
Transition condition circuit in use
FLOW
SFC Graph
SFC storing
SFC altering
SFC display
Connector
Step
Transition condition
Branch
Loop
SFC adding
SFC deleting
Reference No. altering
Element altering
Element deleting
Zoom function
Calling up operation
Active display
A
B
C

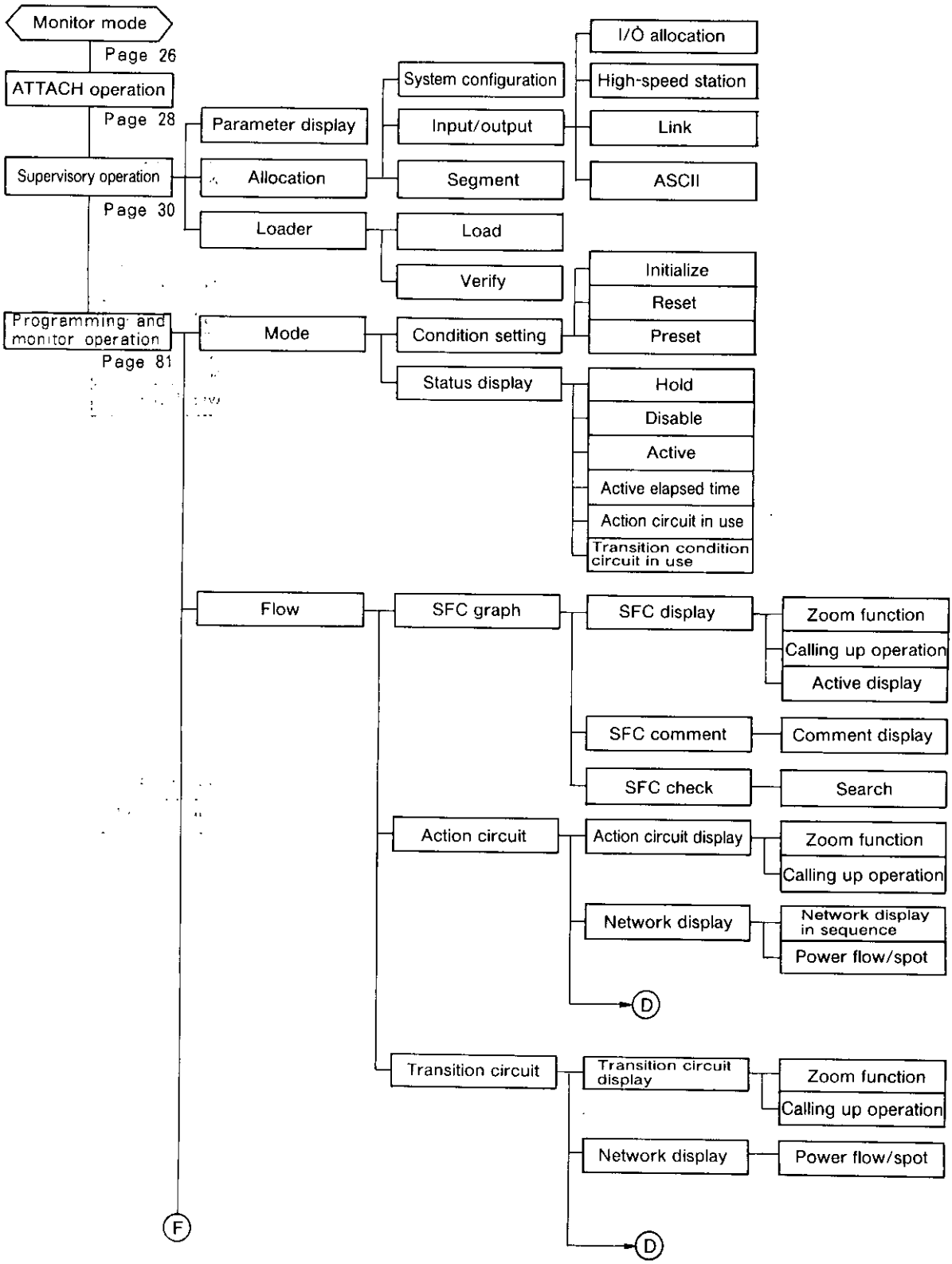
3.1 PROGRAMMING TREE (Cont'd)



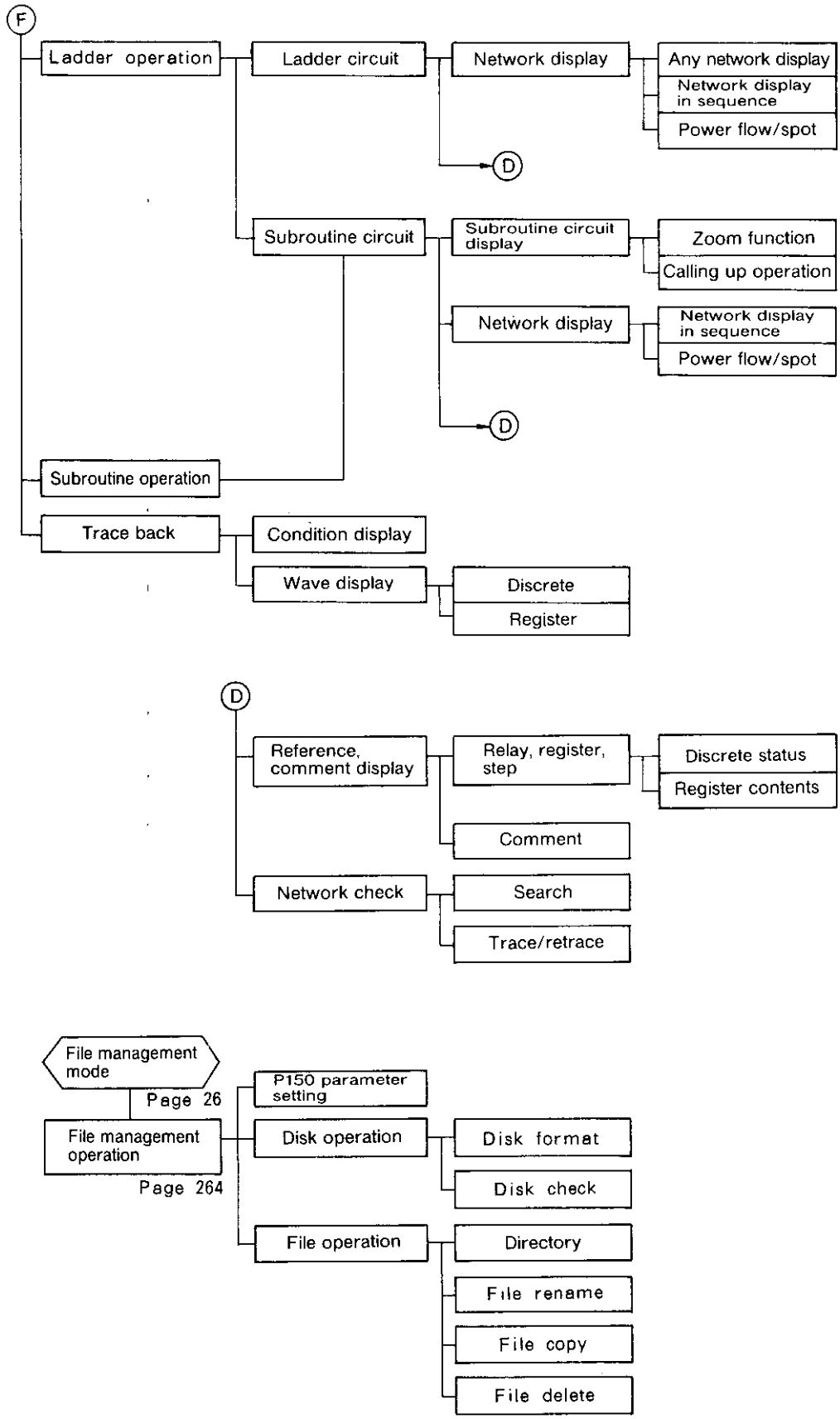

A
B
Transition circuit
Transition circuit display
Zoom function
Calling up operation
Network storing
Network creating
Element storing
Relay, transition coil
Timer, counter
Arithmetics
Data move, matrix
Network altering
Reference No. altering
Element altering
Element deleting
Network deleting
Network display
Power flow/spot
D
Ladder operation
Ladder circuit
Network storing
Relay, coil
Timer, counter
Arithmetics
Data move, matrix
Special
Network altering
Reference No. altering
Element altering
Element deleting
Network adding
Network deleting
Network display
Any network display
Network display in sequence
Power flow/spot
Scan control
Constant sweep
Single sweep
Network edition
Network editing
Network move
Network copy
D
A
E

3.1 PROGRAMMING TREE (Cont'd)




Monitor mode
Page 26
ATTACH operation
Page 28
Supervisory operation
Page 30
Programming and monitor operation
Page 81
Parameter display
Allocation
Loader
System configuration
Input/output
Segment
I/O allocation
High-speed station
Link
ASCII
Load
Verify
Mode
Condition setting
Status display
Initialize
Reset
Preset
Hold
Disable
Active
Active elapsed time
Action circuit in use
Transition condition circuit in use
Flow
SFC graph
SFC display
Zoom function
Calling up operation
Active display
SFC comment
Comment display
SFC check
Search
Action circuit
Action circuit display
Zoom function
Calling up operation
Network display
Network display in sequence
Power flow/spot
D
Transition circuit
Transition circuit display
Zoom function
Calling up operation
Network display
Power flow/spot
D
F

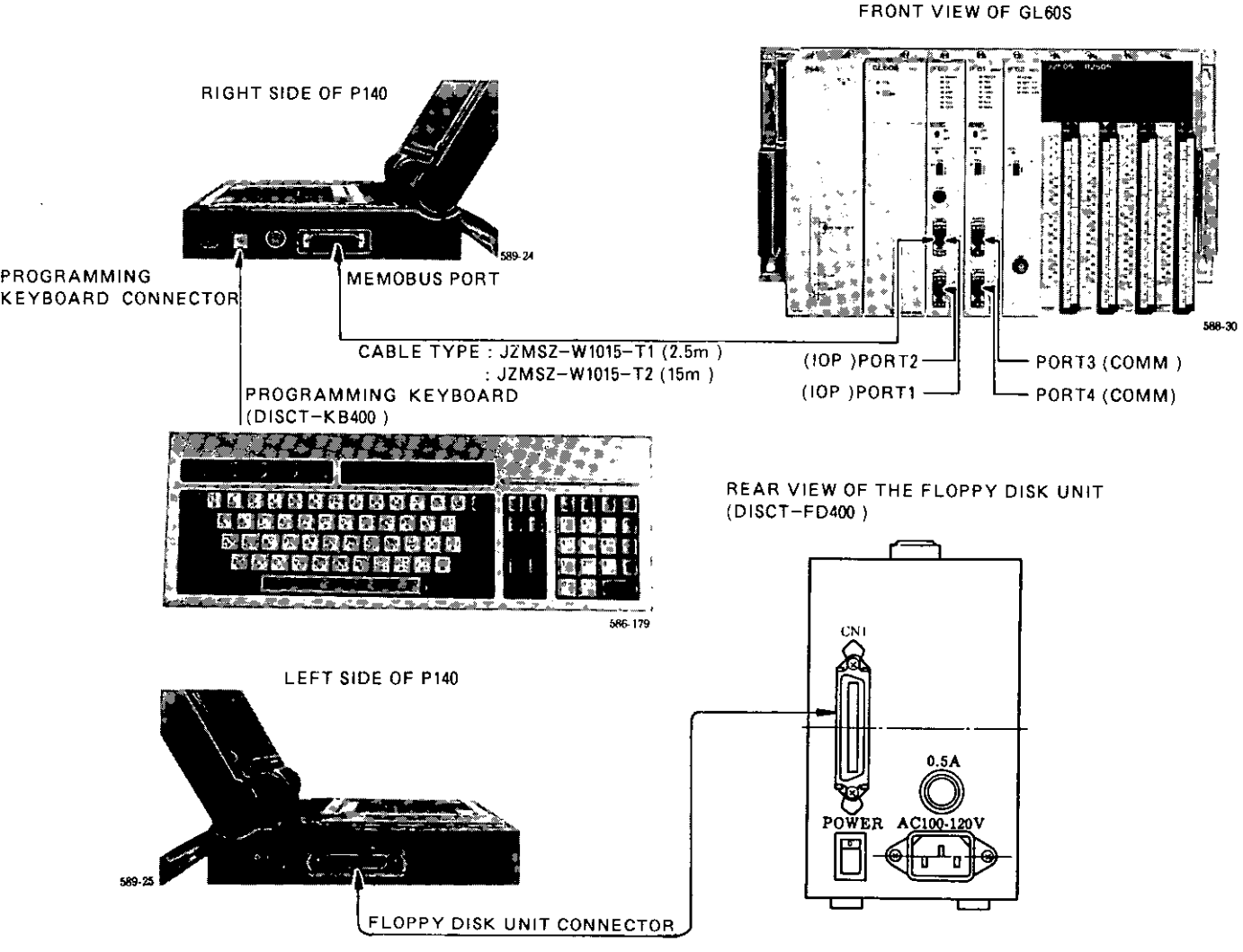
3.1 PROGRAMMING TREE (Cont'd)



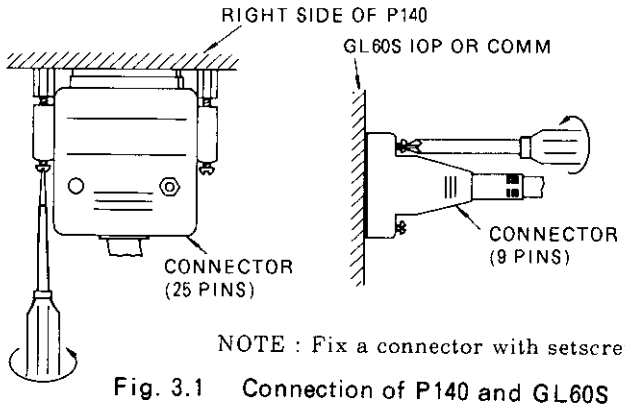
3.2 PREPARATION

(1) CONNECTING P140 TO GL60S WITH PERIPHERAL UNITS

Connect the RS-232C connector of the P140 to the IOP PORT 1 or 2, or COMM PORT 3 or 4 of the GL60S.



- The programming keyboard (DISCT-KB400) is used to input file names and comments for the loader.
- The floppy disk unit (DISCT-FD400) is used for the loader and disk file management.



NOTE : Fix a connector with setscrew so that cable is not disconnected.

Fig. 3.1 Connection of P140 and GL60S

3.2 PREPARATION (Cont'd)

(2) GL60S PORT PARAMETER SETTING

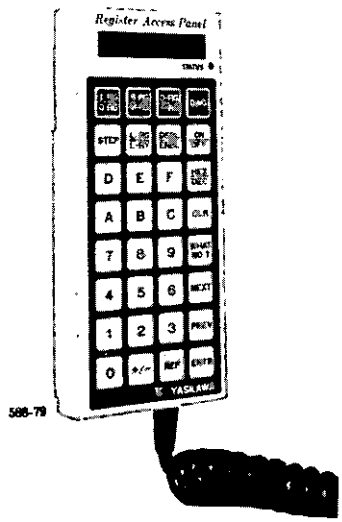
- The procedure for setting the transmission parameters for exchange communications with host computer, P 140 etc. by connecting the GL60S IOP and/or COMM is described here.
- The GL60S IOP and COMM modules are initialized at the factory before shipment to allow both PORT 1, PORT 2, PORT 3 and PORT 4 to be connected unconditionally with P140, making setting correction unnecessary. However, be sure to check for correct setting.
- Without depressing [ENTER] key, the contents cannot be changed.

Setting Item of Communication Parameters by RAP

Items	Description	Indication	Intial Setting
6×0001	Device address	1	1
6×0002	Baud rate	9600	9600
6×0003	Parity check enable	ENABLE	Yes
	Parity check disable	DISABLE	
6×0004	Even parity	EVEN	Even
	Odd parity	ODD	
6×0005	1-stop bit	1	1
	2-stop bit	2	
6×0006	RTU mode (8-bit data)	RTU	RTU
	ASCII mode (7-bit data)	ASCII	
6×0007	Delay count (in unit of 10ms)	000	0

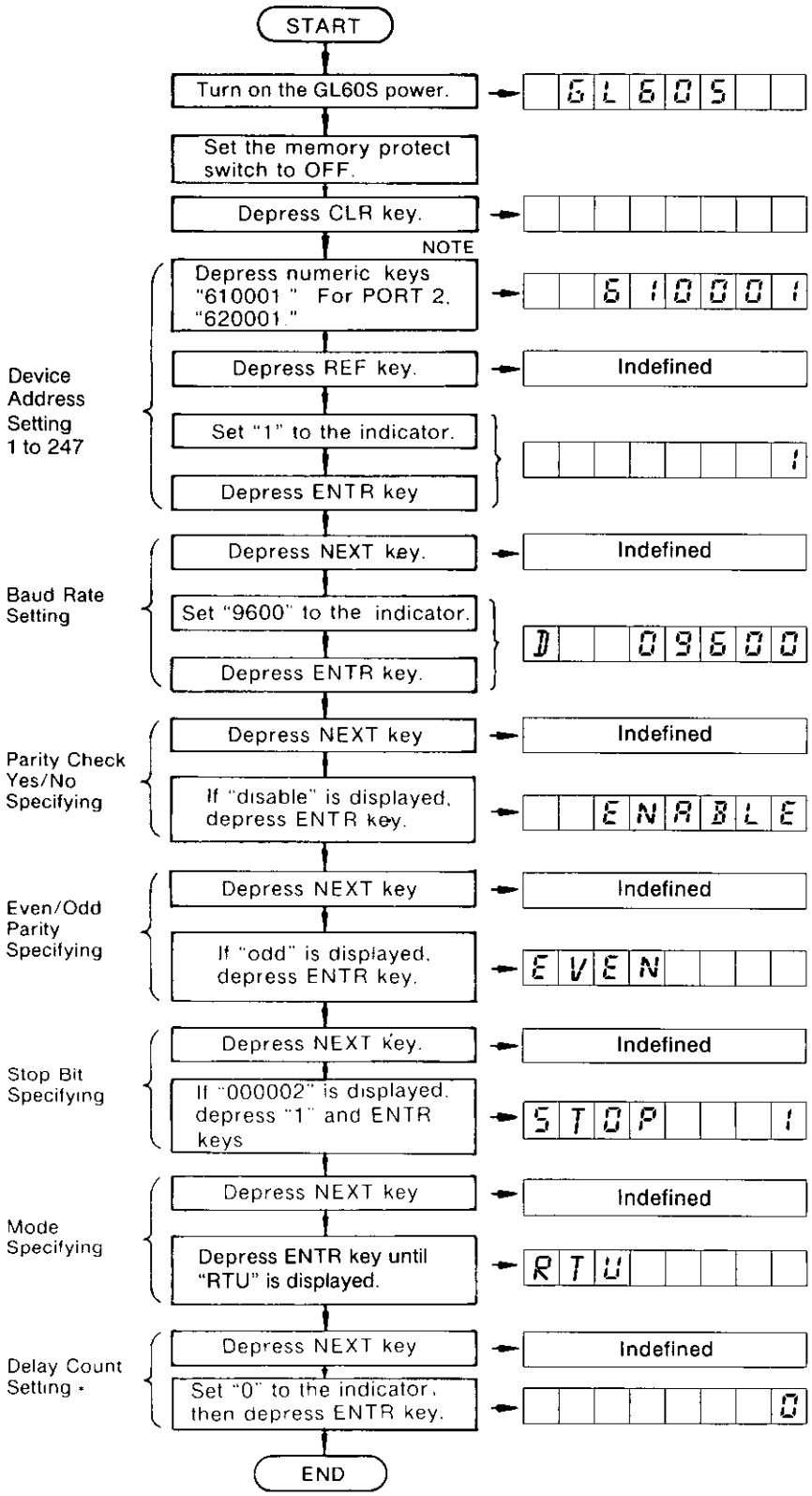
NOTE

1. Any one of port numbers 1 to 4 is put in the "×" position which is the second digit (from the left) of a six-digit number in the items.
2. By inputting the item, the indicator displays it. If the input is in error, depress [CLR] key, then input again.
3. After the item is input, depress [REF] key to display the content of item on the indicator. Then the content of next item is displayed after depressing [NEXT] key.
4. When changing the content set a new content, then depress [ENTR] key.
5. Each port can have different parameters.



REGISTER ACCESS PANEL

Example of GL60S Communication Parameter Setting for Connecting to P140 (For No Initial Setting)

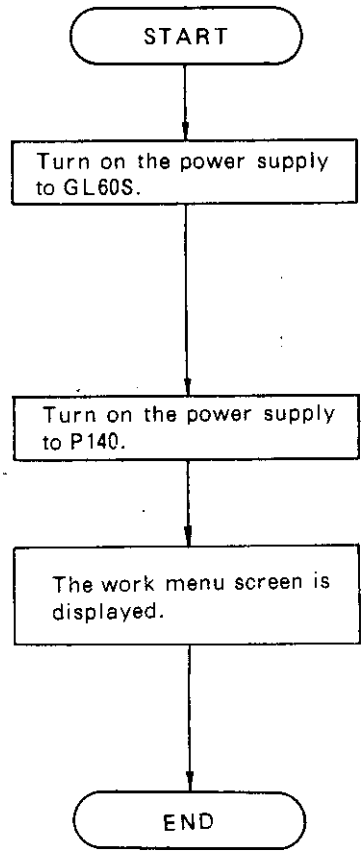


*This function may be used dependent upon the receiving ability of the peripherals by setting a delayed time between the received communication signal and the response of the GL60S. Generally, "0" is set as the delay count.

Note: For PORTS 3 and 4, depress "630001" and "640001", respectively.

3.2 PREPARATION (Cont'd)

(3) TURNING ON P140 POWER

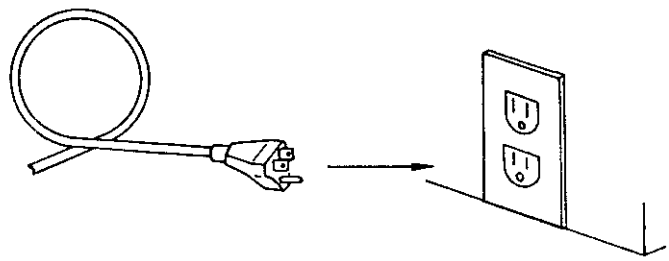


· The RUN indicator lamp goes on after about 5 to 10 seconds.

· Connect the power code to a grounded 100 VAC outlet, then turn on the power switch provided on the left side of the P140.

IMPORTANT

(1) Be sure to plug in the power cable to a 100VAC outlet provided with a grounding terminal.



(2) For longer service life of the liquid crystal display unit, the P140 utilizes an automatic back-light-off function.
Back light of the display automatically goes off when 30 minutes have passed after the last key operation. Depress any key to turn on the back light.

3.3 SELECTION OF OPERATION MODE

PROGRAM MODE: This mode is selected to alter memory contents of GL60S, such as storing and altering SFCs or networks, and altering GL60S status. In this mode, all the program operations are possible, including operations in the monitor mode.

MONITOR MODE: This mode is selected to display the SFCs or networks and GL60S operation status. In this mode, GL60S memory contents cannot be altered. (Accidental or erroneous memory destruction is prevented.)

FILE MANAGEMENT MODE: This mode is selected to check the disk, display file names, delete files and set port parameters etc.

To select the operation modes, use the operation menu (initial display) of P140. Set the memory protect switch provided with each of the P140 and GL60S as specified in Table 3.1.

Table 3.1 Setting of Memory Protect Switch of GL60S

Menu No.	Operation Mode	Memory Protect Switch of GL60S	Protect Switch of P140
1	Program mode	OFF	PRO
2	Monitor mode	ON (or OFF)	NON (or PRO)
3	File management mode	ON (or OFF)	PRO (or NON)

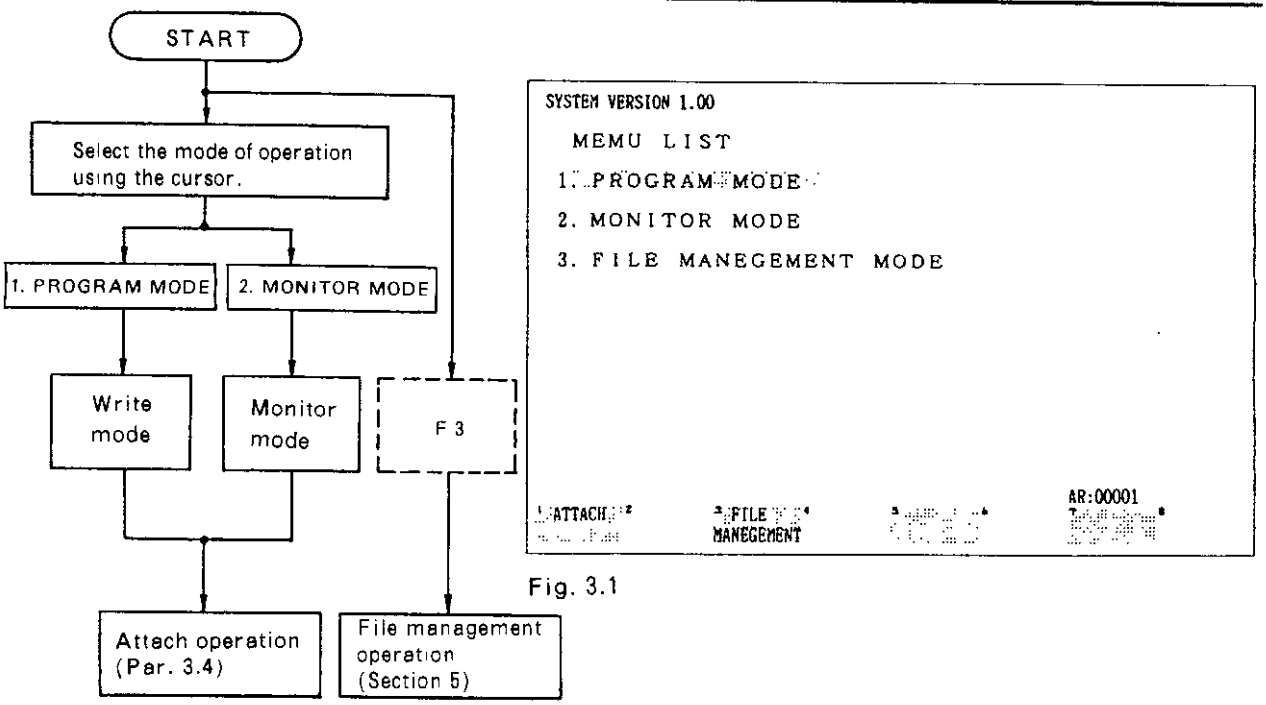


Fig. 3.1

NOTE

The cursor cannot be moved to the FILE MANAGEMENT MODE. To enter this mode, depress the label key F3.

3.3 SELECTION OF OPERATION MODE (Cont'd)

NOTE

1. To clear AR, depress [ERROR CLR AR] key.

2. To change modes after making ATTACH operations, first return to the initial display (Fig. 3.1) and select the menu again. To return the initial display, either depress [SUPER VISRY] key first and then, depress, (INITIAL DISPLAY) key, or depress [SUPER VISRY] key while depressing [SHIFT] key.

Otherwise, change the mode of operation by using the protect switch provided on the P140 to return to the initial screen.

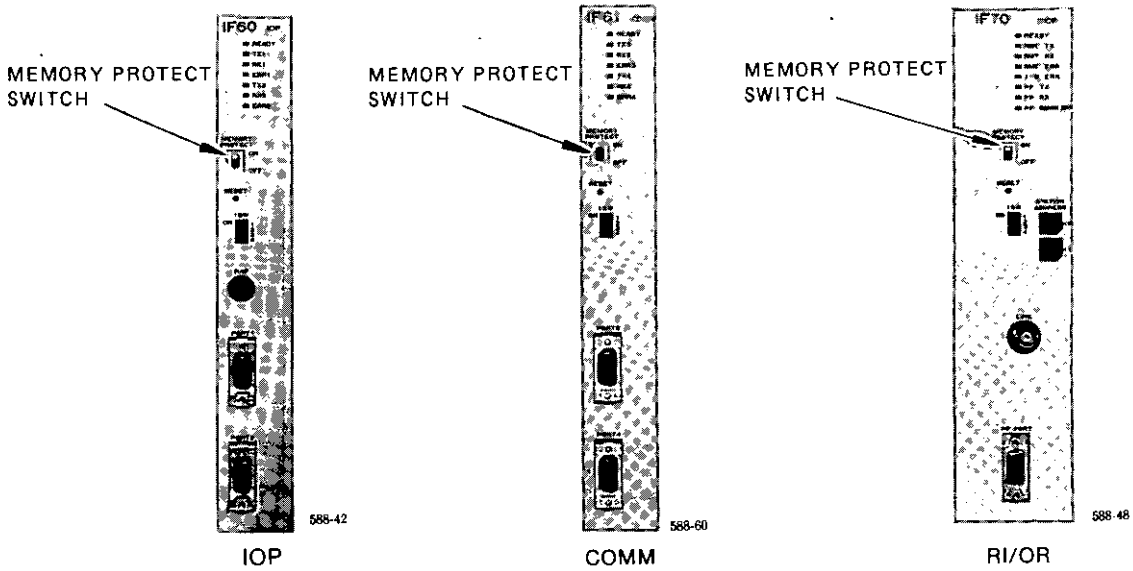


Fig. 3.2 GL60S Memory Protect Switches

IMPORTANT

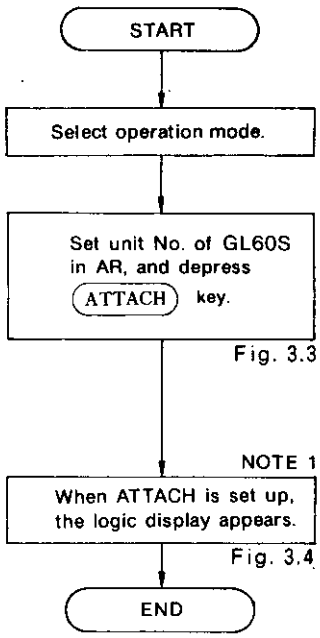
1. Six P140s can be connected to GL60S communication module. However, in this case, only one of them can be used in the program mode and others only in the monitor mode.
2. Even when the GL60S memory protect switch is on, the program mode can be selected. However, memory content altering operations such as storing and altering SFCs or networks, and GL60S status altering are not possible.
3. All the file management mode operations can be executed without connecting to the GL60S.

3.4 ATTACH OPERATION

"ATTACH" means as follows:

· Connect P140 to GL60S by software. Interaction becomes possible only through the ATTACH operation.

The ATTACH operation is required for the program mode and the monitor mode. It is not required for the file management mode.



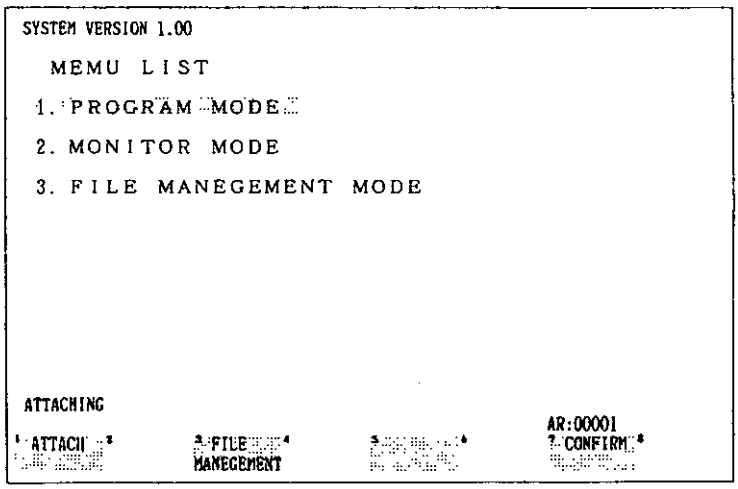


Fig. 3.3

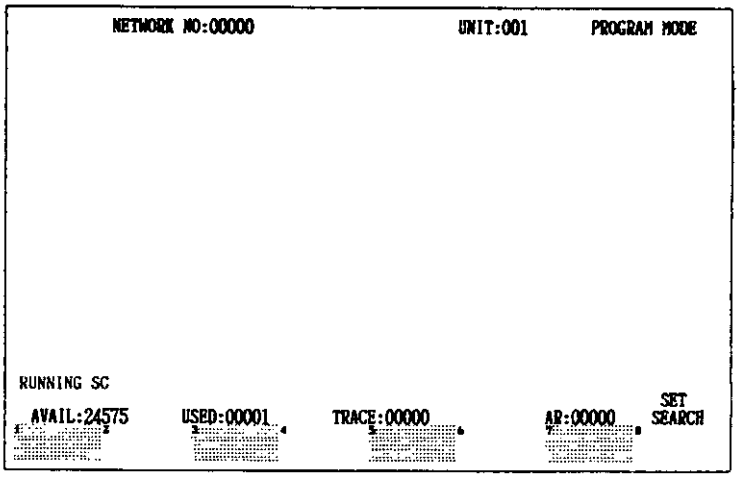


Fig. 3.4

NOTE

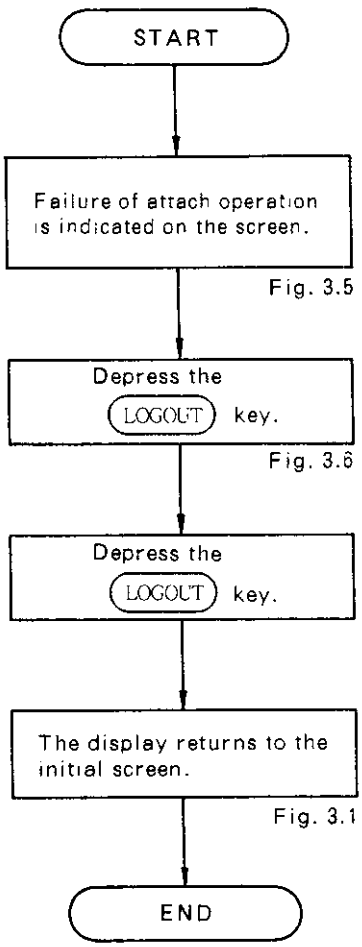
1. If networks are already stored in GL60S, network 1 is displayed after the ATTACH operation.
2. When ATTACH operation is executed, it need not be repeated unless the state before ATTACH (initial display) is re-initialized.
3. The range of unit Nos. is 1 to 247. Unit No. is preset to 1 at the factory.
4. With the display shown in Fig. 3.4, the LADDER programmer can be operated. Either "PROGRAM MODE" or "MONITOR MODE" is displayed in the upper right area of the screen, according to the selected mode.

3.4 ATTACH OPERATION (Cont'd)

5. The state of the CPU, such as RUNNING SC or STOPPED SC, is also displayed on the lower left part of the screen as shown in Fig. 3.4.

6. The [ATTACH] function key is also available for the ATTACH operation marked with *.

7. Even if an ATTACH operation is unsuccessful and the screen displays "OTHER PP HAS ATTACHED IN PROGRAM MODE", attachment to that port can be done forcibly by the following procedure.
   However, attachment to another port is impossible.
   This operation forcibly changes the mode of processing of the PP attached to the port via the YANET or memobus system, from the write mode to the monitor mode. (Indications on the screen are not changed.)



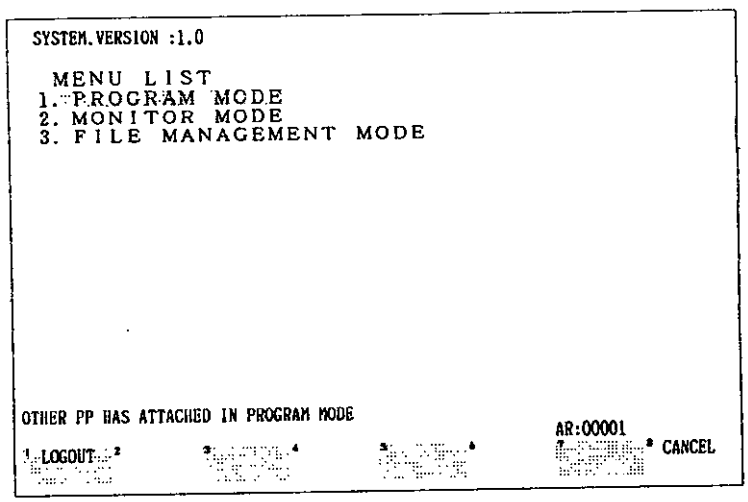


Fig. 3.5

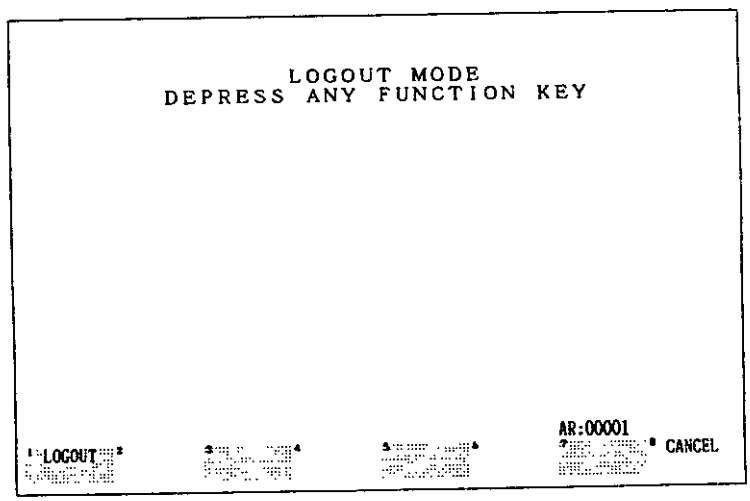


Fig. 3.6

3.5 SUPERVISORY OPERATION

Depressing [SUPER VISRY] key after ATTACH activation produces the display shown in Fig. 3.7, enabling the SUPERVISORY operations indicated in the label area.

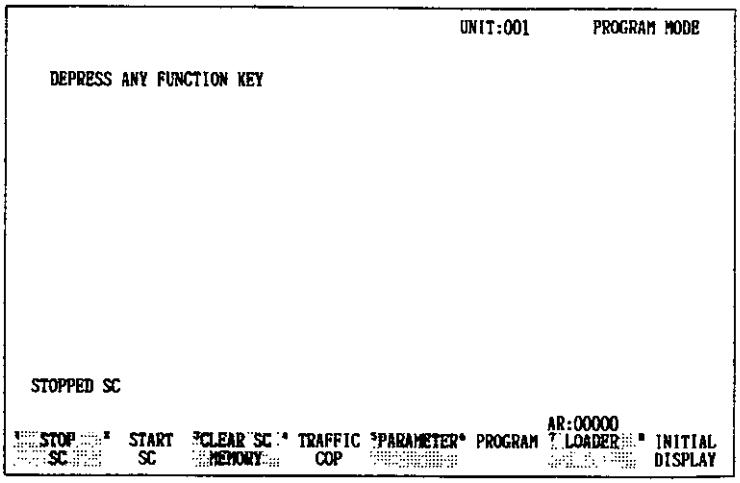


Fig. 3.7

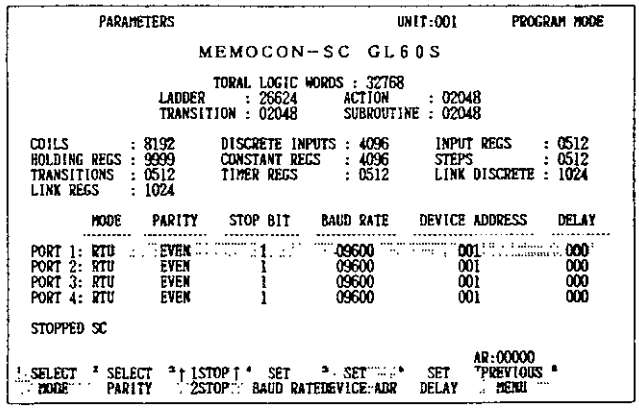
NOTE

1. In the Monitor mode, labels (STOP SC), (START SC) and (CLEAR SC MEMORY) are not displayed.
2. When (INITIAL DISPLAY) key is depressed, or [SHIFT] and [SUPER VISRY] keys are depressed simultaneously, the initial display (Fig. 3.1) appears.

3.5.1 Parameter Display

(1) GL60S PARAMETER DISPLAY

The following items of GL60S are displayed:



- Memory capacity
- Number of coils
- Number of registers
- Communication port parameters

NOTE 1

Contents	Initial Setting
Delay count	0
Device address	1
Baud rate	9600
Stop bit	1
Parity	Even
Mode selection	RTU

Fig. 3.8 GL60S Parameter Display

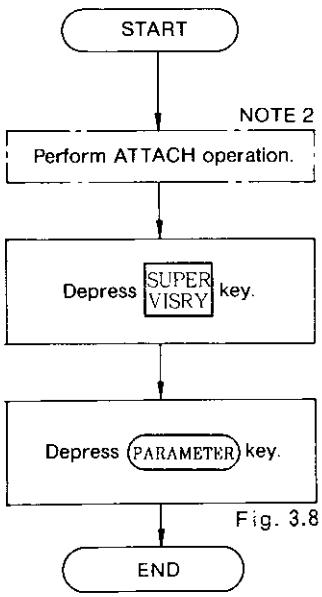


Fig. 3.8

NOTE

1. The GL60S transmits a response at a specified time after it receives a transmit signal. This specified time is called the delay count. Normal setting is 0.
2. When ATTACH operation has already been completed, this step can be skipped.
3. Depressing PREVIOUS MENU key calls Fig. 3.7.

(2) GL60S PORT PARAMETER SETTING

The GL60S communicates with the host computer, P140, ACGC, etc. Via the communication ports 1 to 4. The parameters for data transmission can be specified by following the procedure below.

Items	Setting Range
Device Address	1 to 247
Baud Rate	150, 300, 600, 1200, 2400, 4800, 9600, 19200 (bps)
Parity	Disable, even, odd
Stop Bit	1 or 2
Mode	RUT (8 bits) or ASCII(7 bits)
Delay Count	0 to 255 (in unit of 10 ms)

· Stop the GL60S.

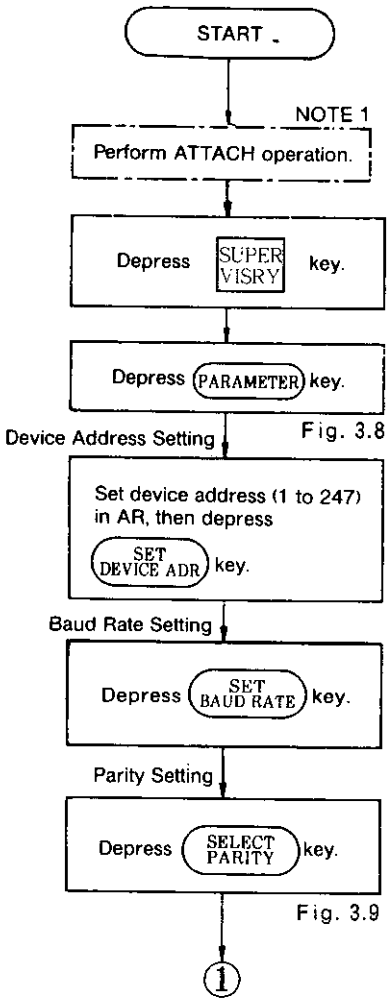
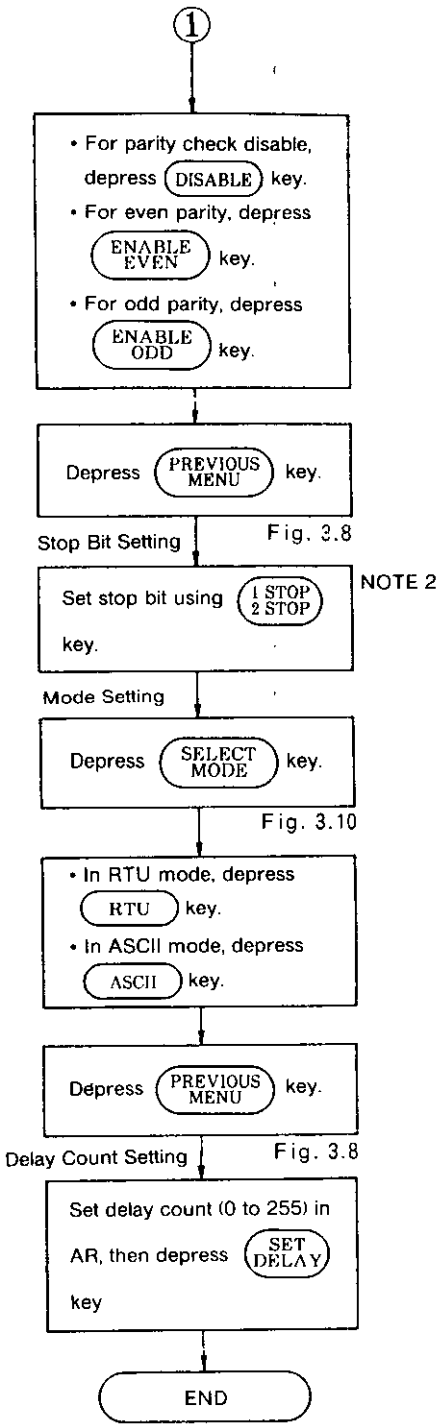


Fig. 3.8

Fig. 3.9

```
PARAMETERS                                   UNIT:001      PROGRAM MODE

                    MEMOCON-SC GL60S

                    TORAL LOGIC WORDS : 32768
              LADDER     : 26624      ACTION     : 02048
              TRANSITION : 02048      SUBROUTINE : 02048

COILS          : 8192    DISCRETE INPUTS : 4096    INPUT REGS    : 0512
HOLDING REGS   : 9999    CONSTANT REGS   : 4096    STEPS         : 0512
TRANSITIONS    : 0512    TIMER REGS      : 0512    LINK DISCRETE : 1024
LINK REGS      : 1024

          MODE    PARITY    STOP BIT    BAUD RATE    DEVICE ADDRESS    DELAY
PORT 1: RTU       EVEN          1         09600          001             000
PORT 2: RTU       EVEN          1         09600          001             000
PORT 3: RTU       EVEN          1         09600          001             000
PORT 4: RTU       EVEN          1         09600          001             000

STOPPED SC

1 DISABL  2 ENABLE  3 ENABLE  4          5          6          AR:00000
          EVEN      ODD                                      PREVIOUS
                                                             MENU
```

3.5.1 Parameter Display (Cont'd)



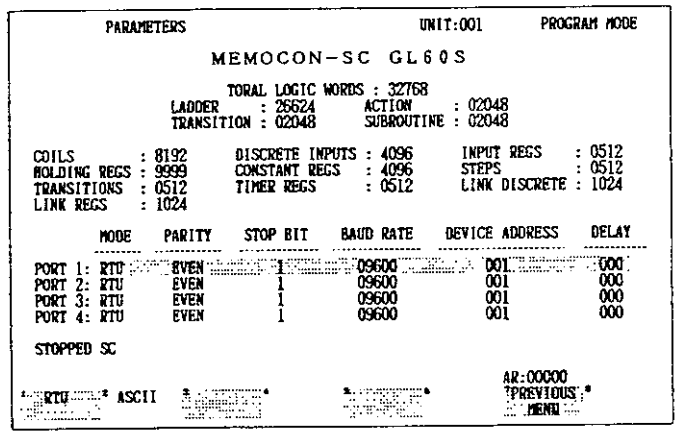


Fig. 3.10

NOTE

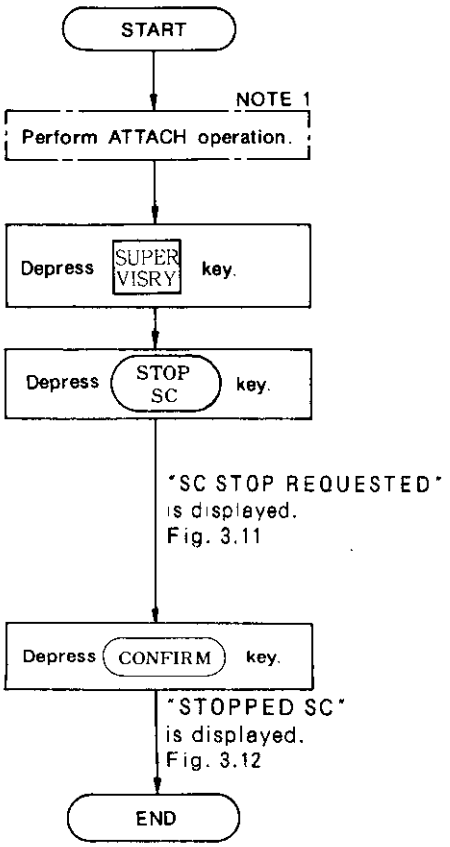
1. When ATTACH operation has already been completed, this step can be skipped.
2. Every time the labeled key (1 STOP 2 STOP) is depressed, arrows (↑↑, ↓↓) move up or down.
3. Depressing the (PREVIOUS MENU) key after completion of parameter setting returns the display to the supervisory display (See Fig. 3.7)
4. If the parameter of a port is changed while communication is being performed at that port, communication is cut off. Be sure that the port is not active before changing a parameter.

3.5.2 Stop GL60S

This operation is used to stop GL60S running.When the GL60S is stopped, "RUN" LED of GL60S goes OFF.

POINT

- With GL60S stopped, all operation are available. Memory clear, I/O allocation altering, network move, single sweep and load can be performed only with GL60S stopped.



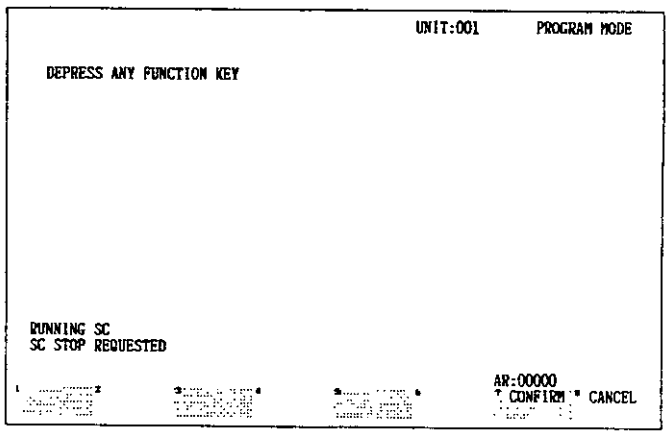


Fig. 3.11

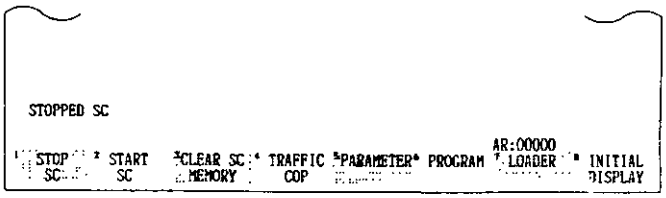


Fig. 3.12

NOTE

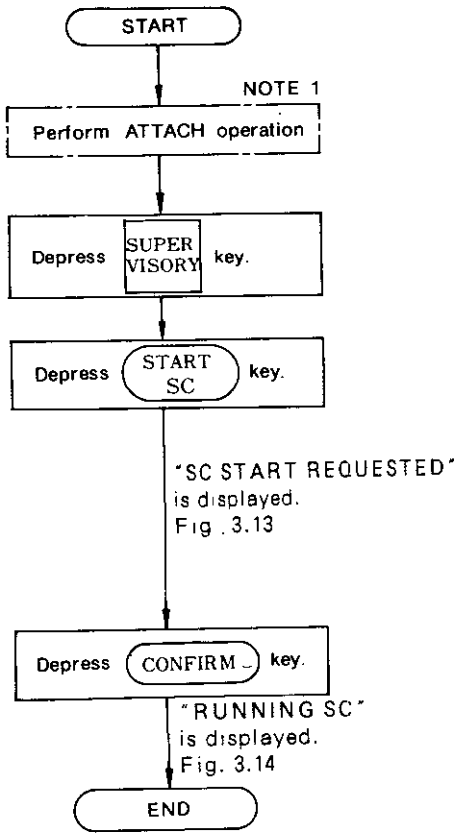
1. When ATTACH operation has already been completed, this step can be skipped.
2. When depressing (CANCEL) key instead of (CONFIRM) key, the display shown in Fig. 3.7 appears with GL60S running.

3.5.3 Start GL60S

This is GL60S start operation, with the GL60S stopped. When the GL60S is started, "RUN" LED of GL60S lights.

POINT

- In both GL60S running and stopped, program altering and storing operations are performed. Memory clear, I/O allocation, network move, single sweep and load can be performed only with GL60S stopped.



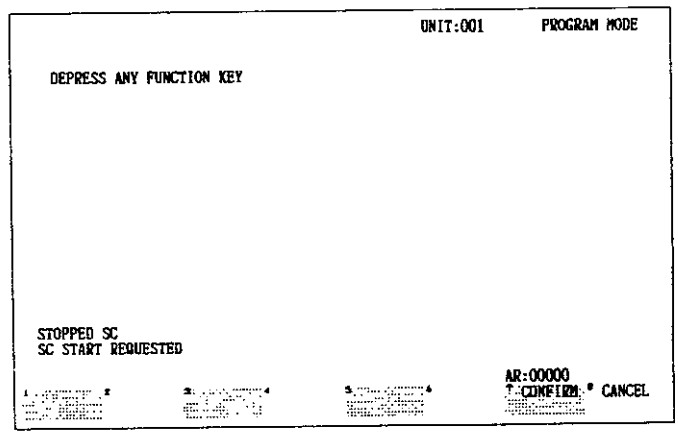


Fig. 3.13

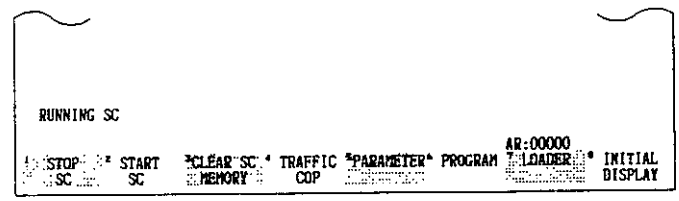


Fig. 3.14

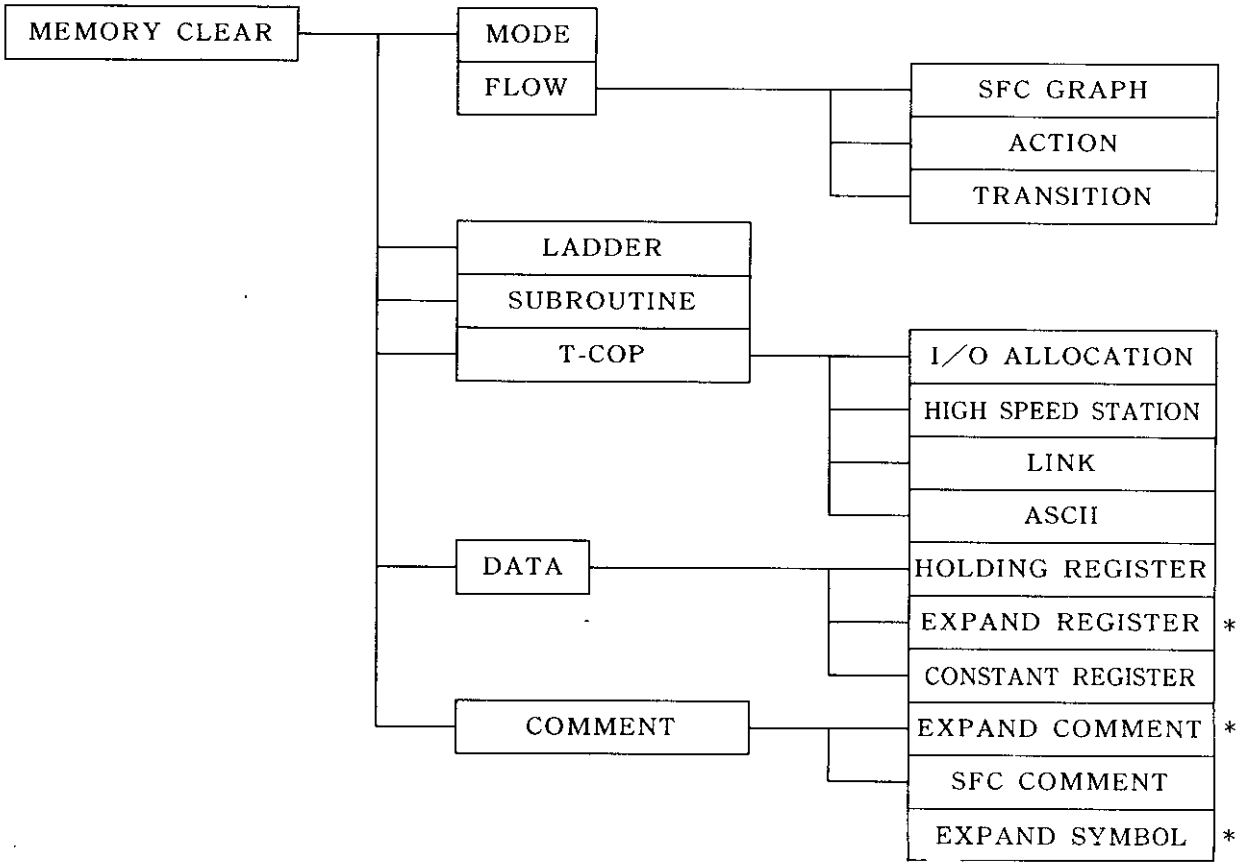
NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. When depressing (CANCEL) key instead of (CONFIRM) key, the display shown in Fig. 3.7 appears with GL60S not running.
3. It takes approximately 5 to 10 seconds to light RUN LED after depressing (CONFIRM) key.

3.5.4 Clear GL60S Memory

This section describes the function to clear the program memory of the SFC, the ladder and subroutine, the contents of the registers and the contents of the allocation table comment.

Each area of the GL60S memory shown below can be cleared individually.



* These are only for DDSCR-GL60S3.

NOTE

Stop the GL60S before clearing the memory areas.

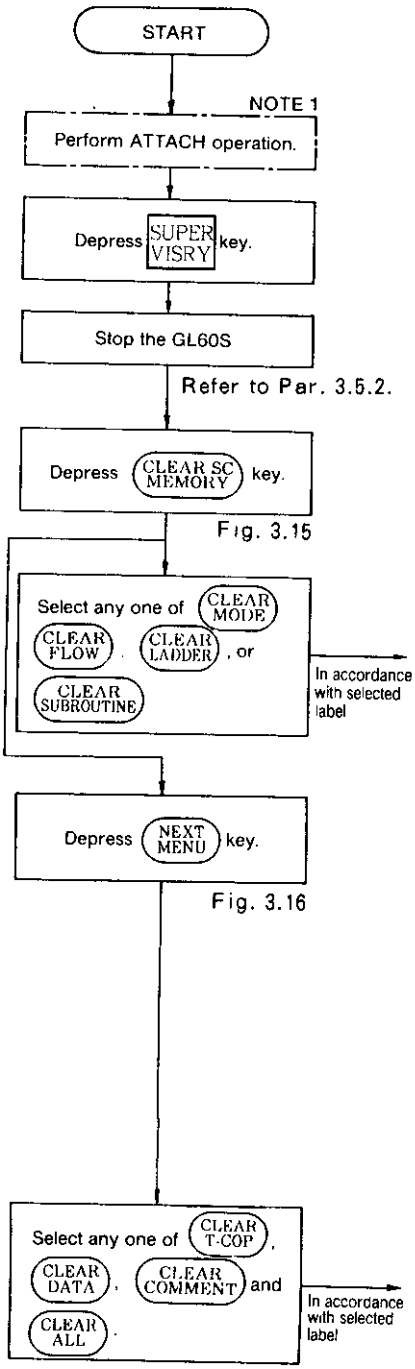
3.5.4 Clear GL60S Memory (Cont'd)

• The following table shows the label keys and their functions.

Label Keys	Functions
CLEAR MODE	Clears condition setting, such as initialize, reset or preset, and status display, such as hold, disable or active, for SFC.
CLEAR SFC GRAPH	Clears the area of the SFC GRAPH programming memory.
CLEAR ACTION	Clears the area of the SFC ACTION programming memory.
CLEAR TRANSITION	Clears the area of the SFC TRANSITION programming memory.
CLEAR ALL SFC	Clears all of the SFC GRAPH, ACTION and TRANSITION programming memory areas.
CLEAR LADDER	Clears the area of the ladder program memory.
CLEAR SUBROUTINE	Clears the area of the subroutine program memory.
CLEAR I/O ALLOC	Clears the contents of the I/O allocation table.
CLEAR ASCII	Clears ASCII port numbers.
CLEAR ALL T-COP	Clears all of the areas for I/O allocation. ASCII port numbers and high speed station.
CLEAR H-SPEED ST	Clears the setting for the high speed station.
CLEAR HOLD REG	Clears the holding register.
CLEAR CONST REG	Clears the constant register.
CLEAR ALL DATA	Clears all of the registers.
*CLEAR EXTEND REG	Clears the contents of the expansion register.
CLEAR SFC COM	Clears the area for the SFC comment.
CLEAR ALL COMMENTS	Clears all of the comment areas.
CLEAR ALL	Clears all of the GL60S memory areas.
*CLEAR EXPAND COM	Clears the comments in the expansion memory.
*CLEAR EXPAND SYM	Clears the symbols in the expansion memory.

* : These label keys are displayed for the DDSCR-GL60S3 CPU only.

Depress the selected labeled key, and then proceed to the steps shown on the right.



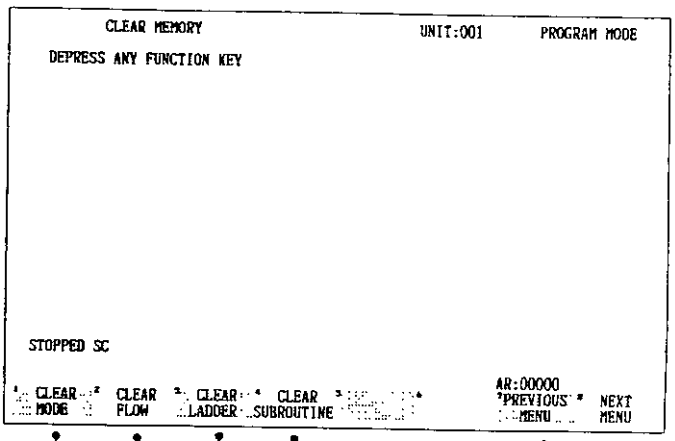


Fig. 3.15

⑤ ① ⑤ ⑤

To Supervisory display (Fig. 3.7)

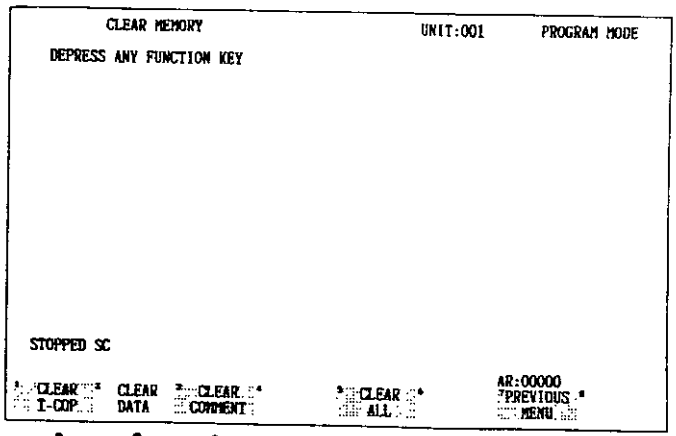


Fig. 3.16

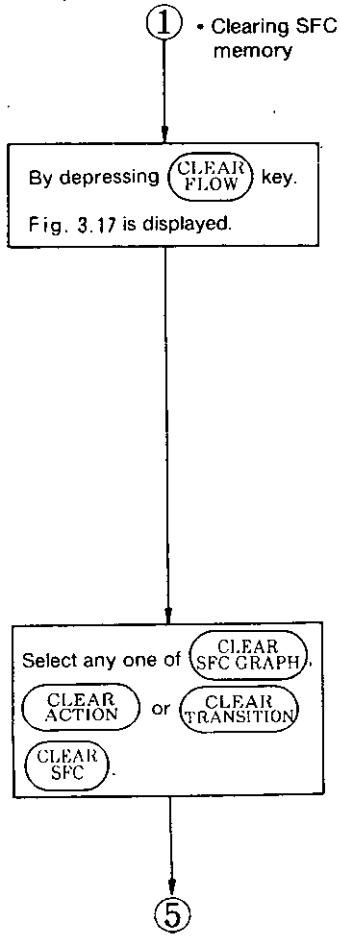
② ③ ④ ⑤

To Fig. 3.15

NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. To clear all of the areas, depress CLEAR ALL on the display shown in Fig. 3.16.

3.5.4 Clear GL60S Memory (Cont'd)



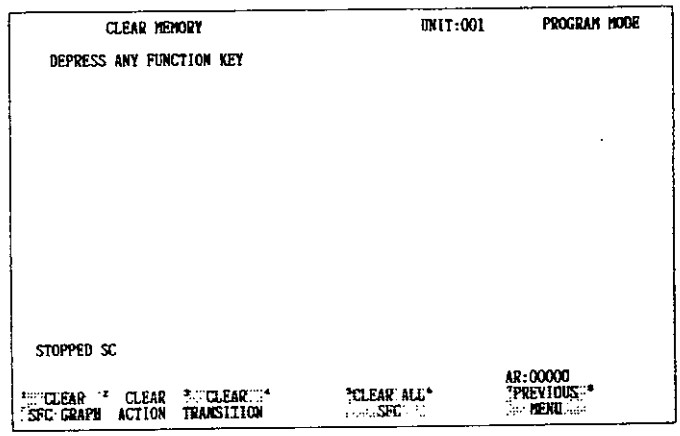
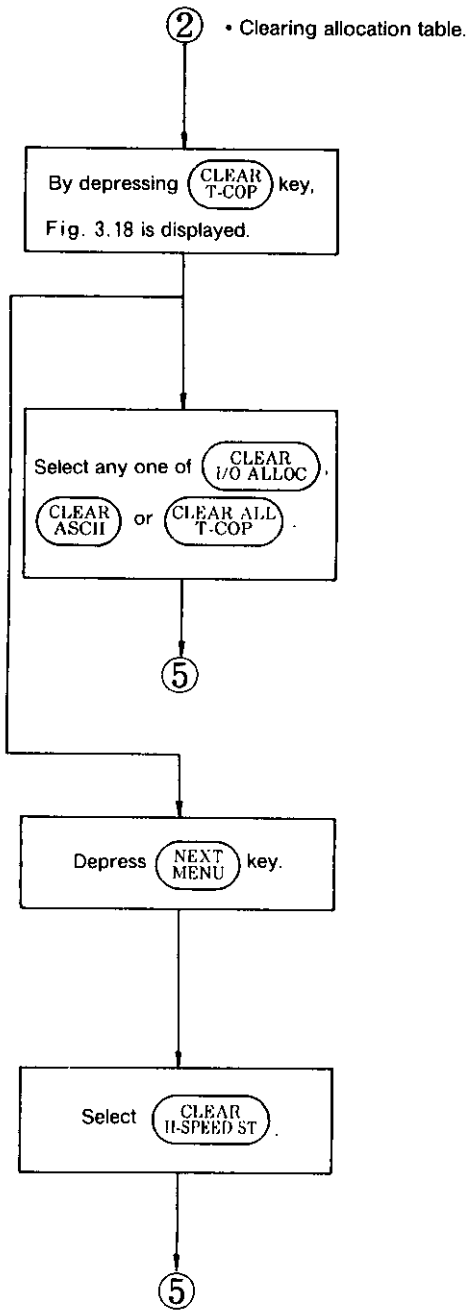


Fig. 3.17

NOTE

1. To clear all of the SFC GRAPH, ACTION and TRANSITION memory areas, depress CLEAR ALL SFC on the display shown in Fig. 3.17.
2. Depressing PREVIOUS MENU on the display shown in Fig. 3.17 returns the display to the state shown in Fig. 3.15.



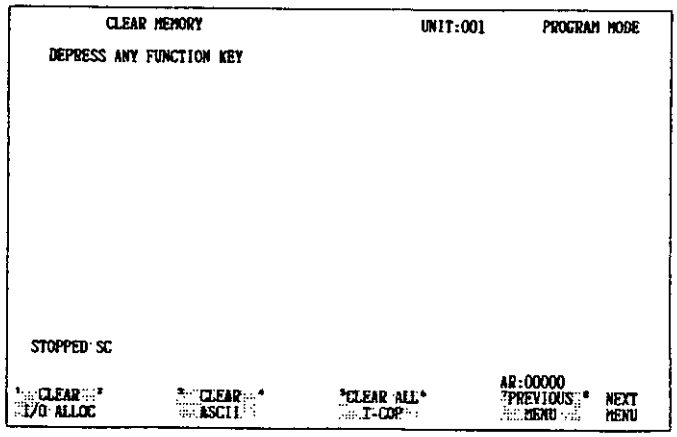


Fig. 3.18

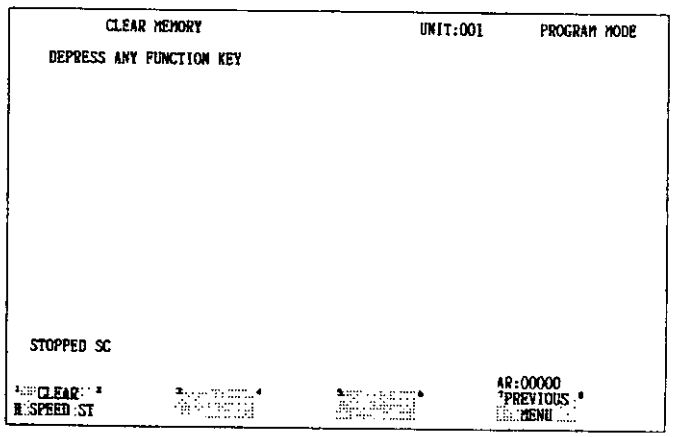
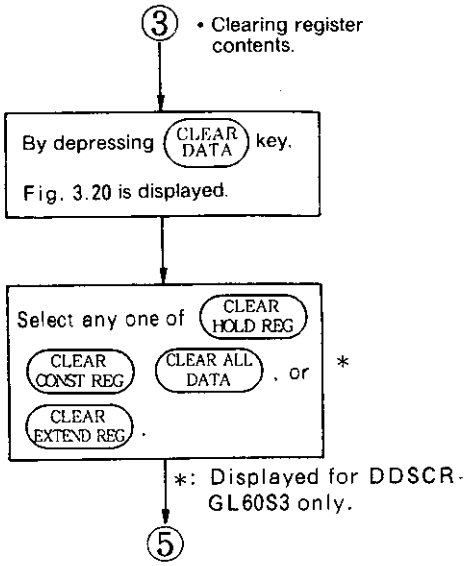


Fig. 3.19

NOTE

1. PREVIOUS MENU selection in Fig. 3.18 calls up the display shown in Fig. 3.16.
2. PREVIOUS MENU selection in Fig. 3.19 calls up the display shown in Fig. 3.18.

3.5.4 Clear GL60S Memory (Cont'd)



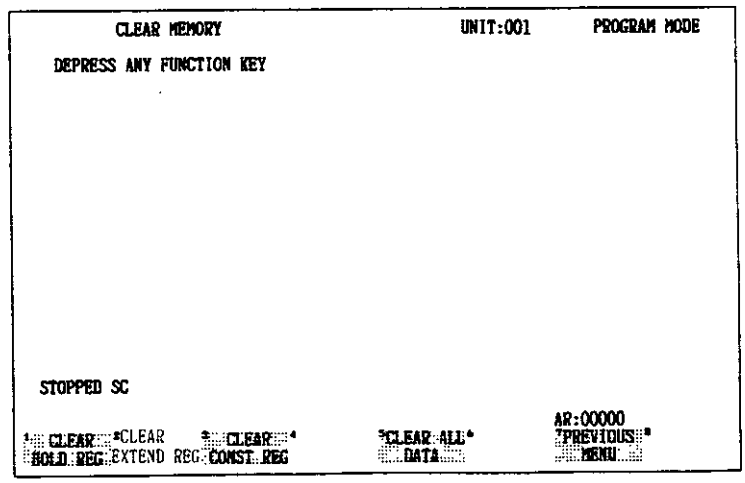
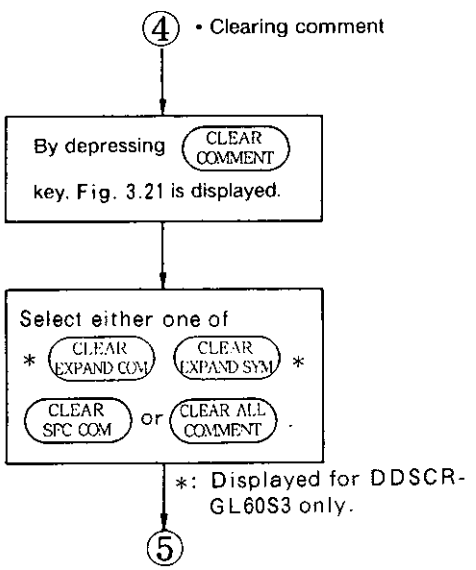


Fig. 3.20

NOTE

PREVIOUS MENU selection in Fig. 3.20 calls up the display shown in Fig. 3.16.



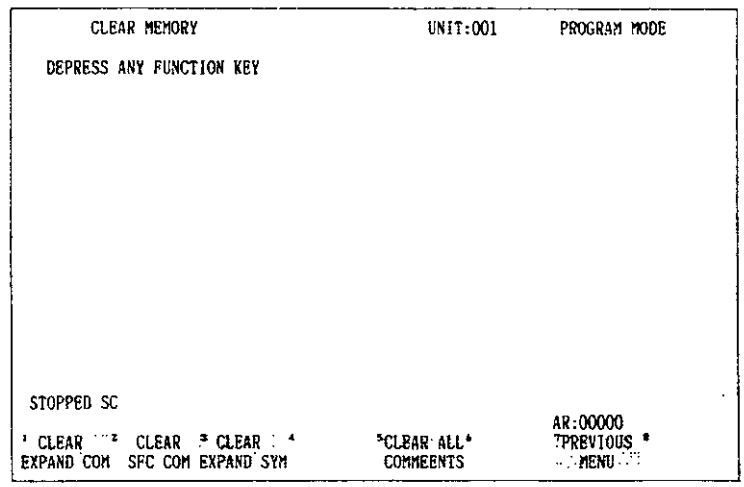
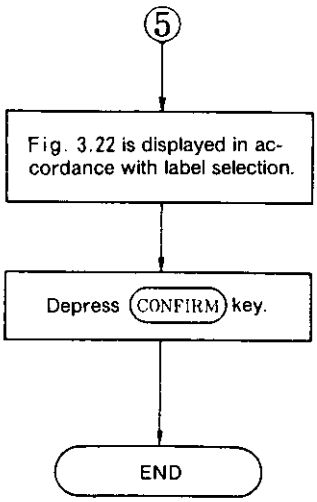


Fig. 3.21

NOTE

PREVIOUS MENU selection in Fig. 3.21 calls up the display shown in Fig. 3.16.



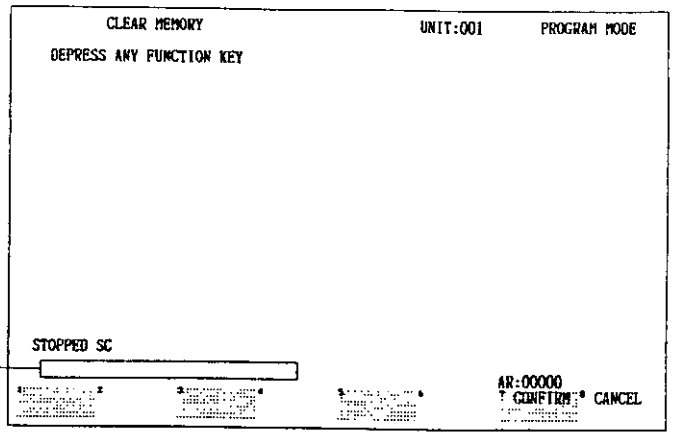


Fig. 3.22

"SC MODE MEMORY CLEAR REQUESTED"
"SC SFC GRAPH MEMORY CLEAR REQUESTED"
"SC ACTION MEMORY CLEAR REQUESTED"
"SC TRANSITION MEMORY CLEAR REQUESTED"
"SC ALL SFC MEMORY CLEAR REQUESTED"
"SC LADDER MEMORY CLEAR REQUESTED"
"SC SUBROUTINE CLEAR REQUESTED"
"SC I/O T-COP MEMORY CLEAR REQUESTED"
"SC ASCII T-COP MEMORY CLEAR REQUESTED"
"SC ALL TRAFFIC COP MEMROY CLEAR REQUESTED"
"SC H SPEED ST T-COP MEMORY CLEAR REQUESTED"
"SC HOLD REGISTER DATA MEMORY CLEAR REQUESTED"
"SC CONSTANT REGISTER DATA MEMORY CLEAR REQUESTED"
"SC ALL DATA MEMORY CLEAR REQUESTED"
"SC EXTEND REGISTER DATA MEMORY CLEAR REQUESTED"
"SC SFC COMMENT MEMORY CLEAR REQUESTED"
"SC ALL COMMENT MEMORY CLEAR REQUESTED"
"SC ALL MEMORY CLEAR REQUESTED"
"SC EXPAND COMMENT MEMORY CLEAR REQUESTED"
"SC EXPAND SYMBOL MEMORY CLEAR REQUESTED"

Any one of the above messages is displayed.

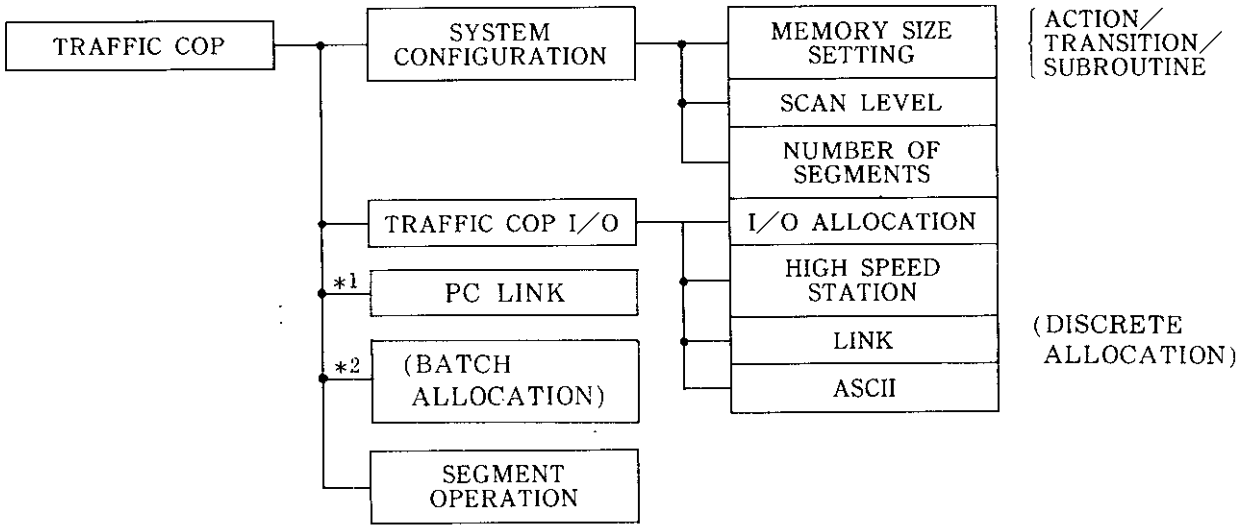
NOTE

1. Depressing the CONFIRM key clears the specified memory area.
2. Depressing the CANCEL key instead of CONFIRM clears no area and returns the system to the display where clearing the area of memory was requested.

3.5.5 Traffic Cop

The areas of the GL60S memory can be divided into two groups when they are allocated. The areas in one group configure the user program memory in the GL60S main unit, and the areas in the other group are used for I/O. The traffic cop of the former areas is called system configuration, and the traffic cop of the latter areas is called I/O allocation. During traffic cop, segment operations, such as status display when the area is segmented and moving segments, can be performed.

The following figure shows the structure of the traffic cop operation.



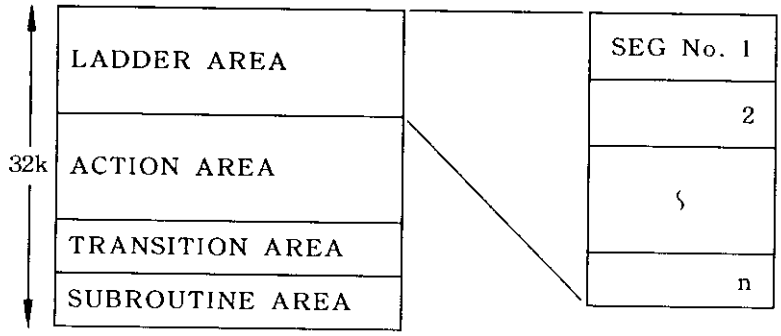
*1: Refer to PC Link Module User's Manual (SIE-C815-14.8).
*2: Refer to YENET-3200 Optical LAN System User's Manual (SIE-C815-14.6).

Fig. 3.23 Allocation Operation

(1) SYSTEM CONFIGURATION

The CPU program memory in the GL60S can be divided into four areas: LADDER area, ACTION area, TRANSITION area, and SUBROUTINE area.

When a two-level scan is selected, the area can be divided into a maximum of 8 segments.



Note: When a one-level scan is selected, the number of segments is automatically determined to be 1.

Fig. 3.24 User Program Memory Map

NOTE

1. When the system configuration is to be altered, the GL60S must be stopped.
2. The system configuration cannot be altered while in the monitor mode or while the GL60S is in operation. However, the contents of the system configuration can be seen.
3. Derpess (WRITE SYSTEM) key whenever the system configuration is stored or altered.
4. The sizes of the user program areas must be within the ranges shown in the following table.

Area	Allowable Range of Size
ACTION	0 to 16 in units of 1kw.
TRANSITION	0 to 16 in units of 1kw.
SUBROUTINE	0 to 16 in units of 1kw.
LADDER	Size obtained by subtracting the above size from the total memory size (automatically determined).

5. The following table shows the scan level and the allowable number of segments.

Scan level	1 or 2
Number of segments	1 to 8

3.5.5 Traffic Cop (Cont'd)

6. Fig. 3.25 is the display in the initial state (cleared state).

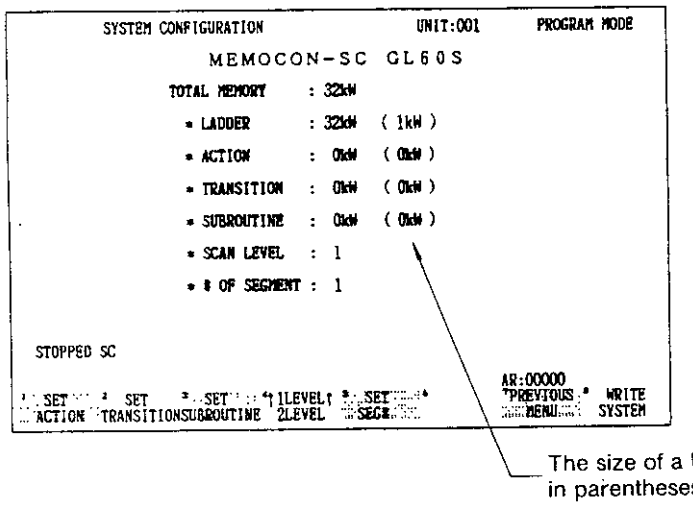
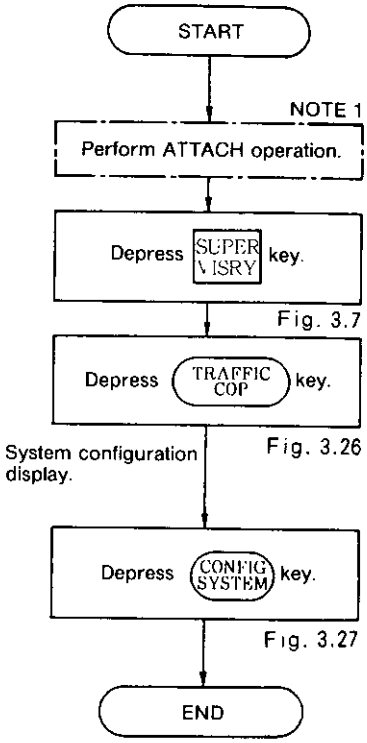


Fig. 3.25 Display in the Initial State

7. Alter the system configuration to execute an SFC program, to use a subroutine and to perform a two-level scan while in the state shown in Fig. 3.25.

■ System Configuration Display



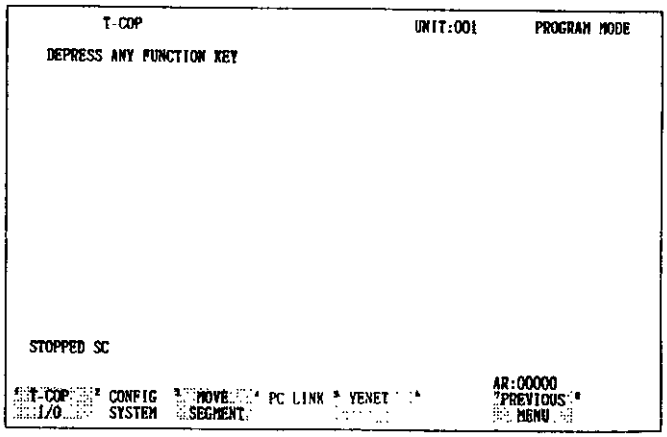


Fig. 3.26

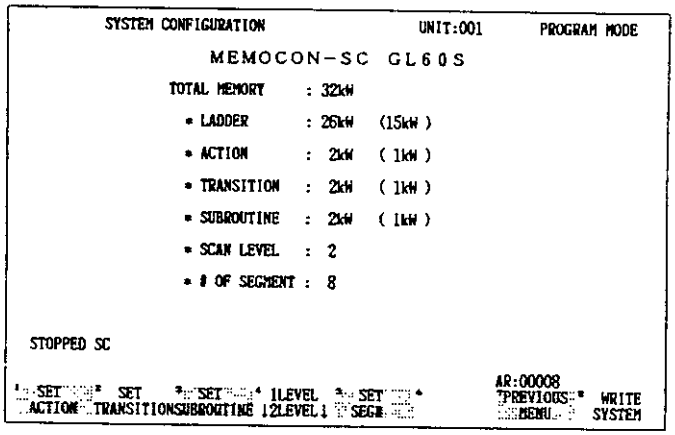


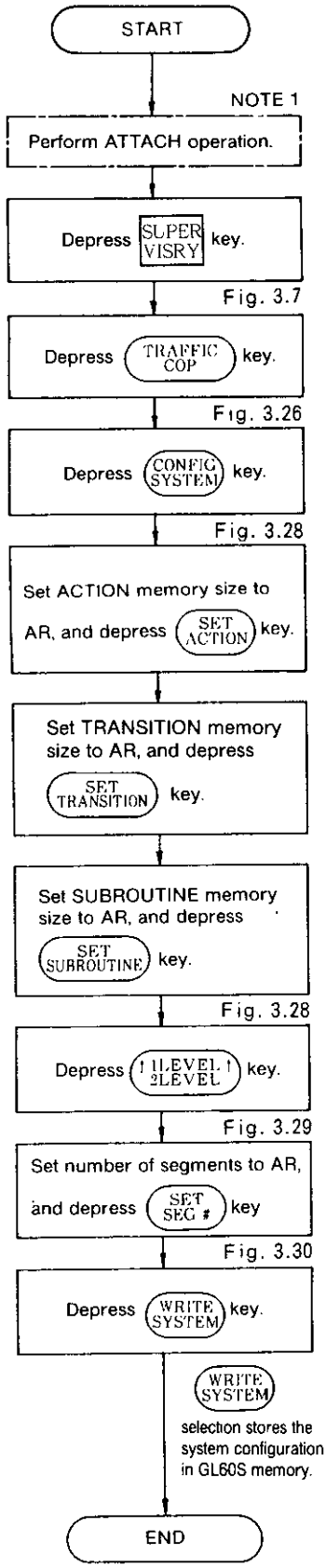
Fig. 3.27

NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. (PREVIOUS MENU) selection in Fig. 3.27 calls up the display in Fig. 3.26.
3. (PREVIOUS MENU) selection in Fig. 3.26 calls up the display in Fig. 3.7.
4. The labels "PC LINK" and "YENET" shown in Fig. 3.26 are displayed only for DDSCR-GL60S1, S2, and S3.

3.5.5 Traffic Cop (Cont'd)

■ System Configuration Storing




```
SYSTEM CONFIGURATION                UNIT:001      PROGRAM MODE
                    MEMOCON-SC GL60S
          TOTAL MEMORY     : 32kW
            * LADDER       : 26kW  ( 1kW )
            * ACTION       :  2kW  ( 1kW )
            * TRANSITION   :  2kW  ( 1kW )
            * SUBROUTINE   :  2kW  ( 1kW )
            * SCAN LEVEL   :  1
            * # OF SEGMENT :  1

STOPPED SC                                          AR:00002
' SET  ' SET  ' SET  ' 1LEVEL ' SET  '*   ?PREVIOUS * WRITE
  ACTION  TRANSITIONSUBROUTINE 2LEVEL  SEG#    MENU   SYSTEM
```

Fig. 3.28

```
SYSTEM CONFIGURATION                UNIT:001      PROGRAM MODE
                    MEMOCON-SC GL60S
          TOTAL MEMORY     : 32kW
            * LADDER       : 26kW  ( 1kW )
            * ACTION       :  2kW  ( 1kW )
            * TRANSITION   :  2kW  ( 1kW )
            * SUBROUTINE   :  2kW  ( 1kW )
            * SCAN LEVEL   :  2
            * # OF SEGMENT :  1

STOPPED SC                                          AR:00002
' SET  ' SET  ' SET  ' 1LEVEL ' SET  '*   ?PREVIOUS * WRITE
  ACTION  TRANSITIONSUBROUTINE 2LEVEL  SEG#    MENU   SYSTEM
```

Fig. 3.29

```
SYSTEM CONFIGURATION                UNIT:001      PROGRAM MODE
                    MEMOCON-SC GL60S
          TOTAL MEMORY     : 32kW
            * LADDER       : 26kW  ( 1kW )
            * ACTION       :  2kW  ( 1kW )
            * TRANSITION   :  2kW  ( 1kW )
            * SUBROUTINE   :  2kW  ( 1kW )
            * SCAN LEVEL   :  2
            * # OF SEGMENT :  8

STOPPED SC                                          AR:00008
' SET  ' SET  ' SET  ' 1LEVEL ' SET  '*   ?PREVIOUS * WRITE
  ACTION  TRANSITIONSUBROUTINE 2LEVEL  SEG#    MENU   SYSTEM
```

Fig. 3.30

NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. When the number of segments is altered from n to n-1, confirm that segment n does not contain a network.
3. Be sure to depress (WRITE SYSTEM) key after all settings are completed, otherwise the data will not be stored in the GL60S.
4. (PREVIOUS MENU) selection in the system configuration display calls up the allocation menu in Fig. 3.26.
5. (PREVIOUS MENU) selection in the allocation menu calls up the display in Fig. 3.7.

(2) TRAFFIC COP I/O

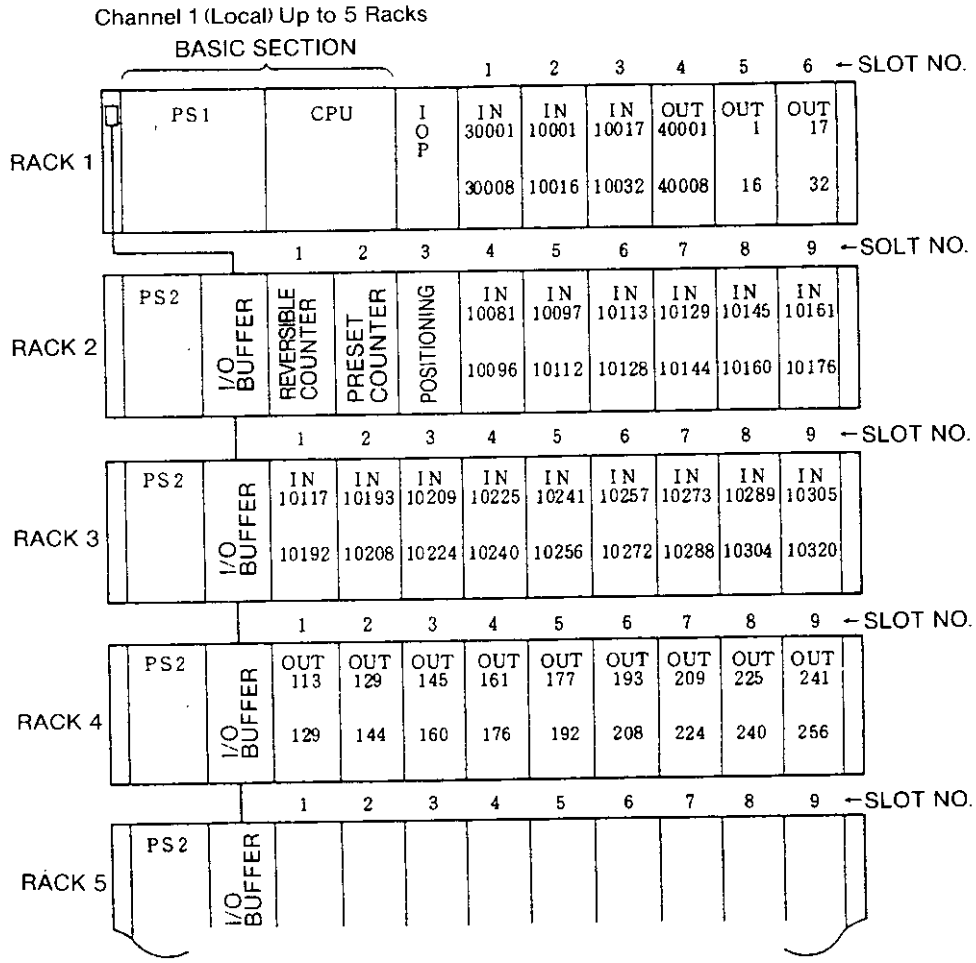
(a) I/O ALLOCATION

The I/O sections of GL60S comprise a completely independent free location system, in which any I/O modules can be installed in any slots. Therefore, all the slots must be allocated to the numbers of the I/O modules to be installed. (This is called I/O allocation.) For each slot, the first reference number and the number of I/O points are set independently. Even if I/O allocation of any slot is altered, the reference number of any other slot may not be shifted.

POINT

- When alteration of I/O allocation is required, the GL60S must be stopped.
- In the monitor mode or the GL60S running, I/O allocation cannot be altered, but I/O allocation contents can be displayed.

3.5.5 Traffic Cop (Cont'd)



IN: Input Module
OUT: Output Module
Figure: Reference No.
PS1: Main Power Supply Module
PS2: Auxiliary Power Supply Module
IOP: I/O Control Module

Fig. 3.31 Sample I/O Allocation

■ I/O Allocation Displays

I/O allocation display has up to 10 displays per channel as shown in Fig. 3.32, up to 5 racks for local I/Os and up to 4 racks for remote I/Os can be displayed.

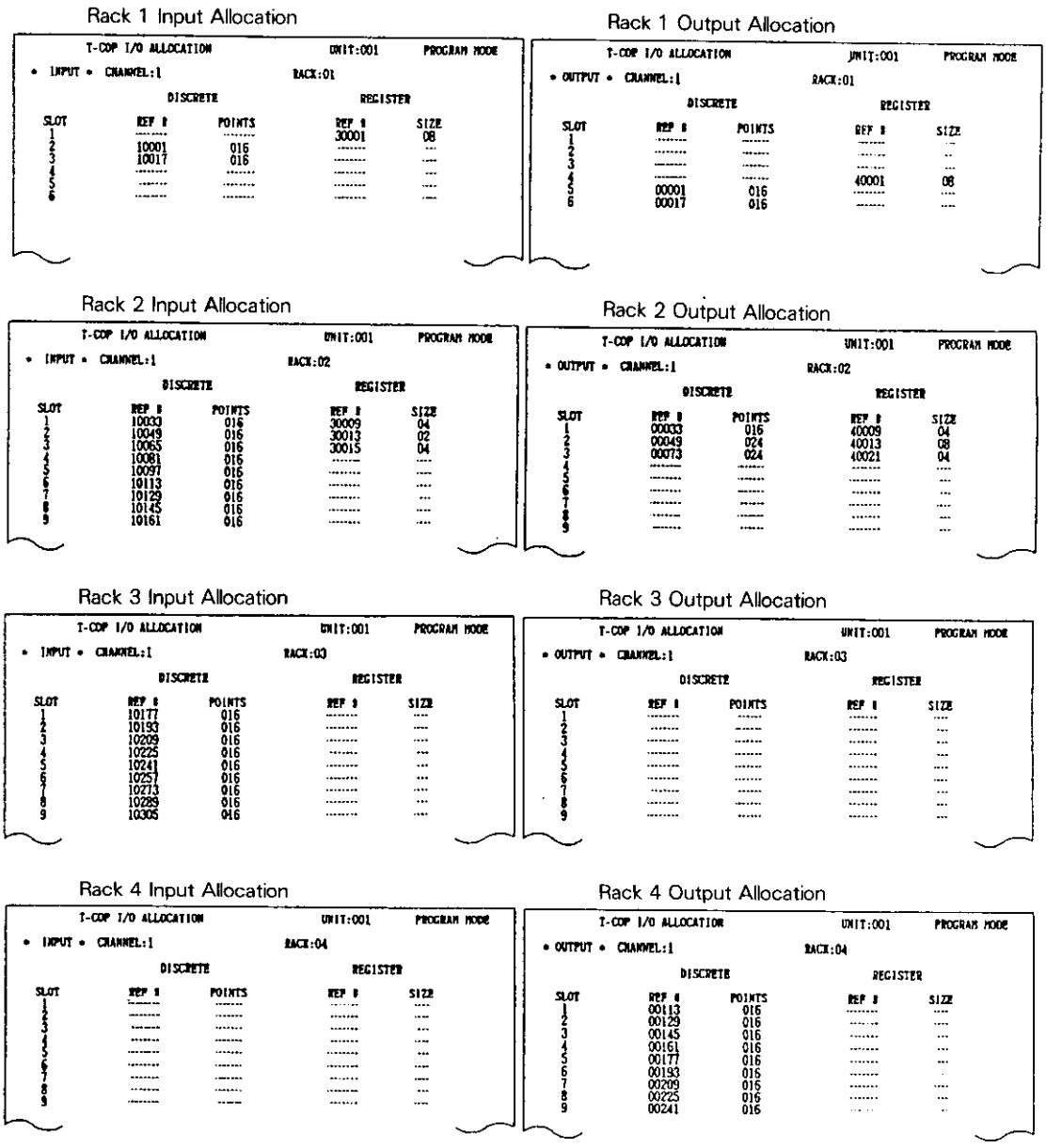


Fig. 3.32 I/O Allocation Displays

3.5.5 Traffic Cop (Cont'd)

■ Description of I/O Allocation

I/O allocation should be made to all slots on which the I/O module is mounted. Display the eight I/O allocation displays for each station is each channel, and set the number according to Table 3.4. Number of racks and slots differs according to channel and station.

Table 3.2 Number of Slots

Channel No. \ Rack No.		1	2	3	4	5
1		6	9	9	9	9
2	ST1	8	9	9	9	—
	ST2	8	9	9	9	—
	∫	∫	∫	∫	∫	∫
	ST31	8	9	9	9	—
3	ST1	8	9	9	9	—
	ST2	8	9	9	9	—
	∫	∫	∫	∫	∫	∫
	ST31	8	9	9	9	—

ST1 to ST31: Station No.

- In slots 1 to 6 of rack 1 in channel 1, the following interface modules can be installed. In this case, do not perform I/O allocation:
  - Remote I/O module
  - PC link module
  - 213 I/F module
- Up to 256 slots can be used for each of the following I/Os: discrete input, discrete output, register input and register output.

• Discrete signal (ON/OFF signal)

	Reference No.	Quantity	
Input	10001	016	For allocation of 16 signals from 10001 (10001 to 10016)
	10017	032	For allocation of 32 signals from 10017 (10017 to 10048)
Output	00001	016	For allocation of 16 signals from 1 (1 to 16)
	00017	032	For allocation of 32 signals from 17 (17 to 48)
	-----	---	No allocation

Set the first reference No. to be allocated to reference No.
Input relay: 10001 + 8N
Output coil: 00001 + 8N N = 0, 1, 2, ... 511

Note: Number of input relays + Number of output coils ≦ 4096

• Register No. (16-bit numerical signal)

	Reference No.	Quantity	
Input	30001	08	For allocation of 8 points from 30001 (30001 to 30008)
	30009	08	For allocation of 8 points from 30009 (30009 to 30016)
Output	40001	08	For allocation of 8 points from 40001 (40001 to 40008)
	40009	08	For allocation of 8 points from 40009 (40009 to 40016)
	-----	--	No allocation

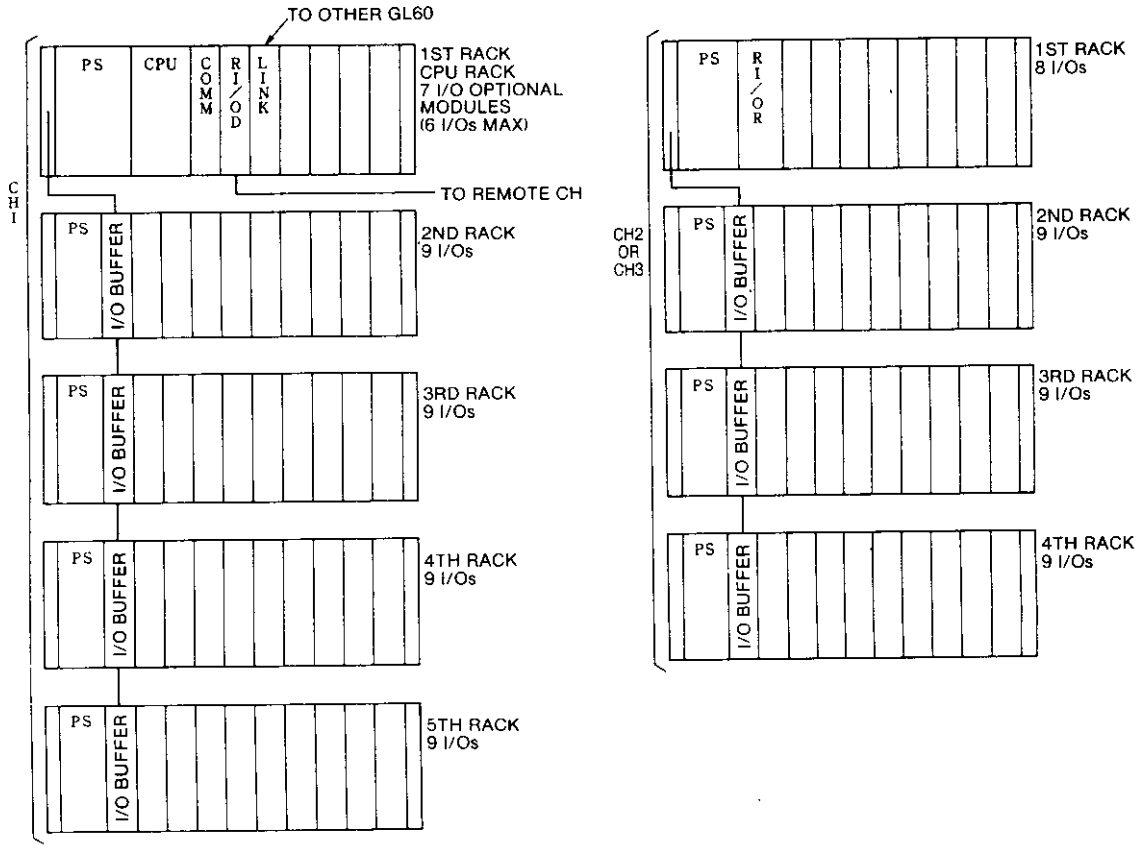
Restriction of number of registers in same slot:
Number of registers ≦ 0 to 8

Note: Number of input registers + Number of output registers ≦ 512

3.5.5 Traffic Cop (Cont'd)

LOCAL CHANNEL (CH1)

REMOTE CHANNEL (CH2, CH3)



Note:
PS: Power Supply Module, CPU: CPU Module, Communication Module,
RIOD: Remote I/O Driver, LINK: PC Link Module,
RIOR: Remote I/O Receiver

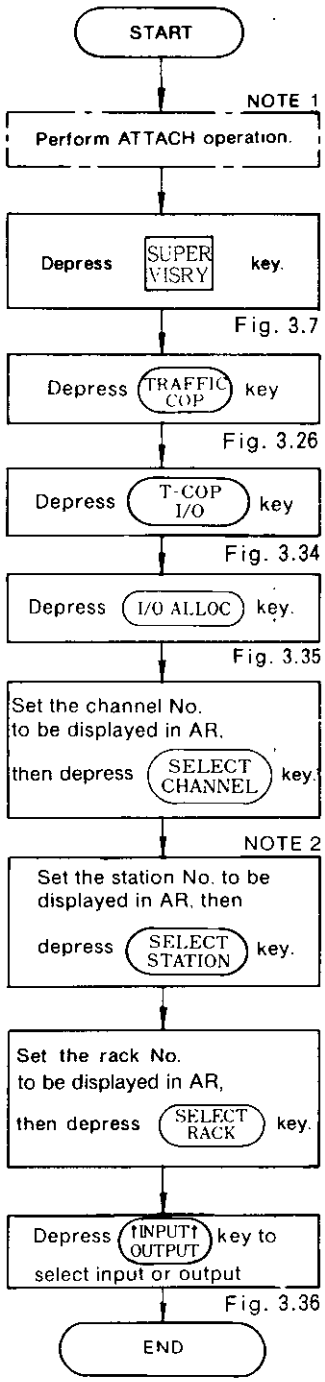
Fig. 3.33 GL60S I/O Section Configuration

Table 3.4 Number of I/O Allocation Point

Module Name	Module Type JAMSC-	Number of Input		Number of Output Points	
		Discrete	Register	Discrete	Register
Discrete 16-Point Input Module	B2501, B2503, B2601	16	0	0	0
		0	1	0	0
Discrete 32-Point Input Module	B2505, B2507, B2603, B2607	32	0	0	0
		0	2	0	0
Discrete 64-Point Input Module	B2605	64	0	0	0
		0	4	0	0
Register Input Module	B2701	0	8	0	0
Analog Input Module	B27□3	0	8	0	0
Discrete 16-Point Output Module	B2500, B2600, B2900, B2904	0	0	0	1
		0	0	0	1
Discrete 32-Point Output Module	B2504, B2602, B2606, B2902	0	0	32	0
		0	0	0	2
Discrete 64-Point Output Module	B2604	0	0	64	0
		0	0	0	4
Register Output Module	B2700	0	0	0	8
Analog Output Module	B27□2	0	0	0	2
Reversible Counter Module	B2801	16	2 or 4	8 or 16	2 or 4
Preset Counter	B2802	16	2	16 or 24	2 - 8
Positioning Module	B2803, B2813	16	4	24	4

3.5.5 Traffic Cop (Cont'd)

■ I/O Allocation Display



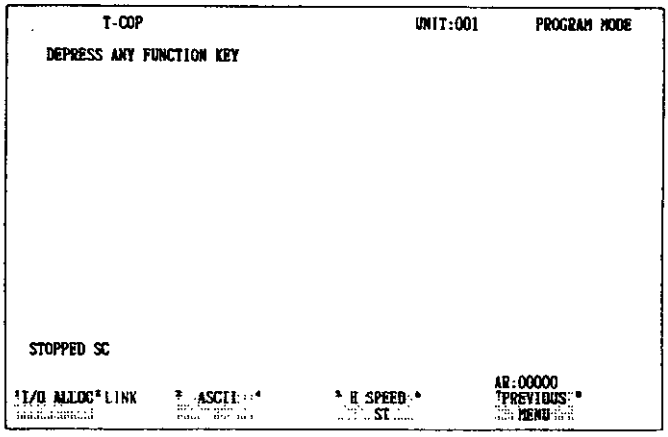


Fig. 3.34

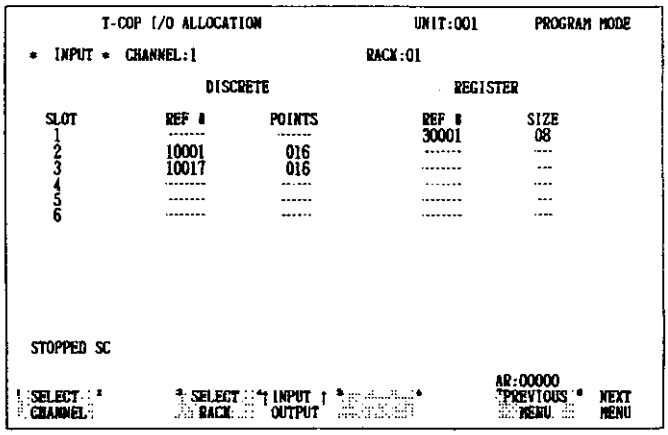


Fig. 3.35

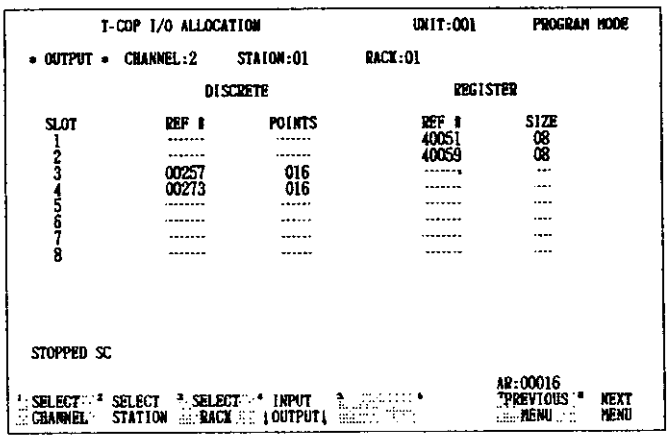
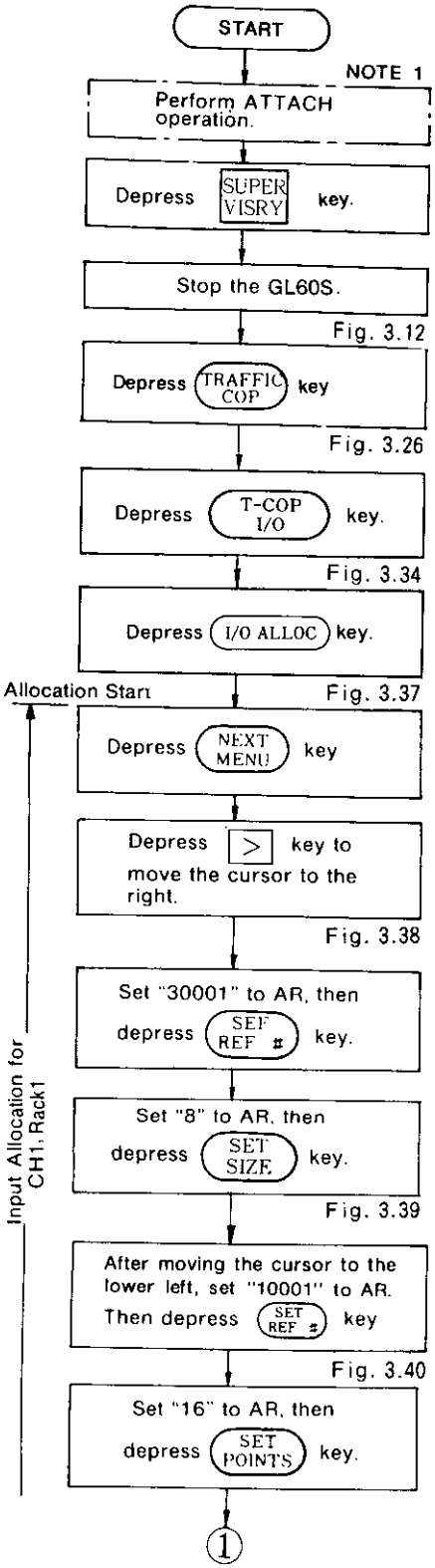


Fig. 3.36

NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. Channel 1 requires no station No. selection.
3. By depressing (PREVIOUS MENU) key, the display shown in Fig. 3.34 appears. Label "PC LINK" shown in Fig. 3.34 is displayed for DDSCR-GL60S1, S2, and S3 only.

■ I/O Allocation Storing



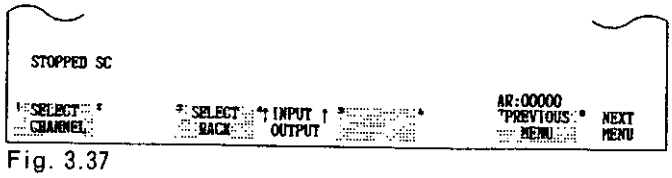


Fig. 3.37

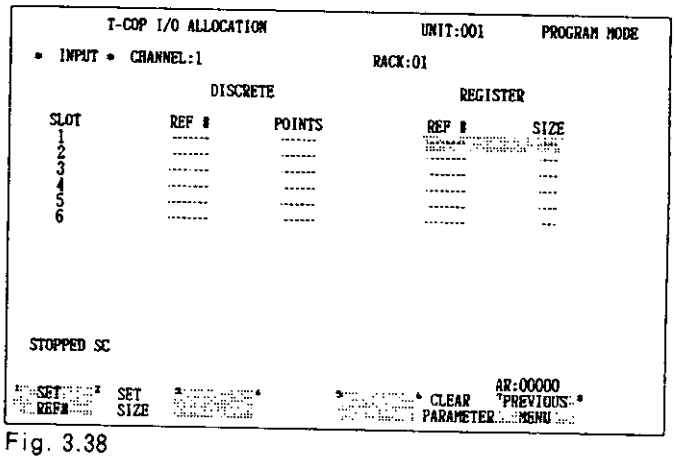


Fig. 3.38

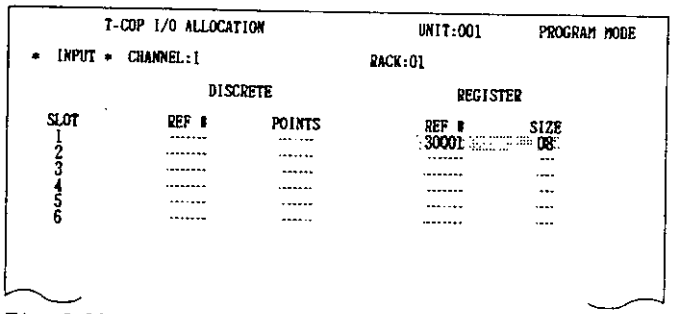


Fig. 3.39

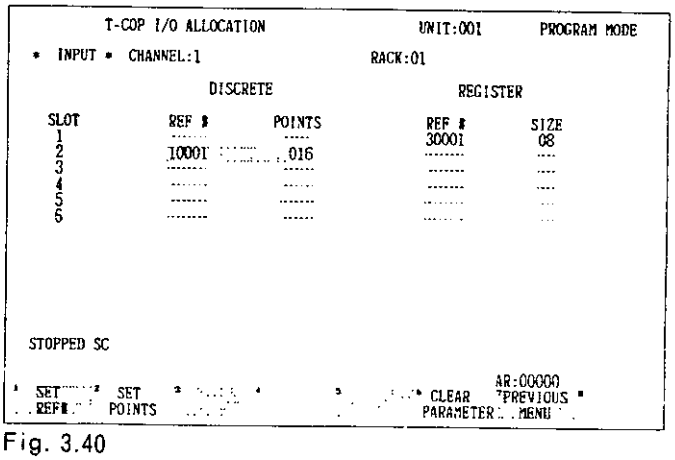
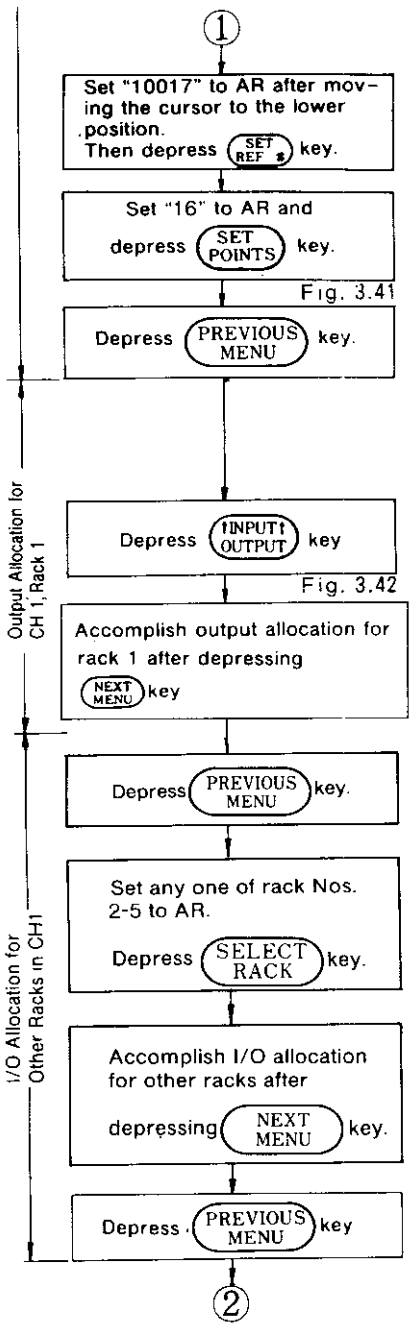


Fig. 3.40

3.5.5 Traffic Cop (Cont'd)

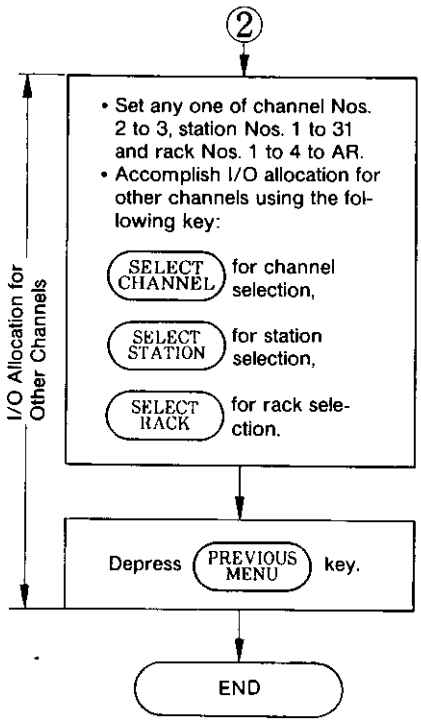



```
T-COP I/O ALLOCATION                    UNIT:001      PROGRAM MODE
* INPUT * CHANNEL:1                     RACK:01
                    DISCRETE                      REGISTER
SLOT      REF #      POINTS          REF #        SIZE
 1        .....      .....           30001        08
 2        10001      016             .....        ---
 3        10017      016             .....        ---
 4        .....      .....           .....        ---
 5        .....      .....           .....        ---
 6        .....      .....           .....        ---
```

Fig. 3.41

```
T-COP I/O ALLOCATION                    UNIT:001      PROGRAM MODE
* OUTPUT * CHANNEL:1                    RACK:01
                    DISCRETE                      REGISTER
SLOT      REF #      POINTS          REF #        SIZE
 1        .....      .....           .....        ---
 2        .....      .....           .....        ---
 3        .....      .....           .....        ---
 4        .....      .....           .....        ---
 5        .....      .....           .....        ---
 6        .....      .....           .....        ---

STOPPED SC
                                                 AR:00000
SELECT CHANNEL   SELECT RACK   INPUT ↓OUTPUT↓   PREVIOUS MENU   NEXT MENU
```

Fig. 3.42



NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. When values are set to REF# and POINTS, for discrete, or REF# and SIZE for register after NEXT MENU key is depressed, the allocation data for the slot is stored into the GL60S allocation table.
3. Label NEXT MENU is not displayed in monitor mode.
4. Depressing CLEAR PARAMETER key clears the allocation at the cursor position.
5. If the reference number used in another slot is set, the following message is displayed.
   "CAUTION: REFERENCE MULTIPLY IN TRAFFIC COP"
   If its setting is OK, depress PROCEED key; if not, depress CLEAR PARAMETER key.
6. When PREVIOUS MENU key is depressed without setting of discrete points or register size, the following message is displayed.
   "ERROR: SPECIFY POINTS OR SIZE PARAMETER"
   Set the numbers.

3.5.5 Traffic Cop (Cont'd)

(b) HIGH SPEED STATION ALLOCATION

High speed or low speed I/O is performed at each station. High speed station allocation is performed to select channels and stations for high speed I/O.

This operation must be performed when the two-level scan function is selected. However, it can be omitted when the one-level scan function is selected because all of the channels and stations are used for high speed I/O.

I/O references, which are allocated to high speed stations, must be sequential by location within a single station to make I/O processing at high speed. Therefore the first reference number and the size are also allocated at the same time.

POINT

- Stop the GL60S when high speed station allocation is to be altered.
- All the stations except those which are allocated for high speed are low speed stations.
- Up to 8 high speed stations can be allocated.
- The segment for a high speed station is automatically allocated segment 1.
- The maximum allocation size of a single station is as follows:
  - Discrete 4096 points
  - Register 512 registers

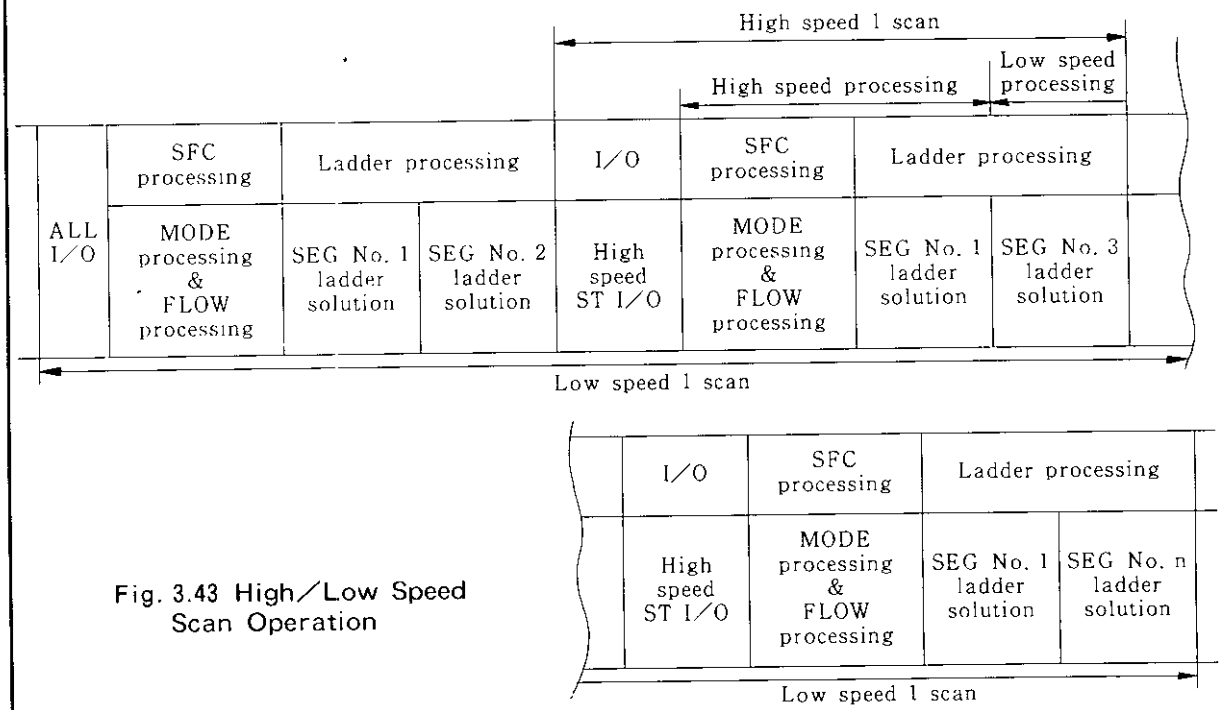
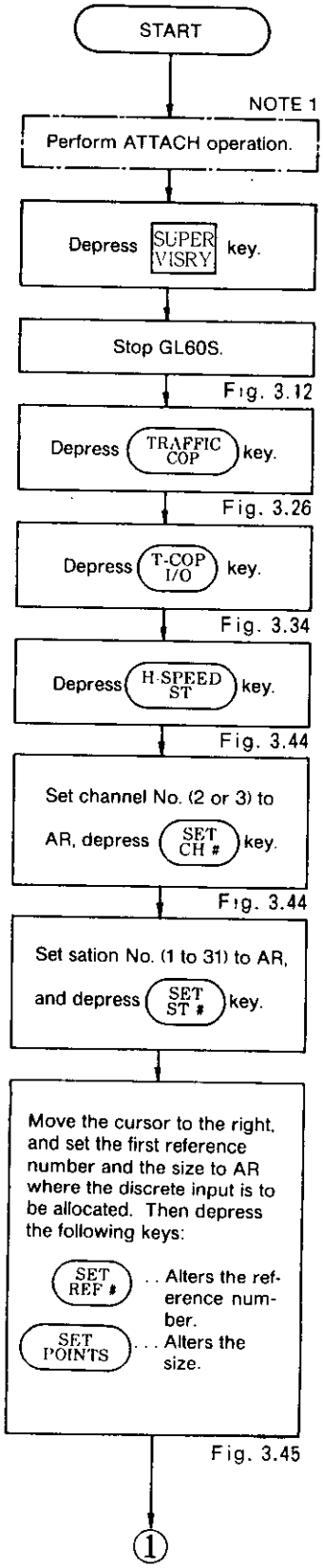


Fig. 3.43 High/Low Speed Scan Operation

■ Storing High Speed Station Allocation



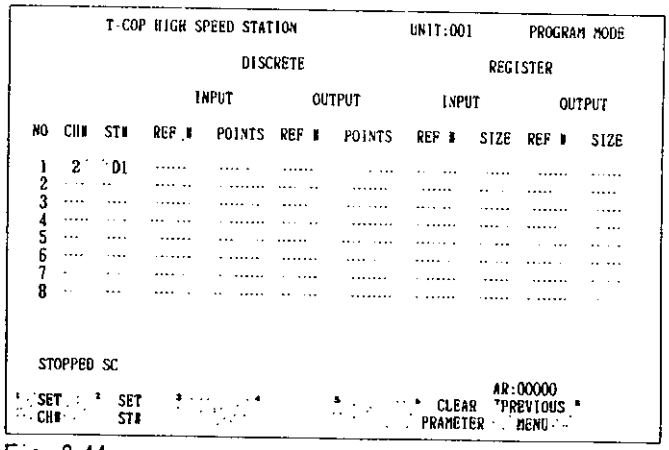


Fig. 3.44

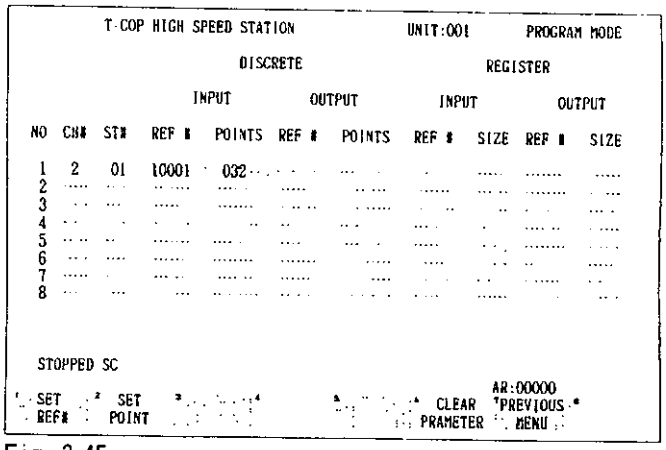


Fig. 3.45

3.5.5 Traffic Cop (Cont'd)

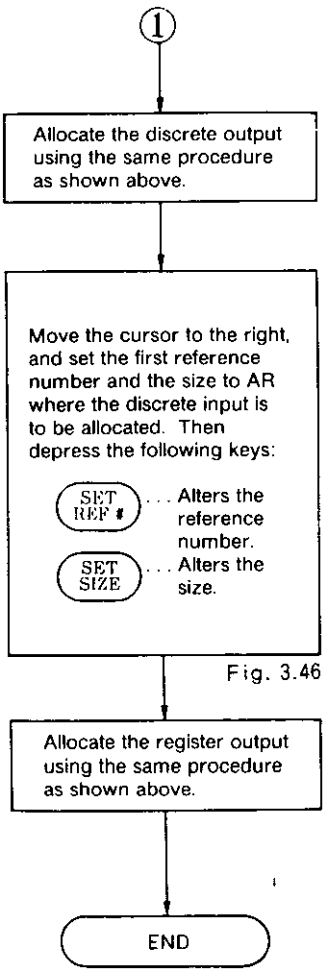


Fig. 3.46

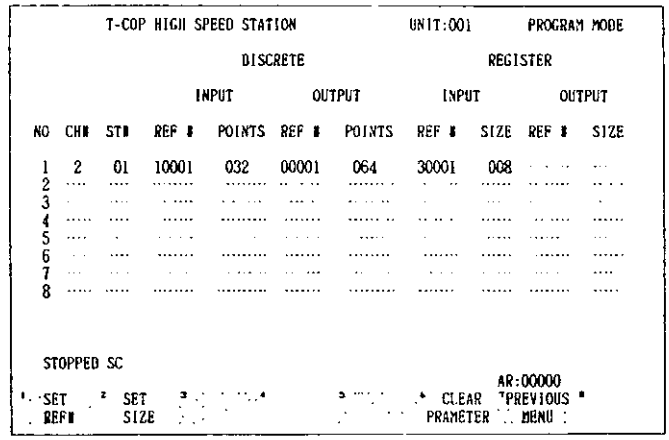


Fig. 3.46

NOTE

1. When operation has already been completed, this step can be skipped.
2. When the velues are set to CH#ST# and REF#POINTS or REF#SIZE, they are stored in the GL60S allocation table.
3. When allocation duplication occurs, the following error message is displayed:

   CAUTION: REFERENCE MULTIPLY IN TRAFFIC COP

If the setting need to be changed, depress (CLEAR PARAMETER) key; if not, derpess (PROCEED) key.

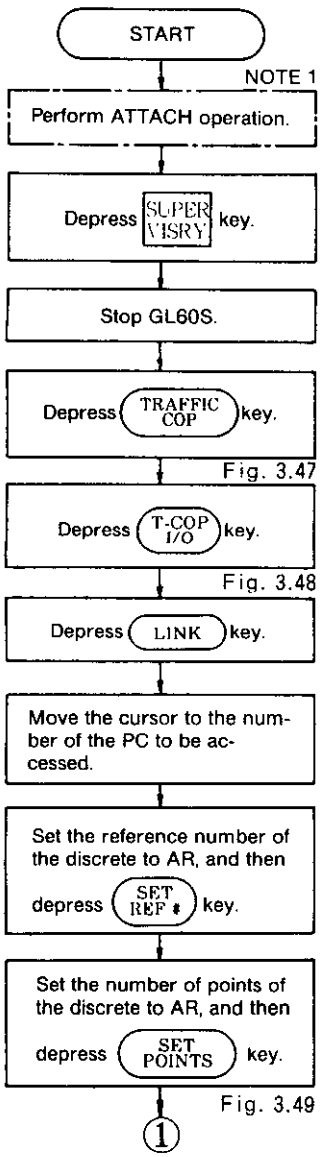
(c) LINK ALLOCATION

The inter-PC link function, which is one of the GL60S link functions, links up to 32 PCs by one line. Link allocation determines the reference numbers and the sizes for the link coil and the link register of another PC to be accessed in a program.

POINT

- This operation describes the discrete allocation mode.
- Stop the GL60S when link allocation is to be altered.
- Allocation duplication is not allowed.
- Up to 1024 points for the discrete and up to 1024 sets for the register can be designated.
- This function is supported by the DDSCR-GL60S1, S2, and S3 CPUs only.

■ Link Allocation Storing



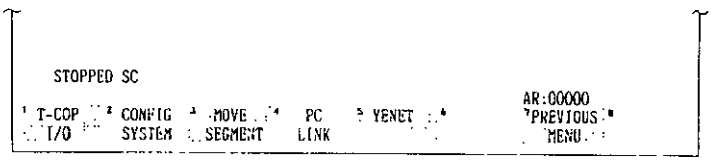


Fig. 3.47

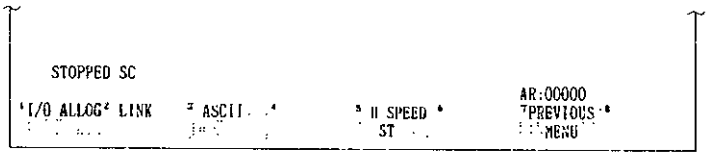


Fig. 3.48

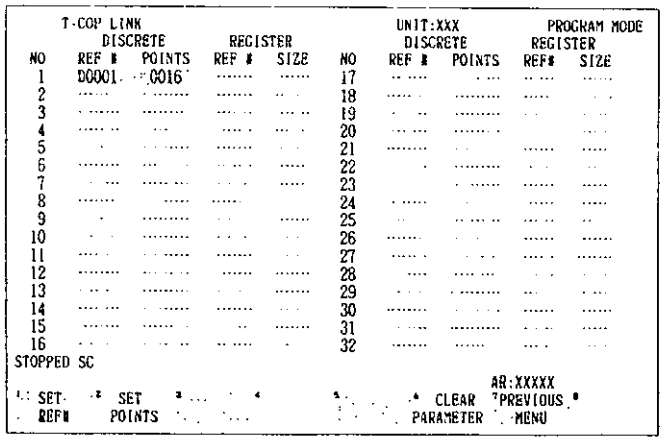


Fig. 3.49

3.5.5 Traffic Cop (Cont'd)

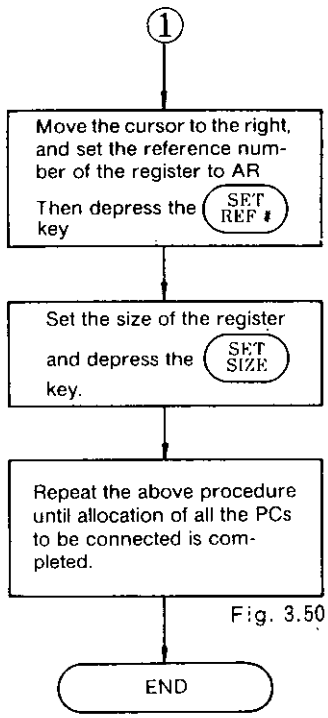


Fig. 3.50

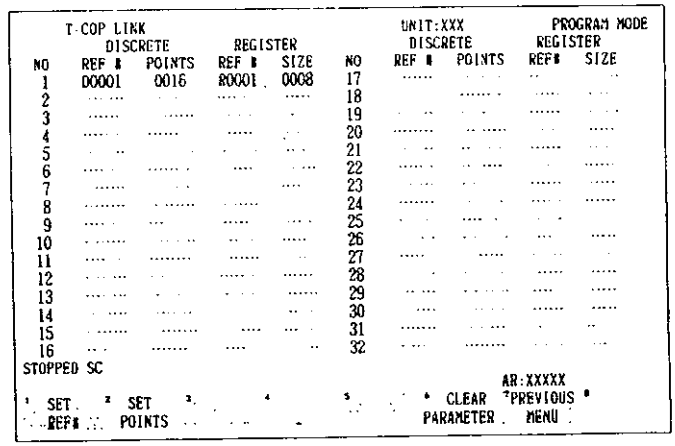


Fig. 3.50

NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. When the values are set to REF#POINTS or REF#SIZE, they are stored in the allocation table.
3. Depressing (PREVIOUS MENU) key calls up the display in Fig. 3.34.
4. Depressing (CLEAR PARAMETER) key clears the link allocation shown at the cursor.

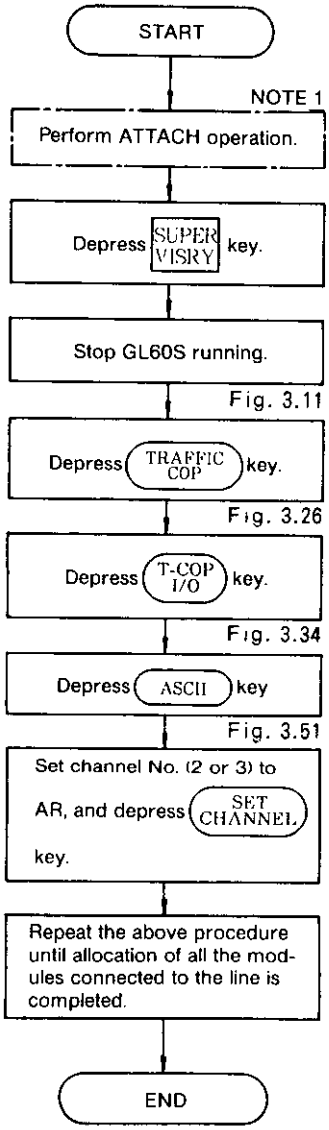
(d) ASCII ALLOCATION

A maximum of 8 ASCII modules (16 ports) can be connected to a line. ASCII allocation specifies the channel to be used by each module.

POINT

- Stop the GL60S when ASCII allocation is to be altered.

■ ASCII Allocation Storing



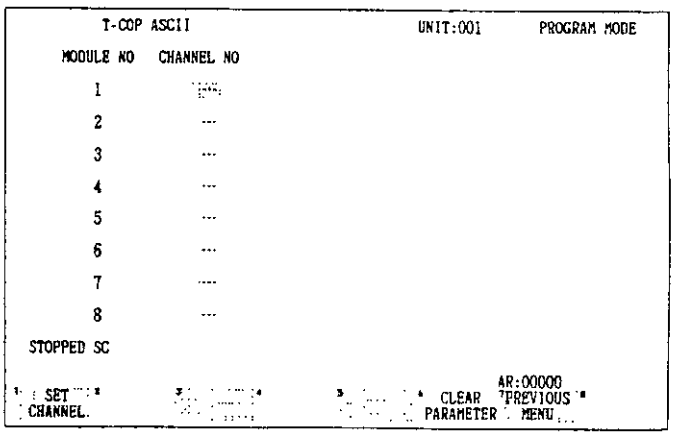


Fig. 3.51

NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. The channel number is stored in the GL60S allocation table when it is specified in the CHANNEL # field on the screen.
3. Depressing PREVIOUS MENU key calls up the display in Fig. 3.34.
4. Depressing CLEAR PARAMETER key clears the link allocation shown at the cursor.

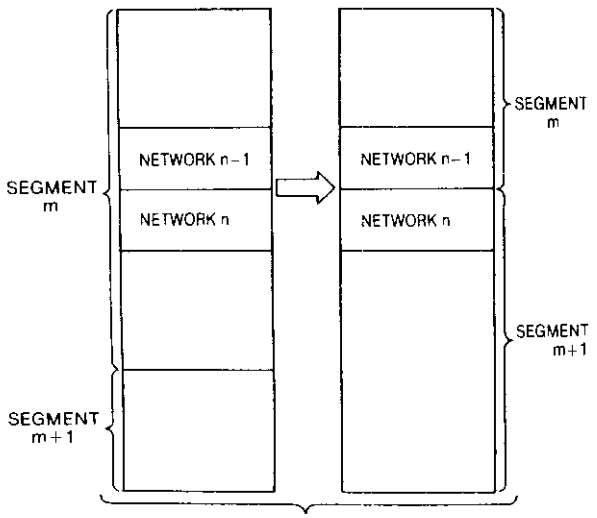
3.5.5 Traffic Cop (Cont'd)

(3) SEGMENT OPERATION

When the storage area is divided into segments, the size of an area for each segment and its network number can be displayed.

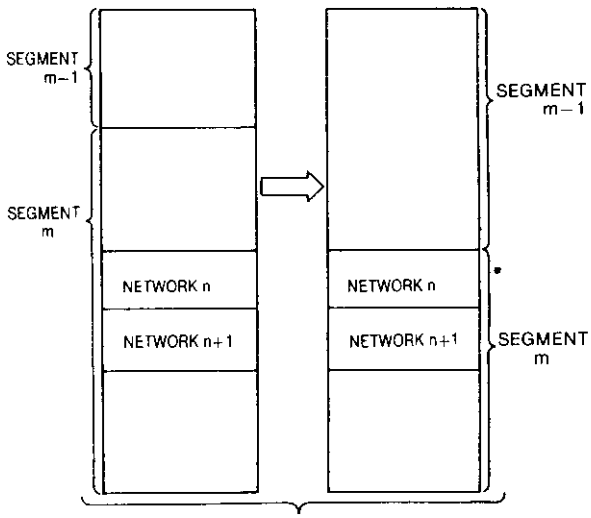
Moving networks can also be performed. The networks from n to the end within segment m can be moved into segment m+1 (MOVE NEXT), and the networks from n to the beginning within segment m can be moved into segment m-1 (MOVE PREVIOUS).

MOVE NEXT



Set n to AR, and depress (MOVE NEXT) key.

MOVE PREVIOUS

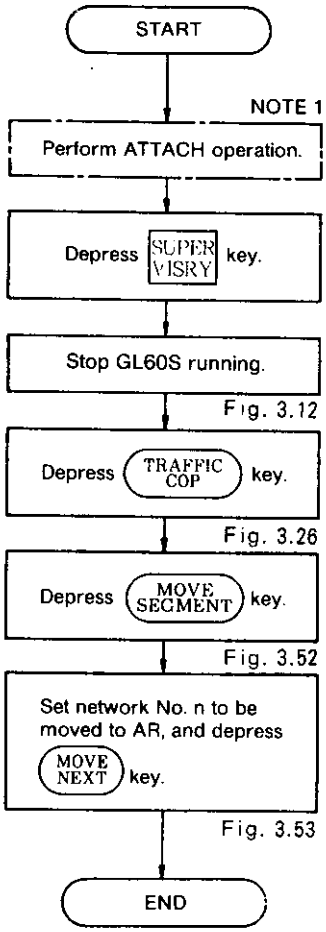


Set n+1 to AR, and depress (MOVE PREVIOUS) key.

NOTE

- Stop the GL60S running at segment operation.

(a) MOVE NEXT OPERATION



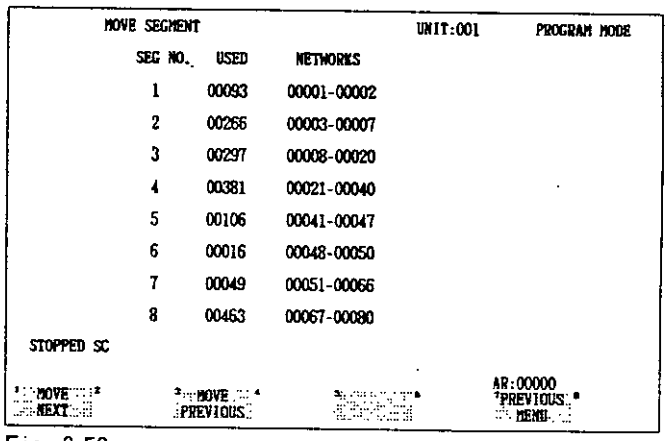


Fig. 3.52

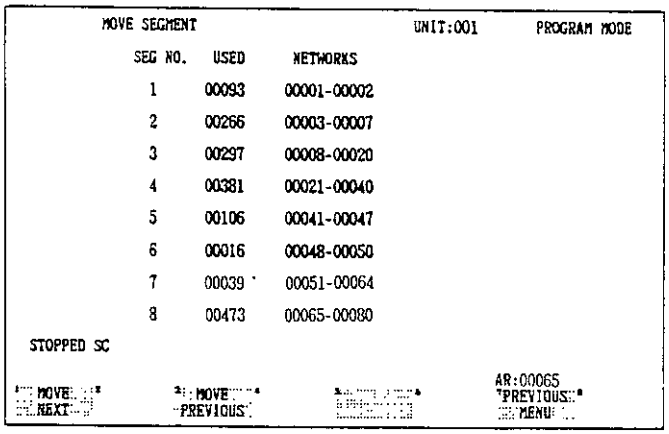


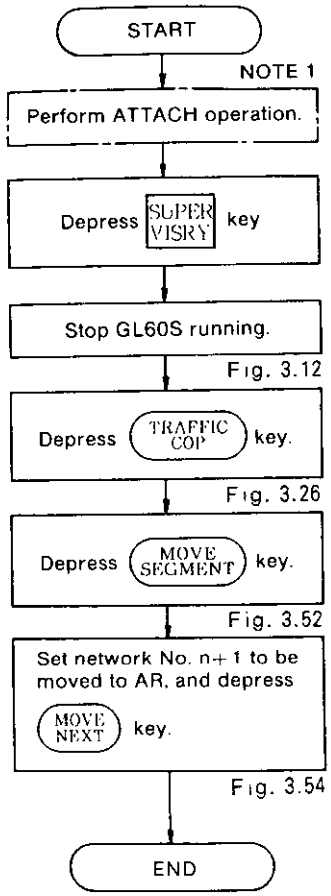
Fig. 3.53

NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. Depressing PREVIOUS MENU key calls up the display in Fig. 3.26.

3.5.5 Traffic Cop (Cont'd)

(b) MOVE PREVIOUS OPERATION



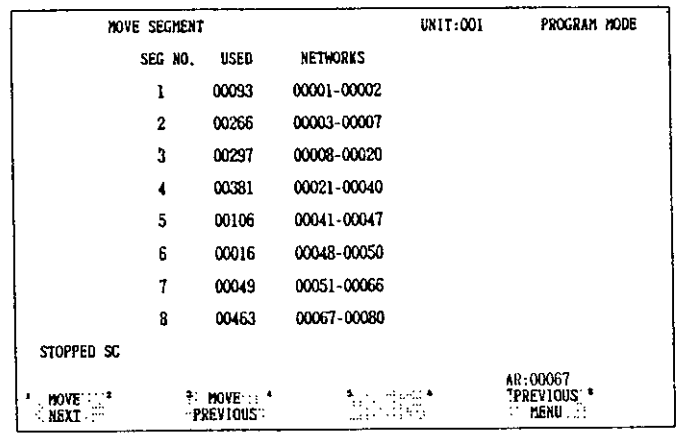


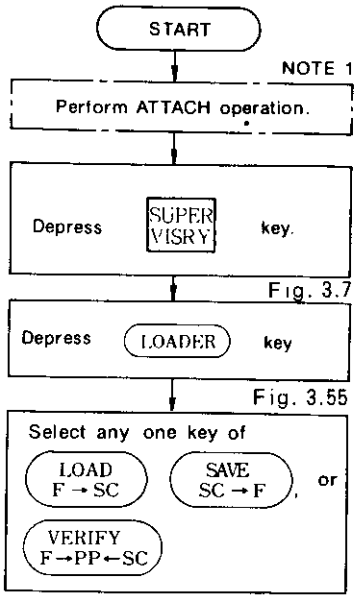
Fig. 3.54

NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. To move the last network into the previous segment, set the last network number + 1 to AR and then depress (MOVE PREVIOUS) key.
3. Depressing (PREVIOUS MENU) key calls up the display in Fig. 3.26.

3.5.6 Loader Operation

This operation is for load, (write-in), save (read out) and verify programs with the GL60S unit. Prepare data disk.
Connect the floppy disk unit (DISCT-FD400) to the P140 to carry out the loader operation.



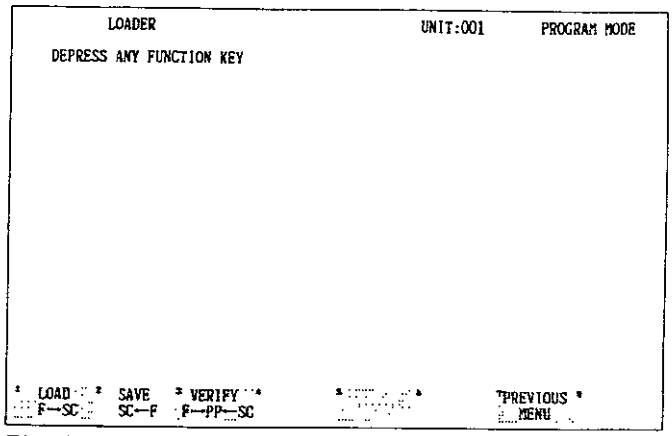


Fig. 3.55

LOAD F→SC ··· GL60S unit ← FD load operation

SAVE SC→F ··· GL60S unit ← FD save operation

VERIFY F→PP←SC ··· GL60S unit ←→ FD verify operation

NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. Label (LOAD F→SC) is not displayed in monitor mode.
3. Depressing (PREVIOUS MENU) key calls up the display in Fig. 3.5.
4. For operation of disk files, refer to Section 5 "FILE MANAGEMENT OPERATION."

3.5.6 Loader Operation (Cont'd)

IMPORTANT

The data disk cannot be used unless formatted.
For initialization, refer to the disk initialization under Par. 5.2 "DISK OPERATION." Blank disks (Model: F150-000) are in the initialized state as delivered.
In configurations supporting the P140 and the FD400 only, both 2DD and 2HD floppy disks can be used. However, if data are shared with the P150, the following restrictions apply.
These restrictions are not applied to the use of blank disks (F150-000) or disks formatted by the P150.

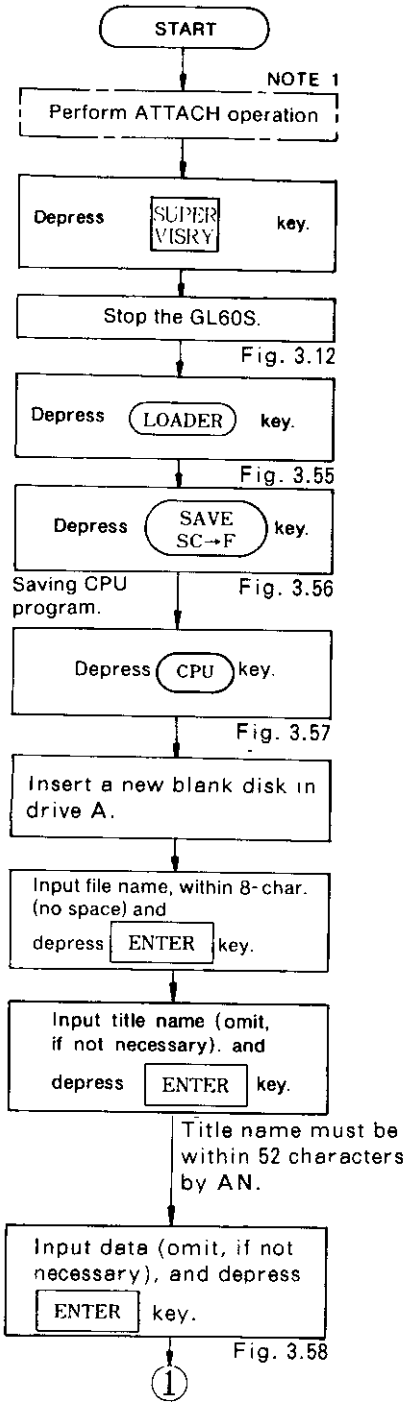
(1) The P140 provides no printer port. Use 2DD disks to use the ladder lister of the P150.
(2) 2HD disks which are applicable to the P140 cannot be used on the P150.
(3) Disks formatted by the P140 cannot be used for the loader facility of sequencers other than the GL60S series.
To share data with the P150, use a blank disk (F150-000) or a disk formatted on the P150.

(1) GL60S → FD SAVE OPERATION

The memory contents of GL60S can be saved on a data disk by the following operation.

When ladder programs have been stored, save the stored programs on a disk. If the programs are destroyed, this disk can be used to restore them by loading.

POINT • Make the data disk ready for writing.



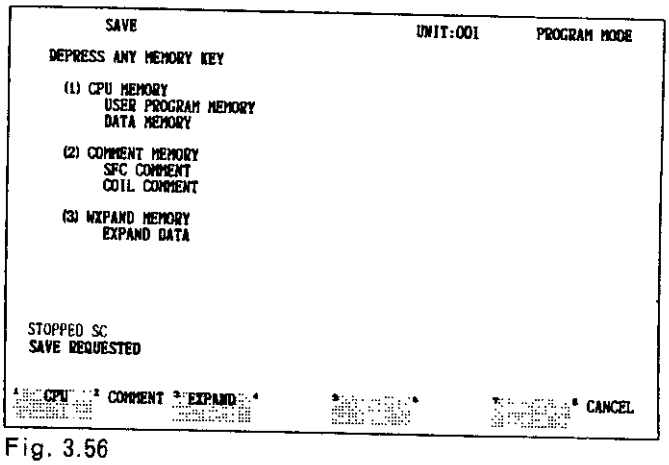


Fig. 3.56

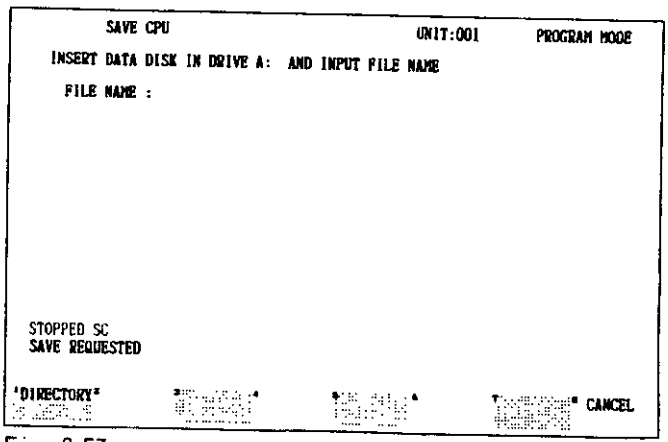


Fig. 3.57

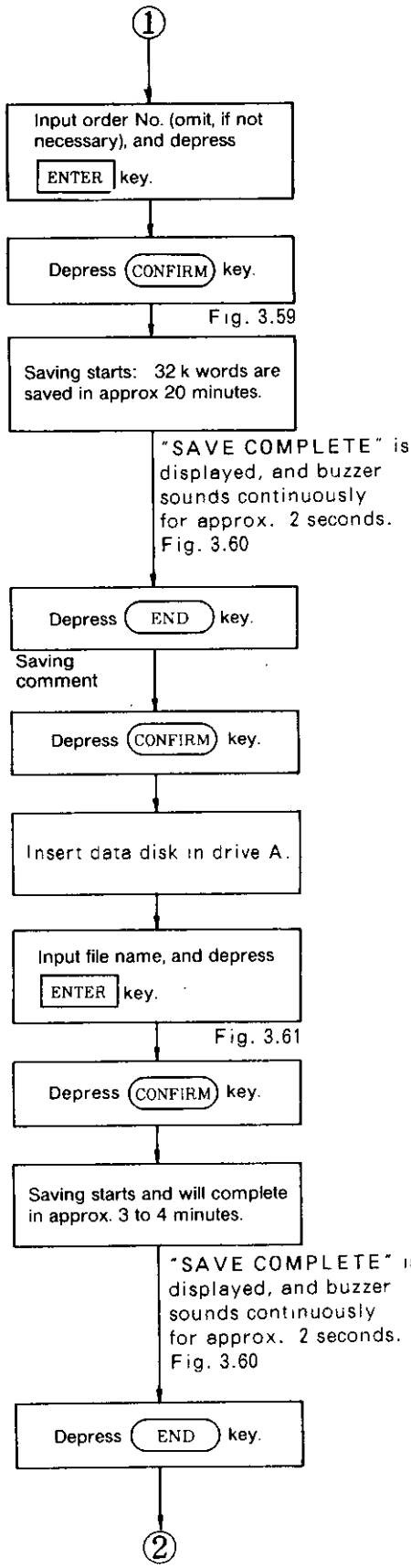
POINT

File name is within 8 characters by AN. Escape character is within 3 characters.

TESTLDR1 • U84

FILE NAME ESCAPE CHARACTER

3.5.6 Loader Operation (Cont'd)



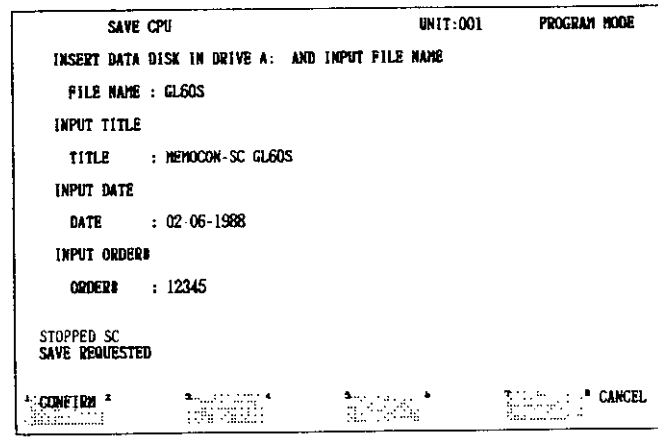


Fig. 3.58

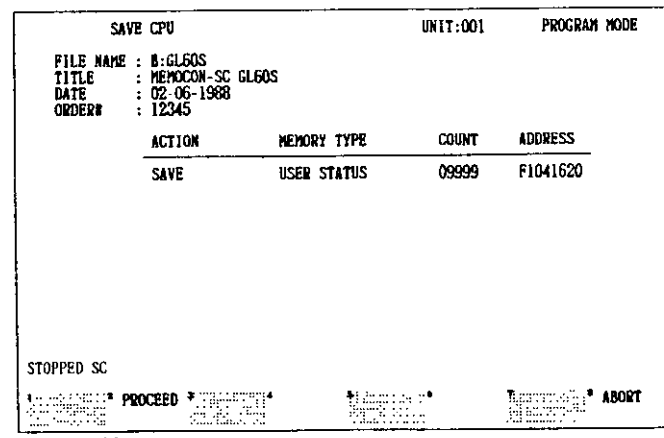


Fig. 3.59

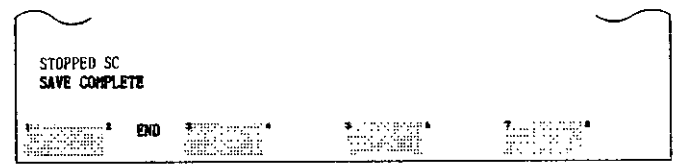


Fig. 3.60

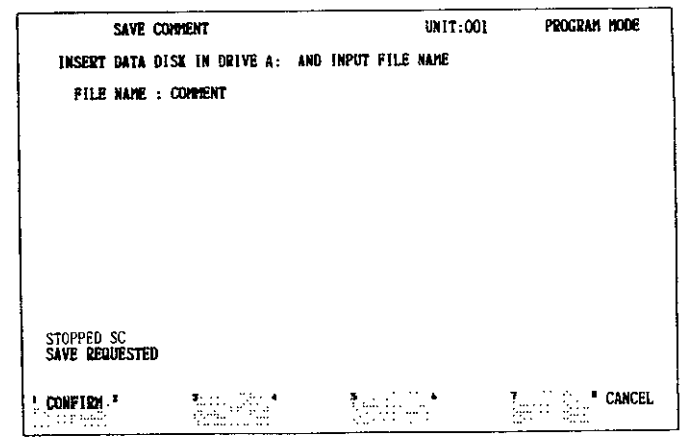
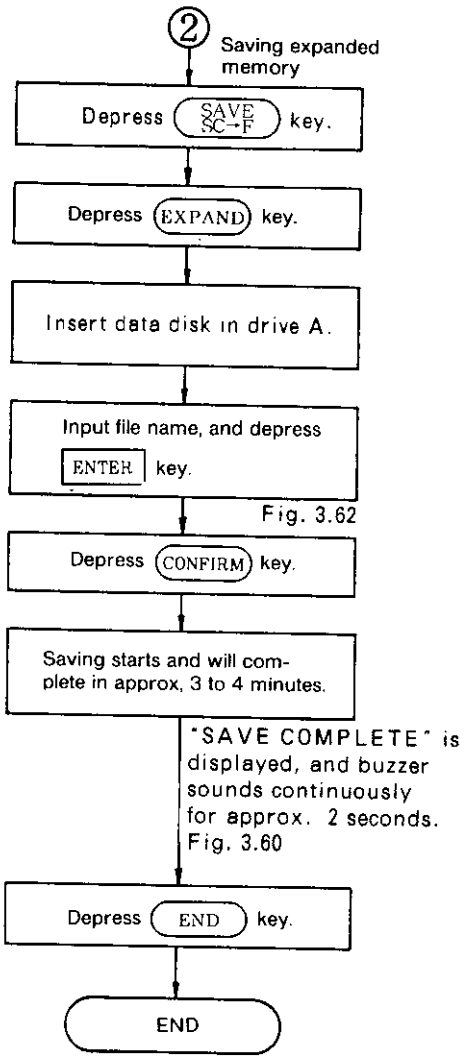


Fig. 3.61



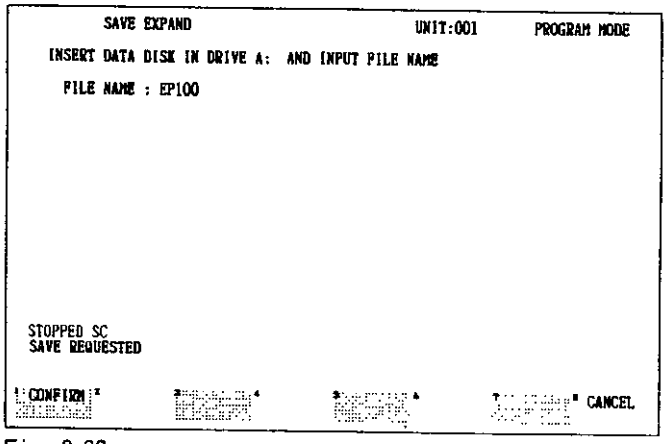


Fig. 3.62

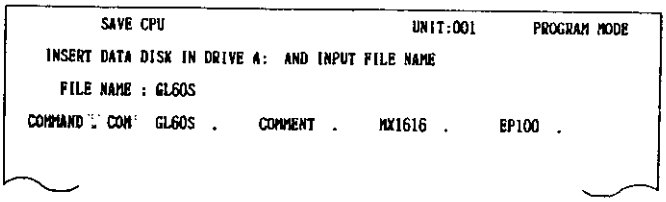


Fig. 3.63

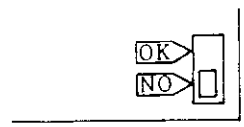
NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. Depressing (DIRECTORY) key displays the file names. (Fig. 3.63)
3. Depressing (CANCEL) key restores the state shown in Fig. 3.55.
4. To stop the save process during save execution, depress (STOP) key. The labels shown in Fig. 3.52 are displayed. Depressing (PROCEED) key causes the saving process to resume, and depressing (ABORT) key returns to the display shown in Fig. 3.55.
5. Date can be input in the form "88-02-06" or "88/02/06" in addition to the example shown in Fig. 3.58.
6. Save operation can be executed also while GL60S is running. However, execution of verify operation causes a miscomparison.

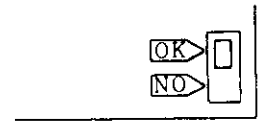
3.5.6 Loader Operation (Cont'd)

IMPORTANT

Make the data disk write enable state beforehand.



(a) Write Disable State



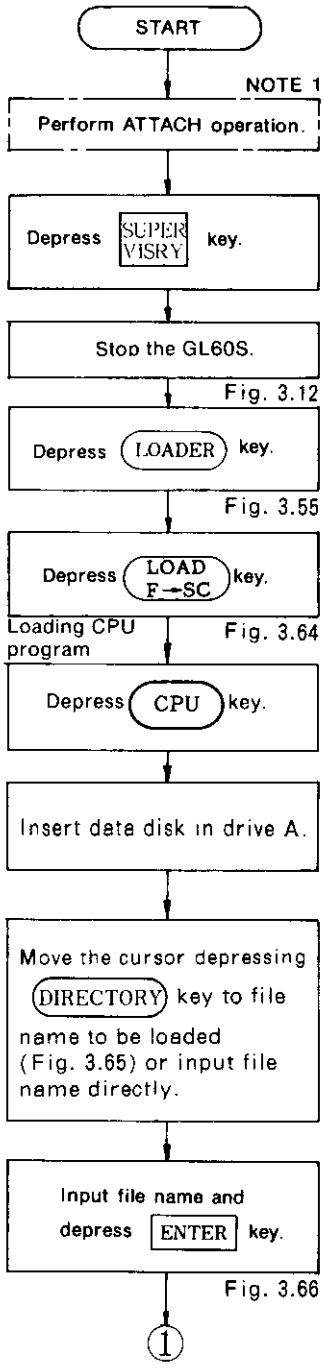
(2) Write Enable State

(2) GL60S ← FD LOAD OPERATION

Programs saved on disks can be written into GL60S. This operation is used to write completed ladder programs into on other GL60S for utilization, and to restore destroyed programs.

POINT

- Stop the GL60S before starting this operation.




```
        LOAD                                    UNIT:001      PROGRAM MODE

  DEPRESS ANY MEMORY KEY

    (1) CPU MEMORY
          USER PROGRAM MEMORY
          DATA MEMORY

    (2) COMMENT MEMORY
          SFC COMMENT
          COIL COMMENT

    (3) WXPAND MEMORY
          EXPAND DATA



  STOPPED SC
  LOAD REQUESTED

*[CPU]* COMMENT * EXPAND*                                          * CANCEL
```

Fig. 3.64

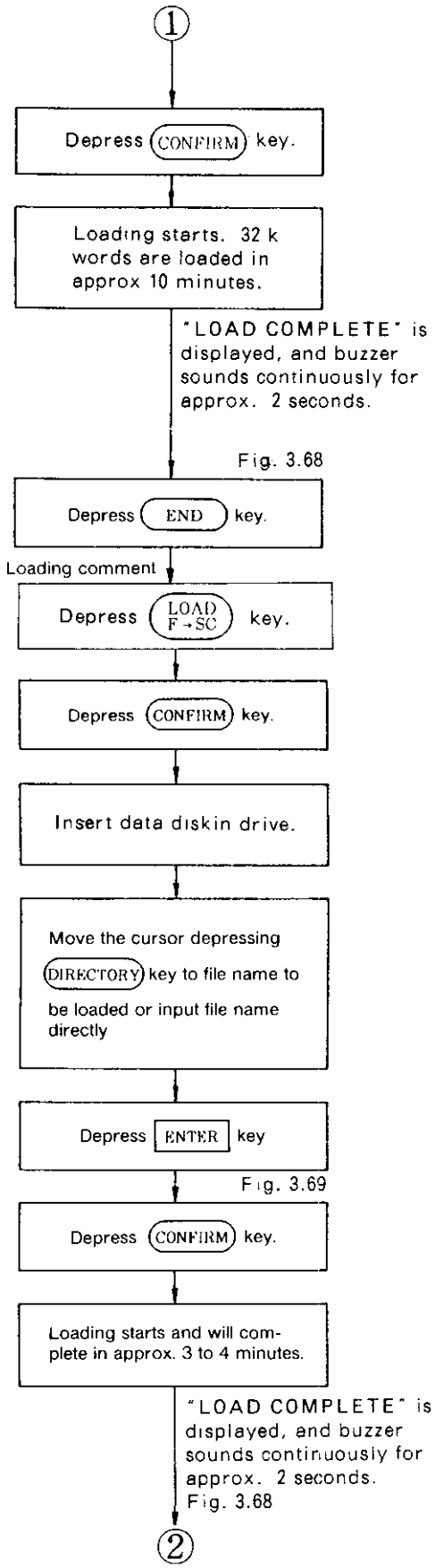
```
        LOAD CPU                                UNIT:001      PROGRAM MODE
  INSERT DATA DISK IN DRIVE A:  AND INPUT FILE NAME
    FILE NAME :
  COMMAND . COM   GL60S .    COMMENT .     MX1616 .     EP100 .




  STOPPED SC
  LOAD REQUESTED

*       *       *       * CANCEL
```

Fig. 3.65

```
        LOAD CPU                                UNIT:001      PROGRAM MODE
  INSERT DATA DISK IN DRIVE A:  AND INPUT FILE NAME
    FILE NAME : GL60S
  COMMAND . COM   GL60S .    COMMENT .     MX1616 .     EP100 .
```

Fig. 3.66

3.5.6 Loader Operation (Cont'd)




```
        LOAD CPU                                  UNIT:001      PROGRAM MODE

   FILE NAME : B:GL60S
   TITLE     : MEMOCON-SC GL60S
   DATE      : 02-06-1988
   ORDER#    : 12345

             ACTION          MEMORY TYPE        COUNT     ADDRESS
             LOAD            USER STATUS        09999     F10400C0

STOPPED SC
 1        2 PROCEED  3        4        5        6        7        8 ABORT
```

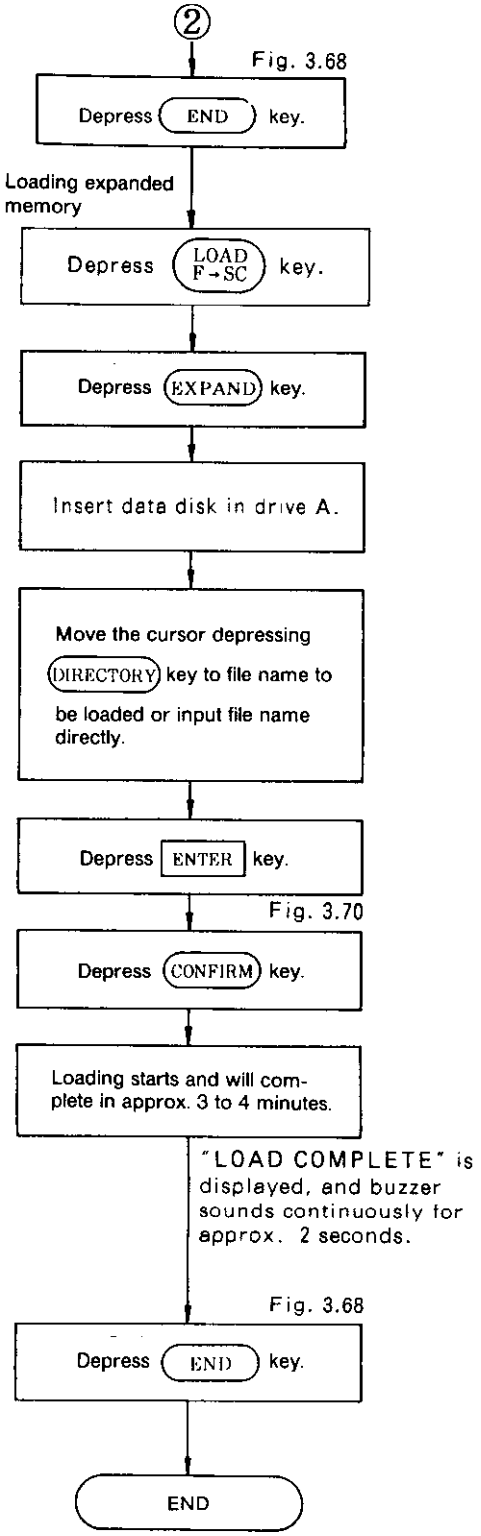
Fig. 3.67

```
STOPPED SC
LOAD COMPLETE

 1        2 END      3        4        5        6        7        8
```

Fig. 3.68

```
        LOAD COMMENT                              UNIT:001      PROGRAM MODE

   INSERT DATA DISK IN DRIVE A:  AND INPUT FILE NAME

     FILE NAME : COMMENT

 COMMAND . COM   GL60S  .     COMMENT  .     MX1616  .     EP100  .
```

Fig. 3.69




```
        LOAD EXPAND                          UNIT:001        PROGRAM MODE
  INSERT DATA DISK IN DRIVE A:  AND INPUT FILE NAME
    FILE NAME : EP100
 COMMAND . COM   GL60S .     COMMENT .     MX1616 .      EP100 .
```

Fig. 3.70

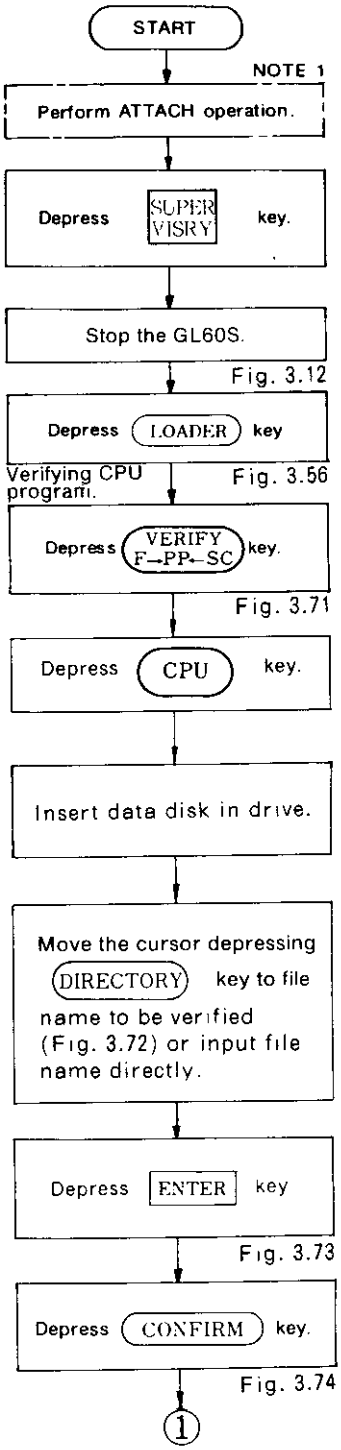
NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. Depressing (CANCEL) key calls up the display shown in Fig. 3.55.
3. To stop the loading during execution, depress (STOP) key. The labels shown in Fig. 3.67 are displayed. Depressing (PROCEED) key causes the loading to resume, and depressing (ABORT) key calls up the display shown in Fig. 3.55.

3.5.6 Loader Operation (Cont'd)

(3) GL60S ⟷ FD VERIFY OPERATION

This operation is used for verification of floppy disk contents and GL60S memory contents.



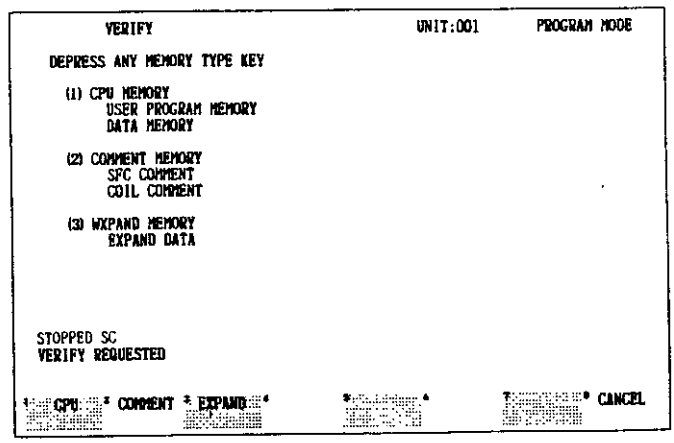


Fig. 3.71

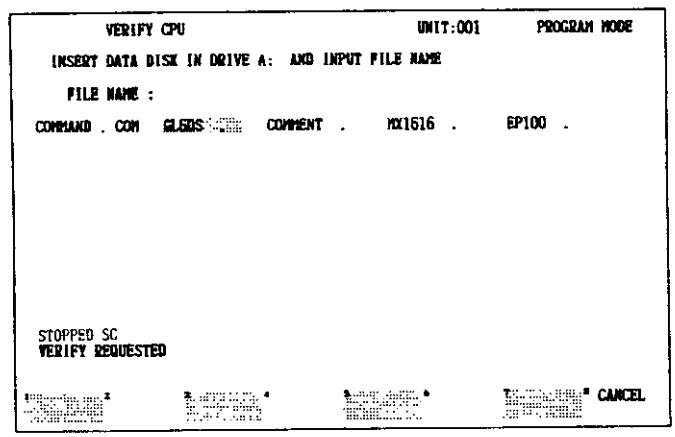


Fig. 3.72

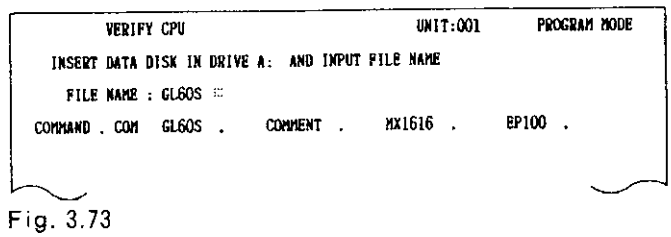


Fig. 3.73

①

Verifying starts. 30 k words are verified in approx. 8 minutes.

"VERIFY COMPLETE" is displayed, and buzzer sounds continuously for approx. 2 seconds.

Fig. 3.75

Depress (END) key.

Verifying comment

Depress (VERIFY F→PP←SC) key.

Depress (COMMENT) key.

Insert data disk in drive A.

Move the cursor depressing (DIRECTORY) key to file name to be verifyed or input file name directly.

Depress [ENTER] key.

Fig. 3.76

Depress (CONFIRM) key.

Verifying starts and will complete in approx. 1 munute.

"VERIFY COMPLETE" is displayed, and buzzer sounds continuously for approx. 2 seconds.

Fig. 3.75

Depress (END) key.

ベリファイ

Depress (VERIFY F→PP←SC) key.

Verifying expanded memory

Depress (EXPAND) key.

②

```
        VERIFY CPU                                  UNIT:001      PROGRAM MODE

   FILE NAME : B:GL60S
   TITLE     : MEMOCON-SC GL60S
   DATE      : 02-06-1988
   ORDER#    : 12345
               ACTION      MEMORY TYPE      COUNT    ADDRESS
               VERIFY      USER STATUS      00512    F1030120

               LAST MISCOMPARE : NONE
                           ADDERSS     MEMORY        DISK

STOPPED SC
      PROCEED  PAUSE  SIZE                                ABORT
               CONTINUE  NO SIZE
```

Fig. 3.74

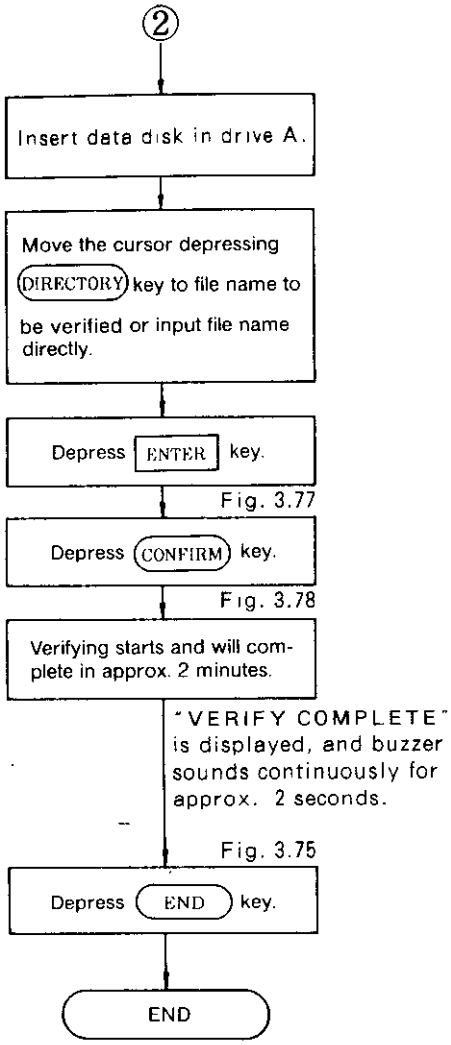
```
STOPPED SC
VERIFY COMPLETE
          END
```

Fig. 3.75

```
        VERIFY COMMENT                              UNIT:001      PROGRAM MODE
   INSERT DATA DISK IN DRIVE A:  AND INPUT FILE NAME
     FILE NAME : COMMENT
 COMMAND . COM   GL60S .    COMMENT .    MX1616 .    EP100 .
```

Fig. 3.76

3.5.6 Loader Operation (Cont'd)




```
      VERIFY EXPAND                          UNIT:001      PROGRAM MODE

  INSERT DATA DISK IN DRIVE A:  AND INPUT FILE NAME

    FILE NAME : EP100

 COMMAND . COM   GL60S  .     COMMENT  .     MX1616  .     EP100  .
```

Fig. 3.77

```
      VERIFY CPU                             UNIT:001      PROGRAM MODE

  FILE NAME : B:GL60S
  TITLE     : MEMOCON-SC GL60S
  DATE      : 02-15-1988
  ORDER#    : 12345

            ACTION          MEMORY TYPE        COUNT     ADDRESS
            VERIFY          USER STATUS        02304     F10A0000

            LAST MISCOMPARE :  1
                        ADDERSS          MEMORY          DISK
                        F10A0000         0000            8000

STOPPED SC
                  PROCEED   PAUSE      SIZE                    ABORT
                            CONTINUE   NO SIZE
```

Fig. 3.78

NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. Depressing (CANCEL) key calls up the display shown in Fig. 3.55..
3. If an obvious miscomparison (difference between the program size and GL60S memory capacity) is found during the verifying process, the process is stopped, and the buzzer sounds intermittently for 10 seconds. Depressing (ABORT) key calls up the display shown in Fig. 3.55.
4. If miscomparison other than the one listed in 3 above, is found during the verifying process, the process is stopped and the label shown in Fig. 3.74 is displayed. Depressing (PROCEED) key causes the verifying process to continue and depressing (ABORT) key calls up the display shown in Fig. 3.55.

   If the major errors* in verification occurs, the buzzer sounds intermittently for 2 seconds. Interrupt the verifying process, and restart from the SAVE operation.

5. Even if miscomparison (as in 3 above) is present, when label display (↑PAUSE↑ CONTINUE) is changed for (PAUSE ↓CONTINUE↓) by (↑PAUSE↑ CONTINUE) key depression, the verifying process continues execution to the end. In this case, for example, "LAST MISCOMPARE: 23", "VERIFY COMPLETE" is displayed in the message area.
6. (↑SIZE↑ NO SIZE) is for future use.

*The major errors in verification may occur in the following areas:
- LOGIC area (Ladder diagrams, SFC stored)
- TRAFFIC COP area (System configuration, I/O allocation stored)
- SYSTEM area

3.6 PROGRAMMING AND MONITOR OPERATION

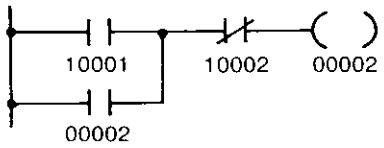
3.6.1 Ladder Operation

(1) LADDER

(a) NETWORK STORING

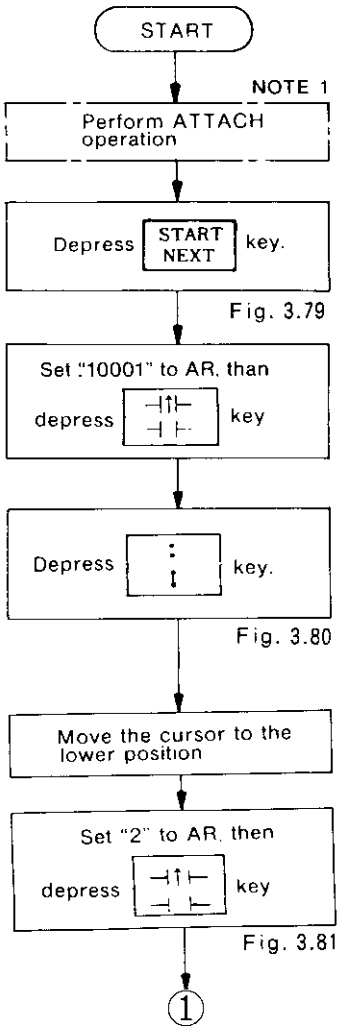
1. RELAY, COIL ①

Sample Relay Logic



POINT

- Any logic coil (output or internal) can be used as a coil only once; however, references to contacts controlled by that coil can be used as many times as required.
- The cursor should be placed in the logic area.



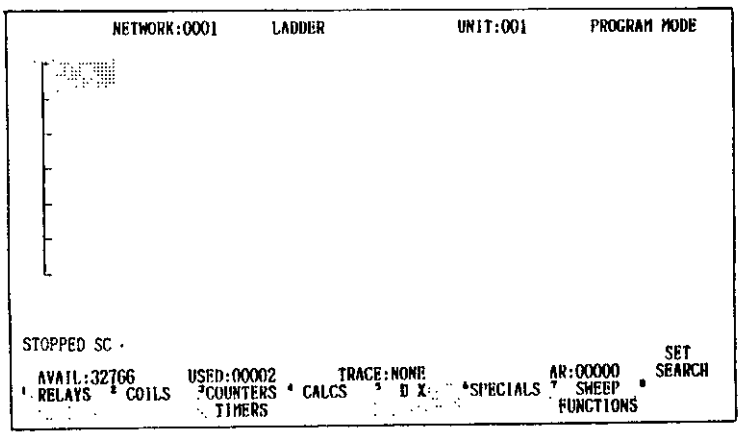


Fig. 3.79

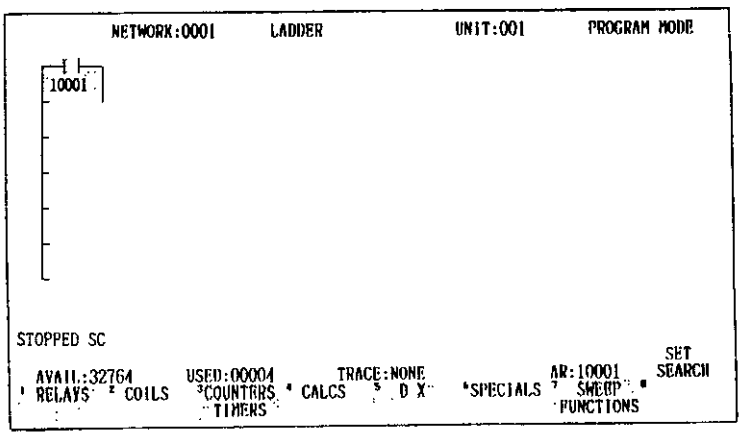
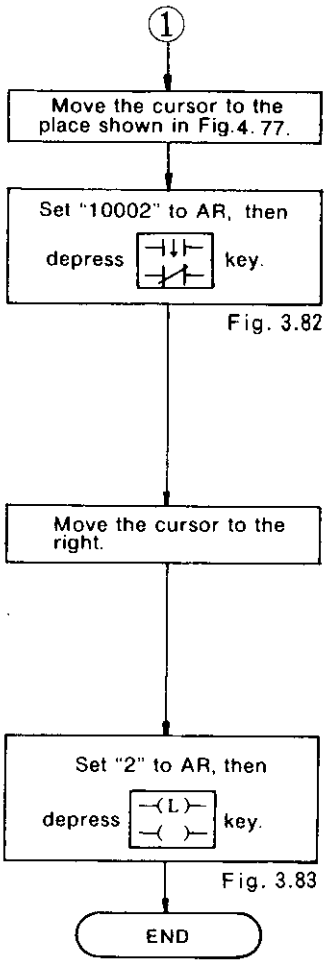


Fig. 3.80



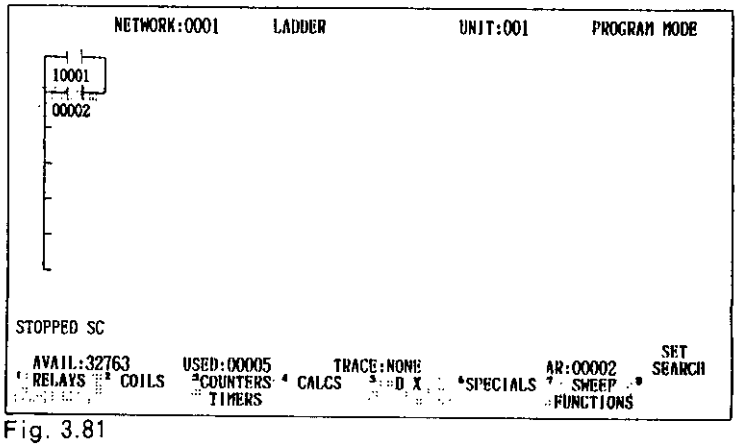


Fig. 3.81

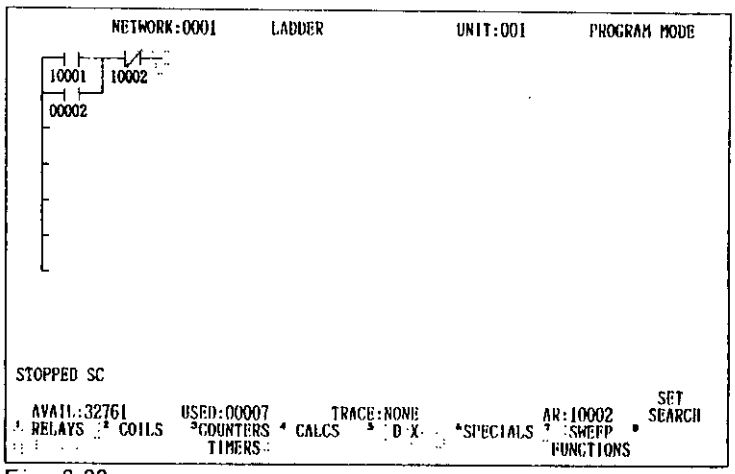


Fig. 3.82

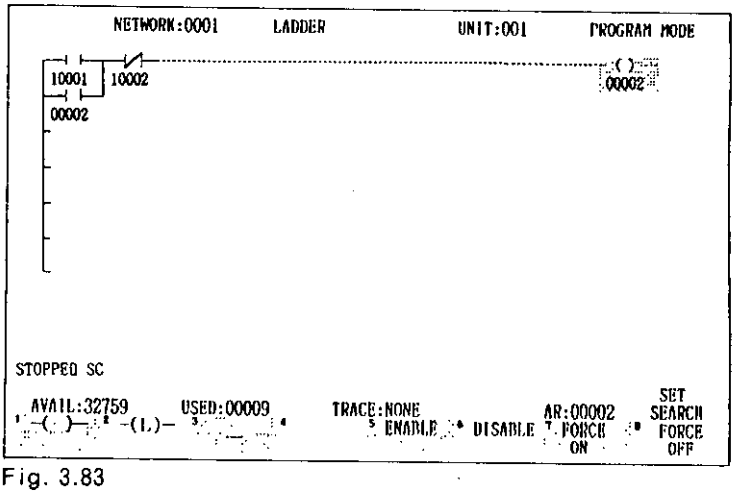


Fig. 3.83

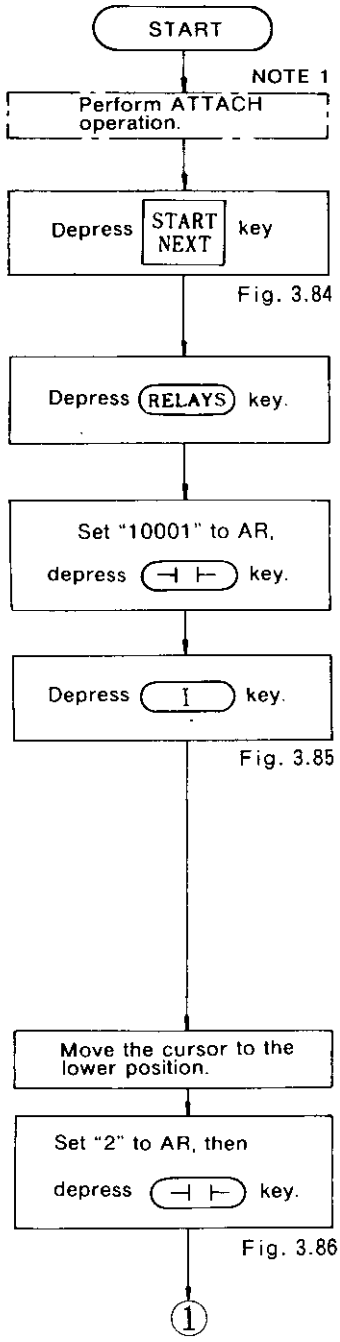
NOTE

1. This step can be skipped if the system is ready to store the program.
2. The elements stored or altered via the P140 are immediately written in the GL60S memory.
3. Altering and storing operations of program are avaliable when the GL60S is at a standstill, or even while running.
4. The label keys are also available for storing of relay contact and coil. See the next page.

3.6.1 Ladder Operation (Cont'd)

1. RELAY, COIL ②

Storing operation is performed with label key.



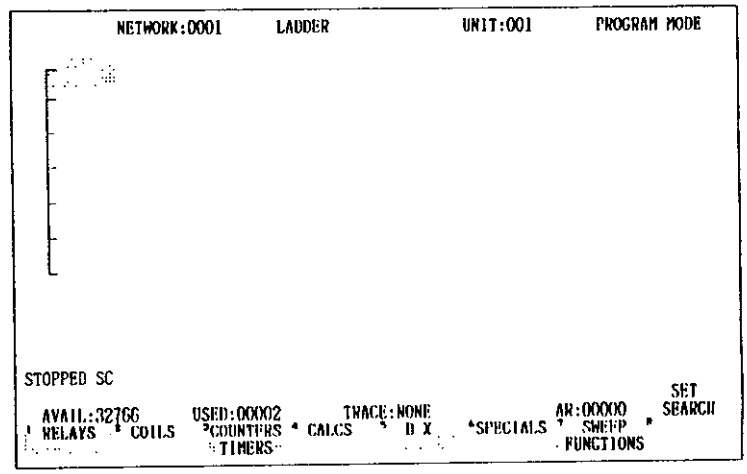


Fig. 3.84

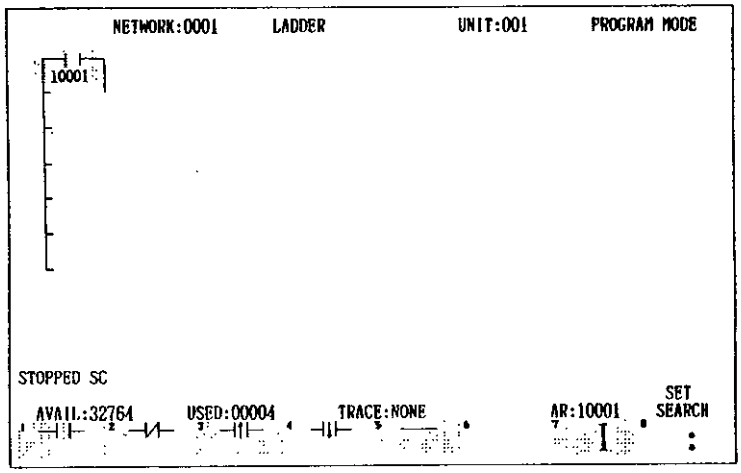


Fig. 3.85

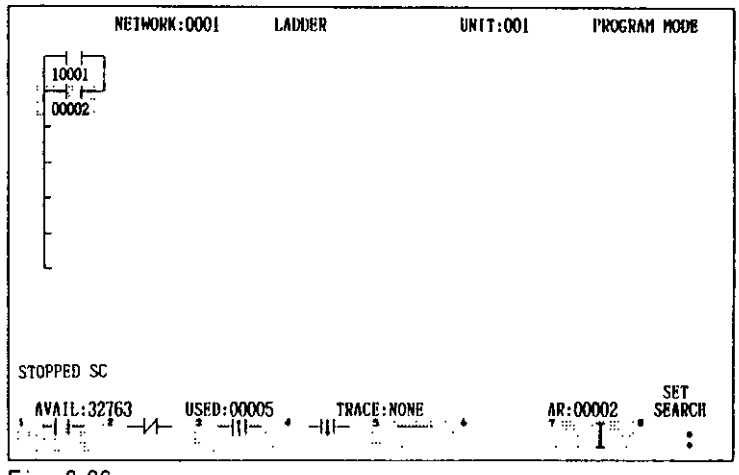
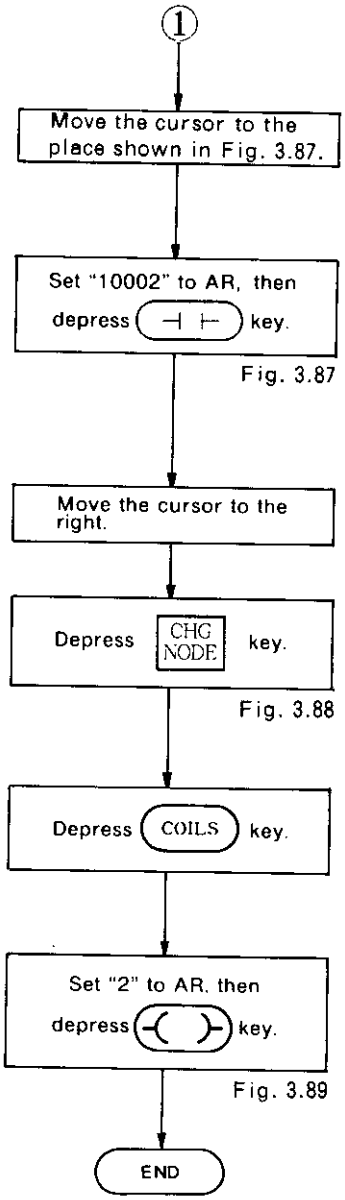


Fig. 3.86



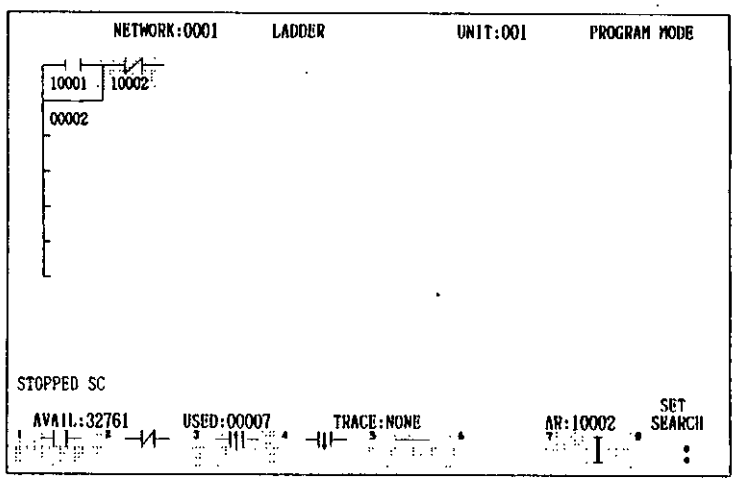


Fig. 3.87

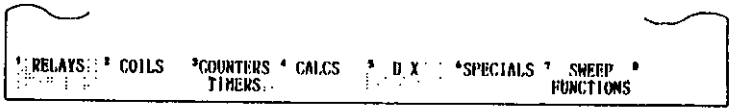


Fig. 3.88

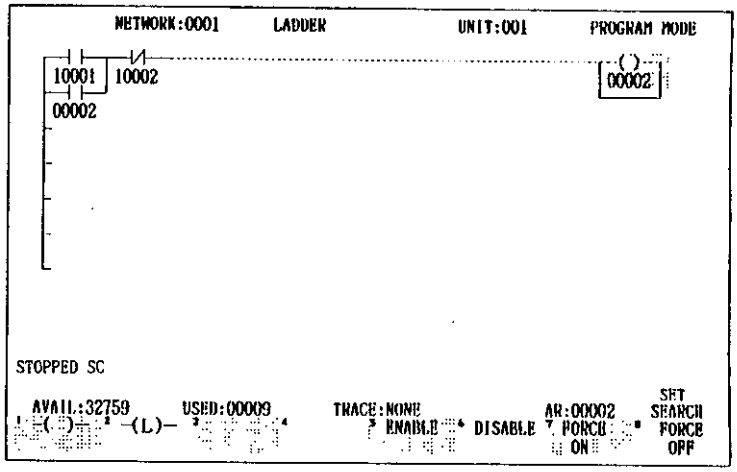


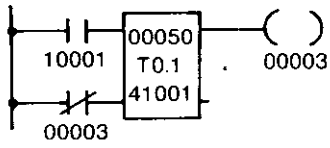
Fig. 3.89

NOTE

- This step can be skipped if the system is ready to store the program.

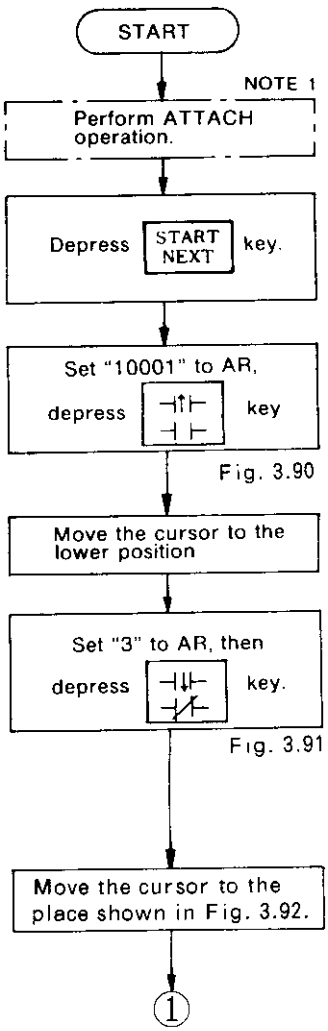
2. TIMER, COUNTER

Sample Timer Logic



POINT

- The cursor should be placed in the logic area.
- Elements of timer and counter should be stored in a range of 1 to 6 rungs.



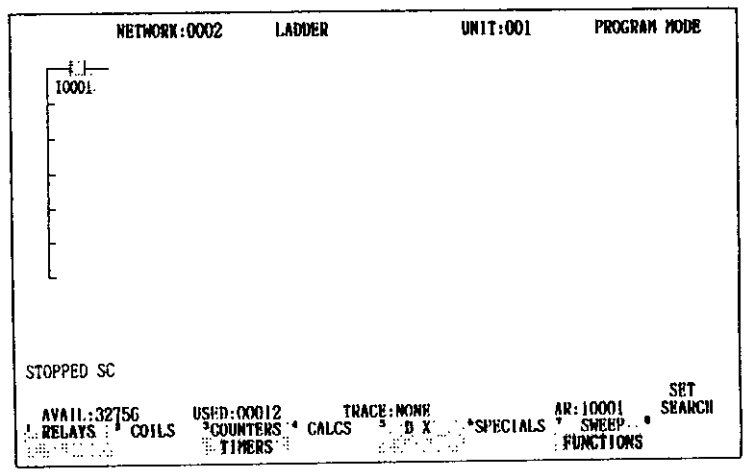


Fig. 3.90

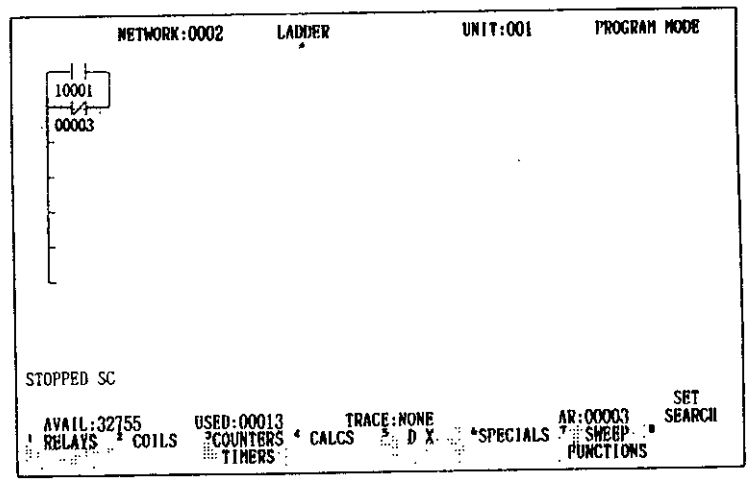


Fig. 3.91

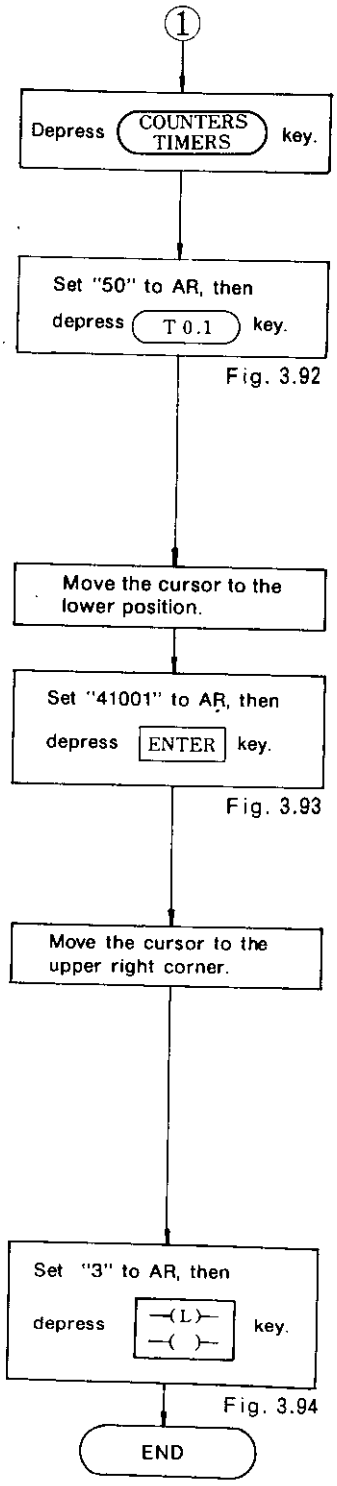


Fig. 3.92

Fig. 3.93

Fig. 3.94

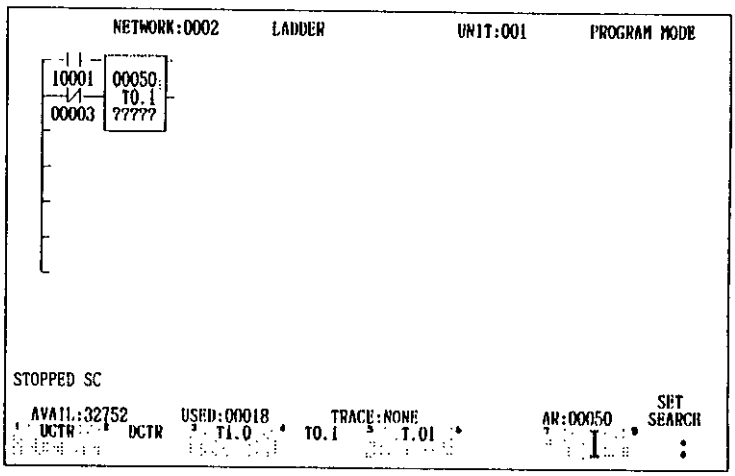


Fig. 3.92

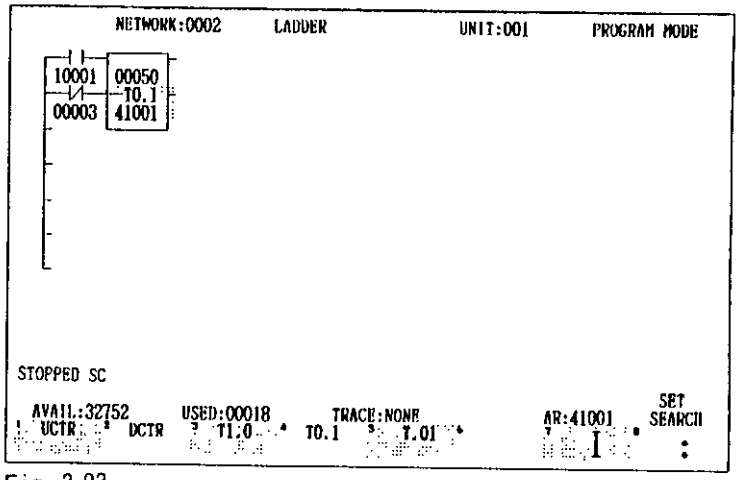


Fig. 3.93

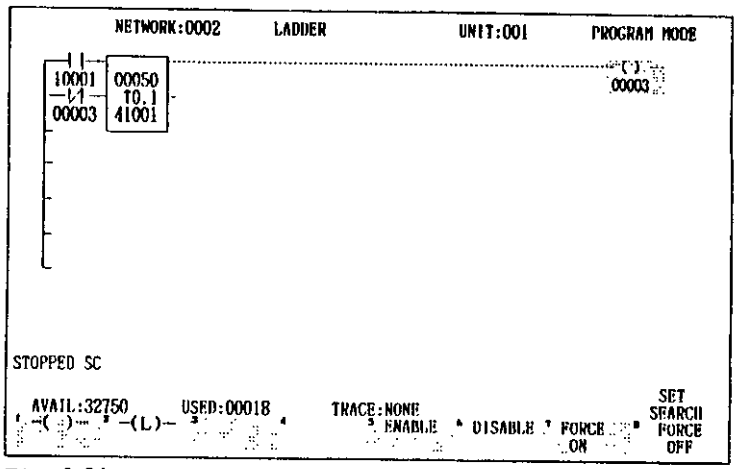


Fig. 3.94

NOTE

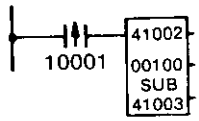
1. This step can be skipped if the system is ready to store the program.
2. The label keys are also available for storing of relay contact and coil.
3. The function keys are also available for storing timers and counters.

3.6.1 Ladder Operation (Cont'd)

3. ARITHMETIC STORING ①

Sample Subtraction Logic

POINT



- The cursor should be placed in the logic area.
- Elements of arithmetic functions should be stored in a range of 1 to 5 rungs.

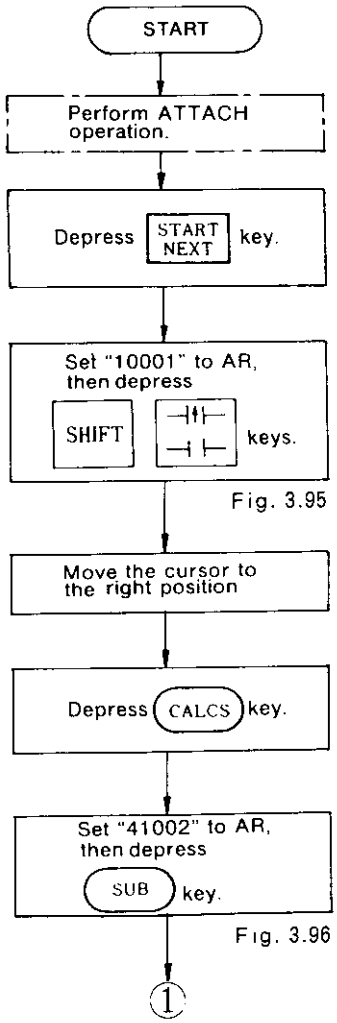


Fig. 3.95

Fig. 3.96

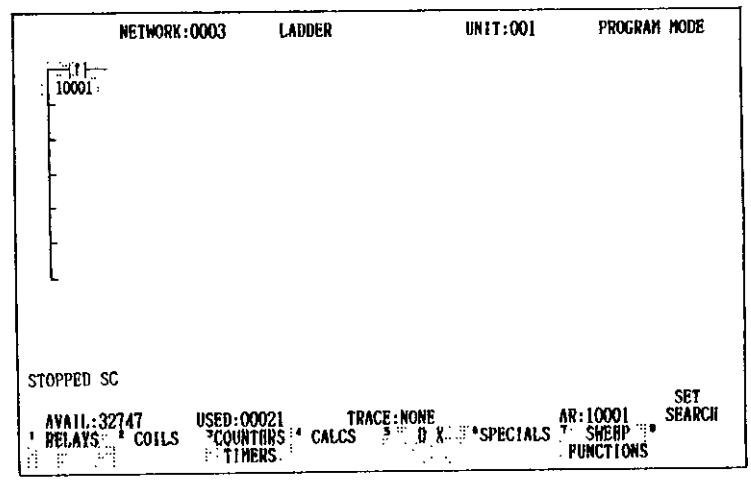


Fig. 3.95

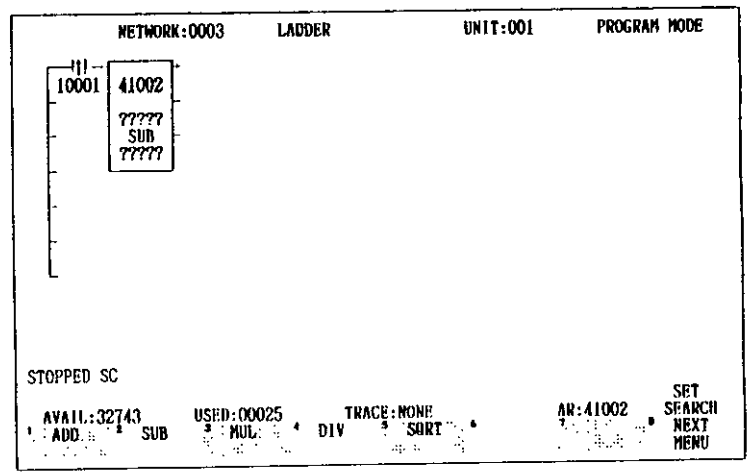
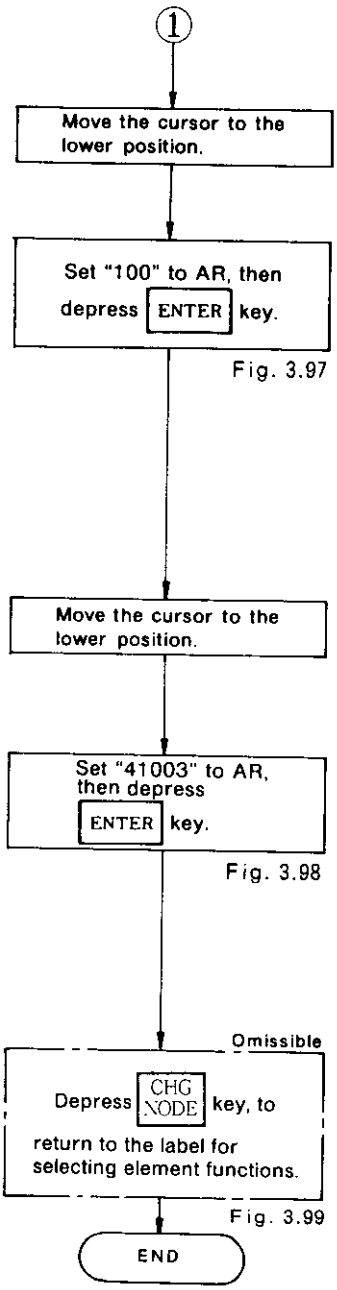


Fig. 3.96



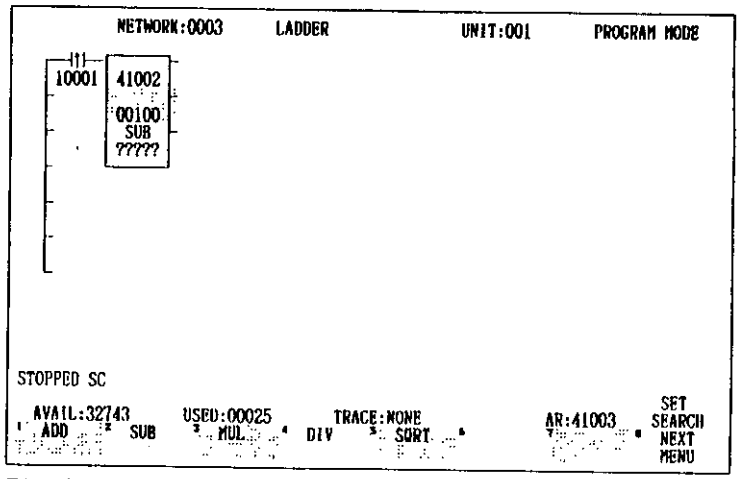


Fig. 3.97

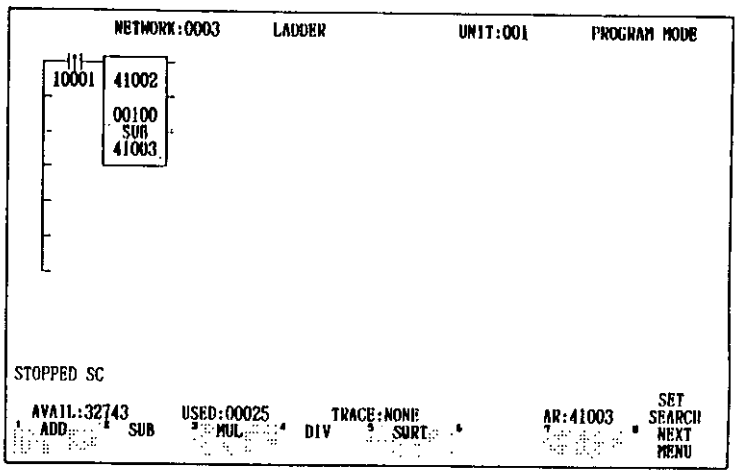


Fig. 3.98

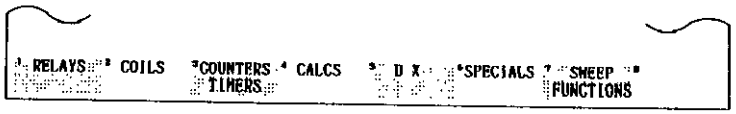


Fig. 3.99

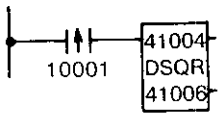
NOTE

1. This step can be skipped if the system is ready to store the program.
2. The label keys are also available for storing of relay contact and coil.
3. The function keys are also available for storing arithmetic operations; SUB, ADD, MUL, and DIV. When the function keys are used, they are displayed as −, +, ×, and ÷, respectively.

3.6.1 Ladder Operation (Cont'd)

3. ARITHMETIC STORING ②

Sample Double-precision Square Root



POINT

- The cursor should be placed in the logic area.
- Square root elements should be stored in a range of 1 to 6 rungs.

START

NOTE 1
Perform ATTACH operation

Depress START NEXT key

Set "10001" to AR, then depress SHIFT keys.

Fig. 3.100

Move the cursor to the right position.

Depress CALCS key

Fig. 3.101

Depress NEXT MENU key.

Fig. 3.102

Depress NEXT MENU key

Set "41004" to AR, then depress DSQR key.

Fig. 3.103

①

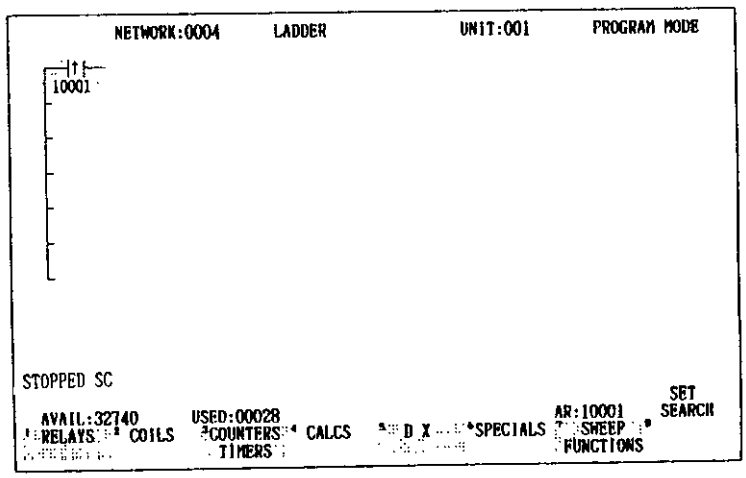


Fig. 3.100

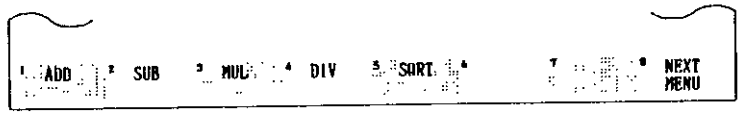


Fig. 3.101

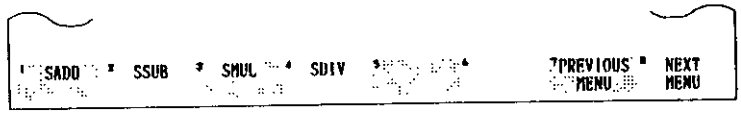


Fig. 3.102

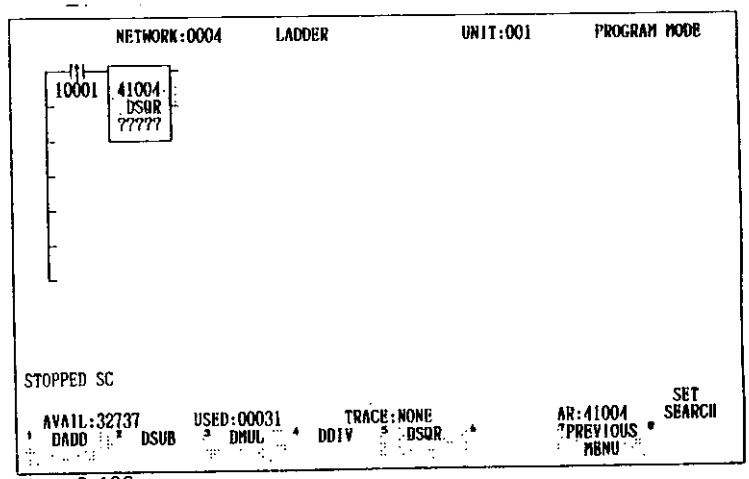


Fig. 3.103

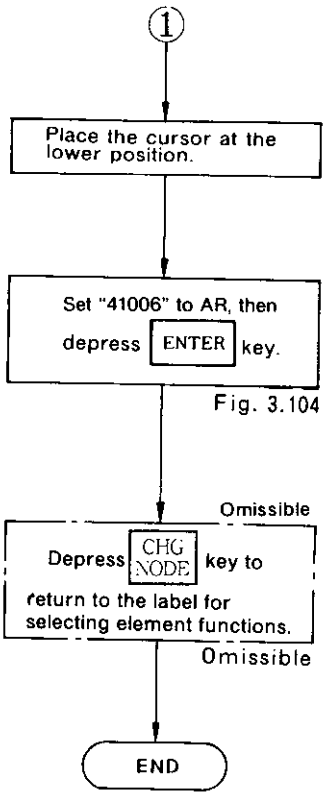


Fig. 3.104

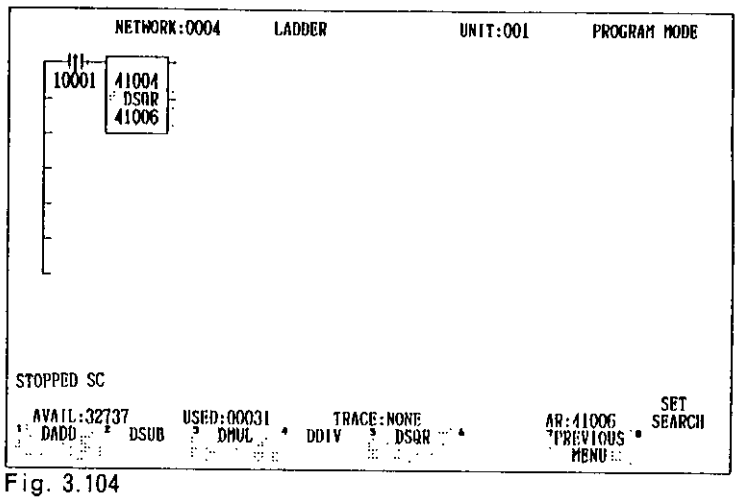
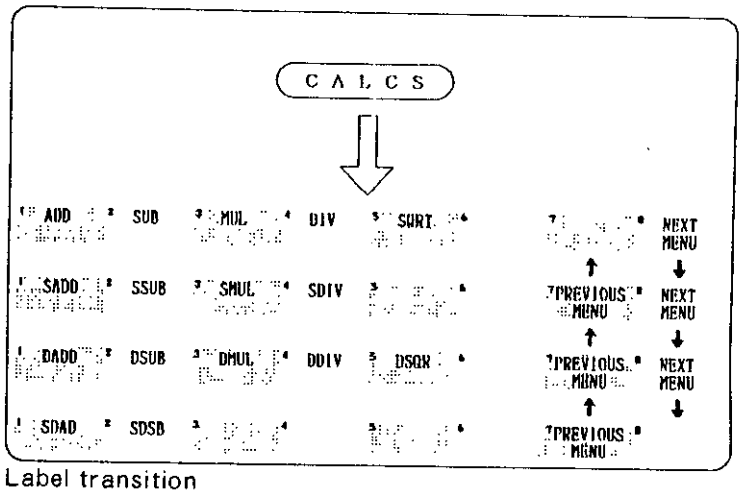


Fig. 3.104



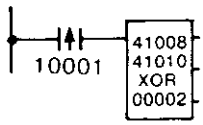
Label transition

NOTE

1. This step can be skipped if the system is ready to store the program.
2. The label keys are also available for storing of relay contact and coil.

4. MOVE AND MATRIX STORING

Sample Logical Exclusive OR of Two Matrices (XOR)



POINT

- The cursor should be placed in the logic area.
- Move elements should be stored in a range of 1 to 5 rungs, and "STAT", "TWST", "SIN" and "COS" elements in a range of 1 to 6 rungs.

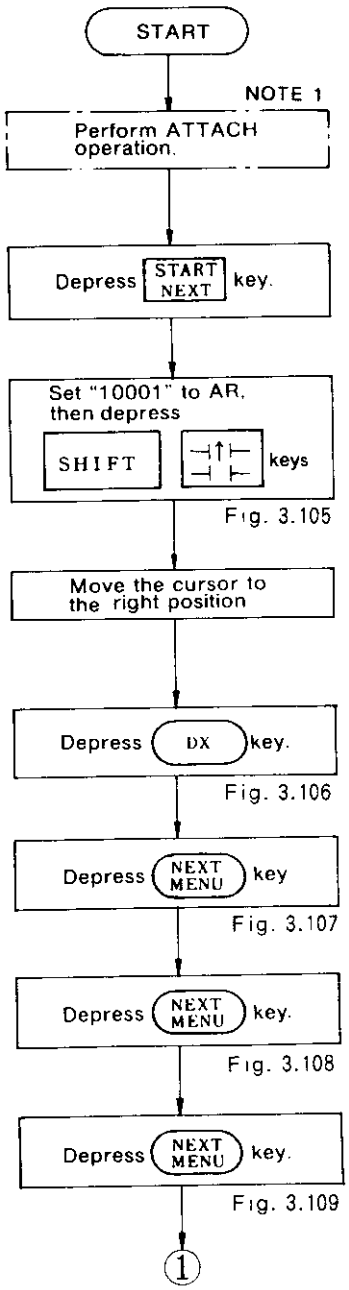


Fig. 3.105

Fig. 3.106

Fig. 3.107

Fig. 3.108

Fig. 3.109

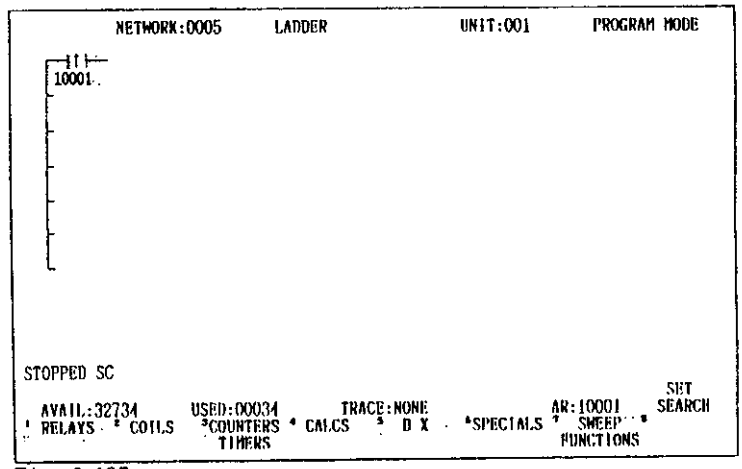


Fig. 3.105

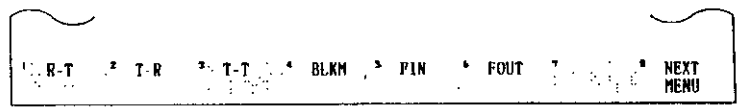


Fig. 3.106

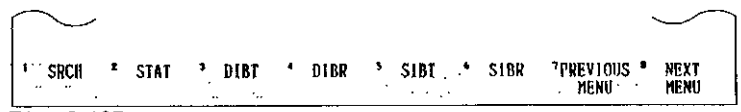


Fig. 3.107

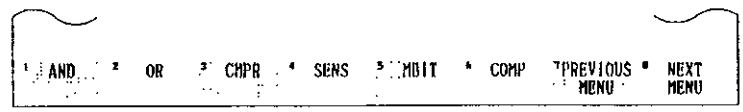


Fig. 3.108

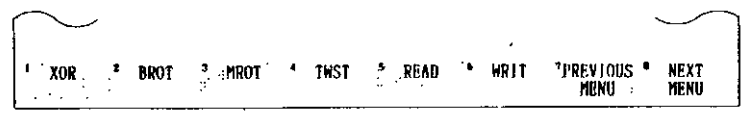
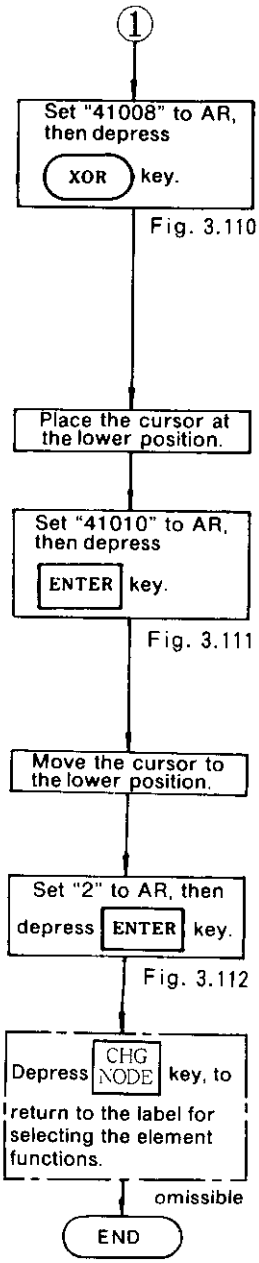


Fig. 3.109



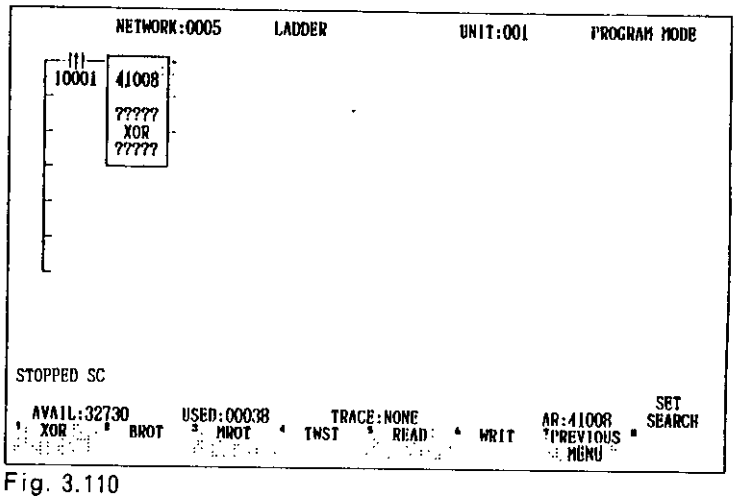


Fig. 3.110

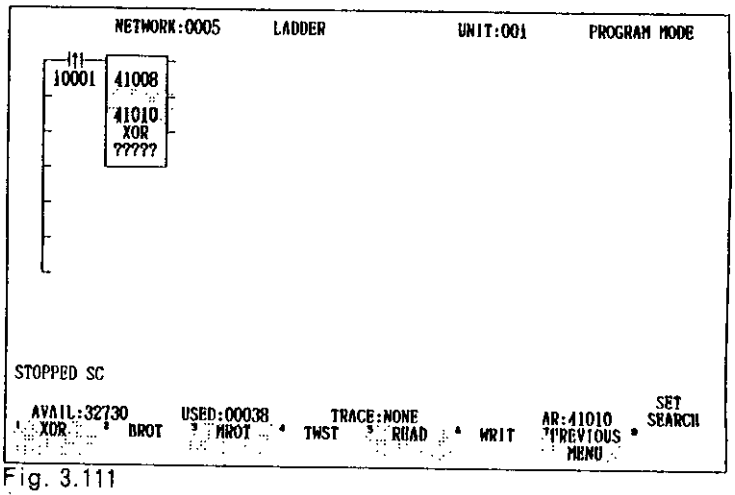


Fig. 3.111

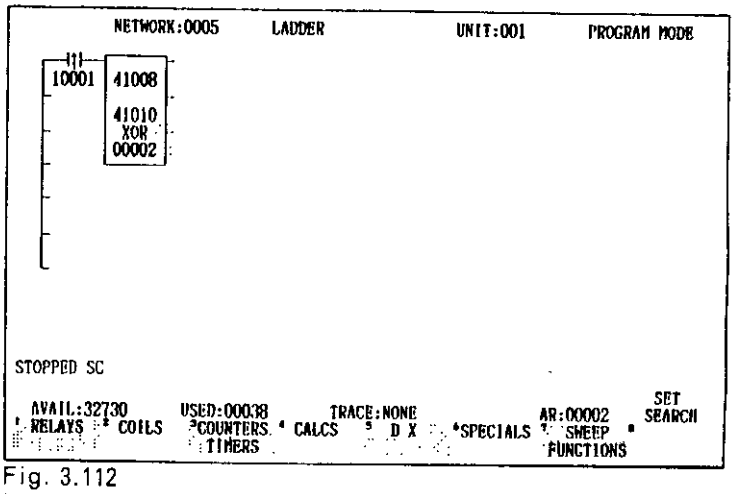


Fig. 3.112

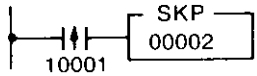
NOTE

1. This step can be skipped if the system is ready to store the program.
2. The label keys are also available for storing of relay contact and coil.

3.6.1 Ladder Operation (Cont'd)

5. SKIP STORING

Sample Skip



POINT

- The cursor should be placed in the logic area.

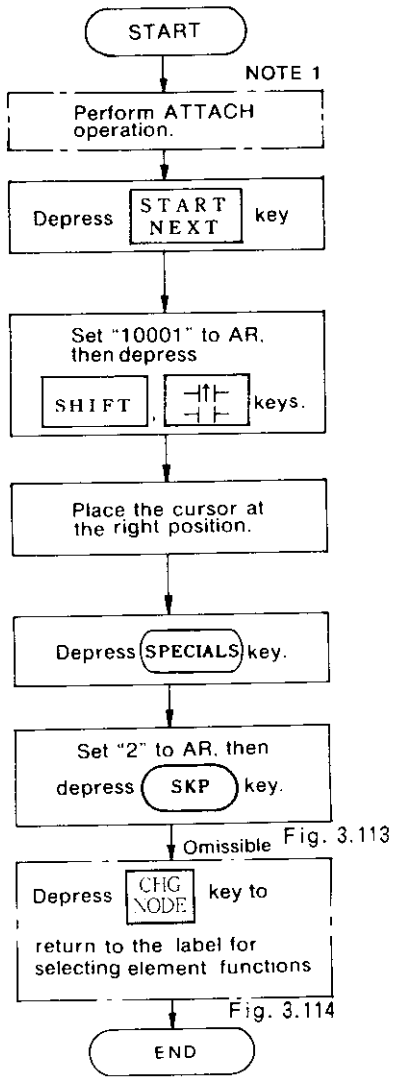


Fig. 3.113

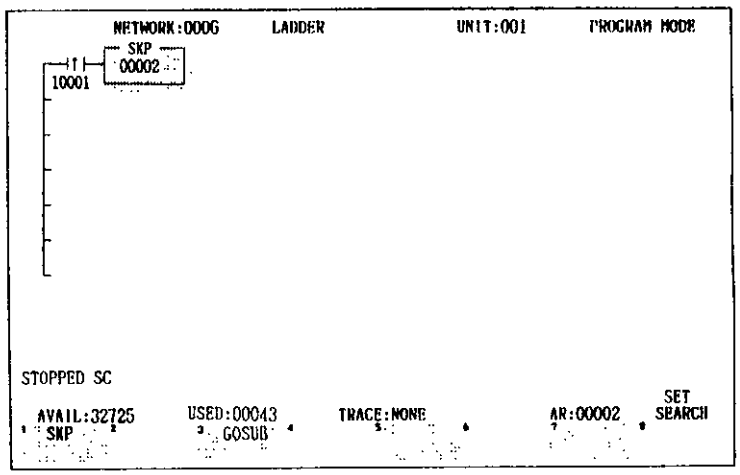


Fig. 3.113

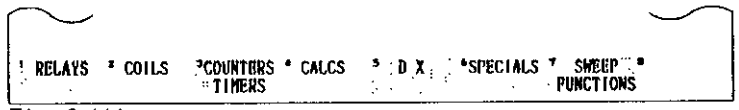


Fig. 3.114

NOTE

1. This step can be skipped if the system is ready to store the program.
2. The label keys are also available for storing of relay contact and coil.

Table 4. Label Displays for Selecting Element Functions

Label Keys \ Label Displays	1	2	3	4	5	6	7	8
RELAYS	RELAYS	COILS	COUNTERS TIMERS	CALCS	D X	SPECIALS	SWEEP FUNCTIONS	
	⊣ ⊢	⊣/⊢	⊣↑⊢	⊣↓⊢	——		I	:
COILS	-( )-	-(L)-			ENABLE	DISABLE	FORCE ON	FORCE OFF
COUNTER TIMERS	UCTR	DCTR	T1.0	T0.1	T.01		I	:
CALCS	ADD	SUB	MUL	DIV	SQRT			NEXT MENU
	SADD	SSUB	SMUL	SDIV			PREVIOUS MENU	NEXT MENU
	DADD	DSUB	DMUL	DDIV	DSQR		PREVIOUS MENU	NEXT MENU
	SDAD	SDSB					PREVIOUS MENU	
D X	R-T	T-R	T-T	BLKM	BIN	FOUT		NEXT MENU
	SRCH	STAT	DIBT	DIBR	SIBT	SIBR	PREVIOUS MENU	NEXT MENU
	AND	OR	CMPR	SENS	MBIT	COMP	PREVIOUS MENU	NEXT MENU
	XOR	BROT	MROT	TWST	READ	WRIT	PREVIOUS MENU	NEXT MENU
	BIN	BCD		COMM			PREVIOUS MENU	NEXT MENU
	FRED	FWRT	SIN	COS	SWAP	SORT	PREVIOUS MENU	NEXT MENU
	BCNT	TSET	BYSL	BYCM	BADD		PREVIOUS MENU	NEXT MENU
*	MBUS	PEER	BROD	BOOK	POLL	DIAG	PREVIOUS MENU	NEXT MENU
*	SND	RCV					PREVIOUS MENU	
SPECIALS	SKP		GOSUB					

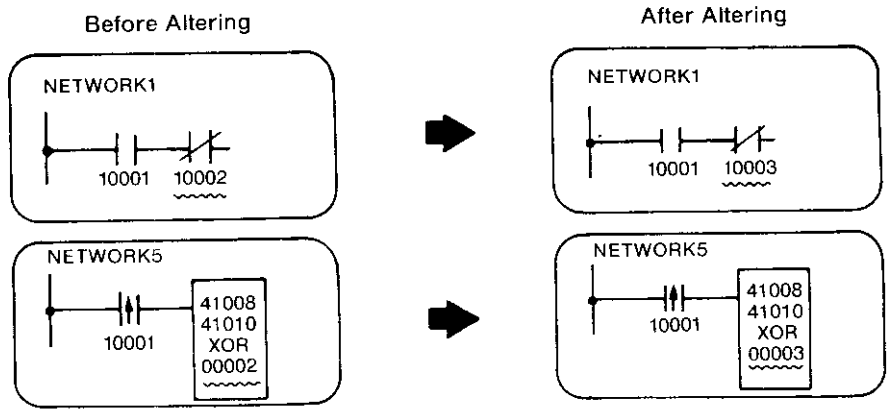
*: This command can be used for the DDSCR-GL60S2 or S3 CPU only.

3.6.1 Ladder Operation (Cont'd)

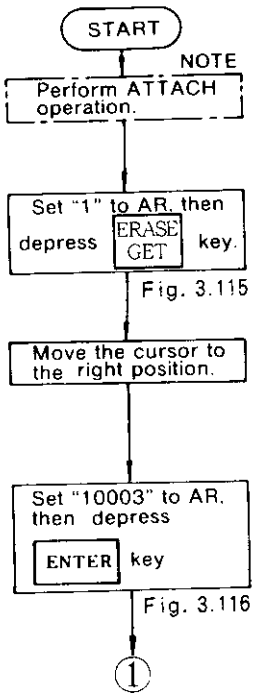
(b) NETWORK ALTERING

1. REFERENCE NUMBER ALTERING

Sample Reference Number and Constant Altering



POINT • The cursor should be placed in the logic ares.



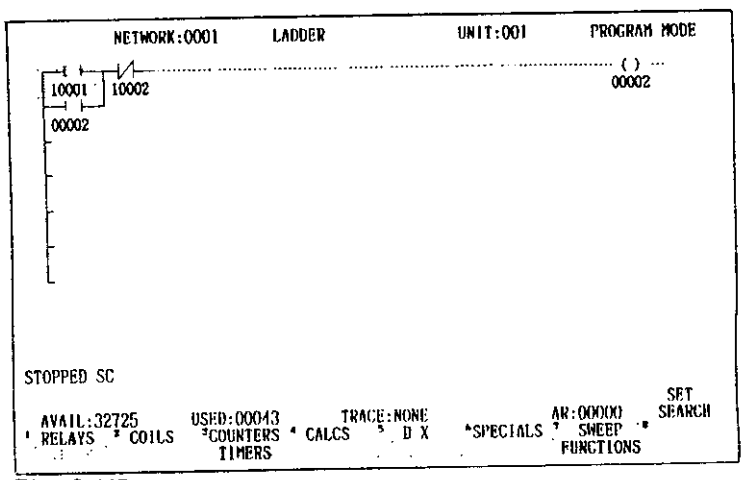


Fig. 3.115

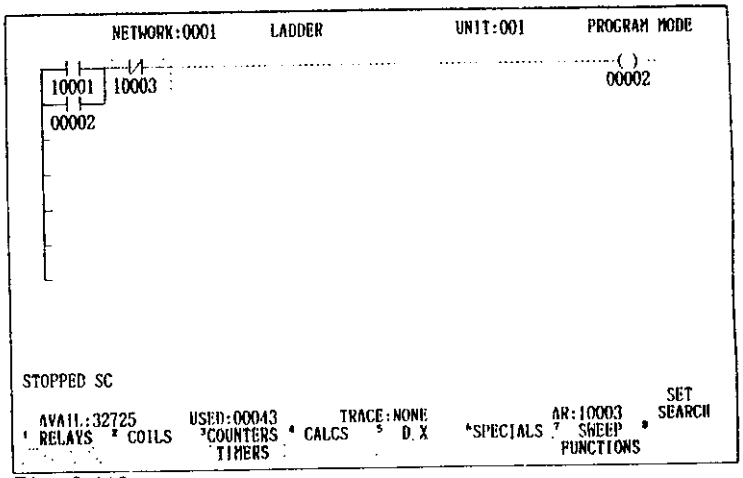
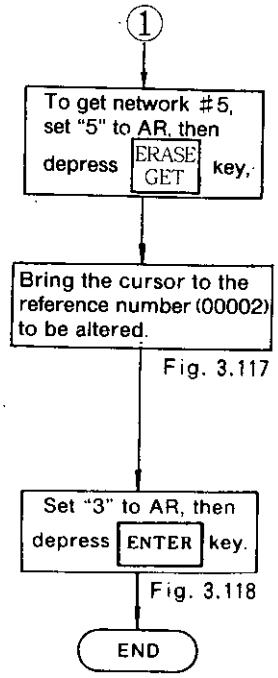


Fig. 3.116



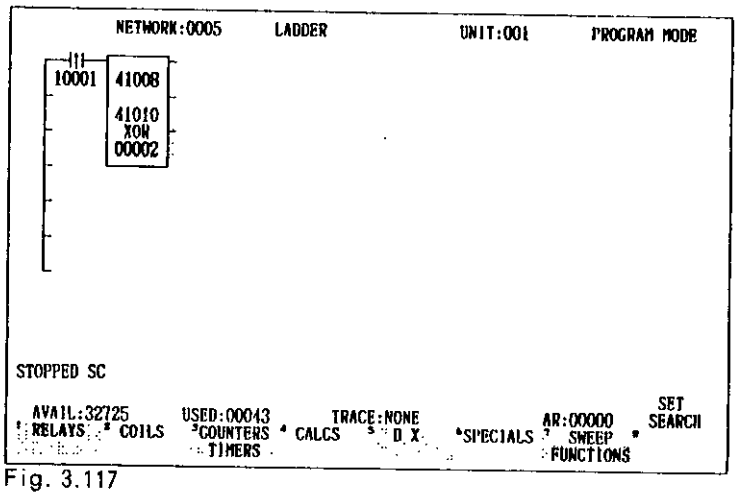


Fig. 3.117

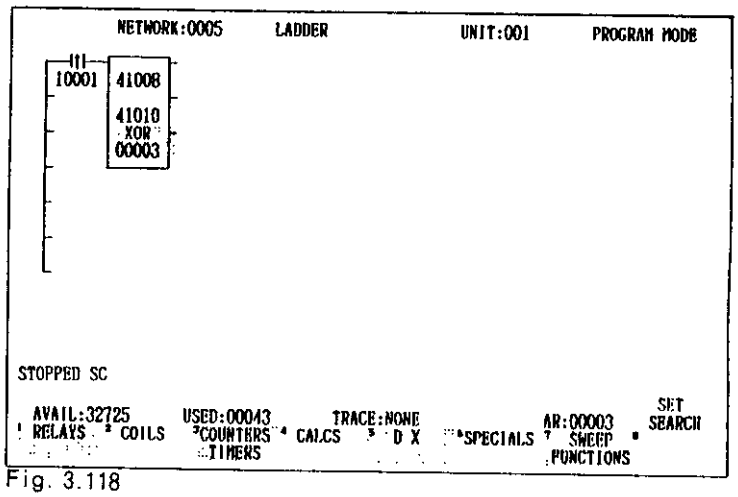


Fig. 3.118

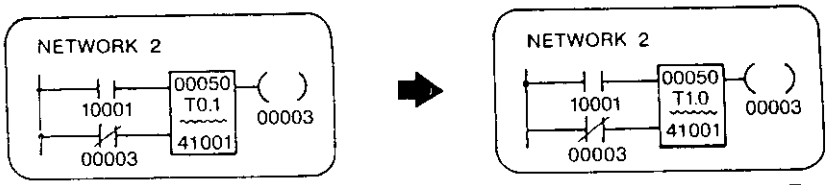
NOTE

This step can be skipped if the system is ready to store the program.

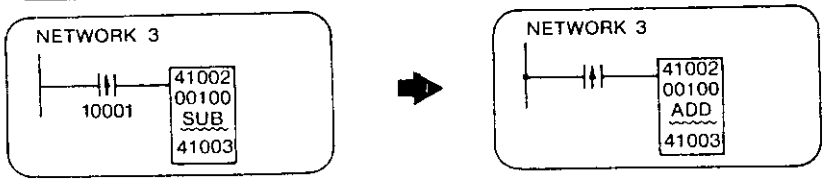
2. ELEMENT ALTERING ①

Before Altering / After Altering

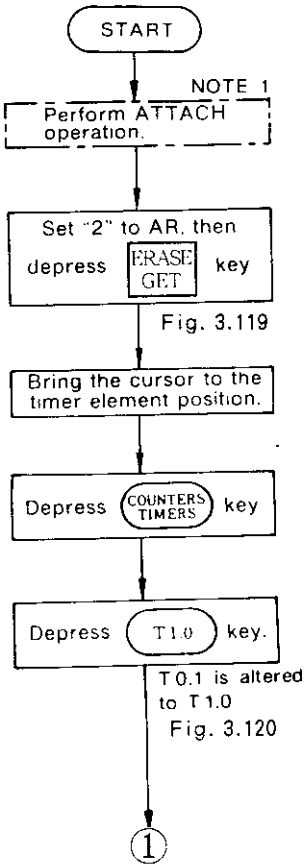
Sample Timer Rate Altering



Sample Arithmetic Altering
[Subtraction →Addition]



POINT • The cursor should be placed in the logic area.



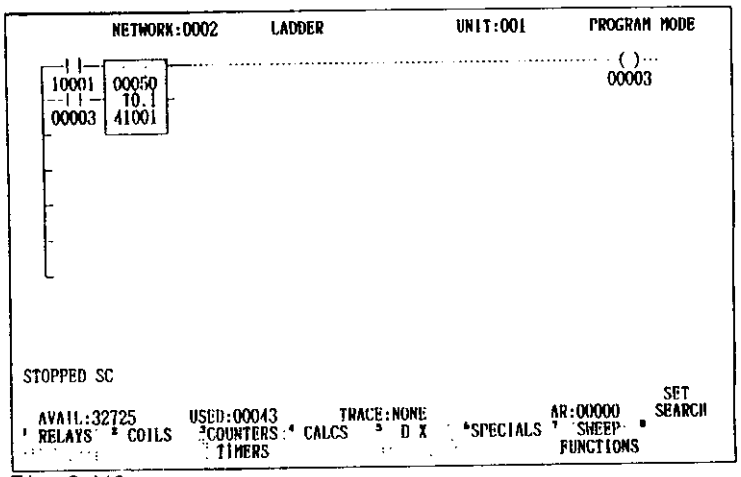


Fig. 3.119

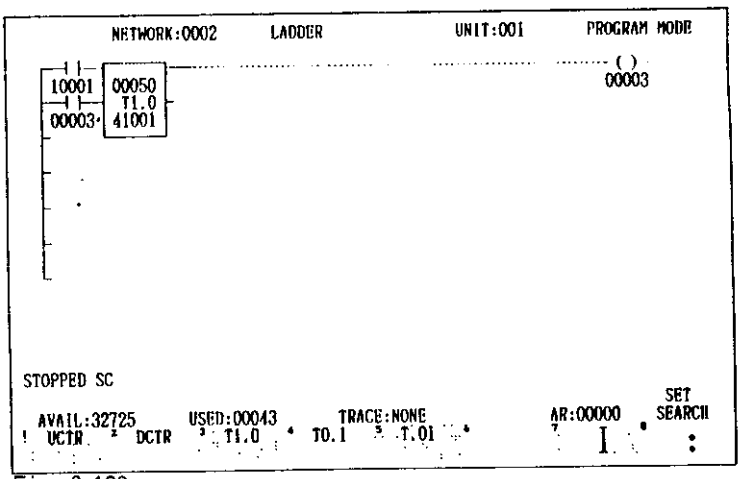
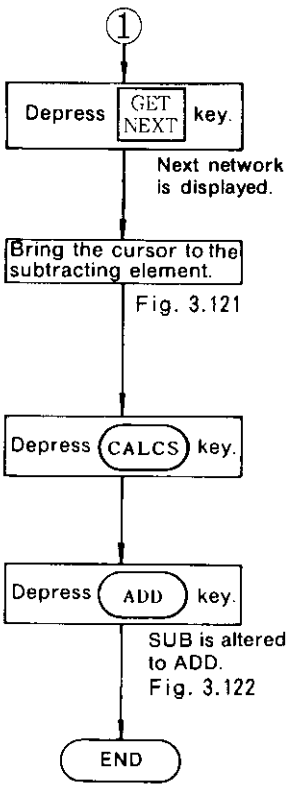


Fig. 3.120



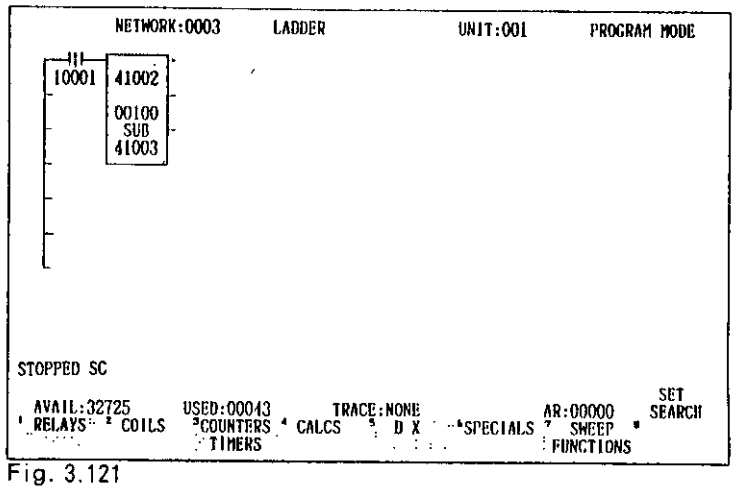


Fig. 3.121

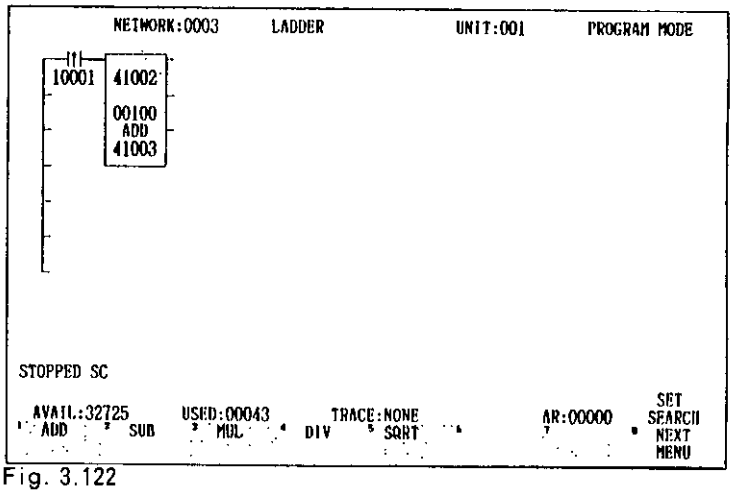


Fig. 3.122

NOTE

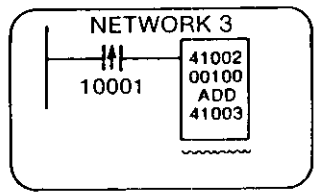
1. This step can be skipped if the system is ready to store the program.
2. If the error message "ERROR: INVALID REPLACEMENT" is displayed, a symbol cannot be altered directly. In this case, perform deleting operation by depressing [NTWK DEL NODE] key, and store new element in CPU.
3. The function keys are also available for changing timers and arithmetic operation elements.

3.6.1 Ladder Operation (Cont'd)

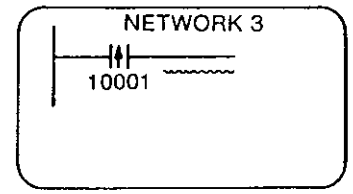
2. ELEMENT ALTERING ②

Sample Altering (Addition → Horizontal Short)

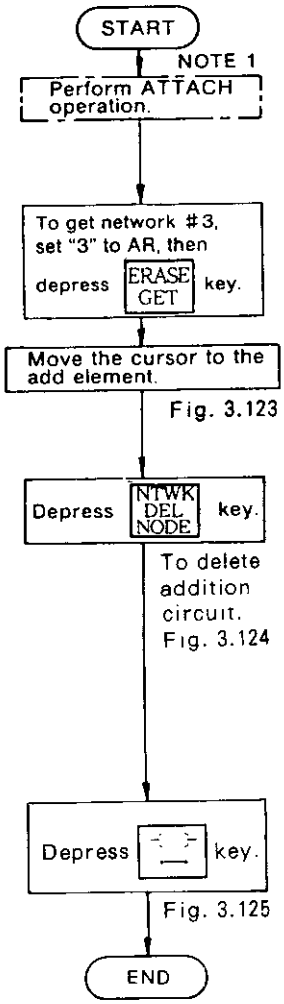
Before Altering



After Altering



POINT • The cursor should be placed in the logic area.



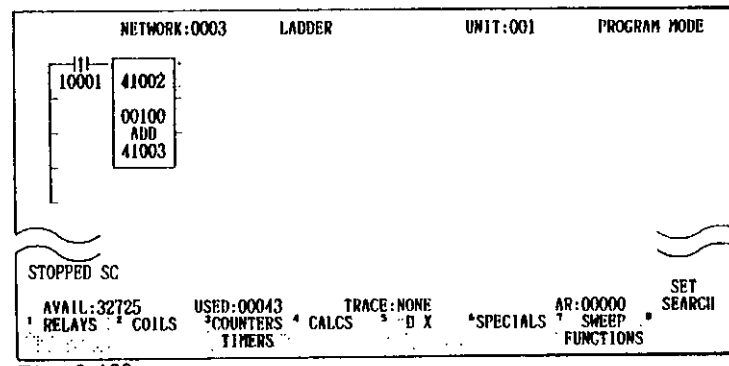


Fig. 3.123

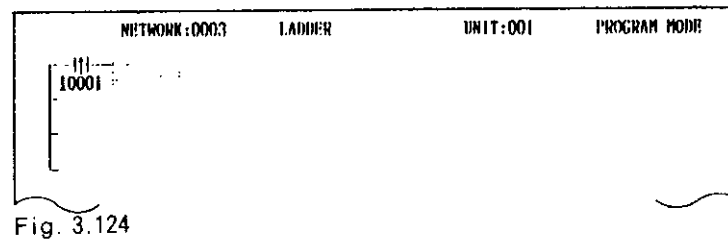


Fig. 3.124

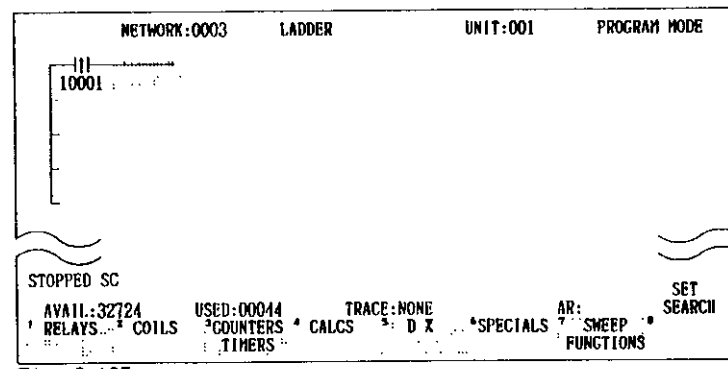


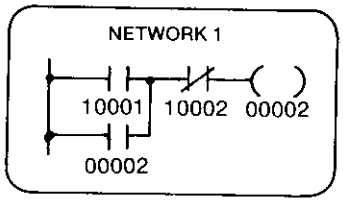
Fig. 3.125

NOTE

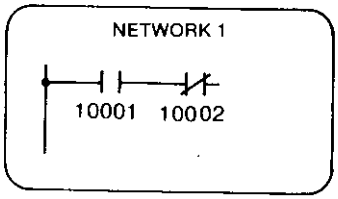
1. This step can be skipped if the system is ready to store the program.
2. The label keys are also available for storing of horizontal short.

3. ELEMENT DELETING

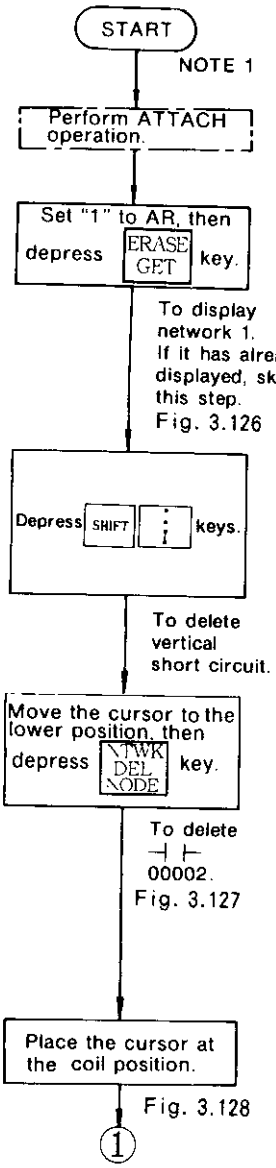
Before Deleting



After Deleting



POINT • The cursor should be placed in the logic area.



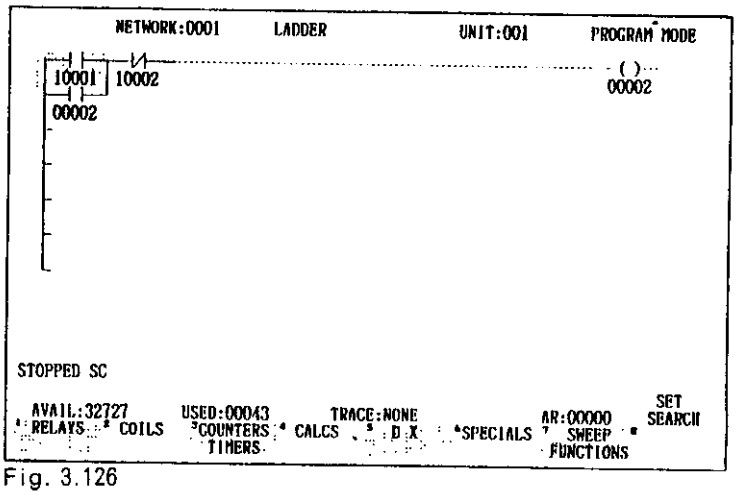


Fig. 3.126

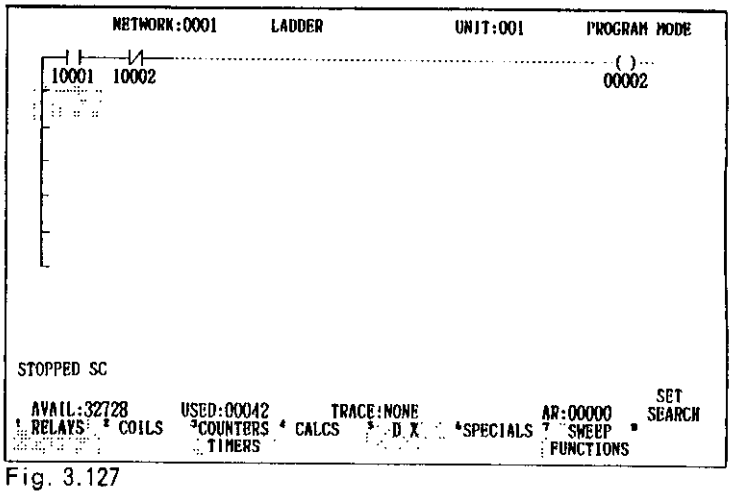


Fig. 3.127

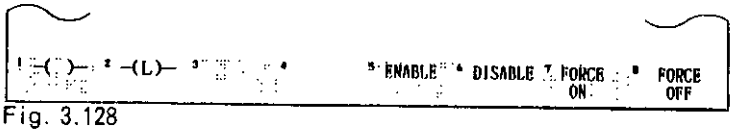
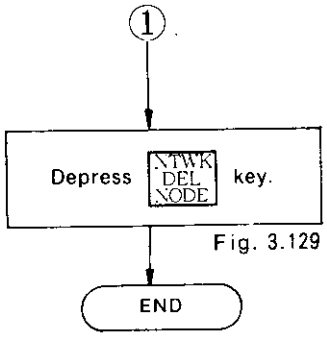


Fig. 3.128

3.6.1 Ladder Operation (Cont'd)



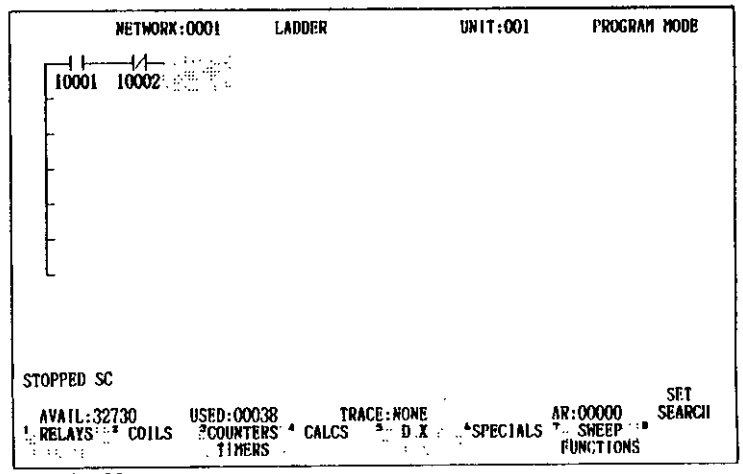


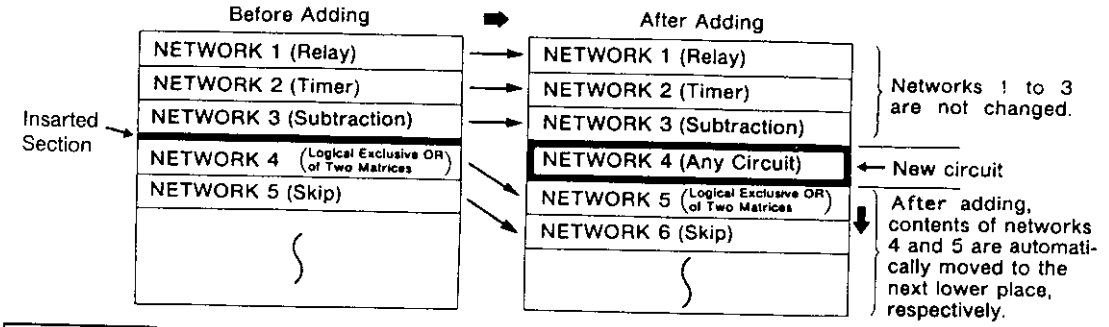
Fig. 3.129

NOTE

1. This step can be skipped if the system is ready to store the program.
2. The label keys are also used to store and delete the vertical short circuit.

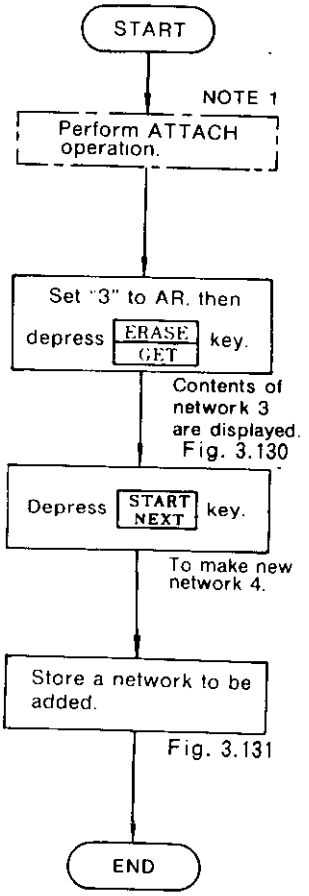
4. NETWORK ADDING

Sample New Network Adding



POINT

- Display the previous network number of a network number to be added on the screen, and depress START NEXT key.
- The cursor should be placed in the logic area.



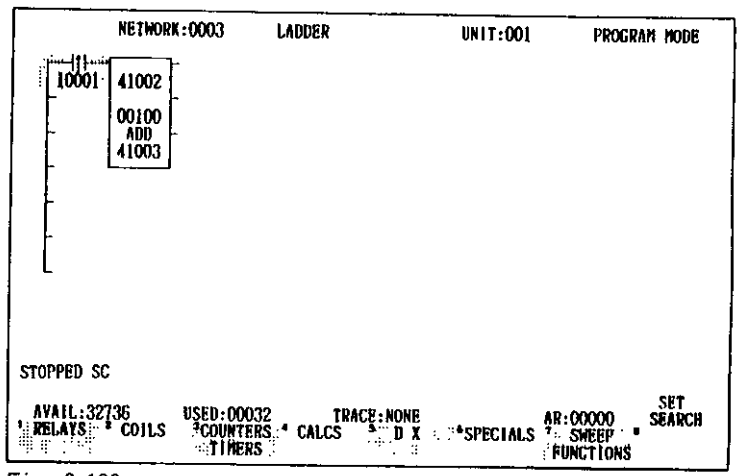


Fig. 3.130

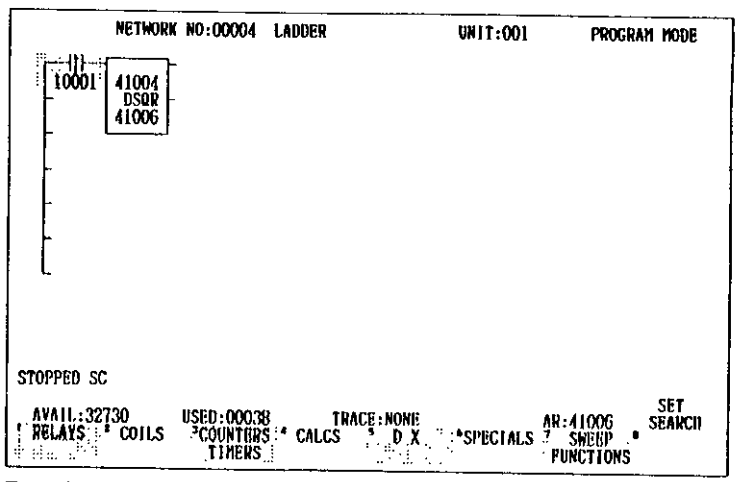


Fig. 3.131

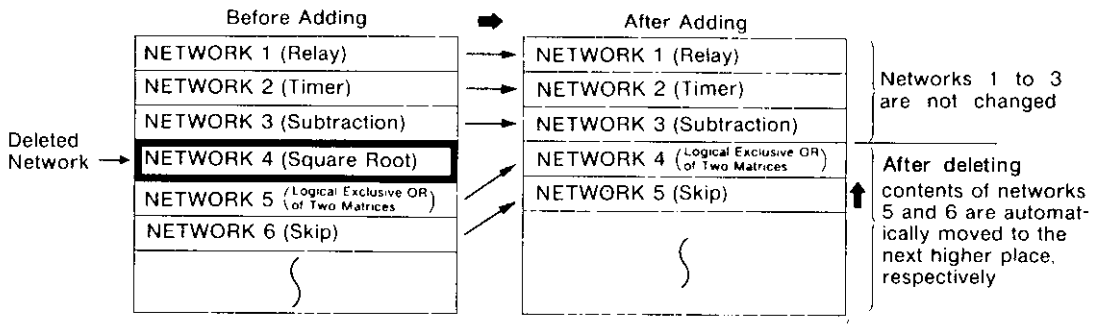
3.6.1 Ladder Operation (Cont'd)

NOTE

1. This step can be skipped if the system is ready to store the program.
2. When adding a new network to network 1, display network " 0 " by depressing [SHIFT] and [ERASE GET] keys, then depress [START NEXT] key to make the new network 1.

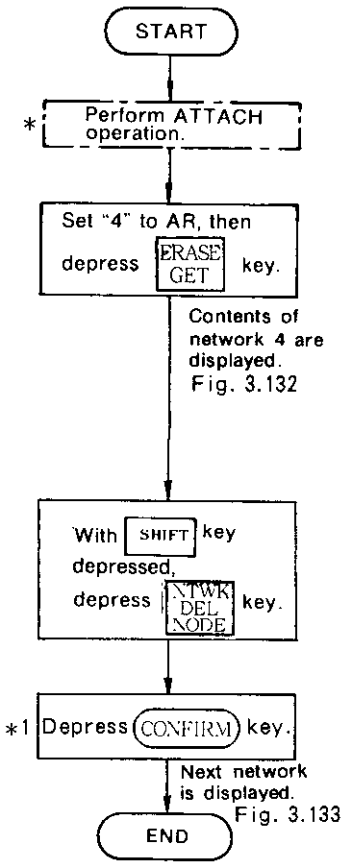
5. NETWORK · DELETING

Sample Network 4 (Square Root) Deleting



POINT

- Display the network to be deleted on the screen, and depress SHIFT , NTWK DEL NODE keys, then CONFIRM key.
- The cursor should be placed in the logic area.



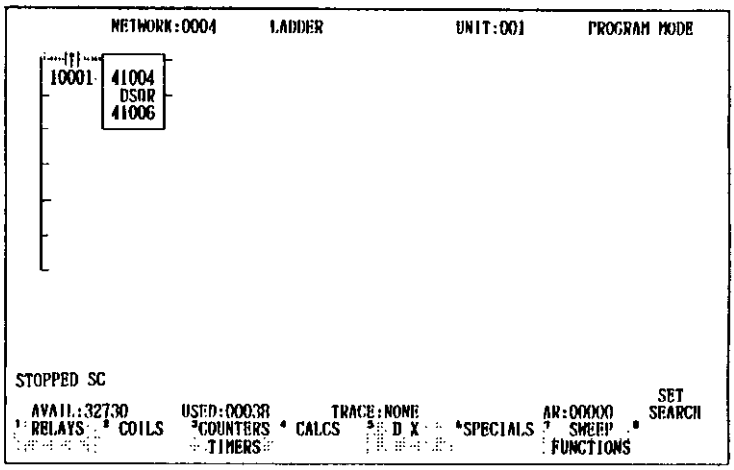


Fig. 3.132

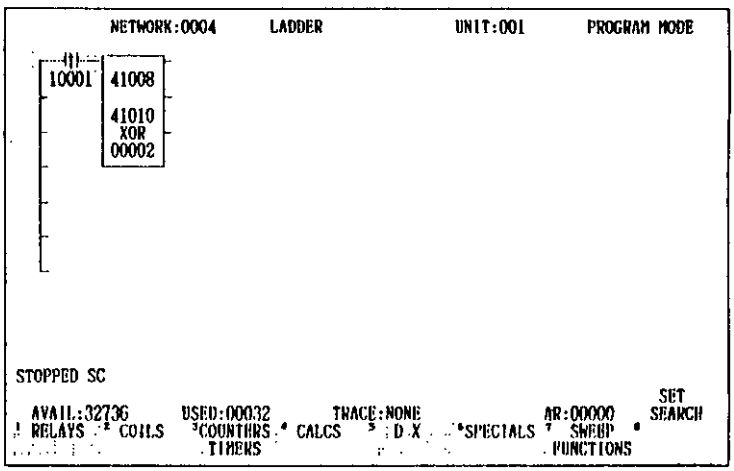


Fig. 3.133

3.6.1 Ladder Operation (Cont'd)

NOTE

1. This step with mark * can be skipped if the system is ready to store the program.

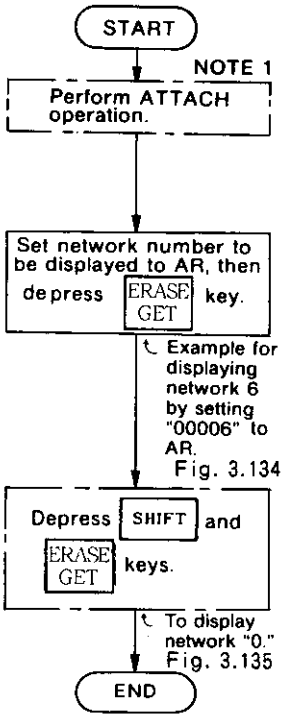
2. *1 When the (CANCEL) key is depressed, delete operation is not executed and the display returns to the screen shown in Fig. 3.132.

(c) NETWORK DISPLAY

1. ANY NETWORK DISPLAY

This function is used to display any programmed network (with network number) using [ERASE GET] key.

POINT • The cursor should be placed in the logic area.



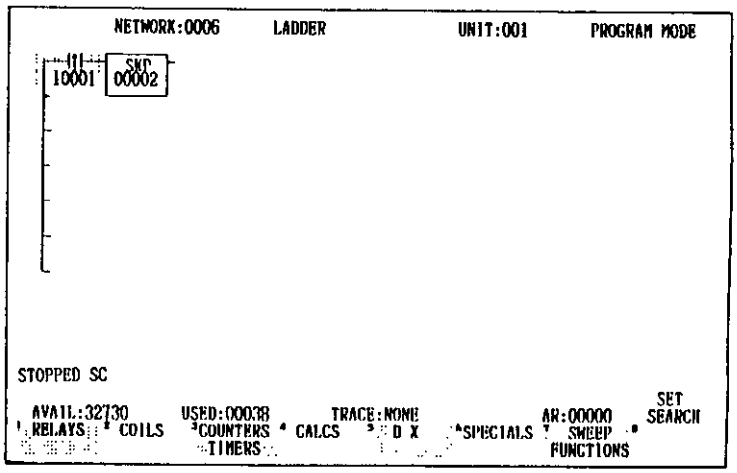


Fig. 3.134

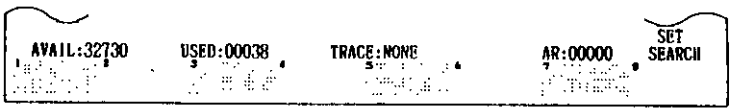


Fig. 3.135

NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. Network "0" is used to add a new network to the network 1. To make the new network, depress [START NEXT] key after the network "0" is displayed.
3. By depressing [ERASE GET] key after setting the value at higher than actual network number, the following message is displayed :
   "ERROR: NETWORK NOT FOUND HIGHEST #: ×××××"
   ↑
   Actual Last Network Number

3.6.1 Ladder Operation (Cont'd)

2. NETWORK CONTINUOUS DISPLAY

This is a function for displaying a network in the network number sequence. The function is used to display the next network or the previous network of the currently displayed network.

- For the next network display: [GET NEXT] key
- For the previous network display: [GET PREV] key

POINT • The cursor should be placed in the logic area.

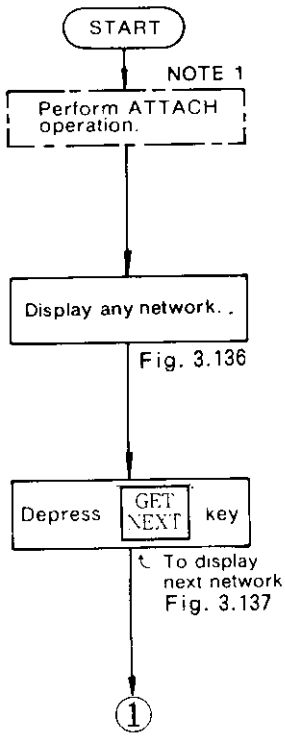


Fig. 3.136

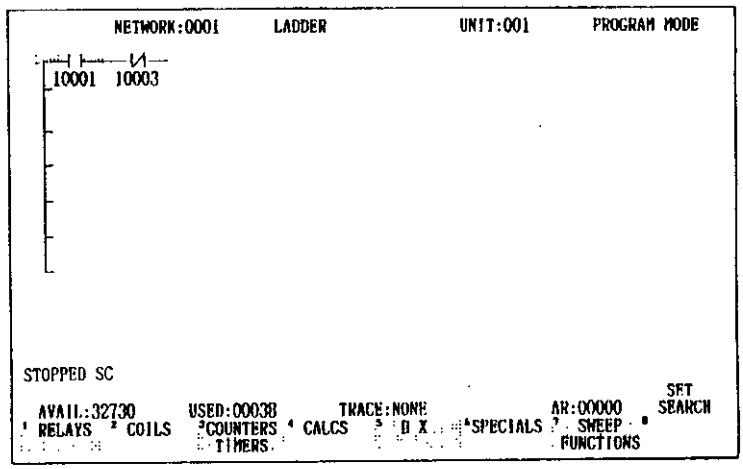


Fig. 3.136

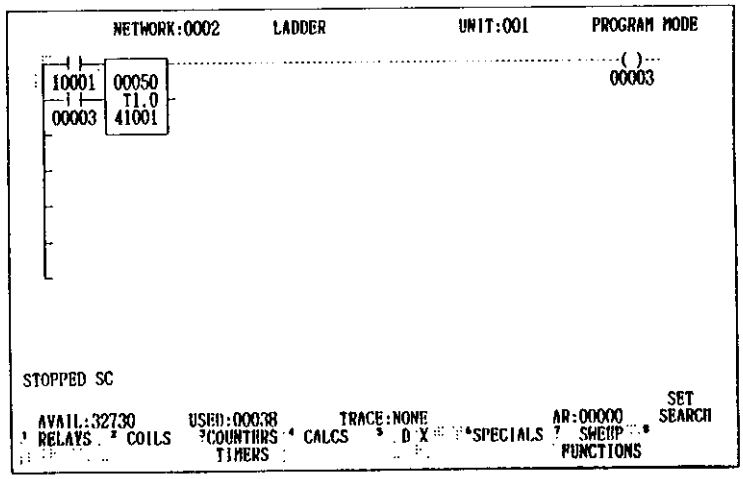
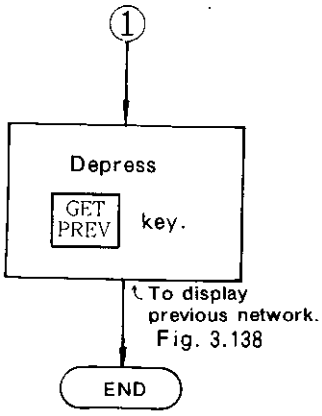


Fig. 3.137



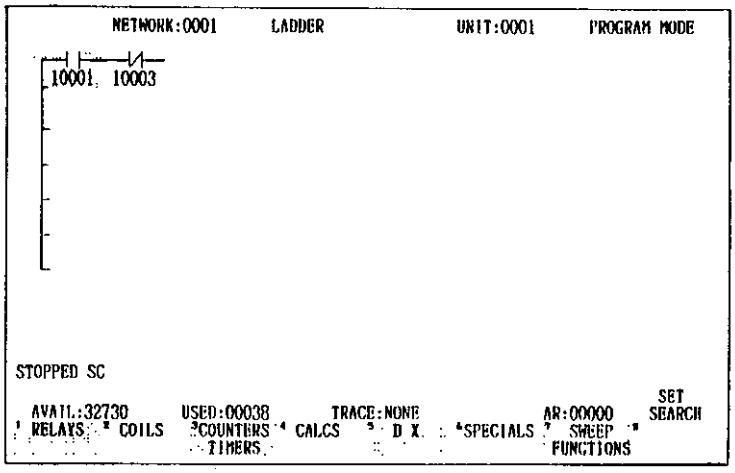


Fig. 3.138

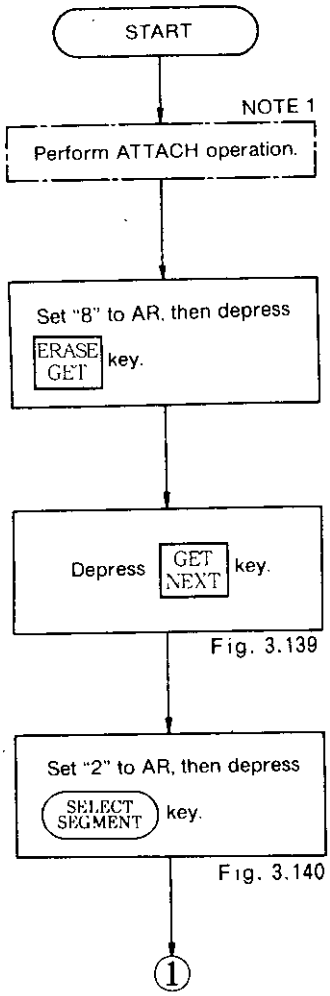
NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. The power flow is displayed only while GL60S is in operation. However, the power flow of the skipped networks is not displayed even while GL60S is running.

3. DISPLAY OF THE FIRST AND THE LAST NETWORKS IN SEGMENTS

The following is the Procedure to display the first network in segment 2 and the last network in segment 1. The segment boundaries must be displayed at the beginning.

Segment 1	Networks 1 – 3
Segment 2	Networks 4 – 6
Segment 3	Networks 7 – 8
∫	∫



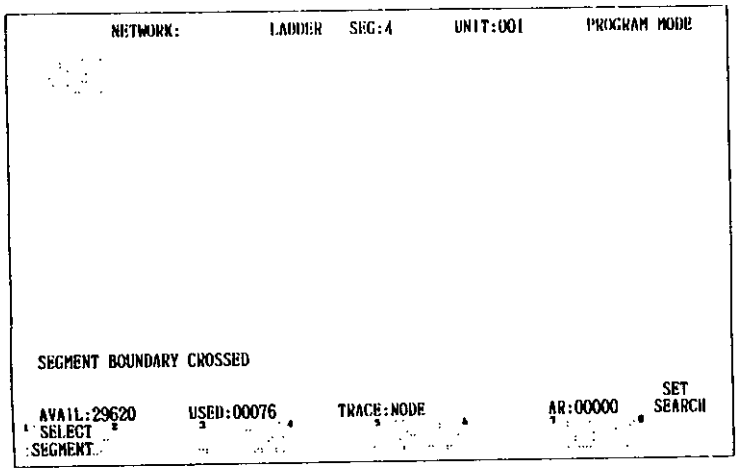


Fig. 3.139

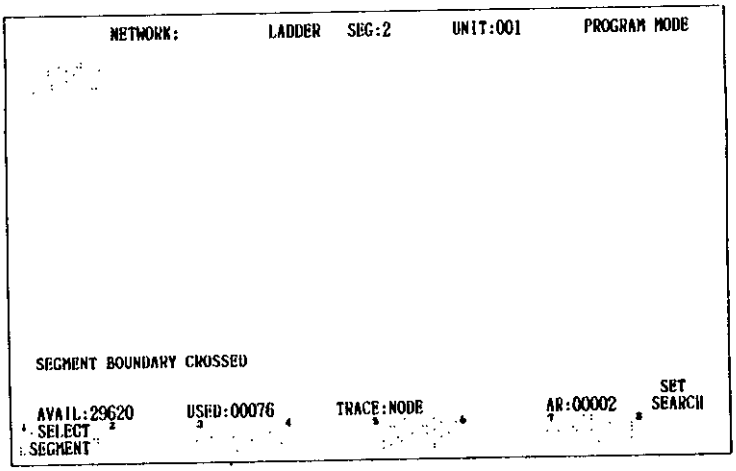
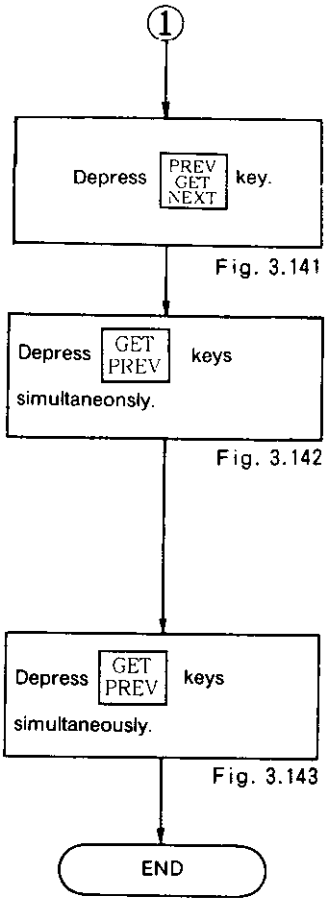


Fig. 3.140



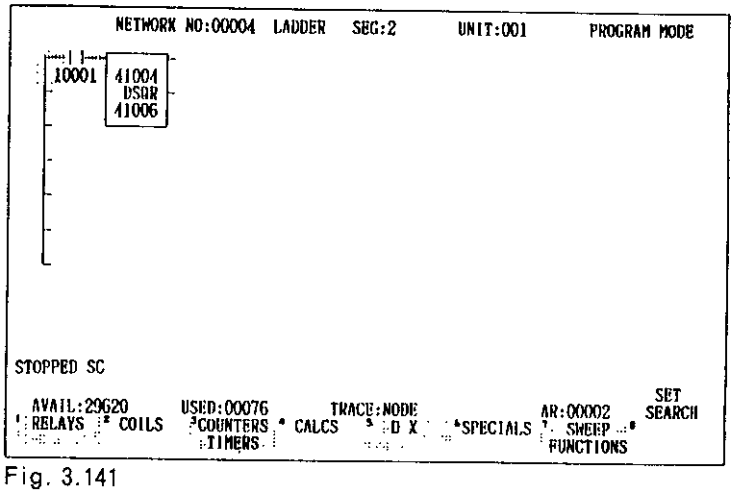


Fig. 3.141

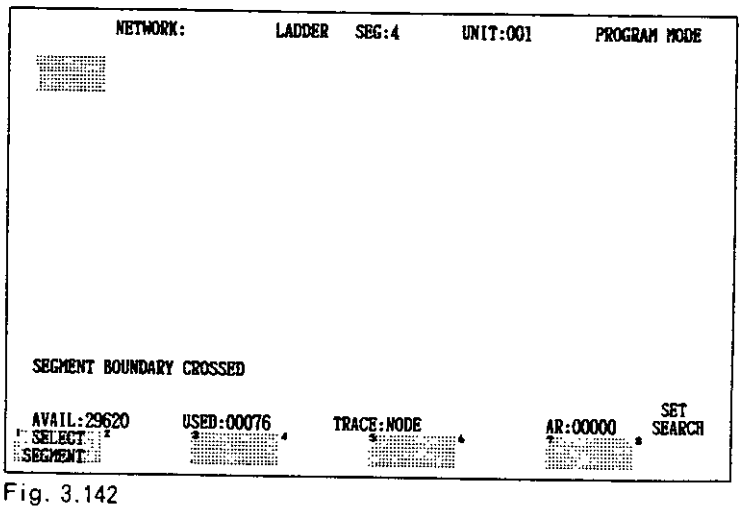


Fig. 3.142

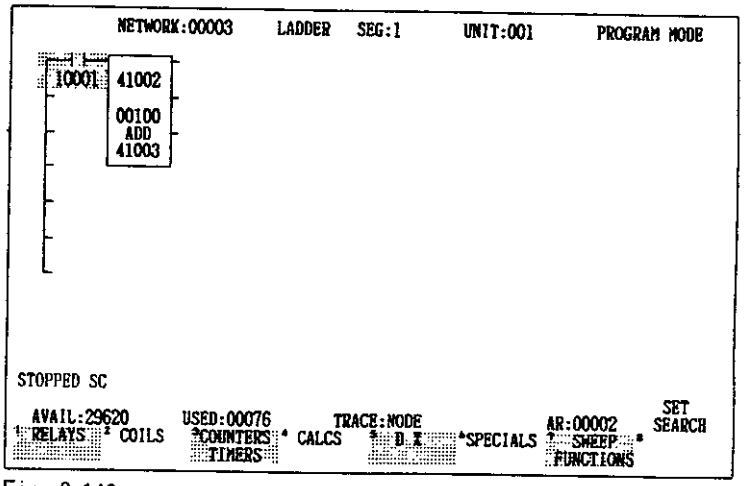


Fig. 3.143

NOTE

1. This step can be skipped if the system is ready to store the program.
2. Initial setting of SEGMENT must be completed in advance.

4. POWER FLOW/SPOT DISPLAY

This function displays to which element power flow is enabled.

Set the GL60S in the operational state.

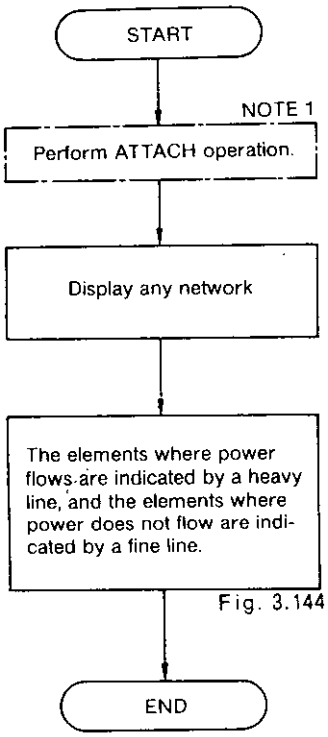


Fig. 3.144

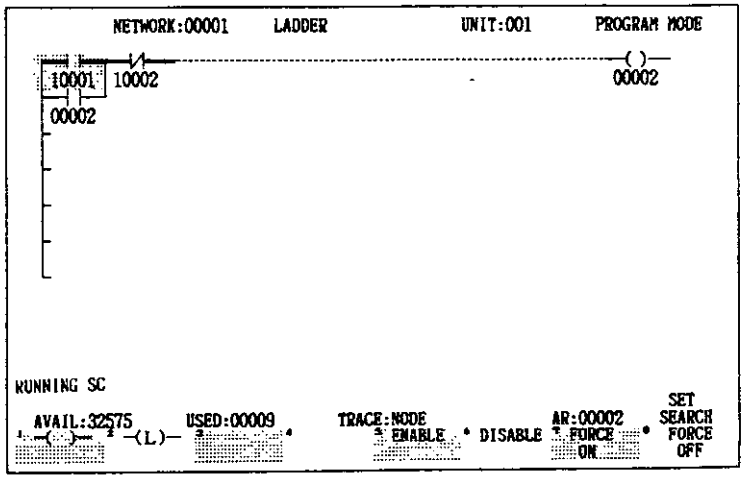


Fig. 3.144

NOTE

1. This step can be skipped if the system is ready to store the program.
2. If the ON/OFF cycle is changed over at a high speed, a correct display may not appear on the screen. In this case, use the RAP section to display correctly.

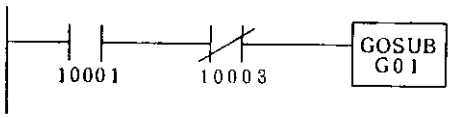
(2) SUBROUTINE

(a) SUBROUTINE DISPLAY

1. ZOOM FUNCTION 1

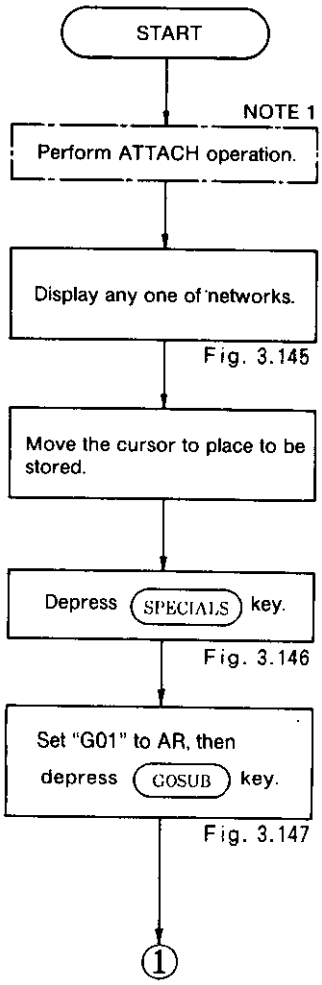
When the subroutine to be displayed exists :

Sample GOSUB



POINT

- The cursor should be placed in the logic area.



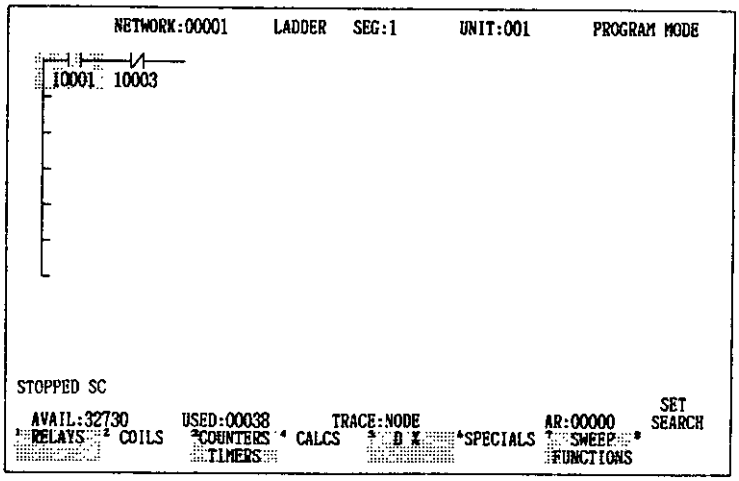


Fig. 3.145

Fig. 3.146

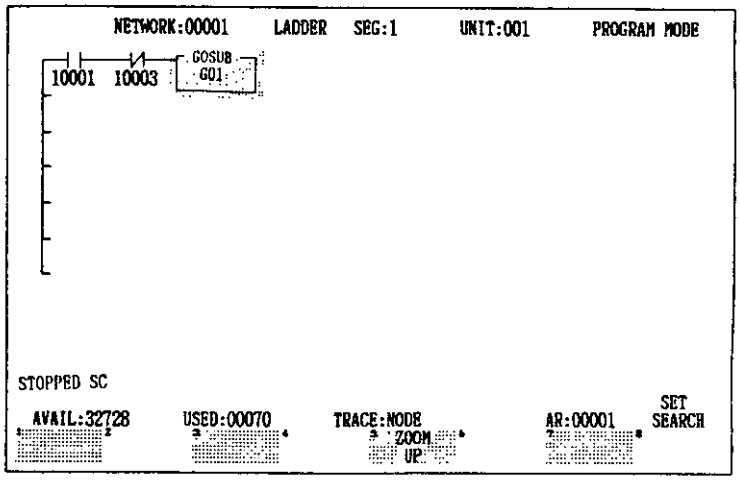


Fig. 3.147

3.6.1 Ladder Operation (Cont'd)

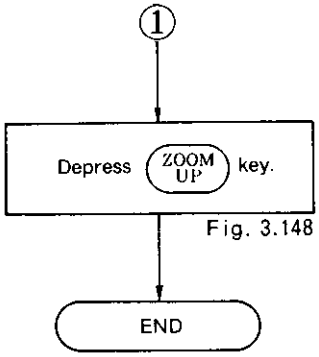


Fig. 3.148

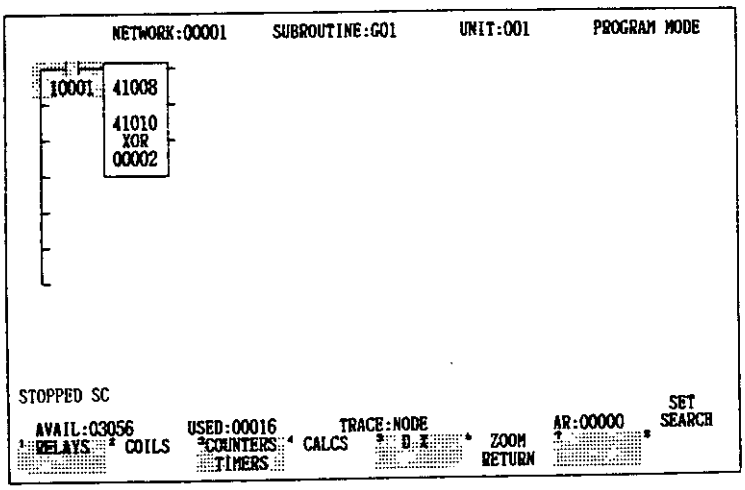
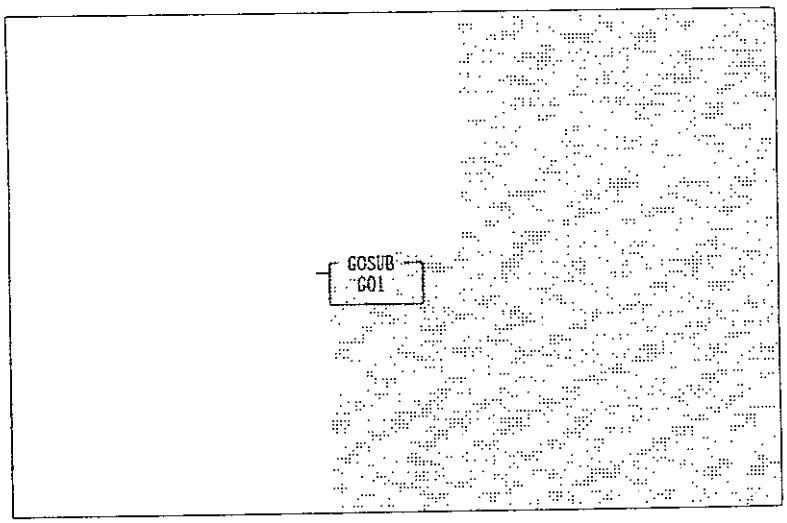


Fig. 3.148

NOTE

1. This step can be skipped if the system is ready to store the program.
2. If "GOSUB" is stored in the area shown below, no elements can be stored in the shaded portion.

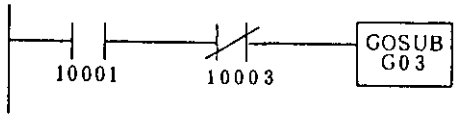


3. To return from the subroutine circuit, depress the ZOOM RETURN key. The display returns to the screen shown in Fig. 3.145.
4. Function keys ZOOM UP and ZOOM RETN are also available. However, those keys cannot be used when the cursor is at the reference position.

1. ZOOM FUNCTION 2

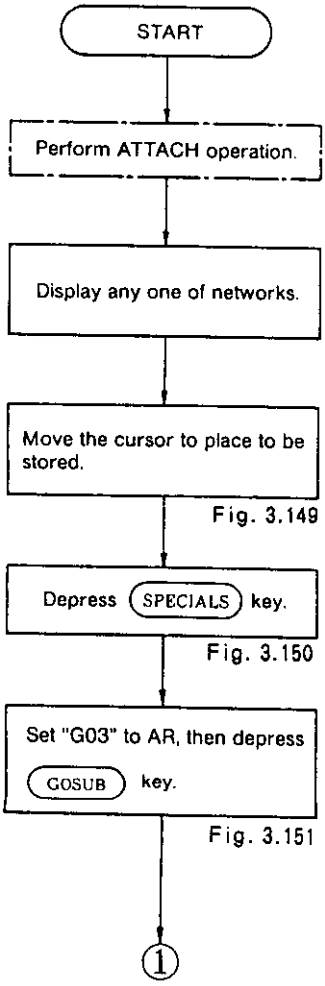
When the subroutine to be displayed does not exist :

Sample GOSUB



POINT

- The cursor should be placed in the logic area.



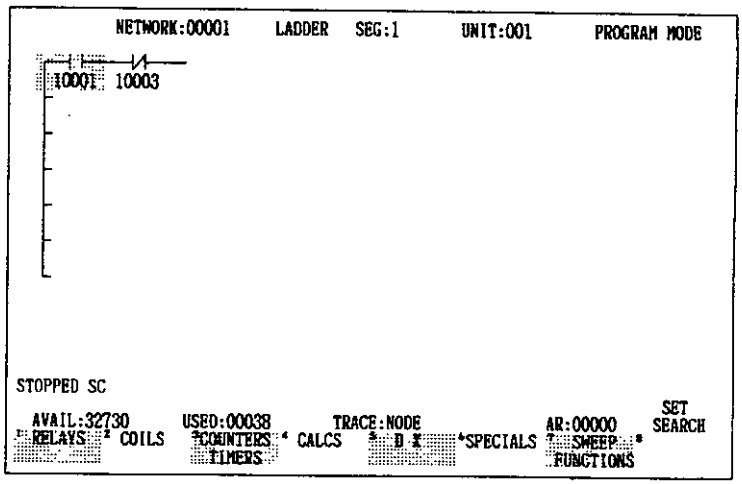


Fig. 3.149

Fig. 3.150

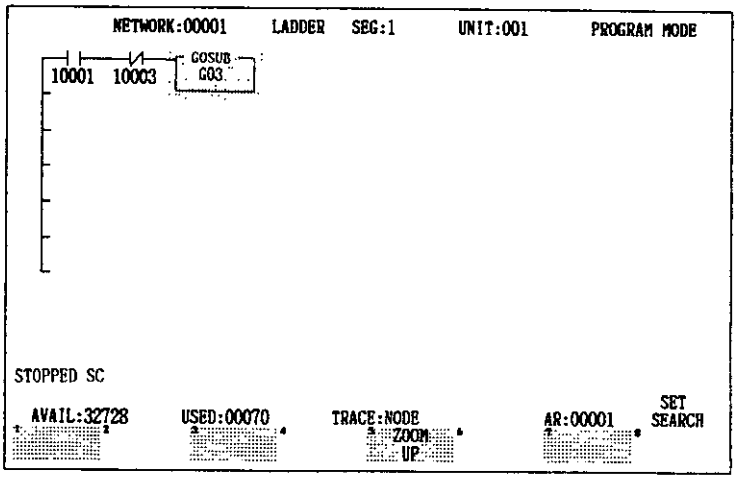
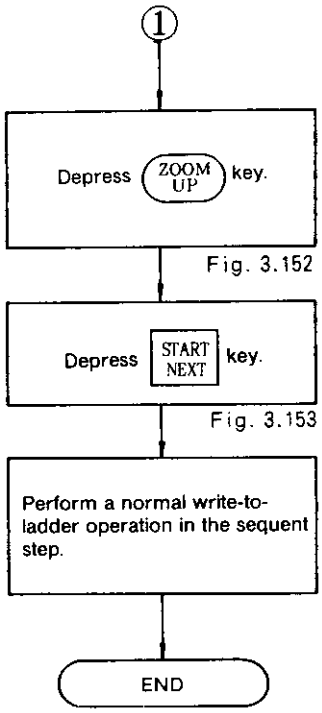


Fig. 3.151

3.6.1 Ladder Operation (Cont'd)



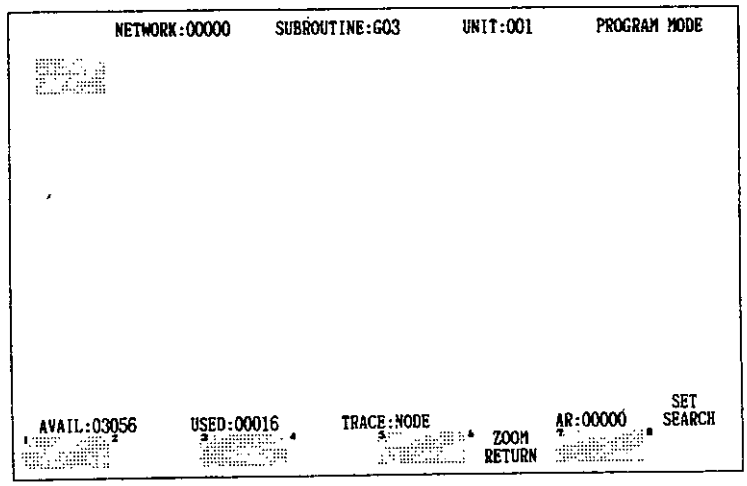


Fig. 3.152

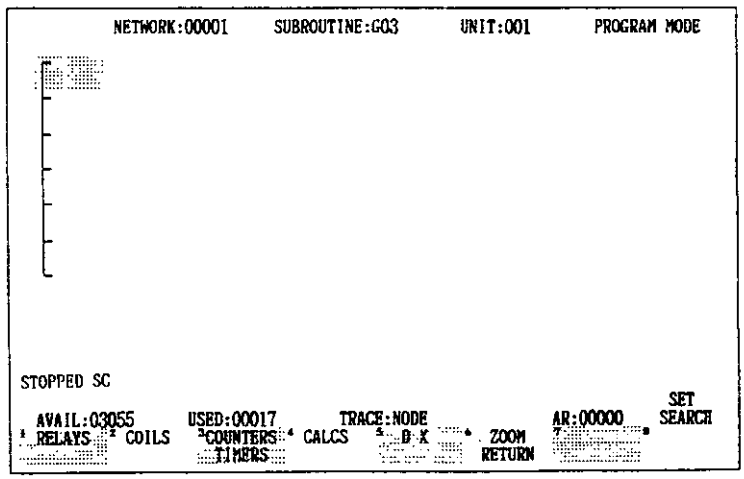
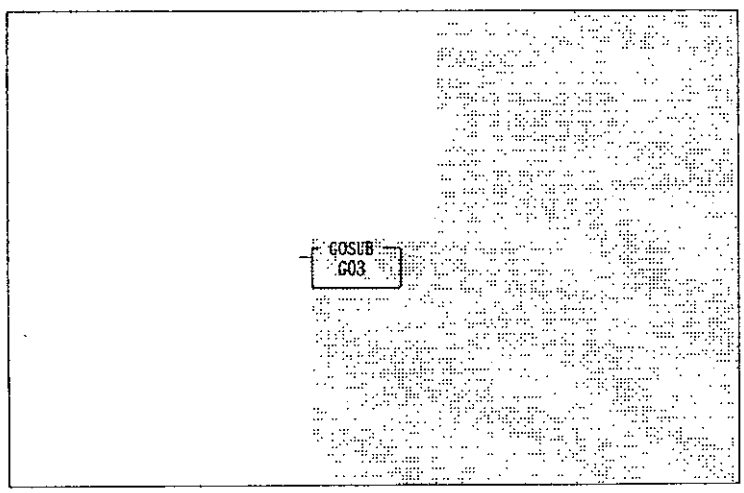


Fig. 3.153

NOTE

1. This step can be skipped if the system is ready to store the program.
2. If "GOSUB" is stored in the area shown below, no elements can be stored in the shaded portion.



2. READ OPERATION

Procedure to display any of the programmed networks.

This operation is performed when the operator knows the number of the subroutine to be displayed. Depress [ERASE GET] key.

POINT • The cursor should be placed in the logic area.

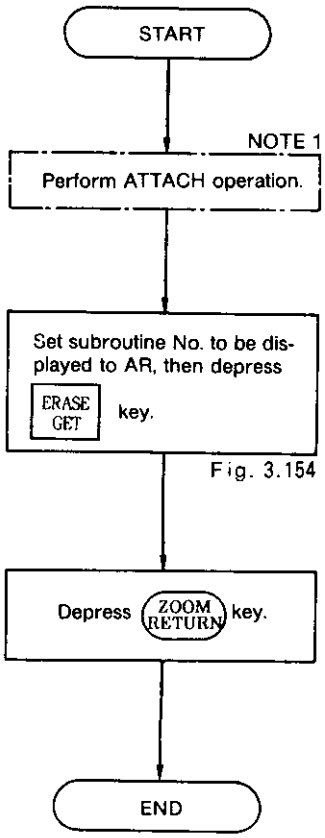


Fig. 3.154

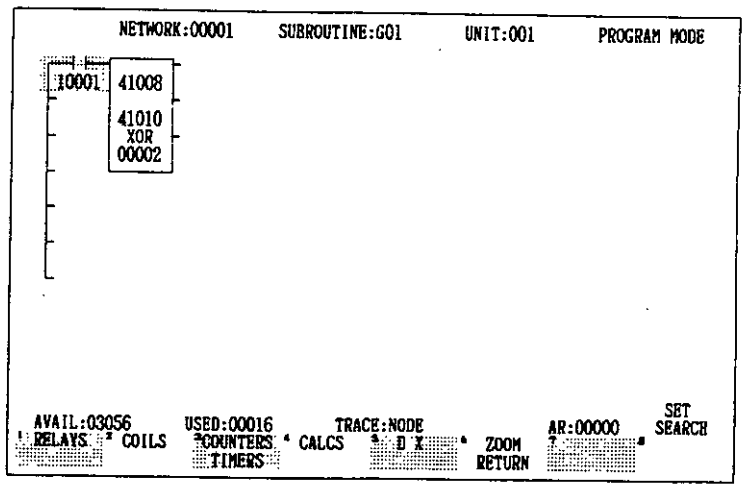


Fig. 3.154

3.6.1 Ladder Operation (Cont'd)

NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. Depressing the (ZOOM RETURN) key returns control to the latest of all the networks calling the subroutine.
3. If a non-programmed subroutine is displayed, the network in the initial state appears, in Fig. 3.155.
4. Function keys [ZOOM UP] and [ZOOM RETN] are also available. However, those keys cannot be used when the cursor is at the reference position.

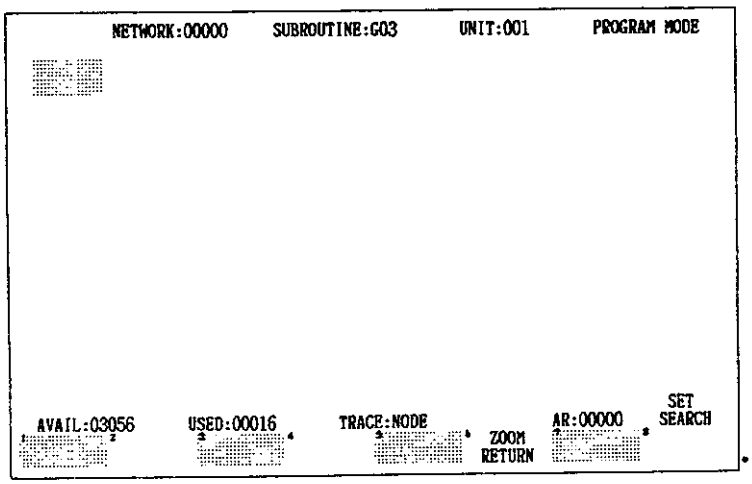


Fig. 3.155

(b) NETWORK STORING

Same as the procedure in Par. 3.6.1 (1) (a).

(c) NETWORK ALTERING

Same as the procedure in Par. 3.6.1 (1) (b).

(d) NETWORK DISPLAY

Same as the procedure in Par. 3.6.1 (1) (c).

Note that the display functions described in Par. 1. ANY NETWORK DISPLAY and 3. DISPLAY OF THE FIRST AND THE LAST NETWORKS IN SEGMENTS are not available.

3.6.2 Subroutine Operation

(1) SUBROUTINE DISPLAY

(a) READ OPERATION

Procedure to read a subroutine by depressing SUPER VISRY key.

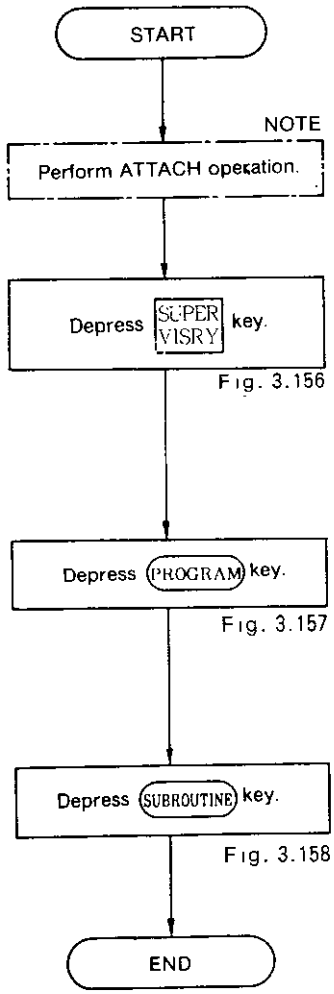


Fig. 3.156

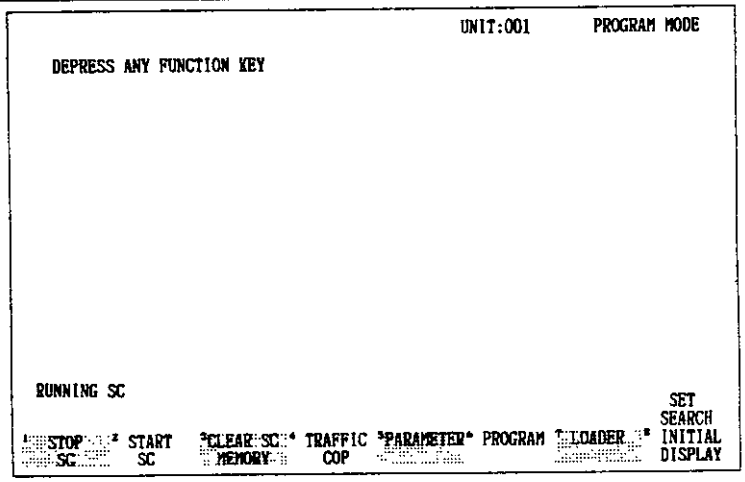


Fig. 3.156

Fig. 3.157

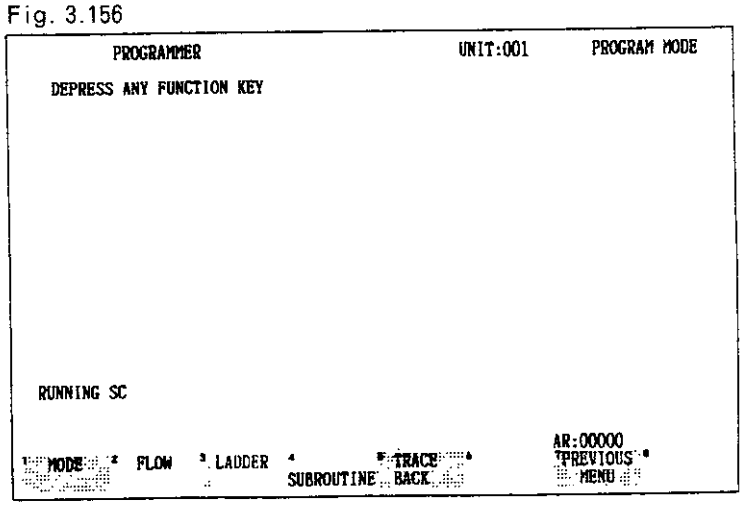


Fig. 3.157

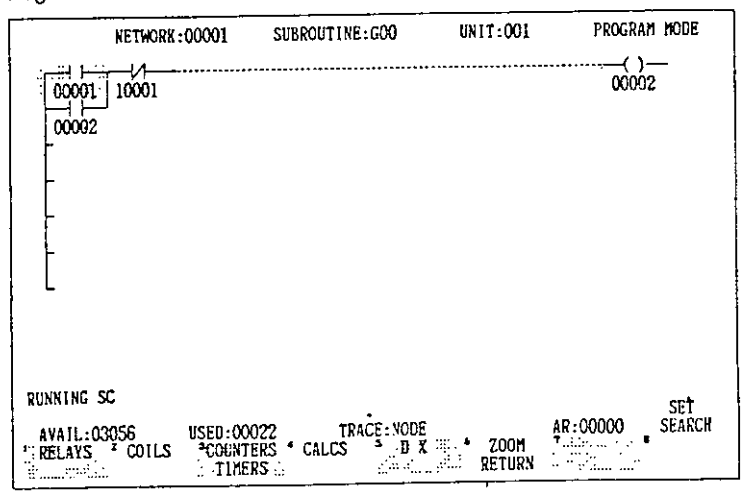


Fig. 3.158

(b) NETWORK STORING

Same as the procedure in Par. 3.6.1 (1) (a).

(c) NETWORK ALTERING

Same as the procedure in Par. 3.6.1 (1) (b).

(d) NETWORK DISPLAY

Same as the procedure in Par. 3.6.1 (1) (c).

Note that the display functions described in Par. 1. ANY NETWORK DISPLAY and 3. DISPLAY OF THE FIRST AND THE LAST NETWORKS IN SEGMENTS are not available.

3.6.3 Display of Reference and Comment

(1) DISPLAY OF RELAY, REGISTER, STEP AND LINK COIL

(a) STATUS DISPLAY OF COIL, INPUT RELAY, STEP, LINK COIL ①

ON and OFF Status of Coils, Input Relays Steps and Link Coils, and Disable Status

Expanding Reference Area: 42 Max (14 Lines × 3 Columns)

Reference Area: 9 Max (3 Lines × 3 Columns)

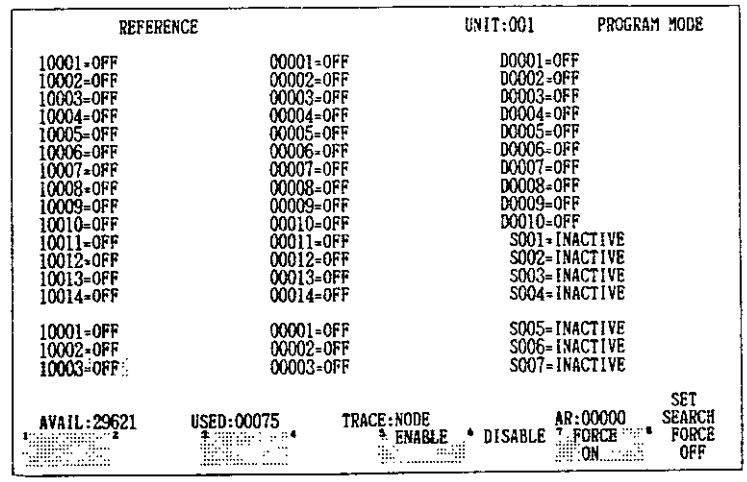
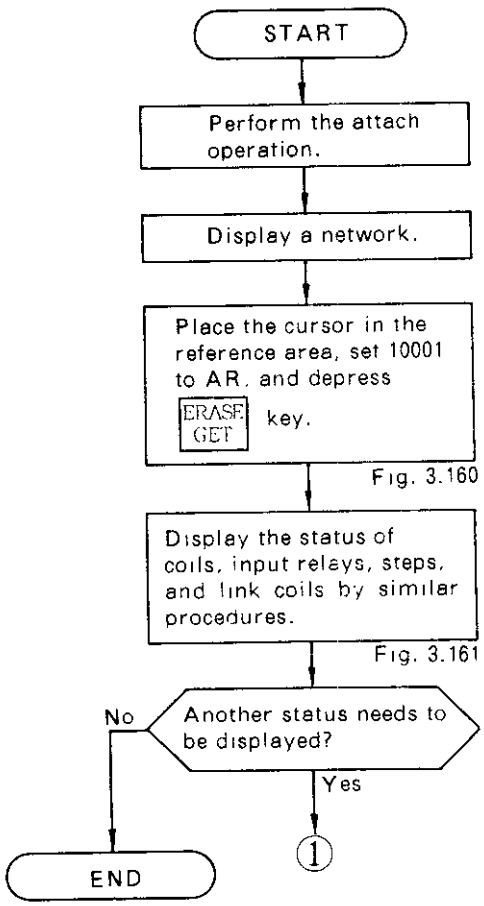


Fig. 3.159

POINT

- The cursor should be placed in the expanding reference area.
- For step and link coil inputs, be sure to use 3-digit and 4-digit data.



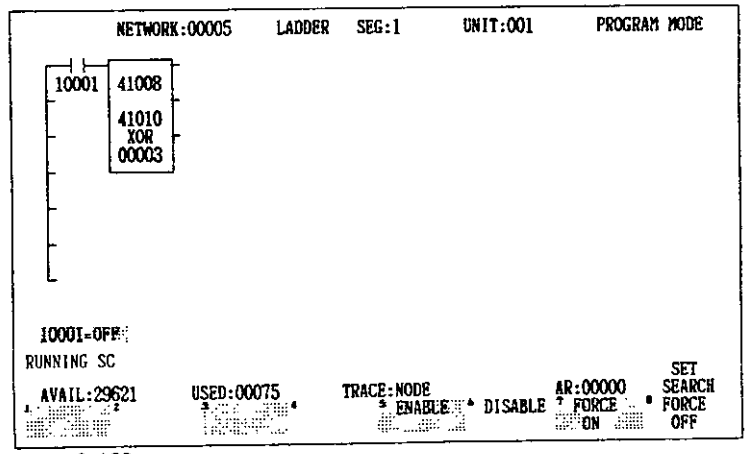


Fig. 3.160

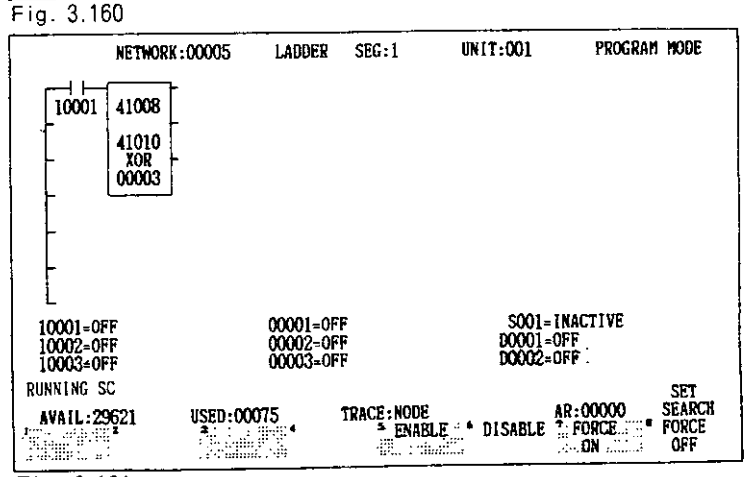
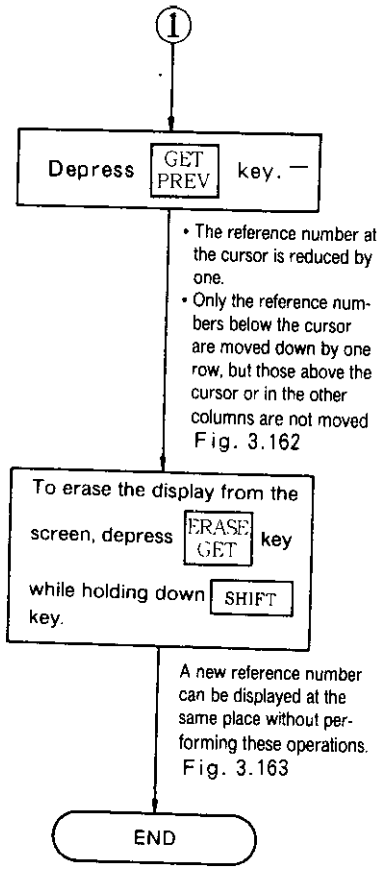


Fig. 3.161



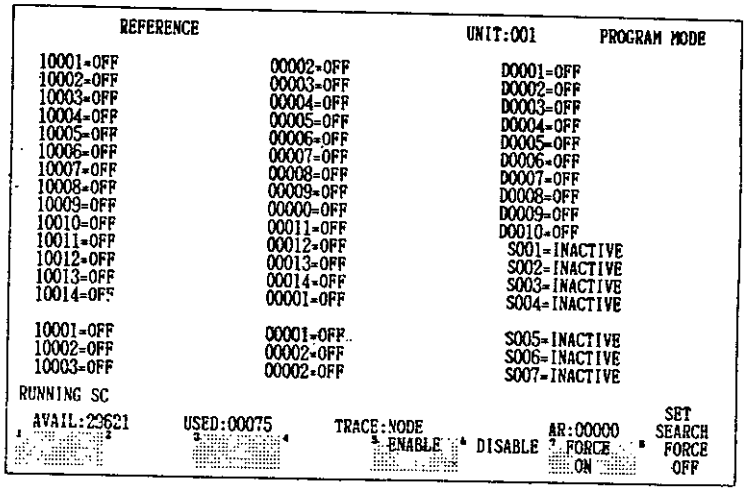


Fig. 3.162

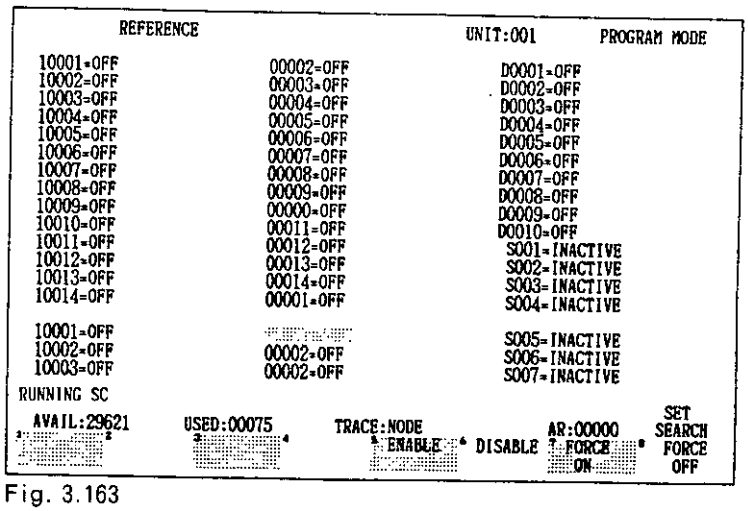


Fig. 3.163

IMPORTANT

If ON/OFF cycle is changed over at a high speed, a correct display may not appear on the screen, In this case, use RAP to display correctly.

NOTE

1. Effective GET NEXT GET PREV Keys Operation

   How to display the status of sequential coils 1 to 17 using the expanding reference area.

   • Display coil "1" on the bottom line in the reference area, then depress GET NEXT key 16 times.

   • Display coil "17" on the top line in the expanding reference area, then depress GET PREV key 16 times.

2. In monitor mode, ENABLE, DISABLE, FORCE ON and FORCE OFF in the label area are not displayed.

3.6.3 Display of Reference and Comment (Cont'd)

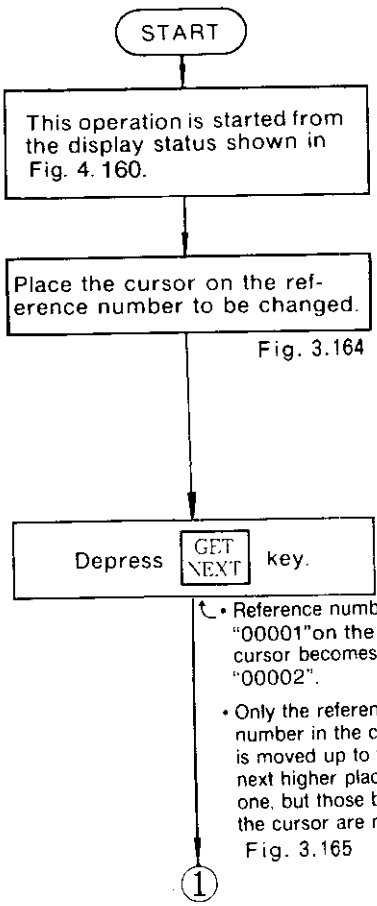
(a) STATUS DISPLAY OF COIL, INPUT RELAY, STEP, LINK COIL ②

This is a function for displaying status of coils, input relays, steps and link coils in order of the reference number. The function is used to display the next reference number or the previous reference number of the currently displayed reference number.

- For the next reference number display: [GET NEXT] key
- For the previous reference number display: [GET PREV] key

POINT

- The cursor should be placed in the reference area or the expanding reference area.



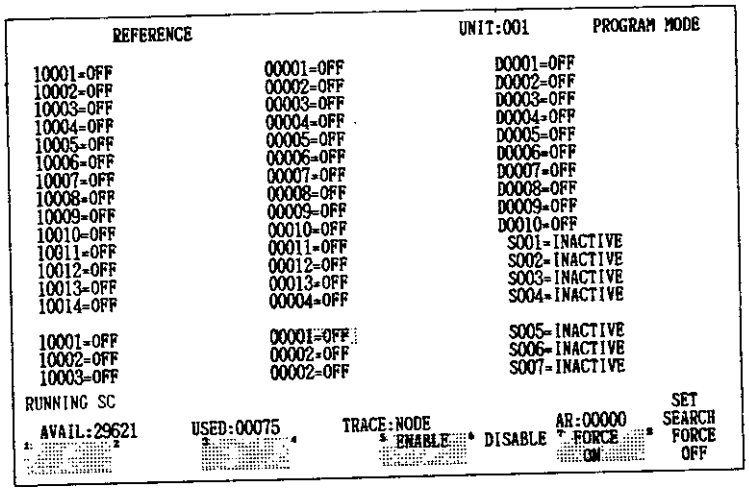


Fig. 3.164

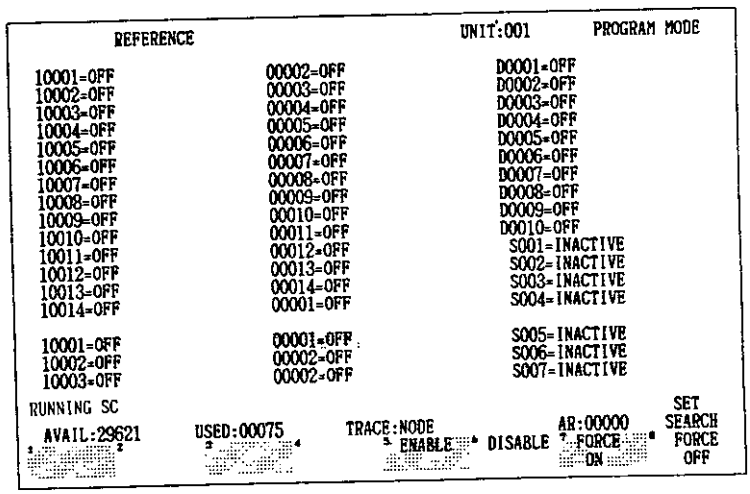
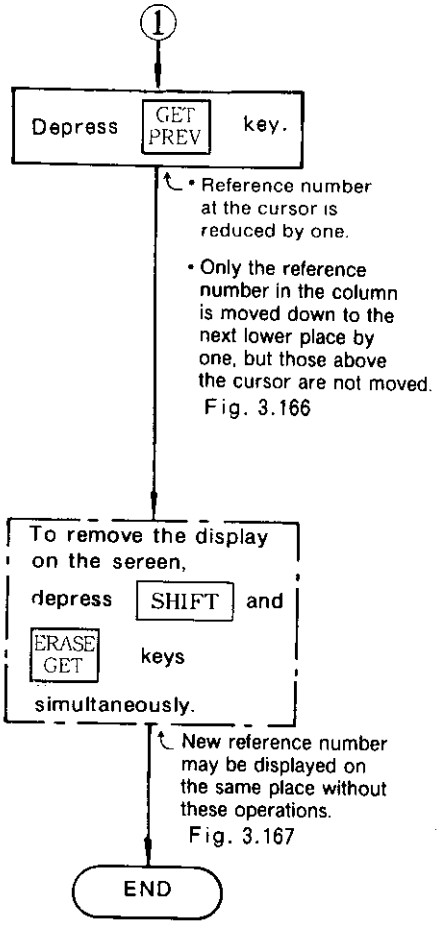


Fig. 3.165



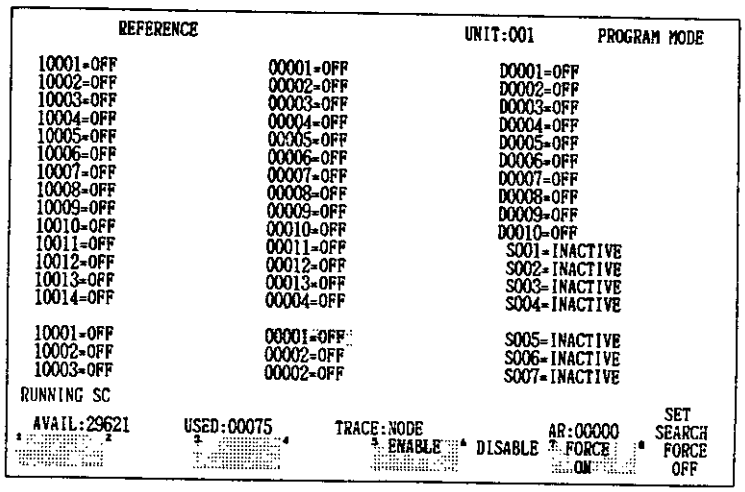


Fig. 3.166

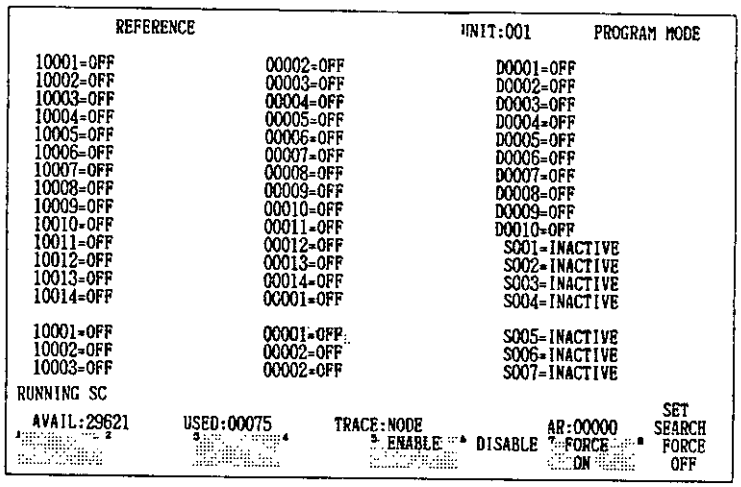


Fig. 3.167

IMPORTANT

If ON/OFF cycle is changed over at high speed, a correct content may not be displayed on P140 screen, but in RAP section of GL60S.

NOTE

1. Effective GET NEXT , GET PREV Key Operation

   How to display the status of sequential coils 1 to 17 using the expanding reference area.

   • Display coil "1" on the bottom line in the reference area, then depress GET NEXT key 16 times.

   • Display coil "17" on the top line in the expanding reference area, then depress GET PREV key 16 times.

2. In monitor mode, (ENABLE) , (DISABLE) , (FORCE ON) and (FORCE OFF) in the label area are not displayed.

3.6.3 Display of Reference and Comment (Cont'd)

(b) REGISTER CONTENTS DISPLAY ①

Display for Contents of Input Register and Holding Register

Register contents can be displayed by any one of the following data types:

- Decimal
- Hexadecimal
- Binary
- ASCII

Signed decimal type data can also be displayed.

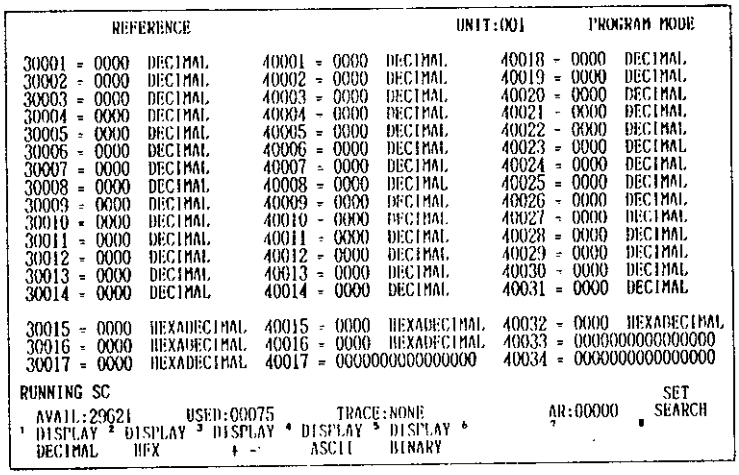
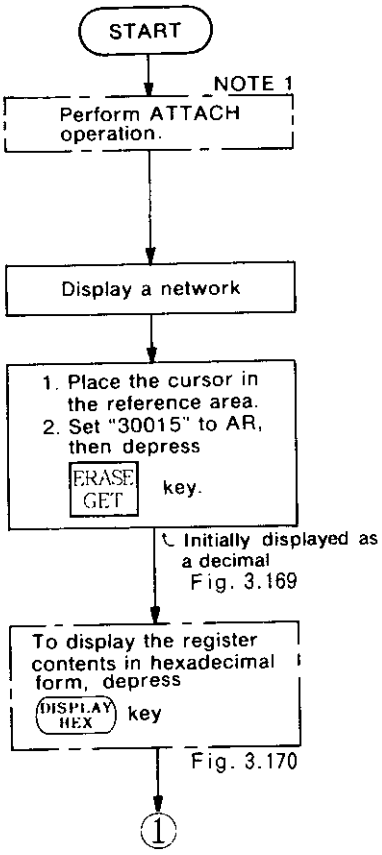


Fig. 3.168

POINT

- The cursor should be placed in the reference area or the expanding reference area.
- The extended register can be processed only by the DDSCR-GL60S3.



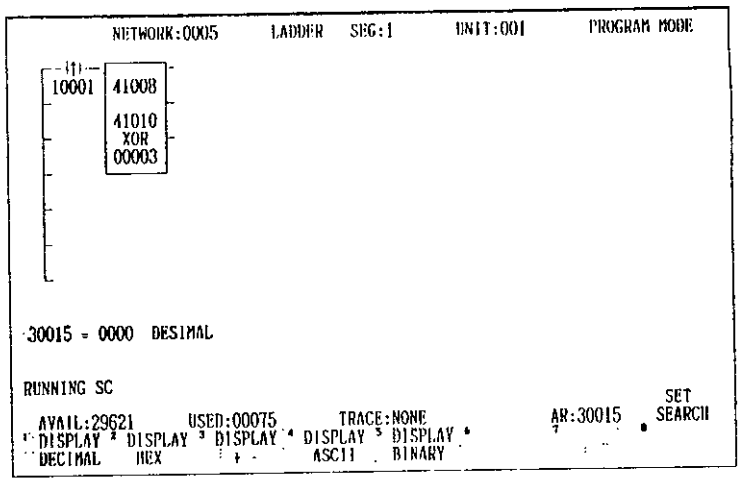


Fig. 3.169

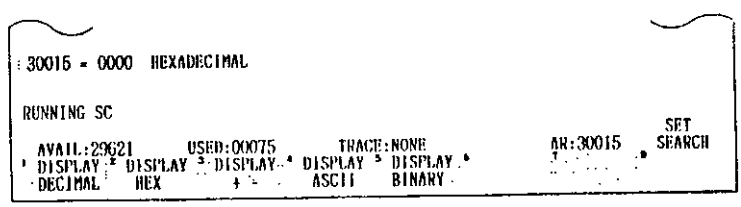
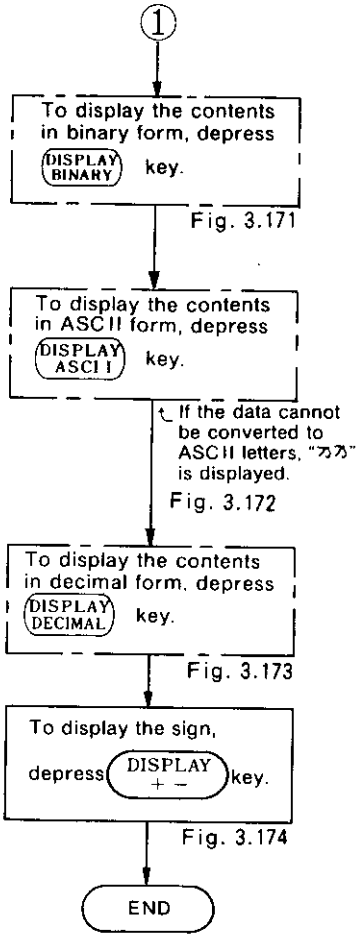


Fig. 3.170



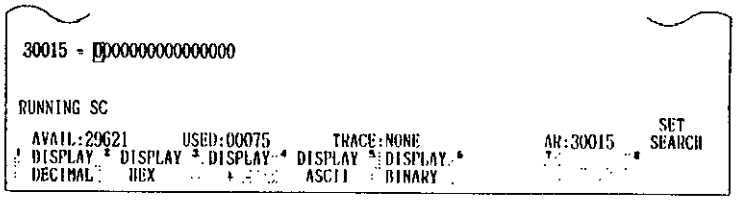


Fig. 3.171

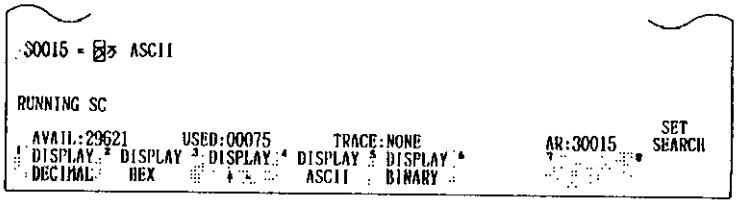


Fig. 3.172

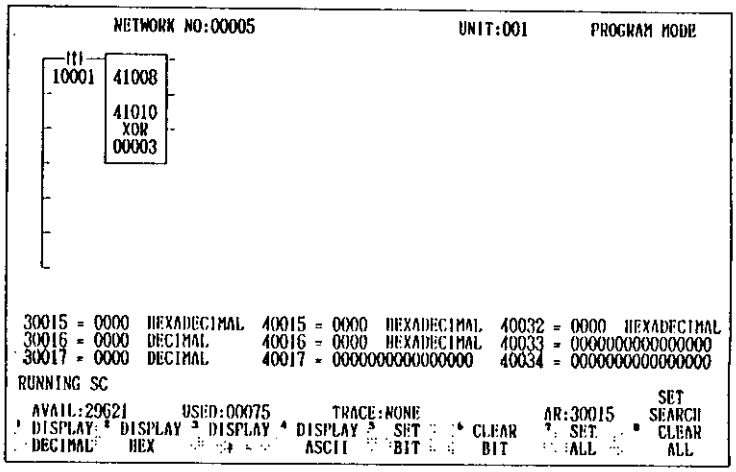


Fig. 3.173

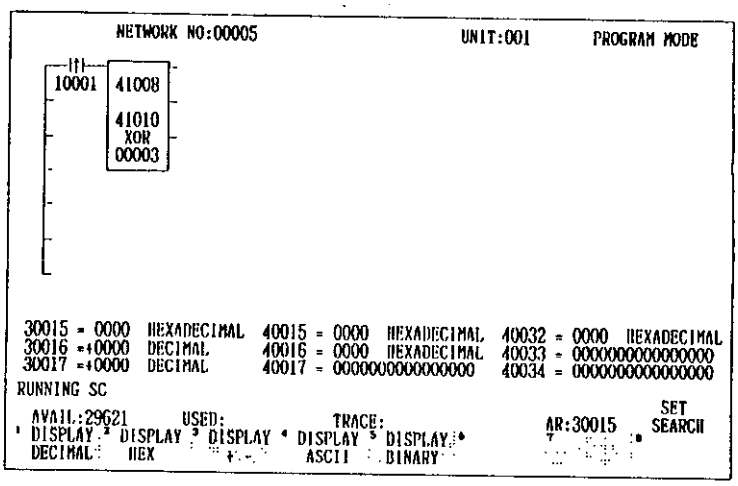


Fig. 3.174

3.6.3 Display of Reference and Comment (Cont'd)

NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. [CHG SCRN] key allows the user to change the screen display from logic screen to alternate screen.
3. In program mode, when the contents in a holding register are displayed in binary only, the following symbols and a small cursor are displayed:

   (SET BIT), (CLEAR BIT), (SET ALL), (CLEAR ALL)

   [40034] = [O] 000000000000000

   Actual Cursor Small Cursor
4. If the register contents are 9999 or more in decimal from, the following display appears.

   Example, 40100 = > 9999 OVERFLOW

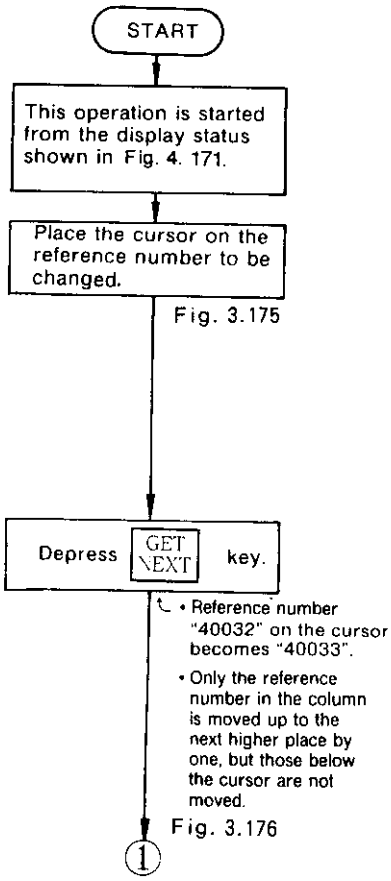
(b) REGISTER CONTENTS DISPLAY ②

This is a function for displaying contents of registers in order of the reference number. The function is used to display the next reference number or the previous reference number of the currently displayed reference number.

- For the next reference number display: [GET NEXT] key
- For the previous reference number display: [GET PREV] key

POINT

- The cursor should be placed in the reference area or the expanding reference area.
- For new display form (next or previous reference number), the display form on the cursor is used.
- The extended register can be processed only by the DDSCR-GL60S3.




```
          REFERENCE                                          UNIT:001      PROGRAM MODE
30001 = 0000  DECIMAL     40001 = 0000  DECIMAL     40018 = 0000  DECIMAL
30002 = 0000  DECIMAL     40002 = 0000  DECIMAL     40019 = 0000  DECIMAL
30003 = 0000  DECIMAL     40003 = 0000  DECIMAL     40020 = 0000  DECIMAL
30004 = 0000  DECIMAL     40004 = 0000  DECIMAL     40021 = 0000  DECIMAL
30005 = 0000  DECIMAL     40005 = 0000  DECIMAL     40022 = 0000  DECIMAL
30006 = 0000  DECIMAL     40006 = 0000  DECIMAL     40023 = 0000  DECIMAL
30007 = 0000  DECIMAL     40007 = 0000  DECIMAL     40024 = 0000  DECIMAL
30008 = 0000  DECIMAL     40008 = 0000  DECIMAL     40025 = 0000  DECIMAL
30009 = 0000  DECIMAL     40009 = 0000  DECIMAL     40026 = 0000  DECIMAL
30010 = 0000  DECIMAL     40010 = 0000  DECIMAL     40027 = 0000  DECIMAL
30011 = 0000  DECIMAL     40011 = 0000  DECIMAL     40028 = 0000  DECIMAL
30012 = 0000  DECIMAL     40012 = 0000  DECIMAL     40029 = 0000  DECIMAL
30013 = 0000  DECIMAL     40013 = 0000  DECIMAL     40030 = 0000  DECIMAL
30014 = 0000  DECIMAL     40014 = 0000  DECIMAL     40031 = 0000  DECIMAL

30015 = 0000  HEXADECIMAL 40015 = 0000  HEXADECIMAL 40032 = 0000  HEXADECIMAL
30016 = 0000  HEXADECIMAL 40016 = 0000  HEXADECIMAL 40033 = 0000000000000000
30017 = 0000  HEXADECIMAL 40017 = 0000000000000000  40034 = 0000000000000000
RUNNING SC

 AVAIL:29621      USED:00075      TRACE:NONE                    SET
 DISPLAY 2 DISPLAY 3 DISPLAY 4 DISPLAY 5 DISPLAY 6      AR:00000  SEARCH
 DECIMAL   HEX                   ASCII   BINARY
```

Fig. 3.175

```
                                                                 PROGRAM MODE
30001 = 0000  DECIMAL     40001 = 0000  DECIMAL     40019 = 0000  DECIMAL
30002 = 0000  DECIMAL     40002 = 0000  DECIMAL     40020 = 0000  DECIMAL
30003 = 0000  DECIMAL     40003 = 0000  DECIMAL     40021 = 0000  DECIMAL
30004 = 0000  DECIMAL     40004 = 0000  DECIMAL     40022 = 0000  DECIMAL
30005 = 0000  DECIMAL     40005 = 0000  DECIMAL     40023 = 0000  DECIMAL
30006 = 0000  DECIMAL     40006 = 0000  DECIMAL     40024 = 0000  DECIMAL
30007 = 0000  DECIMAL     40007 = 0000  DECIMAL     40025 = 0000  DECIMAL
30008 = 0000  DECIMAL     40008 = 0000  DECIMAL     40026 = 0000  DECIMAL
30009 = 0000  DECIMAL     40009 = 0000  DECIMAL     40027 = 0000  DECIMAL
30010 = 0000  DECIMAL     40010 = 0000  DECIMAL     40028 = 0000  DECIMAL
30011 = 0000  DECIMAL     40011 = 0000  DECIMAL     40029 = 0000  DECIMAL
30012 = 0000  DECIMAL     40012 = 0000  DECIMAL     40030 = 0000  DECIMAL
30013 = 0000  DECIMAL     40013 = 0000  DECIMAL     40031 = 0000  DECIMAL
30014 = 0000  DECIMAL     40014 = 0000  DECIMAL     40032 = 0000  HEXADECIMAL

30015 = 0000  HEXADECIMAL 40015 = 0000  HEXADECIMAL 40033 = 0000  HEXADECIMAL
30016 = 0000  HEXADECIMAL 40016 = 0000  HEXADECIMAL 40033 = 0000000000000000
30017 = 0000  HEXADECIMAL 40017 = 0000000000000000  40034 = 0000000000000000
RUNNING SC

 AVAIL:29621      USED:00075      TRACE:NONE                    SET
 DISPLAY 2 DISPLAY 3 DISPLAY 4 DISPLAY 5 DISPLAY 6      AR:00000  SEARCH
 DECIMAL   HEX                   ASCII   BINARY
```

Fig. 3.176

3.6.3 Display of Reference and Comment (Cont'd)

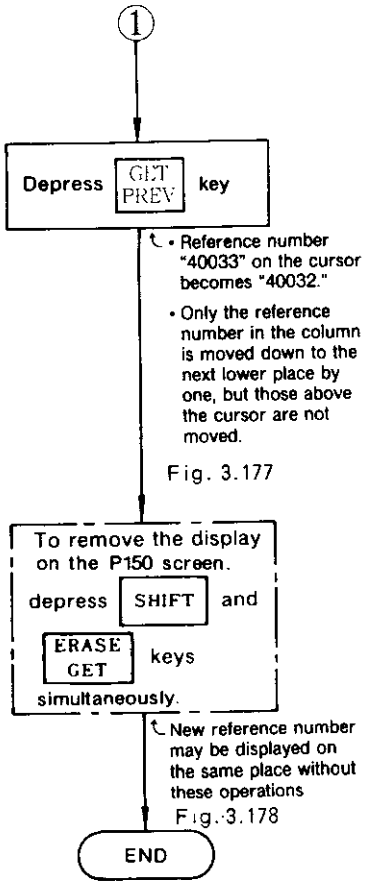


Fig. 3.177

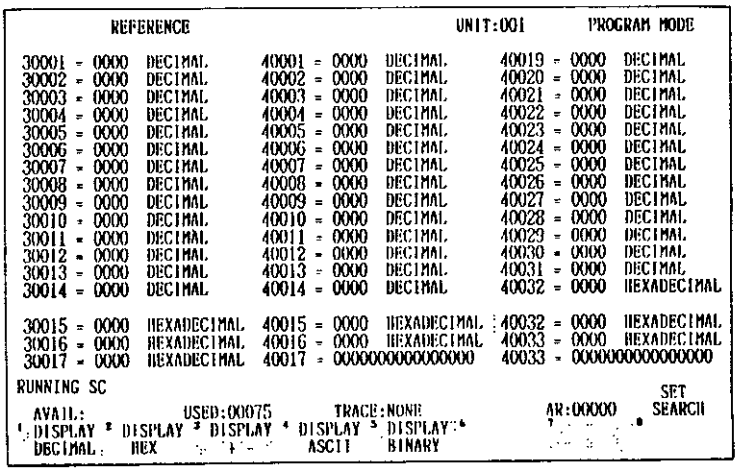


Fig. 3.177

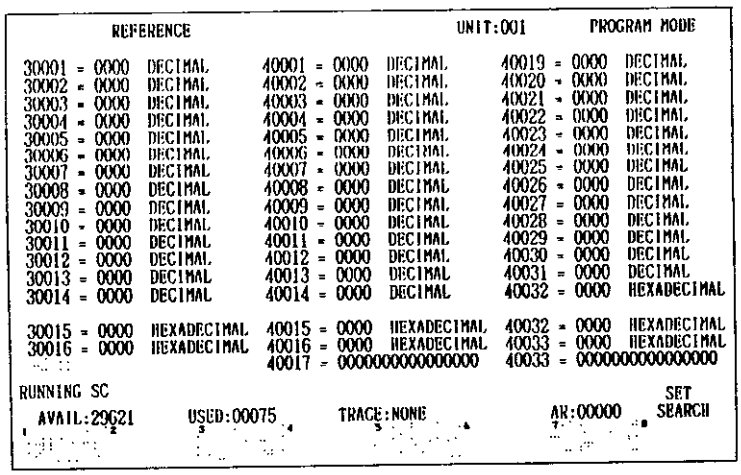


Fig. 3.178

NOTE

1. Effective GET NEXT , GET PREV Keys Operation

How to display the status of sequential coils 40001 to 40017 using the expanding reference area.

- Display register "40001" on the bottom line in the reference area, then depress GET NEXT key 16 times.
- Display register "40017" on the top line in the expanding reference area, then depress GET PREV key 16 times.

(c) DATA STORING IN HOLDING REGISTER

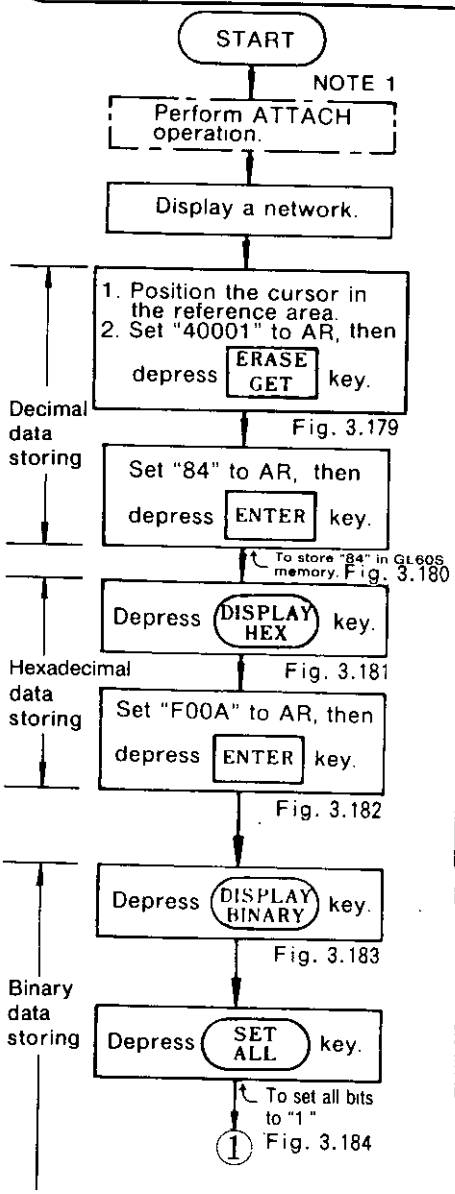
This function is used to store any numerical value (pattern) in any holding register, and it is displayed in the reference area or the expanding reference area.

Data Types and Range:

- Decimal • • • 0000 to 9999
- Hexadecimal • • • 0000 to FFFF
- Binary • • • Any 16-bit pattern
- ASCII • • • Any 2 ASCII characters
- Signed Decimal • • • −9999 to +9999

POINT

- The cursor should be placed in the reference area.
- The P140 cannot store the numerical value in the input register.
- The extended register can be processed only by the DDSCR-GL60S3.



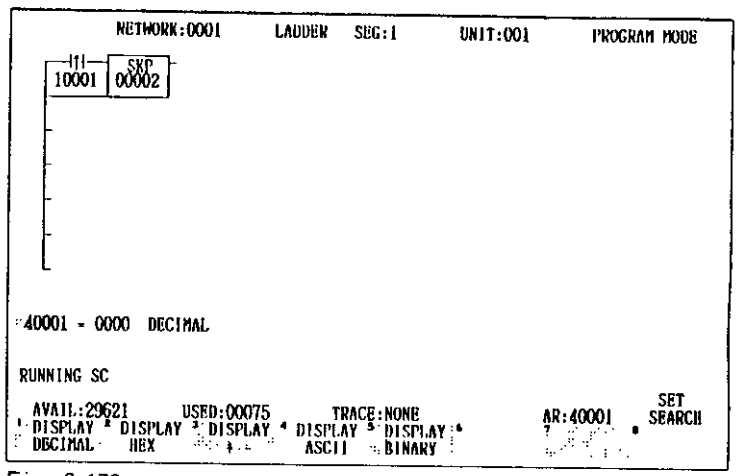


Fig. 3.179

Fig. 3.180

Fig. 3.181

Fig. 3.182

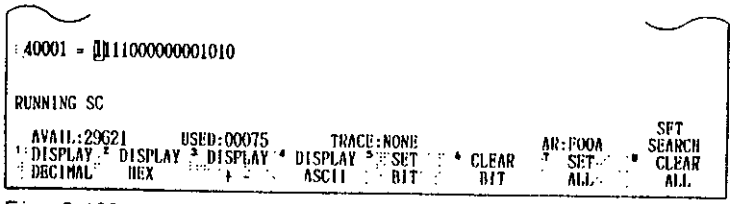
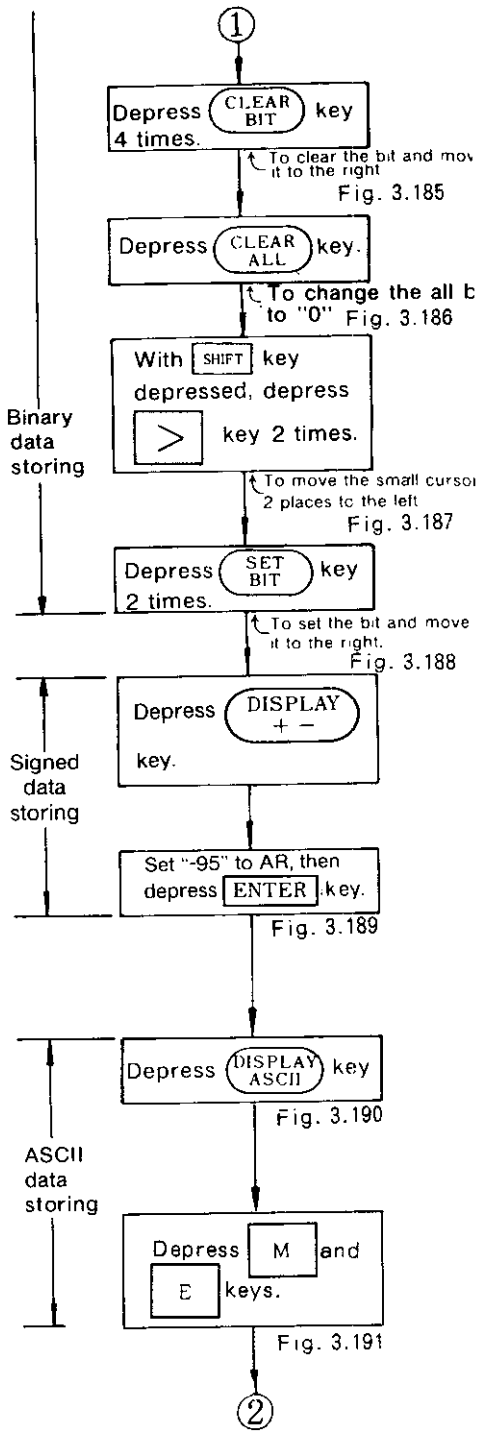
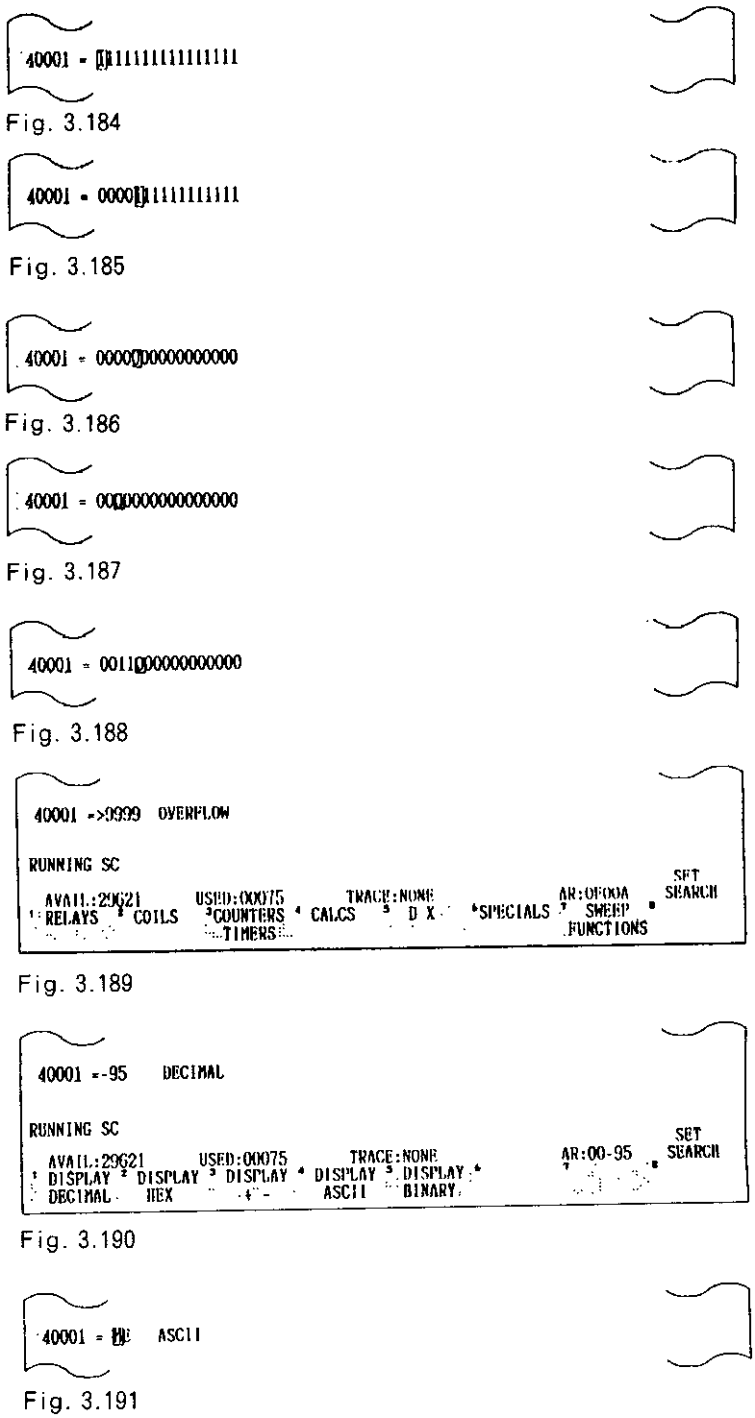


Fig. 3.183

3.6.3 Display of Reference and Comment (Cont'd)





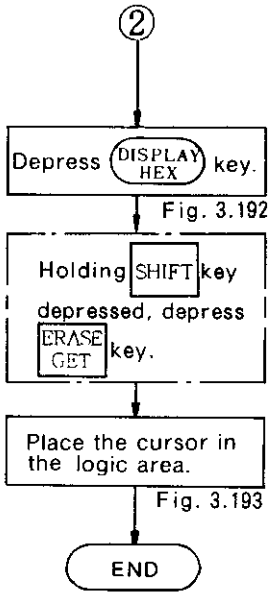


Fig. 3.192

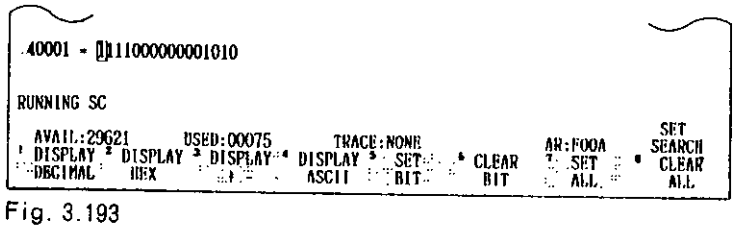


Fig. 3.193

NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. Where the register contents are more than 9999 in decimal, the following display appears.

   Example, 40100 = > 9999 OVERFLOW
3. Because there is no ASCII code corresponding to the register contents, the register contents cannot be converted to ASCII code in ASCII code in ASCII display. Therefore, the following display can be found.

   Example, 40100 = 万 万 ASCII
4. To enter "−" for data with the negative sign, depress function keys SHIFT and −L at the same time.
5. To enter ASCII characters, connect the JIS keyboard (type No.: DISCT-KB400) to the P140.

3.6.3 Display of Reference and Comment (Cont'd)

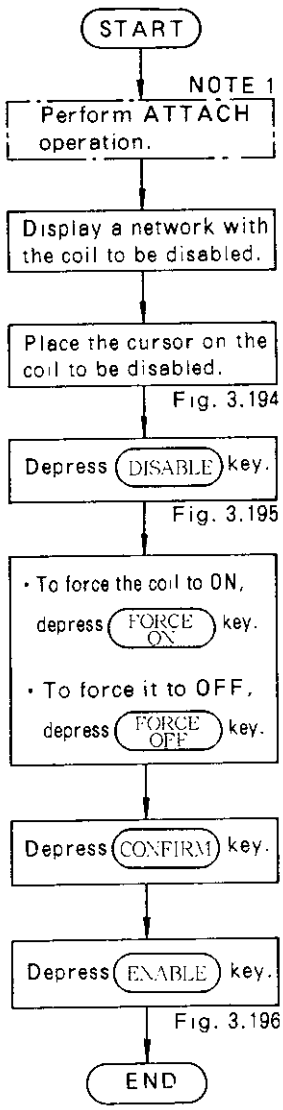
(2) DISABLE OPERATION

(a) DISABLE OF COIL, LINK COIL (LOGIC AREA)

The Disable function is used to simulate a network operation, and simplify the checkout and maintenance of a control system using the GL60S Controller. As an example, disable operation for a logic coil and a link coil in the logic area is shown below.

POINT

- The cursor should be placed in the logic area.
- This function is effective only on the coil with —( )— or —(L)— in the logic area.



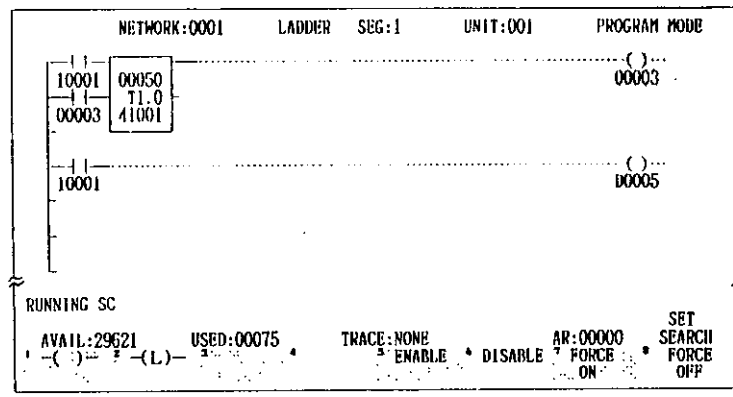


Fig. 3.194

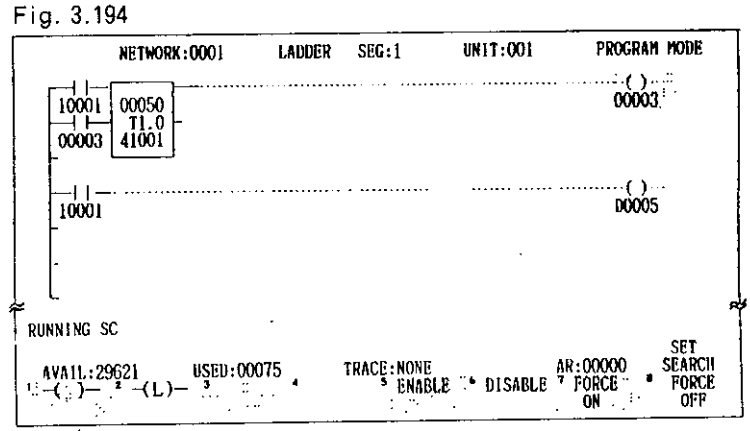


Fig. 3.195

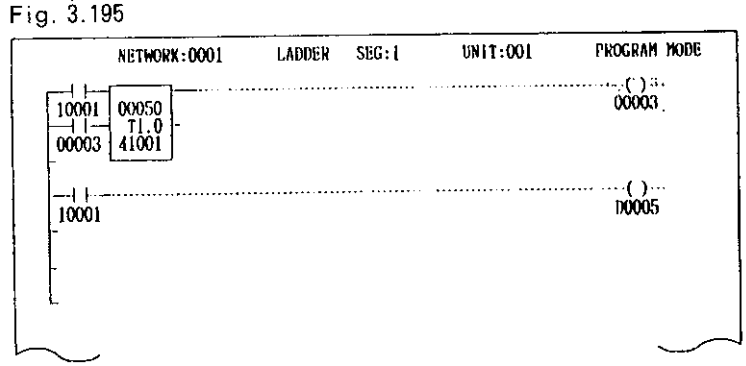


Fig. 3.196

NOTE

1. This step can be skipped if the system is ready to store the program.
2. Unnecessary disabled coils should be enabled.
3. Function keys are also available in place of the label keys except the CONFIRM key.

3.6.3 Display of Reference and Comment (Cont'd)

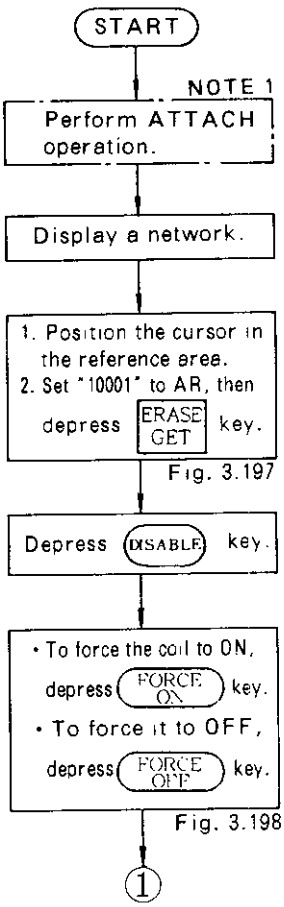
(b) DISABLE COIL, INPUT RELAY, LINK COIL (REFERENCE AREA)

This Disable operation is carried out in the reference area.

POINT

- The cursor should be placed in the reference area or the expanding reference area.
- Where input relays are used for a destination of data transfer function, they must be disabled either ON or OFF.
- Where logic coils are used for the destination of the data transter function, the disable operation should be performed so as not to activate the data transfer function.

  Generally, a result of data transfer takes precedence over all others. However, when the logic coils and the input relays are disabled or the disabled ones are cycled ON-OFF-ON-OFF, a disabled status takes precedence over the data transfer.



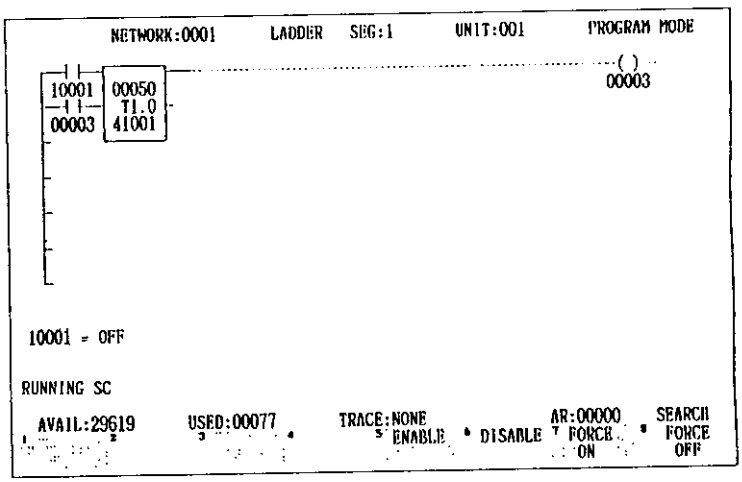


Fig. 3.197

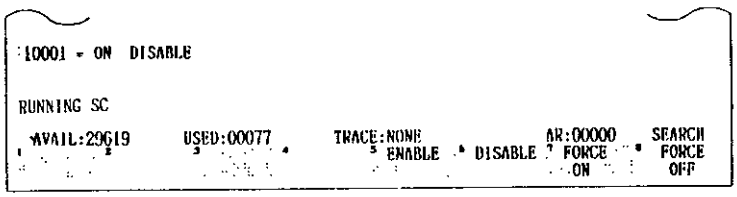
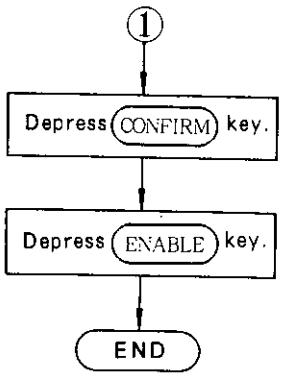


Fig. 3.198



NOTE

1. This step can be skipped if the system is ready to store the system.
2. Unnecessary disabled coils and input relays should be enabled.
3. Function keys are also available in place of the label keys except the CONFIRM key.

3.6.4 Network Checking

(1) SEARCH ①

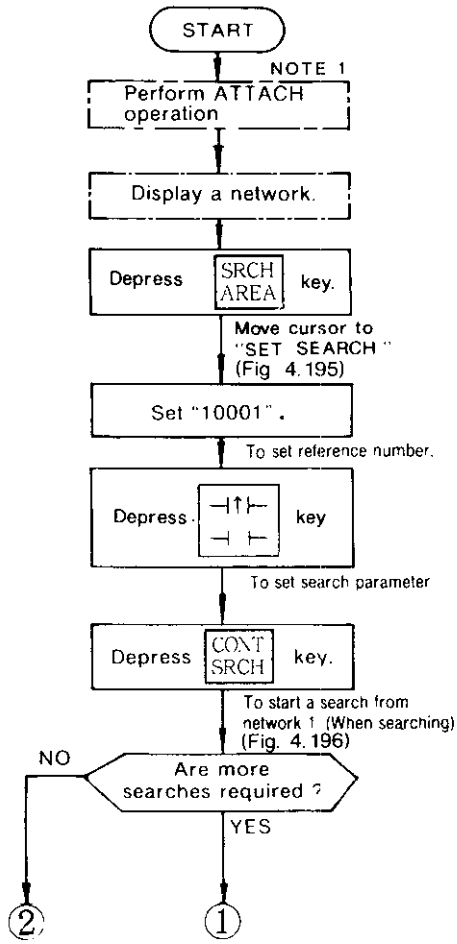
The logic in the GL60S can be searched for specific elements. Networks containing the desired elements will be placed on the P140 screen, one at a time. The cursor is placed on the specified element. (Example of search for ⊣⊢ 10001)

There are three setting methods as shown below.

- Symbol (element function) setting
- Reference number setting
- Symbol and reference number settings

POINT

- Reference number not displayed in the network can also be searched, except in special case.



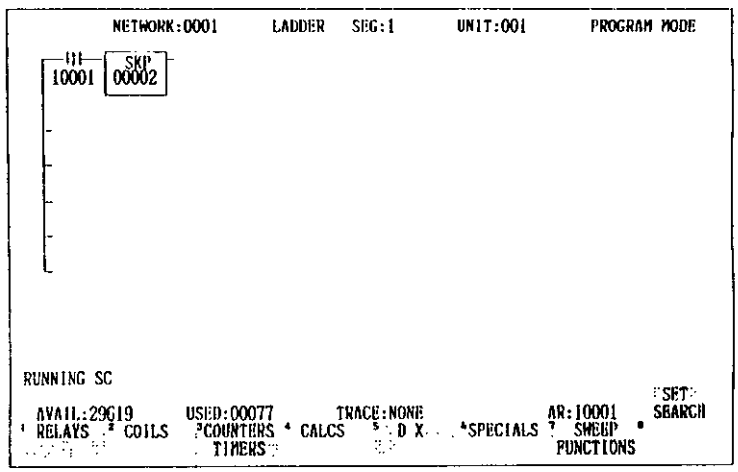


Fig. 3.199

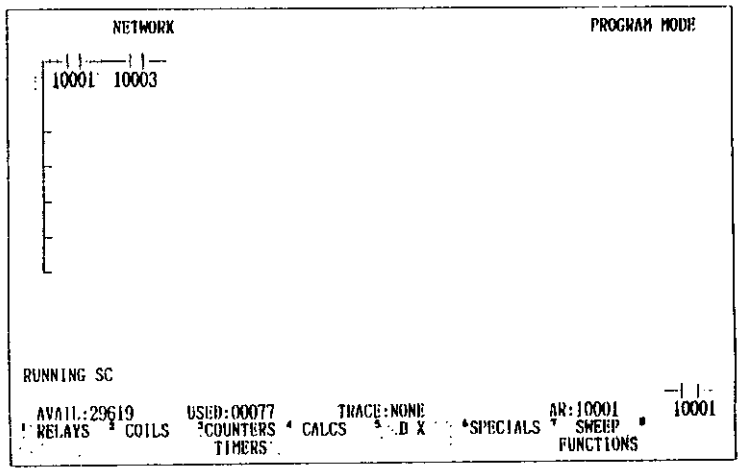
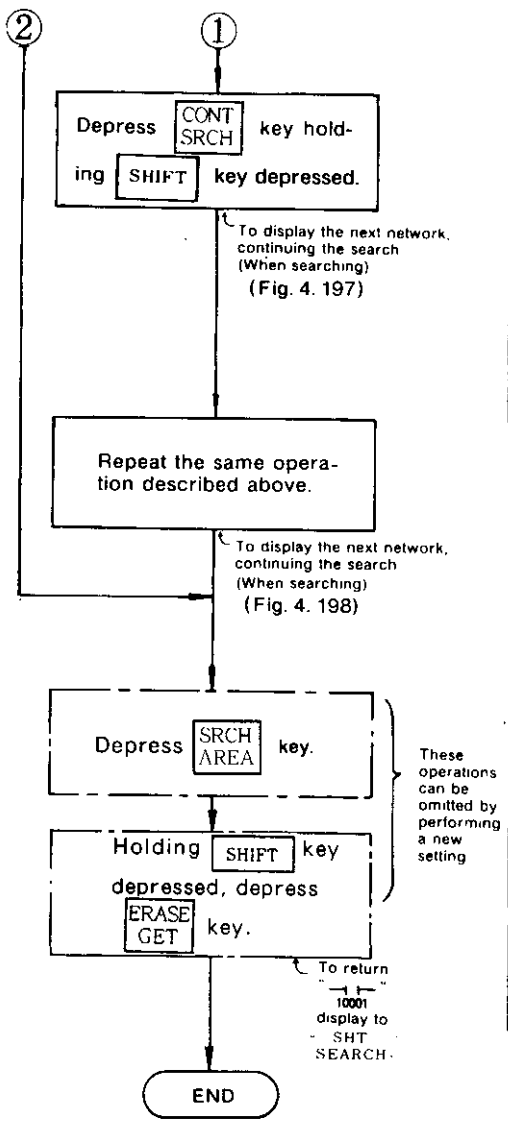


Fig. 3.200



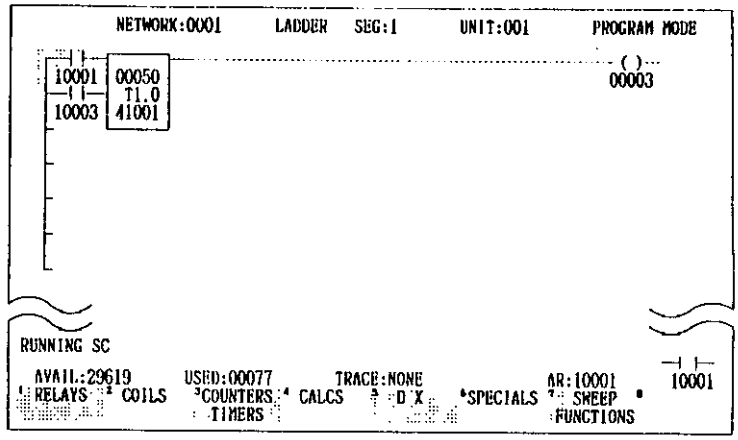


Fig. 3.201

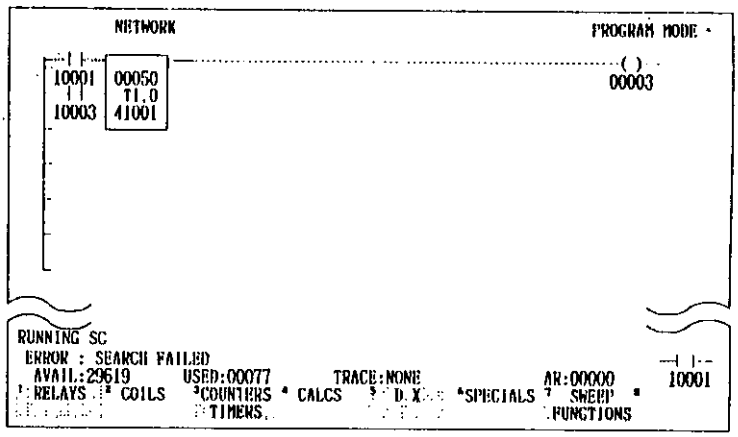


Fig. 3.202

SEARCHING LIMITATIONS

You cannot perfrom the following searching functions:

- Constant searching
- Searching for the destination reference used in DIBT and DIBR functions.
- Searching for the source reference used in SIBT and SIBR functions.
- Searching by specifying both symbol and reference number for 2- or 3-element function (except for the reference number in the lower position).

3.6.4 Network Checking (Cont'd)

NOTE

1. When ATTACH operation has already been completed, or the monitoring can be performed, this step can be skipped.
2. Where the cursor is placed in " SET SEARCH " and label for selecting functions display does not appear, depress [CHG NODE] key.
3. Where the symbol is set prior to the reference number setting, "ALL" instead of the reference number is displayed. Furthermore, where the set symbol is changed for any symbol in another function group, "ALL" is displayed instead of the reference number.
4. Sample settings of search parameter
   - [DISABLE ALL] : Searching of all coils and input relays in Disable status
   - [40084] : Searching of the holding register 40084
   - [WRIT ALL] : Searching of all WRIT elements
   - [-(L)- ALL] : Searching of all latched coils
5. When the cursor is moved from " SET SEARCH " position to logic area, depress [∧] or [∨] key.
6. Function keys [∧] or [∨] can also be used for moving the cursor to (SET SEARCH) .

(1) SEARCH ②

This function is utilized to search coils and input relays in Disable status. It is useful if you forget to clear Disable status (to Enable).

POINT

- Use the same essentials described in SEARCH ①.
- After searching, in addition to the network display, the status messages appear.

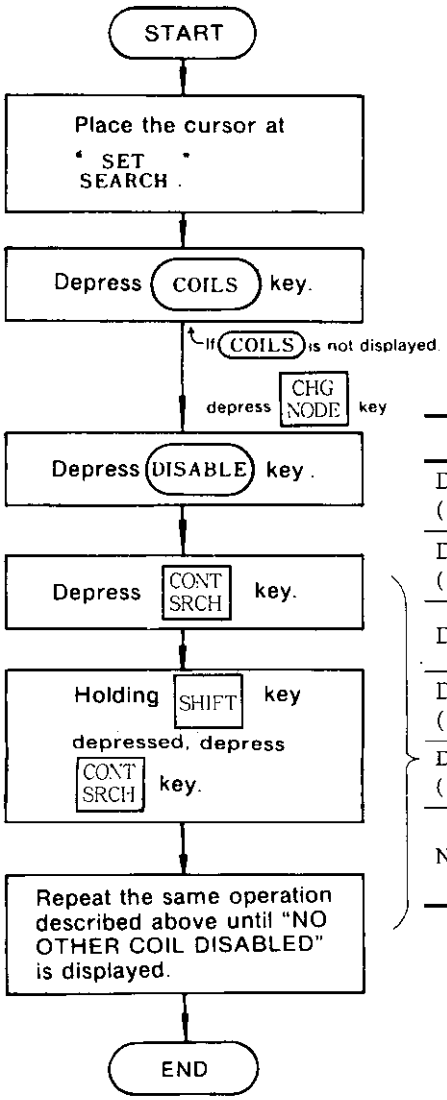


Table 4.7

Message	Description
DISCRETE 0 × × × × DISABLED (USED)	The coil 0 × × × × has already been programmed and is disabled.
DISCRETE 0 × × × × DISABLED (NOT USED)	The coil 0 × × × × has not been programmed but is disabled.
DISCRETE 1 × × × × DISABLED	The input relay 1 × × × × is in the Disabled status.
DISCRETE D × × × × DISABLED (NOT USED)	The link coil D × × × × has already been programmed and is disabled.
DISCRETE D × × × × DISABLED (NOT USED)	The link coil D × × × × has not been programmed but is disabled.
NOT OTHER COIL DISABLED	It appears during search procedures when all disabled coils and input relays have been found.

NOTE

1. Displays in the logic area, the reference area and the expanding reference area remain on the screen.
2. ∗: Cannot be entered by function keys SHIFT and DISAB ENABL.

3.6.4 Network Checking (Cont'd)

Table 4.8 Label Displays for Selecting the Search Element Functions

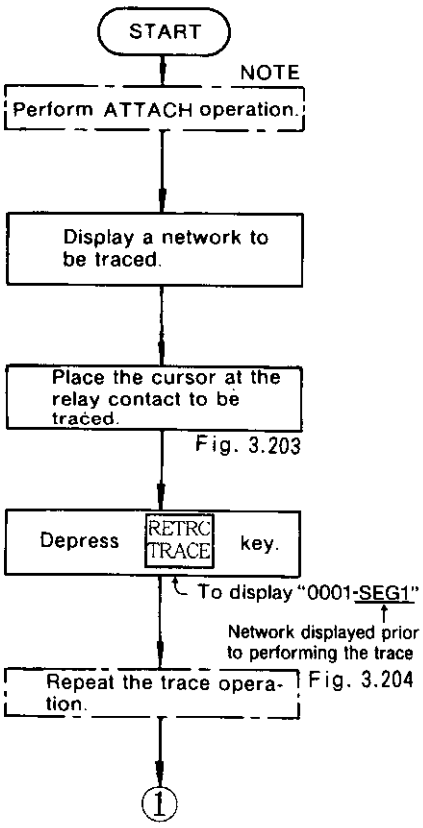
Label Keys \ Label Displays	1	2	3	4	5	6	7	8	
RELAYS	RELAYS	COILS	COUNTERS TIMERS	CALCS	D X	SPECIALS	SWEEP FUNCTIONS		
	—| |—	—|/|—	—|↑|—	—|↓|—	——		I		:
COILS	—( )—	—(L)—			ENABLE	DISABLE	FORCE ON		FORCE OFF
COUNTER TIMERS	UCTR	DCTR	T1.0	T0.1	T.01		I		:
CALCS	ADD	SUB	MUL	DIV	SQRT				NEXT MENU ↓
	SADD	SSUB	SMUL	SDIV			↑ PREVIOUS MENU		NEXT MENU ↓
	DADD	DSUB	DMUL	DDIV	DSQR		↑ PREVIOUS MENU		NEXT MENU ↓
	SDAD	SDSB					↑ PREVIOUS MENU		
D X	R-T	T-R	T-T	BLKM	BIN	FOUT			NEXT MENU ↓
	SRCH	STAT	DIBT	DIBR	SIBT	SIBR	↑ PREVIOUS MENU		NEXT MENU ↓
	AND	OR	CMPR	SENS	MBIT	COMP	↑ PREVIOUS MENU		NEXT MENU ↓
	XOR	BROT	MROT	TWST	READ	WRIT	↑ PREVIOUS MENU		NEXT MENU ↓
	BIN	BCD		COMM			↑ PREVIOUS MENU		NEXT MENU ↓
	FRED	FWRT	SIN	COS	SWAP	SORT	↑ PREVIOUS MENU		NEXT MENU ↓
	BCNT	TSET	BYSL	BYCM	BADD		↑ PREVIOUS MENU		NEXT MENU ↓
*	MBUS	PEER	BROD	BOOK	POLL	DIAG	↑ PREVIOUS MENU		NEXT MENU ↓
*	SND	RCV					↑ PREVIOUS MENU		
SPECIALS	SKP		GOSUB						

(2) TRACE, RETRACE

1. When any relay contact (0××××) on the screen is specified and traced, the trace function forms the network that drives the referenced coil corresponding to the relay contact. The same operation should be repeated until your job on the trace is completed.
2. The retrace function allows the user to return to the network that was displayed prior to performing a trace, using the reverse procedures of the trace.
3. When any input relay or register on the screen is specified and traced, the specified reference status is displayed in the reference area, and then the trace operation is interrupted. With the cursor placed in the logic area, the specified reference status remains in the reference area.

POINT

· The relay contact (0××××) used in the data transfer function cannot be traced.



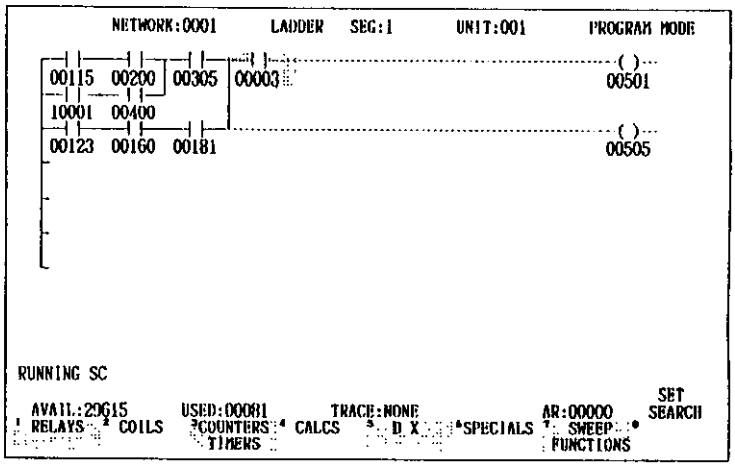


Fig. 3.203

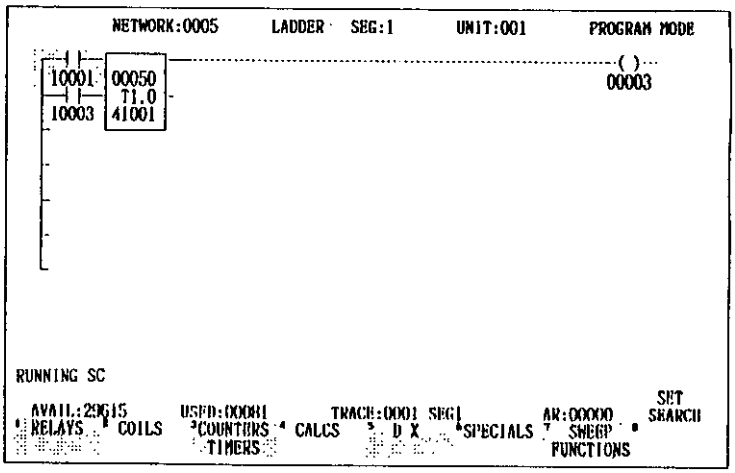


Fig. 3.204

3.6.4 Network Checking (Cont'd)

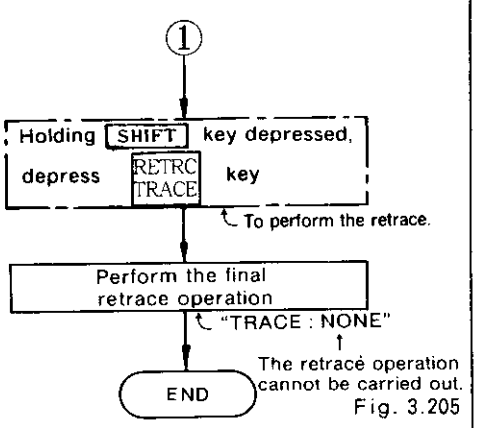


Fig. 3.205

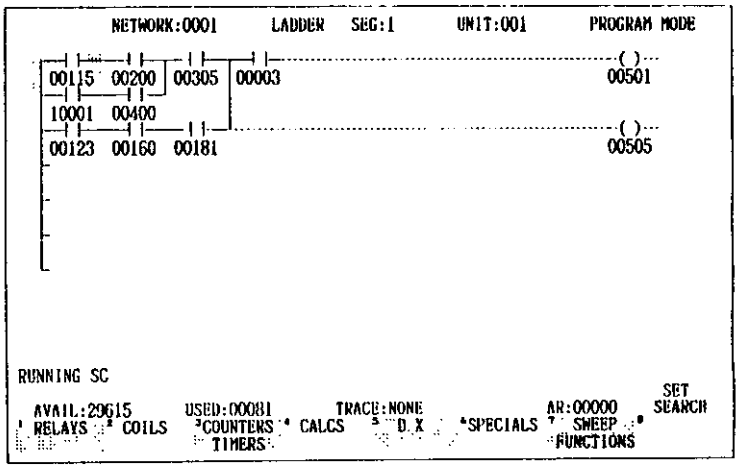


Fig. 3.205

NOTE

This step can be skipped if the system is ready to store the program or to make the monitoring.

3.6.5 Scan Control

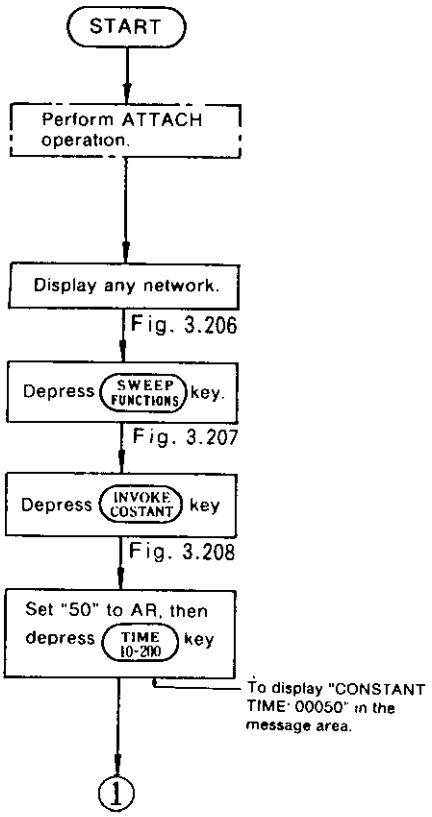
(1) CONSTANT SWEEP

The constant sweep is a function to make a constant scan time by setting an objective scan time of the GL60S. As a result, accuracy of simple positioning control can be gained. Example of objective scan time, 50 ms is shown below.

POINT

- An objective scan time must be larger than an actual scan time. Set any value of 10 to 200 ms in the unit of 10 ms, as the objective scan time, to the holding register 49998.
- If smaller than the actual scan time, the objective scan time is disregarded.
- When using the constant sweep function, the following two registers are occupied:
  - 49998 – Objective scan time setting
  - 49999 – Actual scan time (varied in units of 10 ms)

  When not using the constant sweep function, these two registers can be used in any way the user prefers.



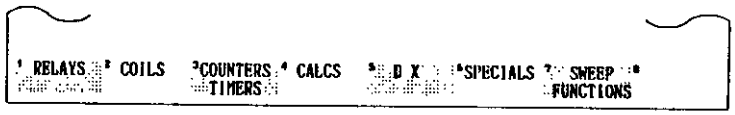


Fig. 3.206

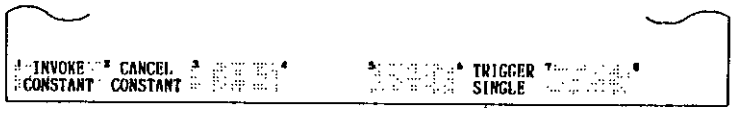


Fig. 3.207

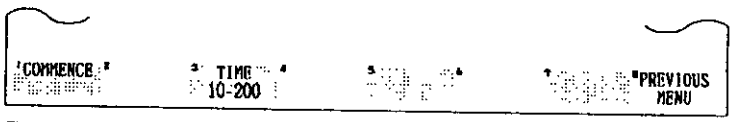
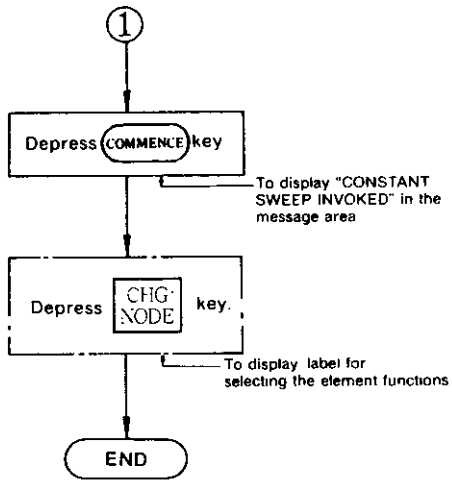


Fig. 3.208

3.6.5 Scan Control (Cont'd)



NOTE

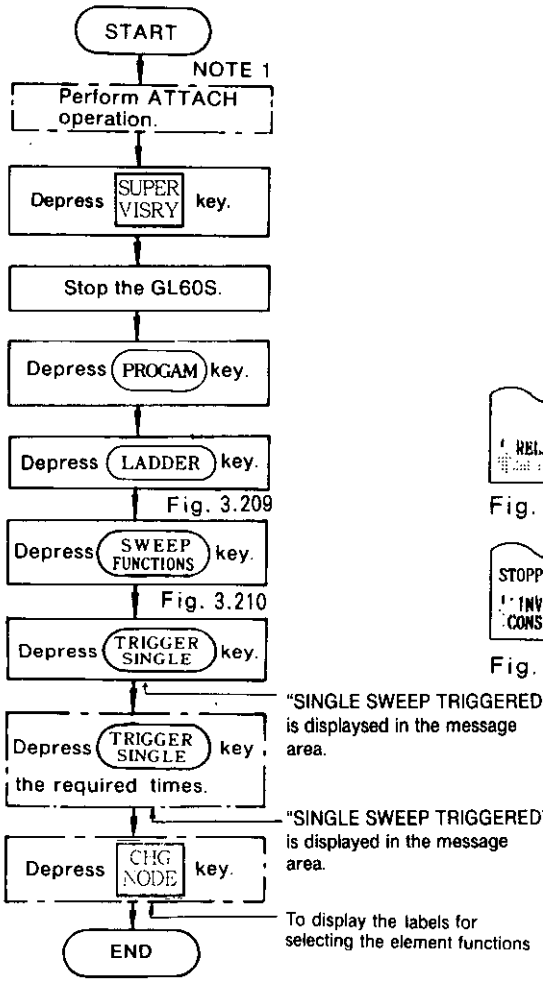
1. This step can be skipped if the system is ready to store the program.
2. If the labels for selecting the element functions are not displayed on the screen. Depress CHG NODE key.
3. The holding registers 49998 and 49999 should not be used for other applications except when the constant sweep operation is not activated.
4. If a value more than 200 ms is set to the holding register 49998 during constant sweep, it is used as 200 ms.
5. To clear the constant sweep, depress CANCEL CONSTANT key.
6. Where a detailed scan time is required, create a ladder diagram for measuring the scan time.

(2) SINGLE SWEEP

A network is solved in only one scan cycle by a single sweep operation. It is used to simulate a network operation or an arithmetic operation.

POINT

- The GL60S must be at a standstill.
- Actual I/O operation is not executed for the data. A simulation requires any idea, such as input relays disabled.
- For single sweep operation, it is recommended that a network or a reference to be checked be previously displayed in the logic area or the reference area.



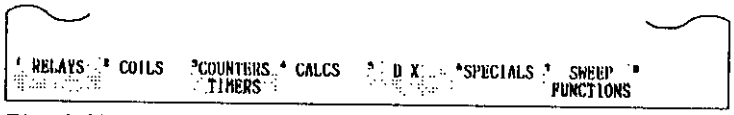


Fig. 3.209

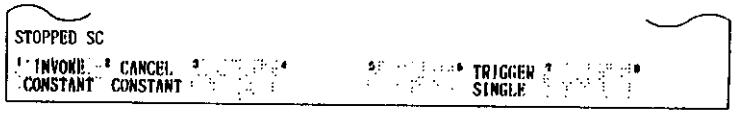


Fig. 3.210

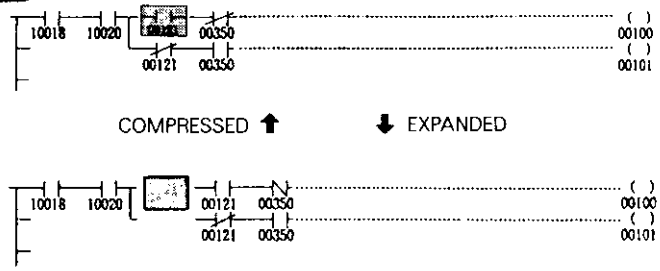
NOTE

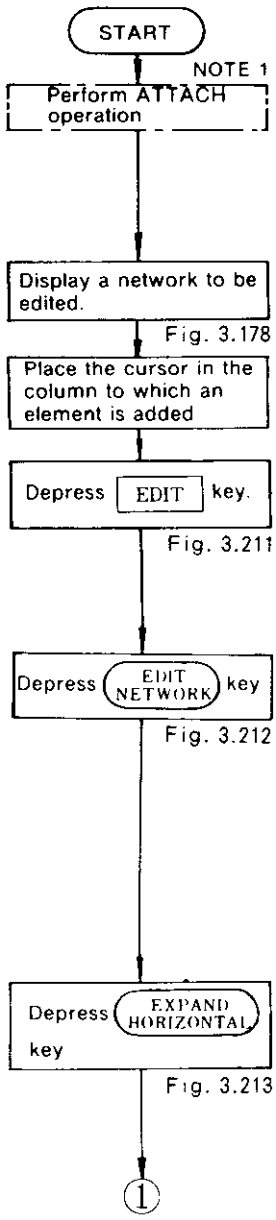
1. This step can be skipped if the system is ready to store the program.
2. If the labels for selecting the element functions are not displayed on the screen, depress CHG NODE key.

3.6.6 Network Edition Operation

(1) NETWORK EDITION ①

This is an editing function for expanding or compressing a network in a horizontal direction. The function should be used to edit every column of the network.





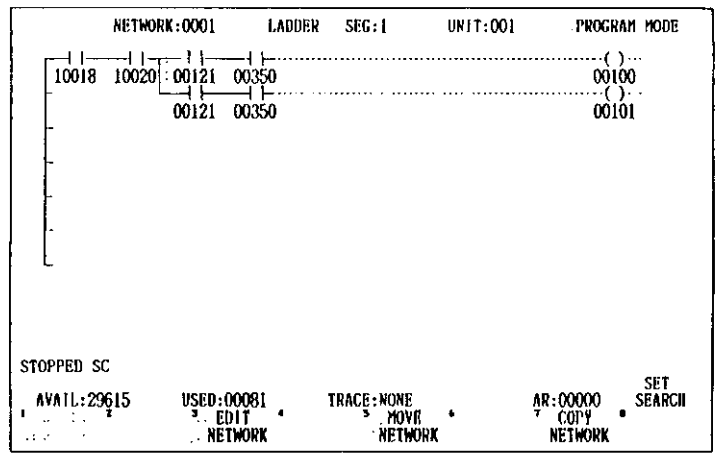


Fig. 3.211

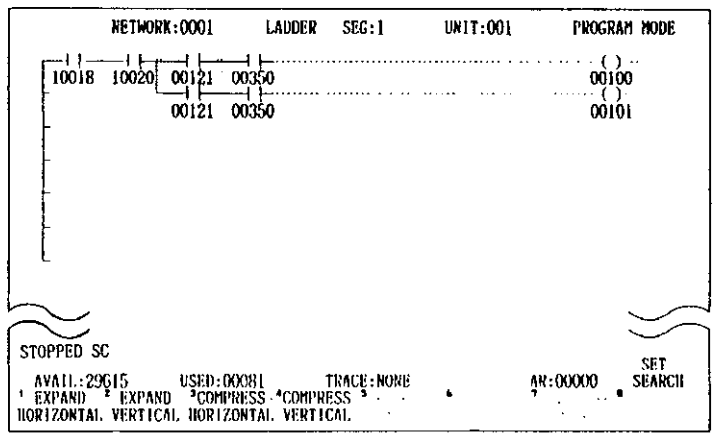


Fig. 3.212

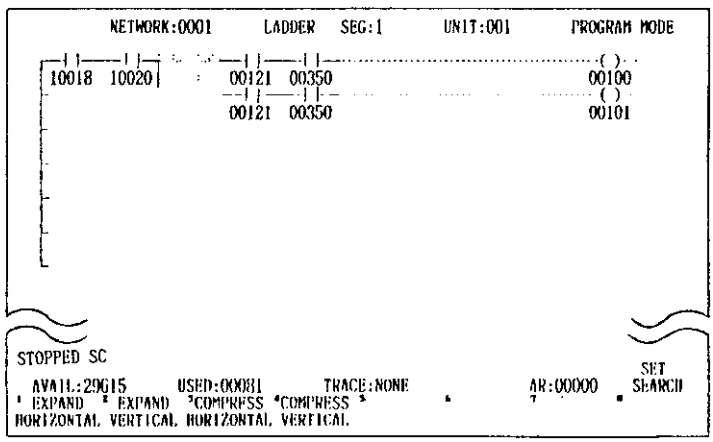
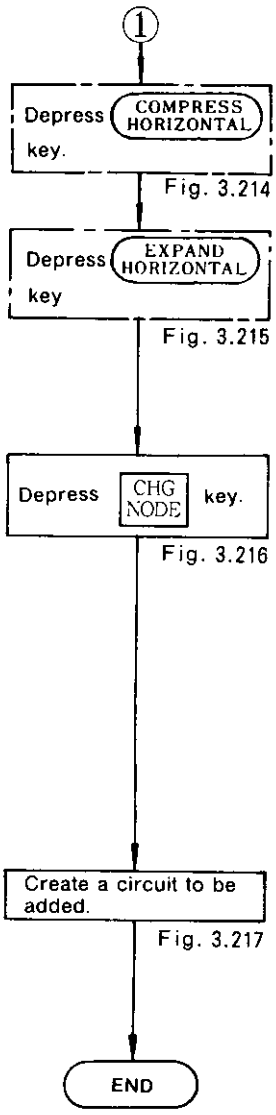


Fig. 3.213



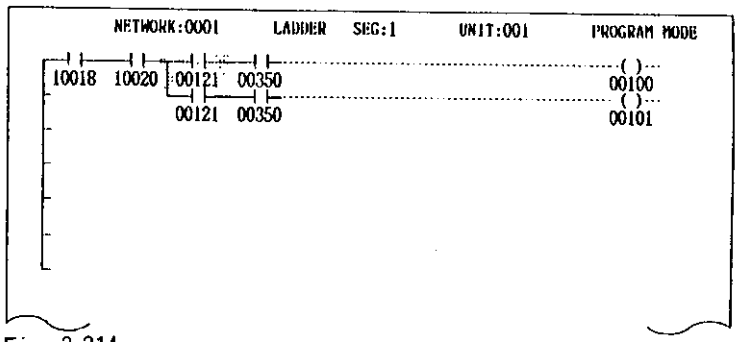


Fig. 3.214

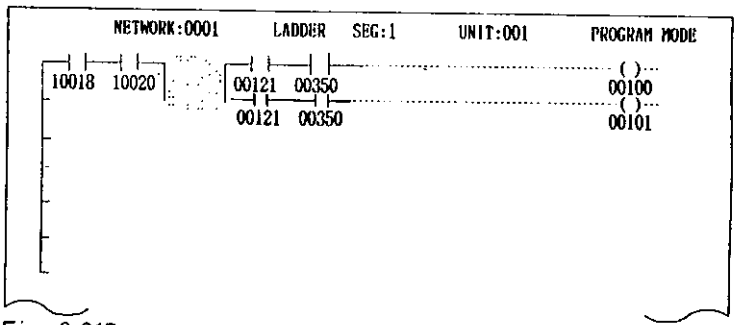


Fig. 3.215

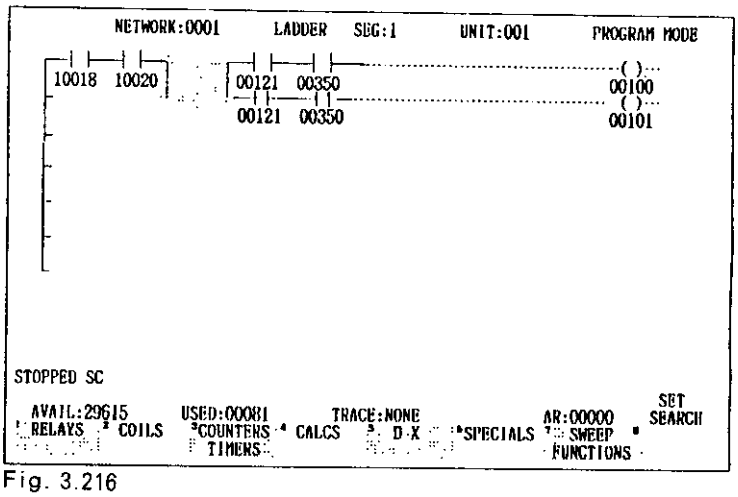


Fig. 3.216

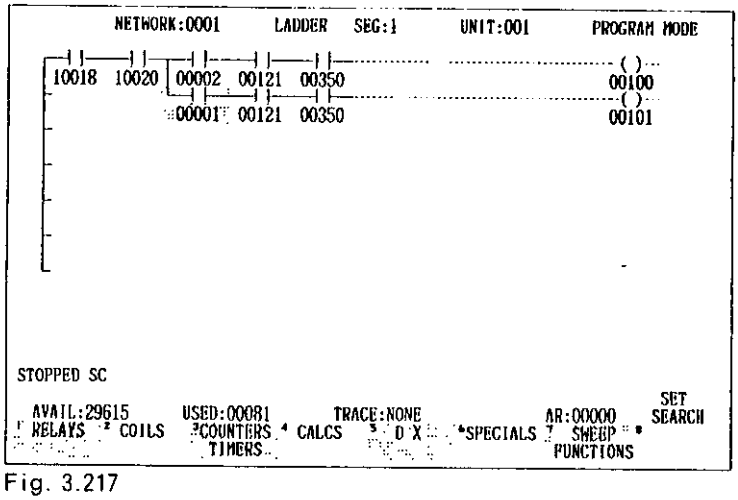


Fig. 3.217

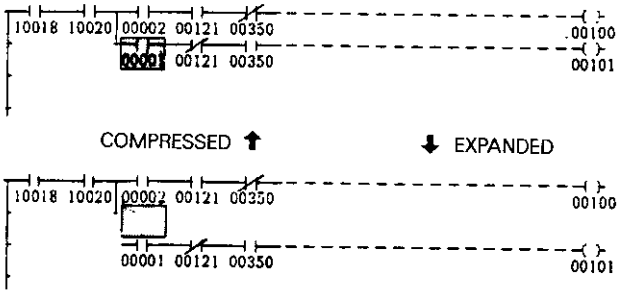
3.6.6 Network Edition Operation (Cont'd)

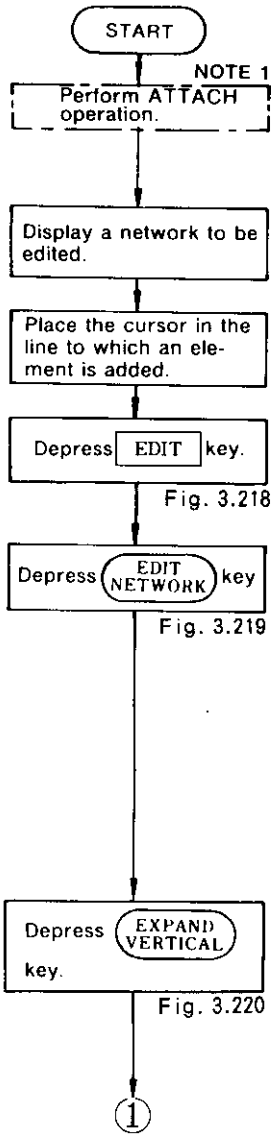
NOTE

1. This step can be skipped if the system is ready to store the program.
2. Memory capacity to be used is increased by expanding a network in the horizontal direction and decreased by compressing it.
3. Depressing [CHG NODE] key returns the current label display to the label display to the lable display for selecting the element functions.

(1) NETWORK EDITION ②

The editing function is used to expand or compress a network in a vertical direction. It is recommended that every line of the network be edited.





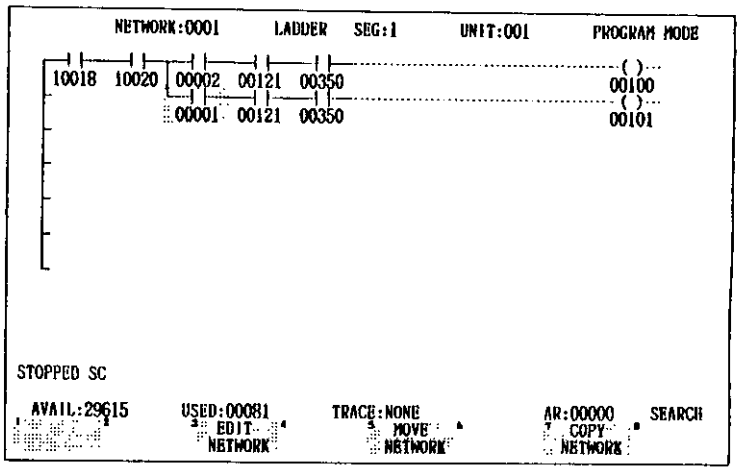


Fig. 3.218

Fig. 3.219

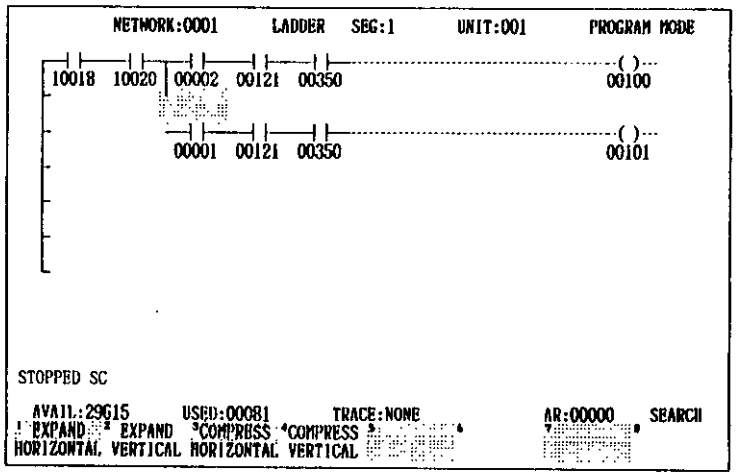
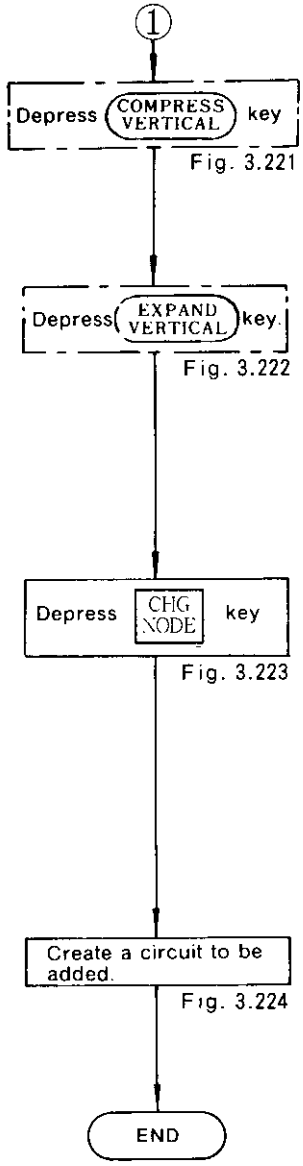


Fig. 3.220

3.6.6 Network Edition Operation (Cont'd)



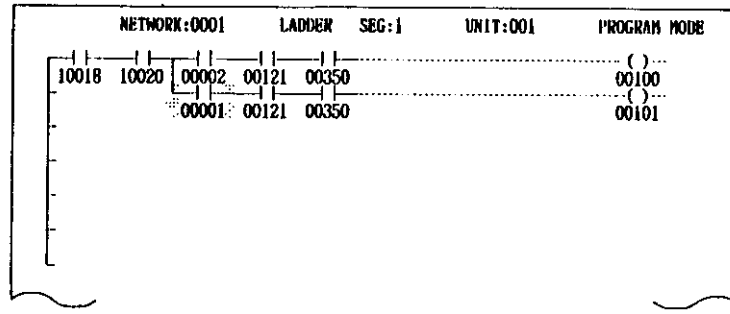


Fig. 3.221

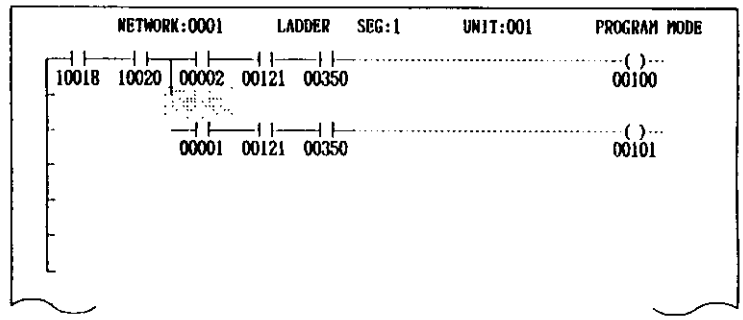


Fig. 3.222

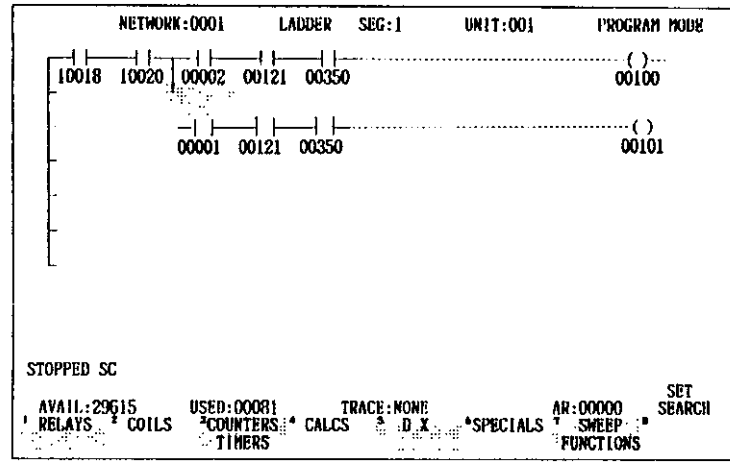


Fig. 3.223

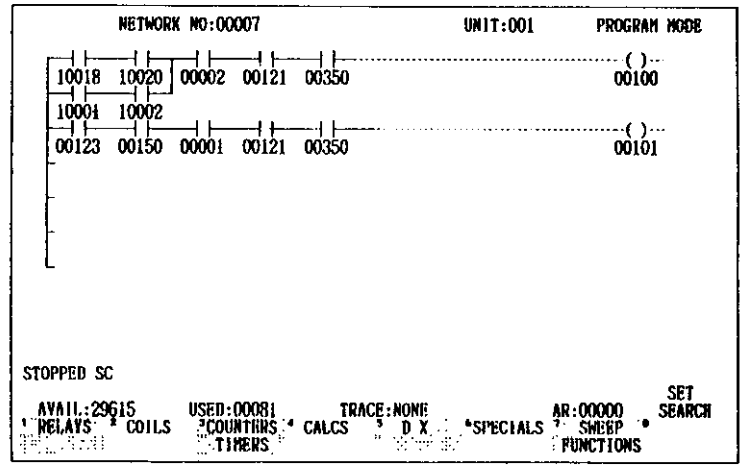


Fig. 3.224

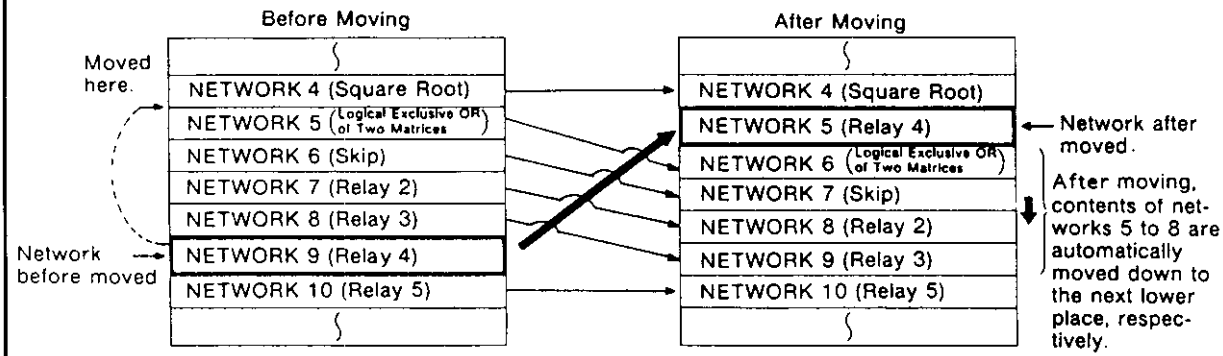
NOTE

1. This step can be skipped if the system is ready to store the program.
2. Memory capacity to be used is not varied by expanding or compressing a network in the vertical direction.
3. Depressing [CHG NODE] key returns the current label display to the label display for selecting the element functions.

3.6.6 Network Edition Operation (Cont'd)

(2) NETWORK MOVE ①

Current-displayed network content (network 9) is moved to smaller network number (network 5).



POINT

- To move a network to the next to the network N, set N + 1 to AR.
- The GL60S must be at a standstill.

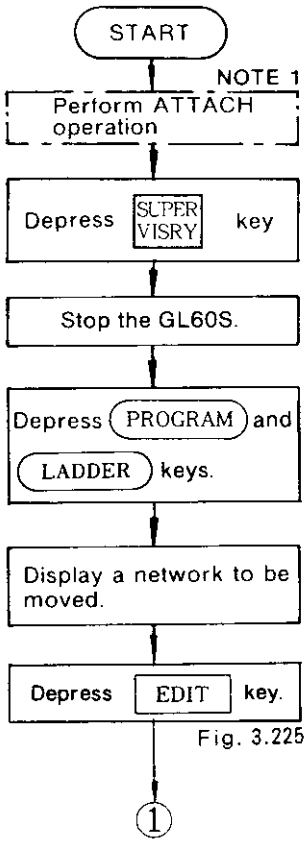


Fig. 3.225

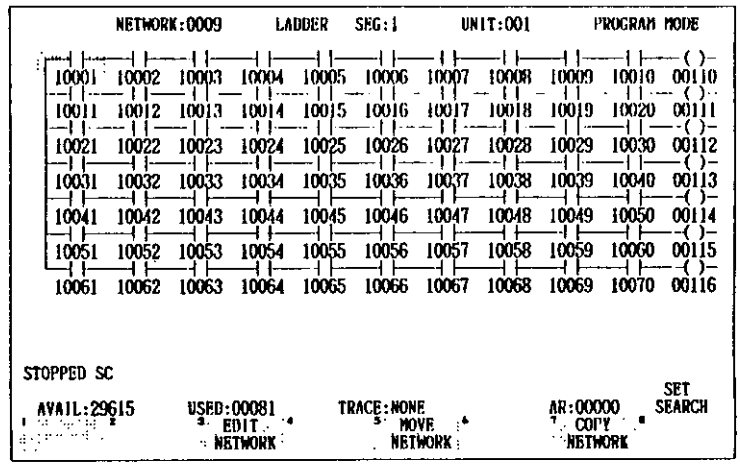
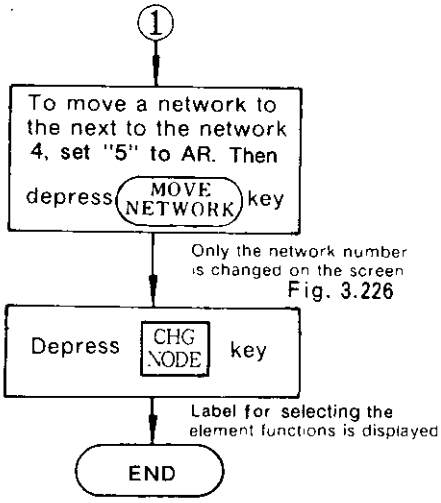


Fig. 3.225



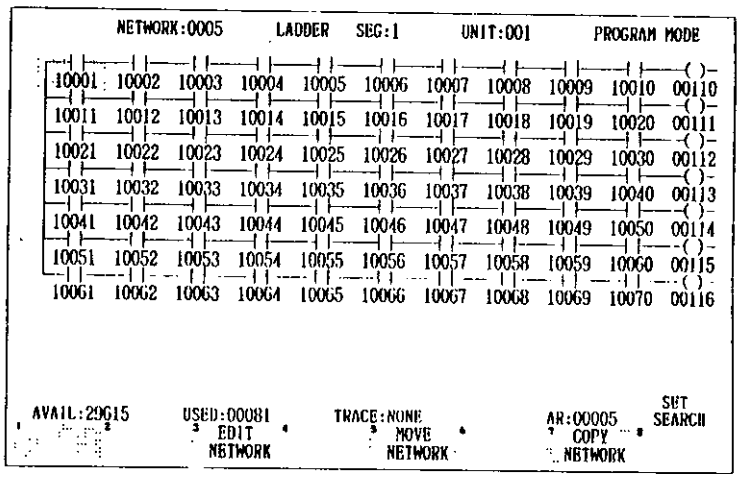


Fig. 3.226

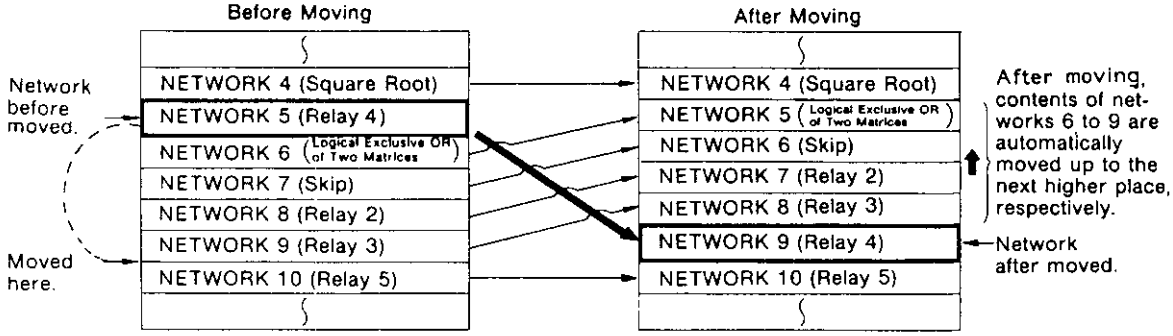
NOTE

1. This step can be skipped if the system is ready to store the program.
2. To display the label for selecting the element functions, depress CHG NODE key without use of MOVE NETWORK key.

3.6.6 Network Edition Operation (Cont'd)

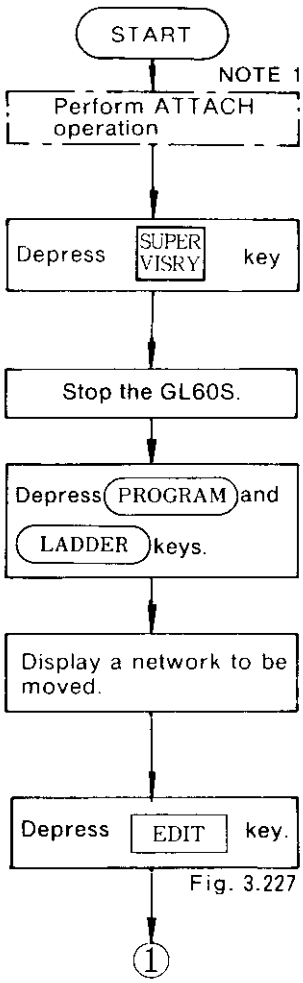
(2) NETWORK MOVE ②

Current-displayed network content (network 5) is moved to larger network number (network 9).



POINT

- To move a network to the next to the network N, set N+1 to AR.
- The GL60S must be at a standstill.



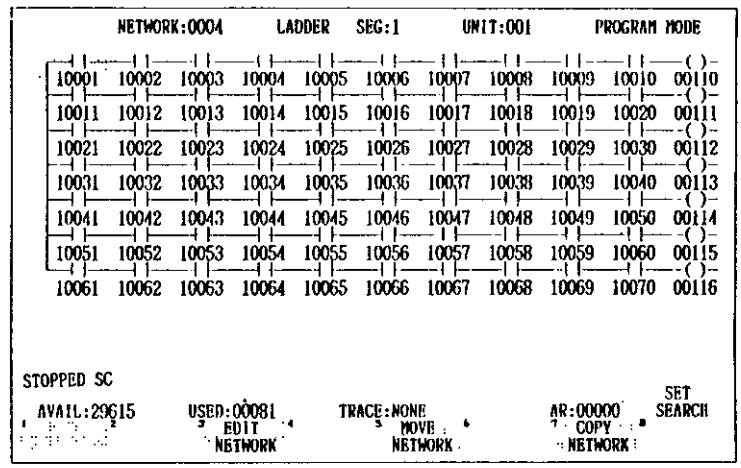
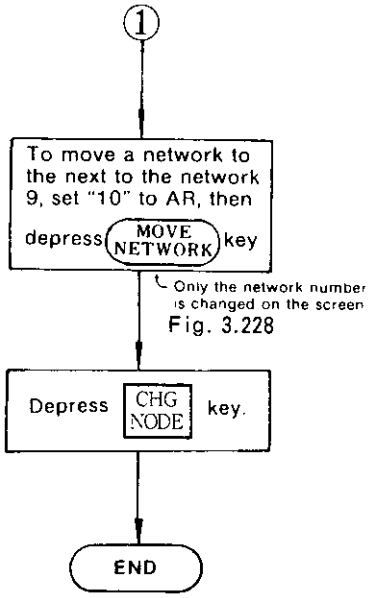


Fig. 3.227



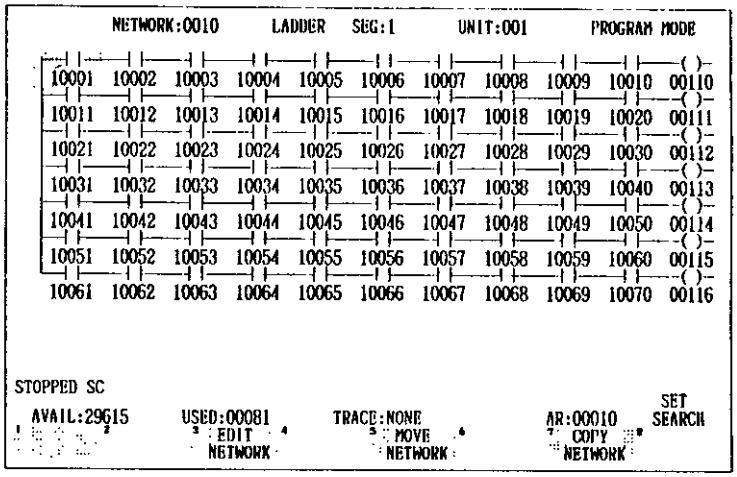


Fig. 3.228

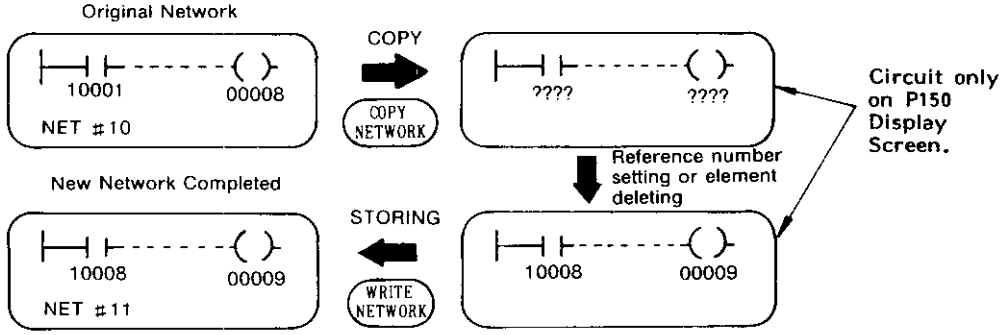
NOTE

1. This step can be skipped if the system is ready to store the program.
2. To display the label for selecting the element functions, depress CHG NODE key without use of MOVE NETWORK key.

3.6.6 Network Edition Operation (Cont'd)

(3) NETWORK COPY

The network copy function is used to create a network of a similar circuit pattern based on the network written in the GL60S memory.



POINT

- A network only on P140 display screen is written in the GL60S memory simply by depressing (WRITE NETWORK) key.
- Where adding elements, use the stored network, but not a copied network.
- If a new network is stored in the network N, each network number following the current network N is increased by +1.

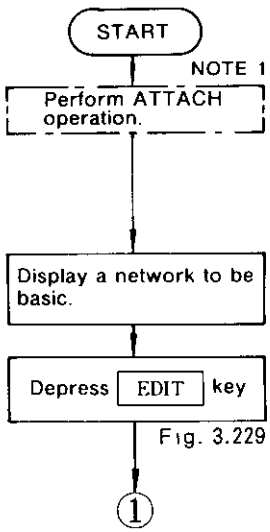


Fig. 3.229

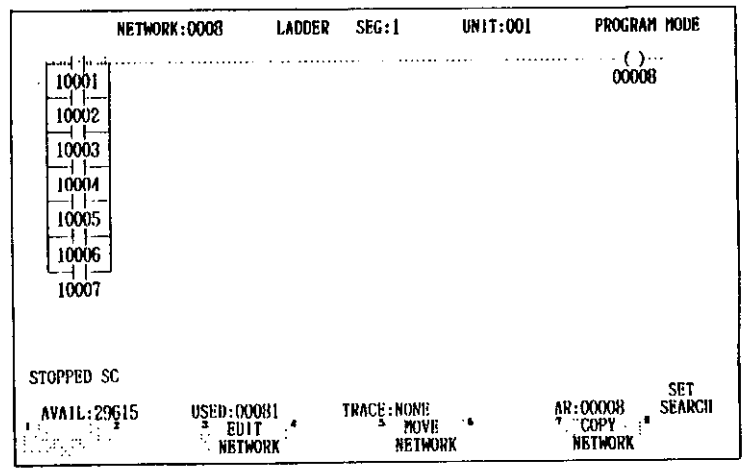
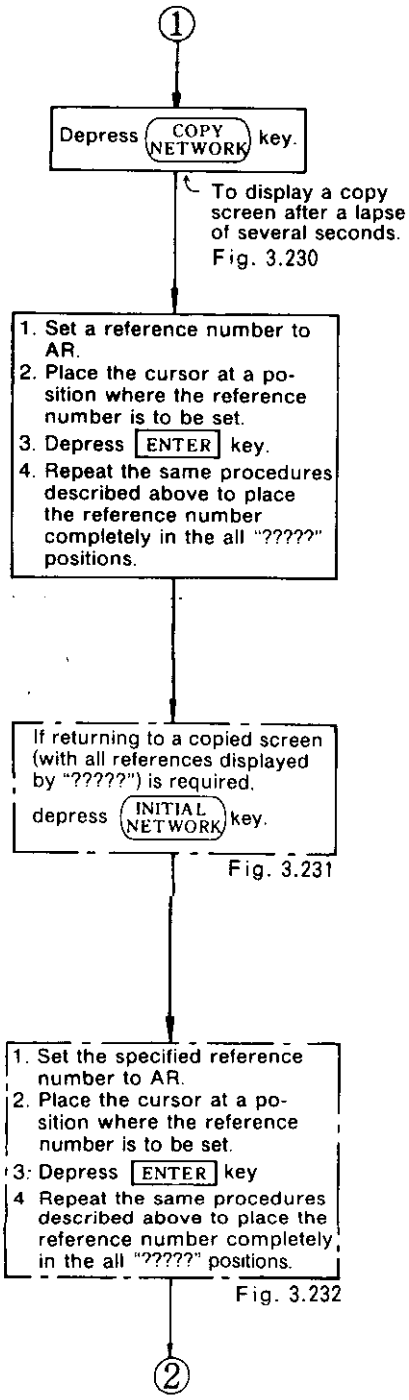


Fig. 3.229



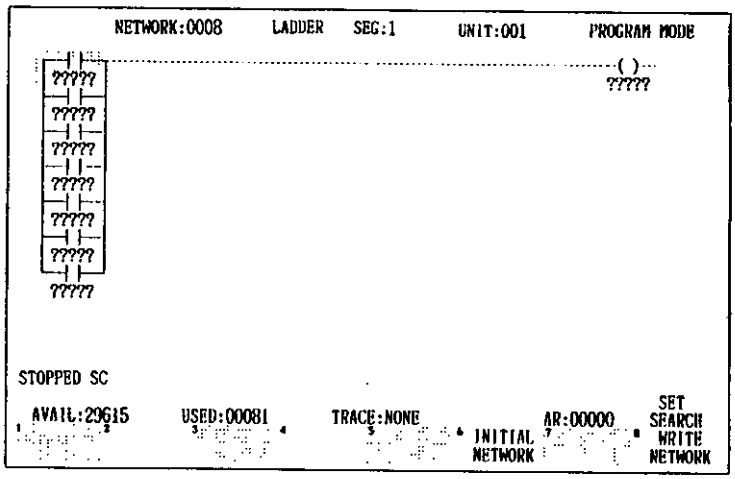


Fig. 3.230

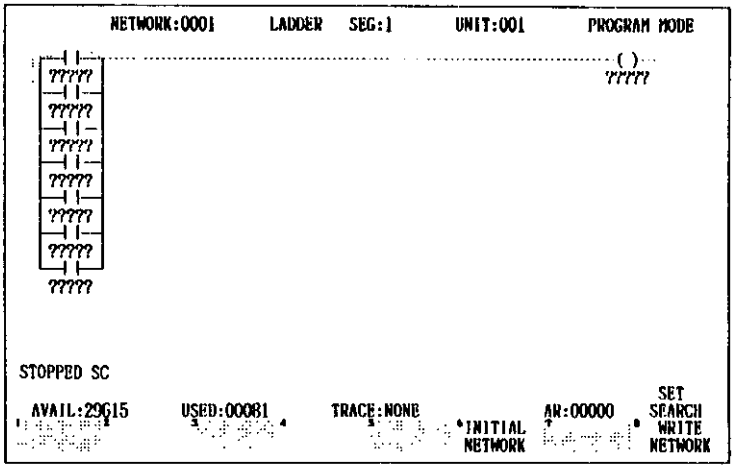


Fig. 3.231

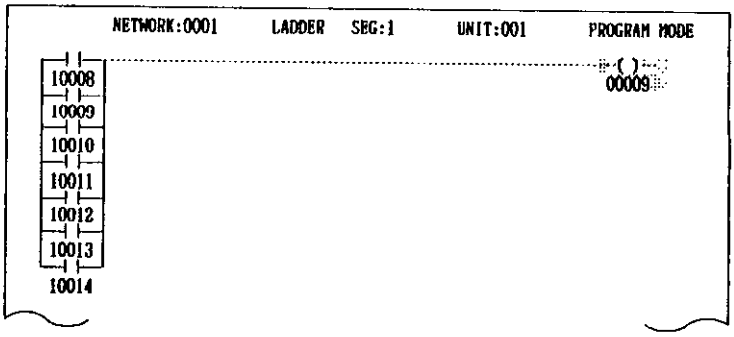
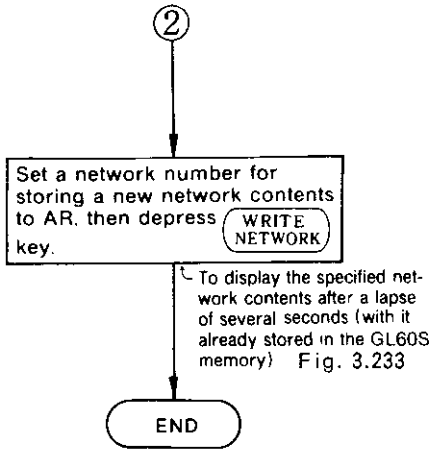


Fig. 3.232

3.6.6 Network Edition Operation (Cont'd)



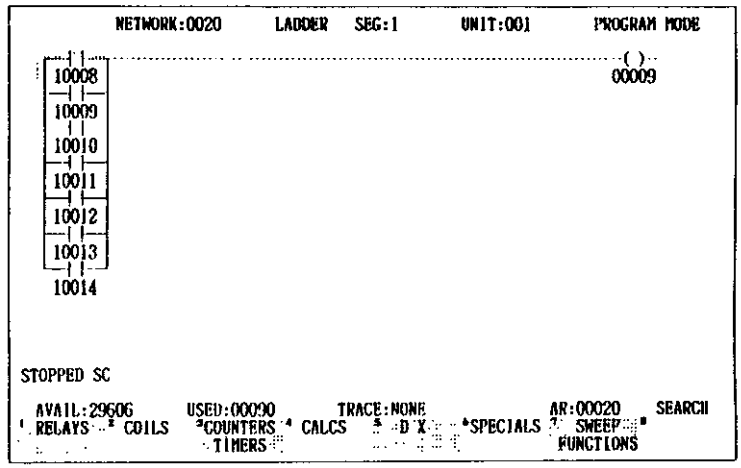


Fig. 3.233

NOTE

1. This step can be skipped if the system is ready to store the program.
2. To return the copied screen to the original screen without using WRITE NETWORK key, depress EDIT key, then CHG NODE key.
3. The network is stored in the GL60S by depressing WRITE NETWORK key.

   However, if the GL60S memory capacity for string the networks is out of memory, storing operation is not activated and the error message "NO AVAIL MEMORY" is displayed.

3.7 TRACE BACK

This function displays the ON/OFF state of the GL60S coils and the contents of the register chronologically.

POINT

- The states of 1024 points either before or after the trigger point can be displayed.
- Up to 8 points of the discrete and a set of register values can be traced back.

- Discrete

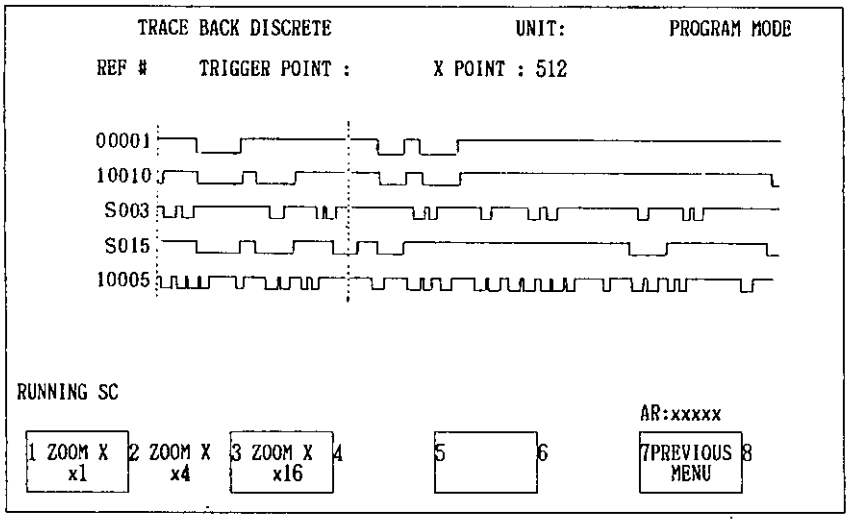


Fig. 3.234

- Register

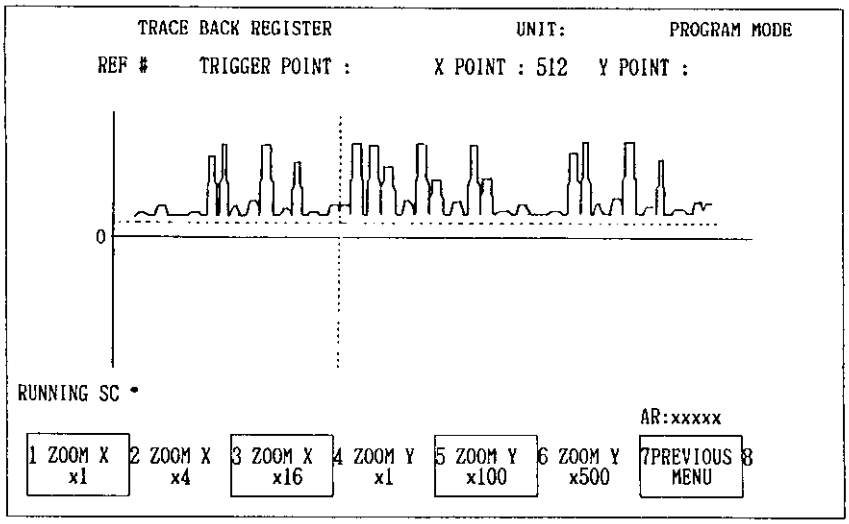


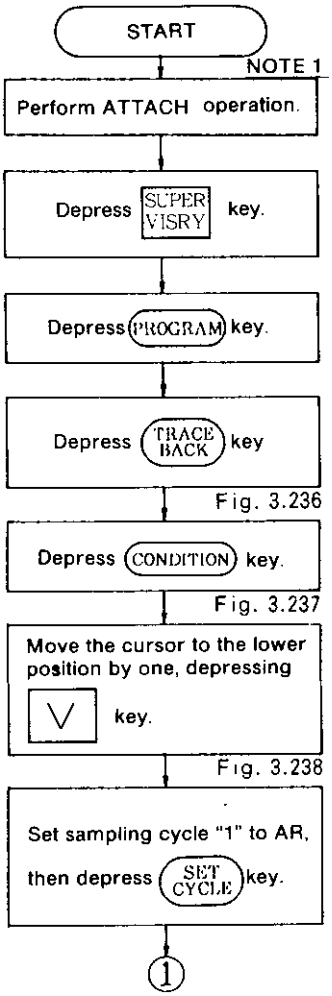
Fig. 3.235

3.7.1 Parameter Setting

(1) SETTING

The following parameters must be set prior to displaying the trace back waveform.

- Parameters
  1. Sampling cycle
  2. Trigger point
  3. Trigger conditions
     - Discrete Max 8 points
     - Register Max 1 register



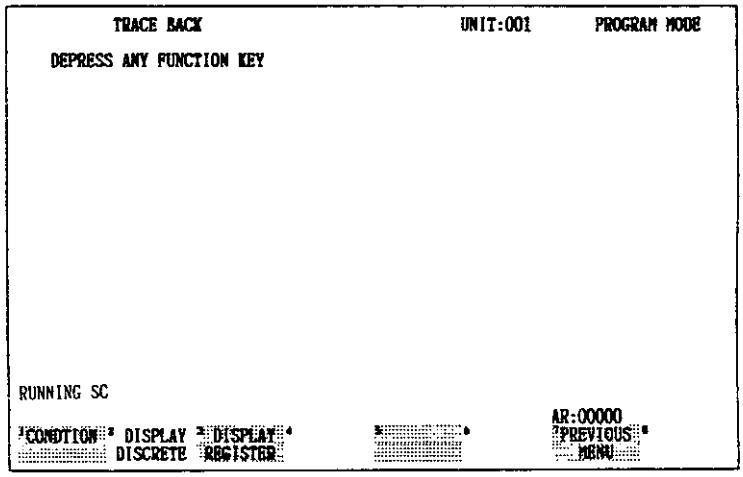


Fig. 3.236

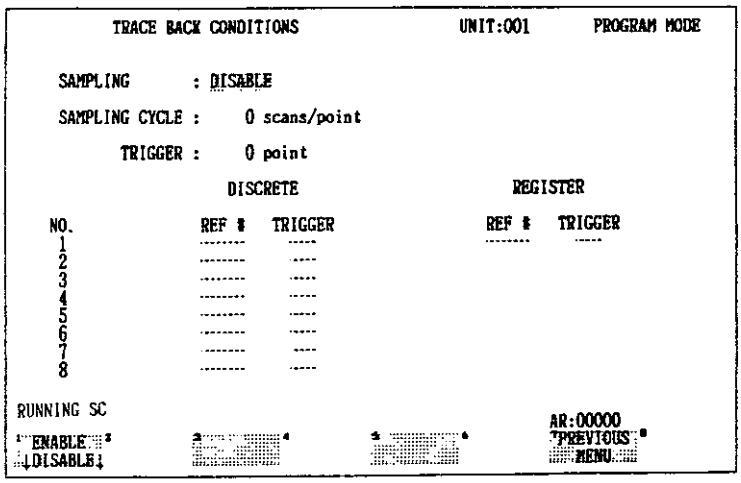


Fig. 3.237

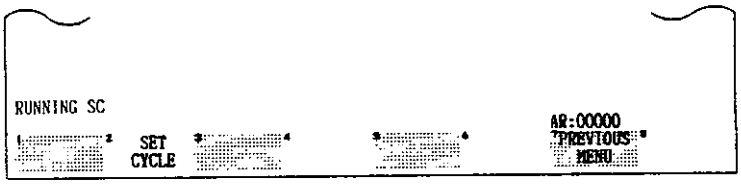


Fig. 3.238

①

Move the cursor to the lower position by one, depressing ∨ key.

Fig. 3.239

Set trigger point "1024" to AR, then depress SET POINTS key.

Move the cursor to the lower position by one, depressing ∨ key.

Fig. 3.240

Set "1" to AR, then depress SET REF # key.

1. Move the cursor to the lower position by one.
2. Set "10010" to AR.
3. Depress SET REF # key.

1. Move the cursor to the lower position by one.
2. Set "S003" to AR.
3. Depress SET REF # key.

1. Move the cursor to the lower position by one.
2. Set "S015" to AR.
3. Depress SET REF # key.

Depress TRIGGER OFF key.

1. Move the cursor to the lower position by one.
2. Set "10005" to AR.
3. Depress SET REF # key.

Move the cursor to the upper-right position by depressing ∨ key.

Fig. 3.241

② To (2) ACTIVATION

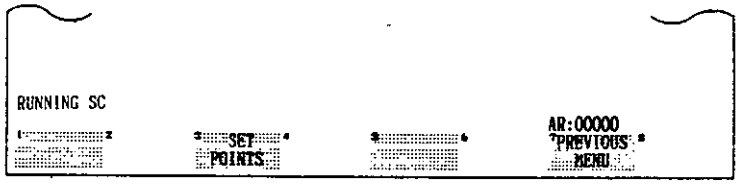


Fig. 3.239

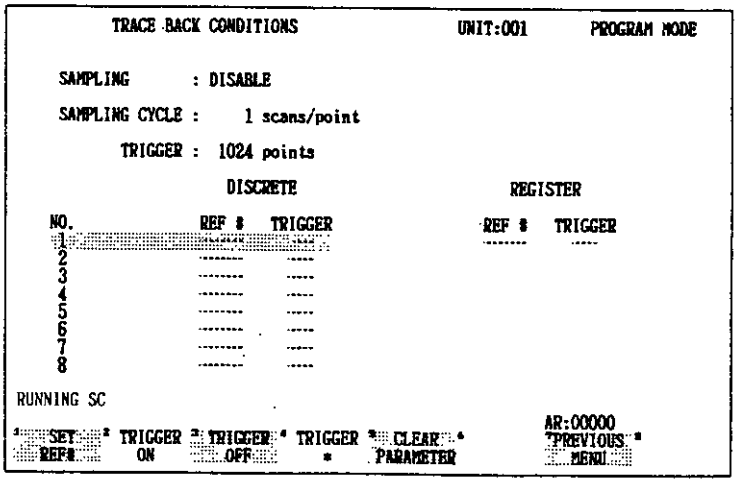


Fig. 3.240

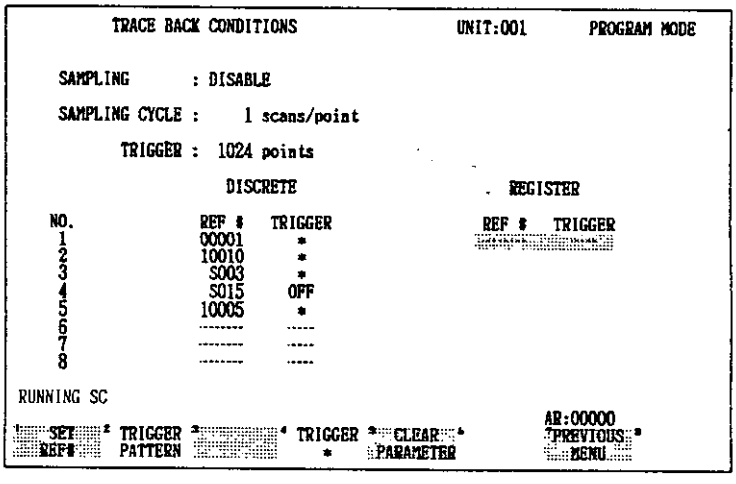


Fig. 3.241

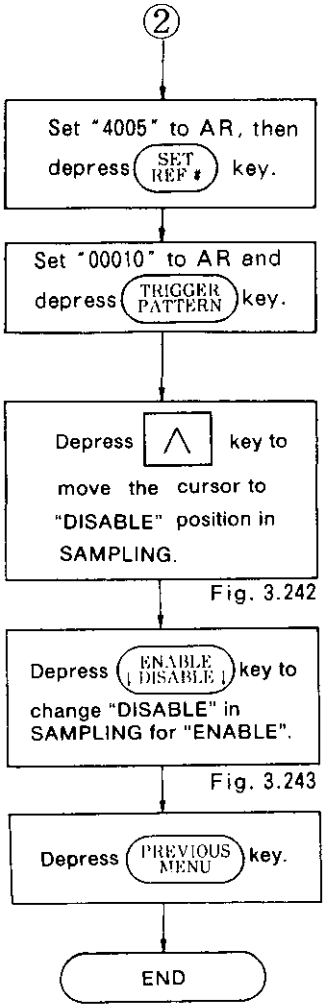
3.7.1 Parameter Setting (Cont'd)

NOTE

1. This step can be skipped if the system is ready to store the program.
2. Sampling cycle means the frequency at which sampling is performed at a scan operation.
3. A trigger point must be specified to determine the range of trace data. The specified value indicates the position of the trigger point for display. The allowable range includes 1024 points counting back from the actual trigger point.
   Examples:
   - If 0 is specified, the states of the 1024 points counting back from the actual trigger point are displayed.
   - If 1024 isspecified, the states of the 1024 points counting ahead from the actual trigger point are displayed.
4. As the trigger condition for the discrete, either the first scan after turning ON or the first scan after turning OFF must be selected. Depress (TRIGGER ON) key to select the former, or (TRIGGER OFF) key to select the latter.
5. As the trigger condition for the register, the contents of the register must be specified. Set the value of the trigger point to AR and depress (TRIGGER PATTERN) key.
6. If the reference number is set during the trigger condition setting, the display "TRIGGER" changes to "*".
   This indicates that no trigger condition is set. If the trigger conditions are set, (TRIGGER *) key changes the display to "*" and makes the trigger conditions invalid.
7. The trigger conditions are established when all the trigger conditions including those for the discrete and the register are satisfied. (Estabished when all the conditions are ANDed.)
8. When the trigger conditions are set, depressing (CLEAR PARAMETER) key clears the cursor.
9. Depressing (PREVIOUS MENU) key calls up the display in Fig. 3.236.

(2) ACTIVATION

Activate the trace back function following the procedure below after setting the trace back parameters.




```
        TRACE BACK CONDITIONS                UNIT:001      PROGRAM MODE

    SAMPLING       : DISABLE
    SAMPLING CYCLE :     1 scans/point
          TRIGGER  :  1024 points
                          DISCRETE                      REGISTER
    NO.            REF #   TRIGGER          REF #    TRIGGER
     1             00001     *               40005      10
     2             10010     *
     3              S003     *
     4              S015     OFF
     5             10005     *
     6             -------   ----
     7             -------   ----
     8             -------   ----
RUNNING SC                                              AR:00000
 ↑ENABLE*                                              *PREVIOUS*
 ↓DISABLE↓                                              MENU
```

Fig. 3.242

```
        TRACE BACK CONDITIONS                UNIT:001      PROGRAM MODE

    SAMPLING       : ENABLE
    SAMPLING CYCLE :     1 scans/point
          TRIGGER  :  1024 points
                          DISCRETE                      REGISTER
    NO.            REF #   TRIGGER          REF #    TRIGGER
     1             00001     *               40005      10
     2             10010     *
     3              S003     *
     4              S015     OFF
     5             10005     *
     6             -------   ----
     7             -------   ----
     8             -------   ----
RUNNING SC                                              AR:00000
 ↑ENABLE↑*                                             *PREVIOUS*
 DISABLE                                                MENU
```

Fig. 3.243

NOTE

1. Sampling trace data starts when it is enabled by depressing ↑ENABLE DISABLE↑ key. If trigger conditions are established, sampling automatically stops.
2. Sampling trace data stops again when it is disabled by depressing ↑ENABLE DISABLE↑ key. If sampling is forced to be disabled, the waveform cannot be displayed correctly.

3.7.2 Waveform Display

When trigger conditions are established, waveform of trace data can be displayed. Select either discrete or register to display the waveform.

(1) DISCRETE

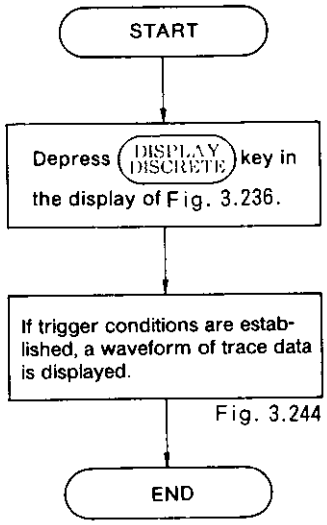


Fig. 3.244

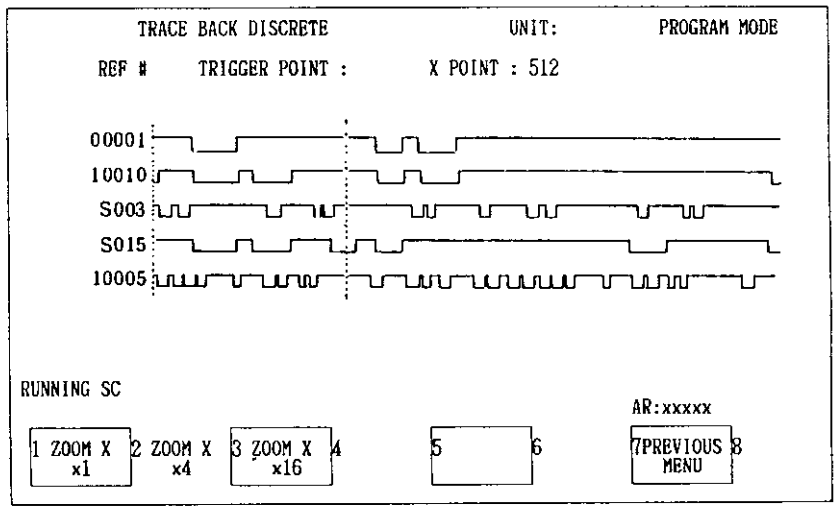


Fig. 3.244

NOTE

1. The dotted line [T] indicates the position of the trigger point. The value at the "TRIGGER POINT" display shows its coordinates.
2. The dotted line [O] indicates the position of the moving cursor. The value at the "X POINT" display shows its coordinates. The moving cursor makes it easy for the operator to know the position of each reference number precisely.
3. A waveform of trace data can be elongated up to 16 times in the horizontal direction. Depressing (ZOOM × ×4) key elongates the waveform 4 times, while depressing (ZOOM × ×16) key elongates 16 times. To display the entire waveform again, depress (ZOOM × ×1) key.
4. Depressing (PREVIOUS MENU) key calls up the display in Fig. 3.236.
5. A waveform cannot be displayed unless trigger conditions have been established. If sampling is forced to be disabled by depressing (↑ENABLE↑ DISABLE) key, a waveform cannot be displayed correctly.

(2) REGISTER

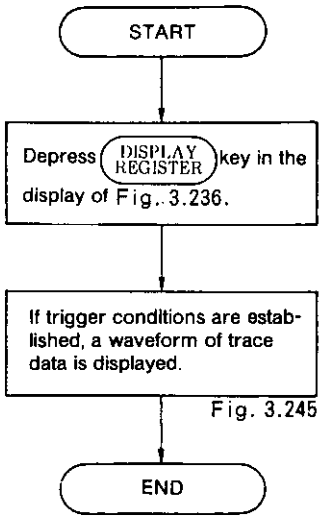


Fig. 3.245

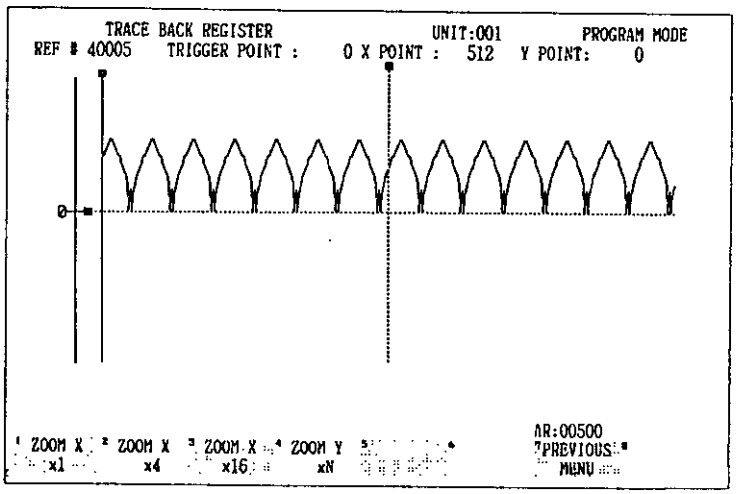


Fig. 3.245

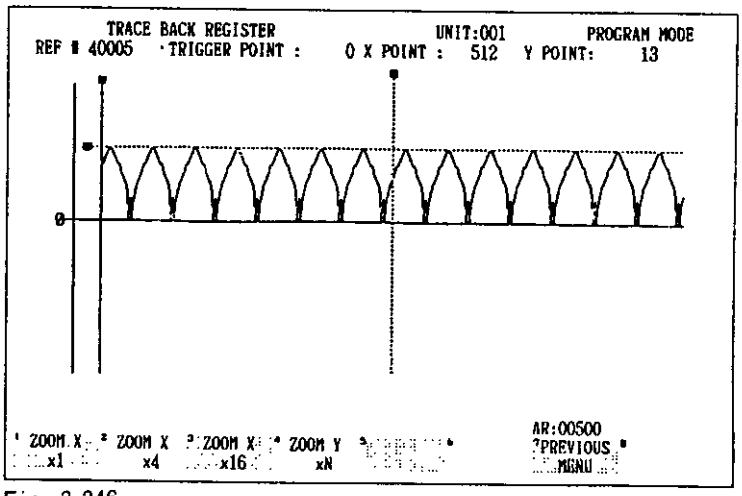


Fig. 3.246

3.7.2 Waveform Display (Cont'd)

NOTE

1. The dotted line [T] indicates the position of the trigger point. The value at the "TRIGGER POINT" display shows its coordinates.
2. The dotted line [O] indicates the moving cursor in the horizontal direction, and the dotted line S indicates the moving cursor in the vertical direction. The values at the "X POINT" and "Y POINT" displays indicates their coordinates, respectively. (See Fig. 3.246.)
3. A waveform of trace data can be elongated up to 16 times in the horizontal, direction and up to 500 times in the vertical direction. (The times of sampling are shown in the horizontal direction, and the contents of the register are shown in the vertical direction.)

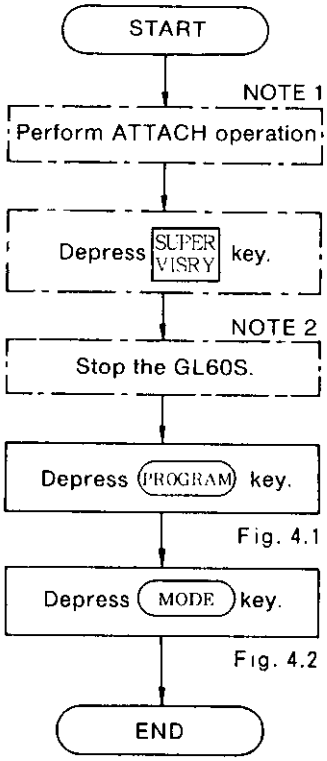
   Depressing (ZOOM × ×4) key elongates the waveform 4 times in the horizontal direction, and depressing (ZOOM × ×16) key elongates it 16 times in the same direction. To display the entire waveform again, depress (ZOOM × ×1) key.

   Depressing the (ZOOM Y×N) after entering a vertical direction magnification to AR elongates the waveform. The magnification rate can be set up to 500 in steps of 10.

4. Depressing (PREVIOUS MENU) key calls up the display in Fig. 3.236.
5. A waveform cannot be displayed unless trigger conditions have been established. If sampling is forced to be disabled by depressing (↑ENABLE↑ DISABLE) key, a waveform cannot be displayed correctly.

4. MODE OPERATION

The mode operation is used to set conditions for processing steps referring to status of reference numbers of relays and coils, as well as to display the status of steps, etc. Shown below are the procedures down to display of the mode operation screen.



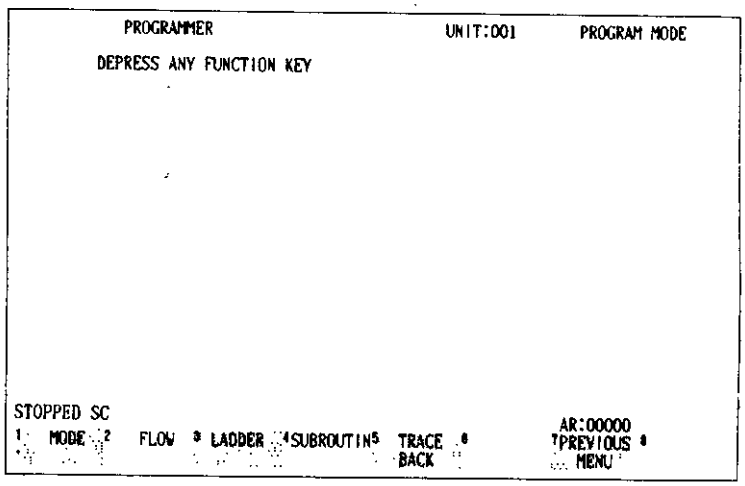


Fig. 4.1

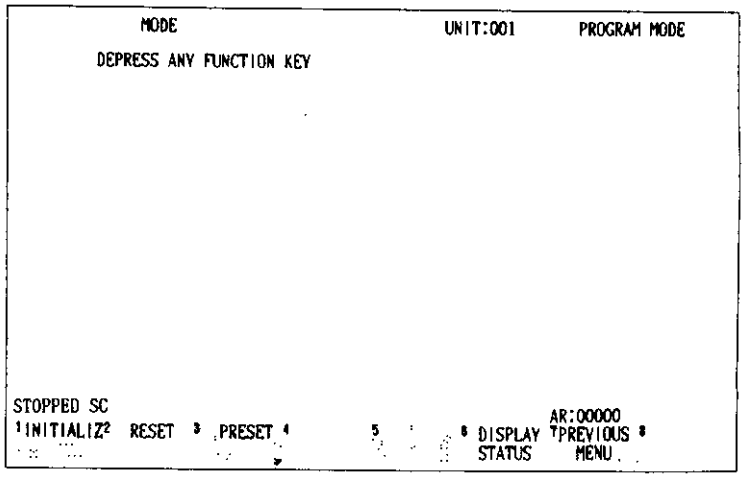


Fig. 4.2

4. MODE OPERATION (Cont'd)

NOTE

1. When operation has already been completed, this step can be skipped.
2. This step is only necessary for setting conditions.
3. Three selections of condition settings are:
   - Initialize ..... INITIALIZ
   - Reset ..... RESET
   - Preset ..... PRESET
4. The six statuses listed below can be displayed after depressing DISPLAY STATUS key.
   - Step hold status ..... DISPLAY HOLD
   - Step disabled status ..... DISPLAY DISABLE
   - Step active status ..... DISPLAY ACTIVE
   - Elapsed time of step active status ..... DISPLAY TIME
   - Current status of action circuit ..... DISPLAY ACTION
   - Current status of transition condition circuit ..... DISPLAY TRANSITION

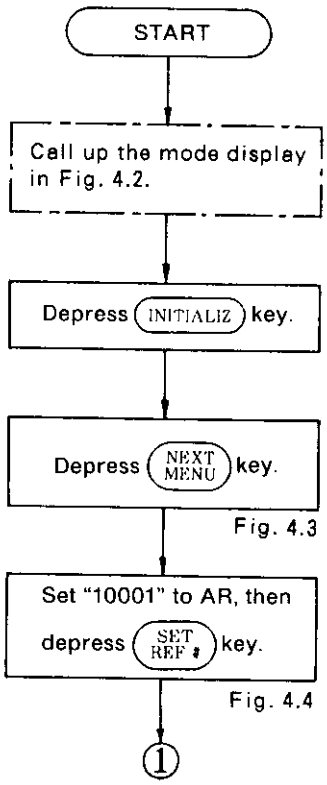
4.1 CONDITION SETTING

This section describes the operations to set conditions for processing steps referring to the status of reference numbers of relays and coils.

(1) INITIALIZE

This function sets the conditions for activating the initial step. To do this, the reference numbers of relays and coils are used.

POINT · GL60S must be stopped in advance.



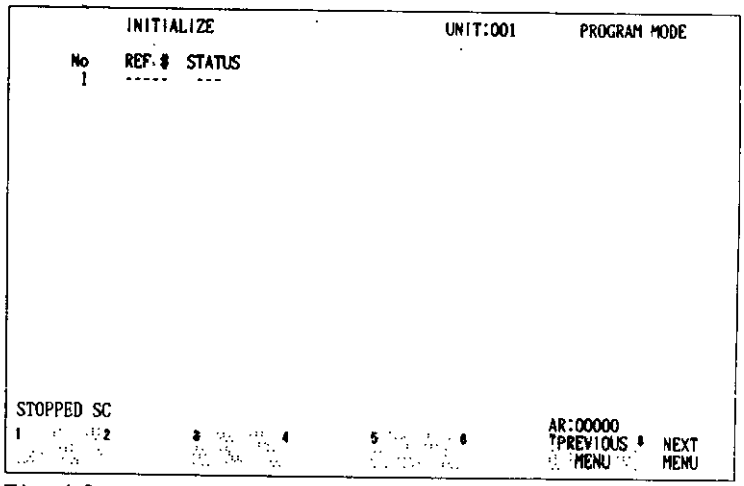


Fig. 4.3

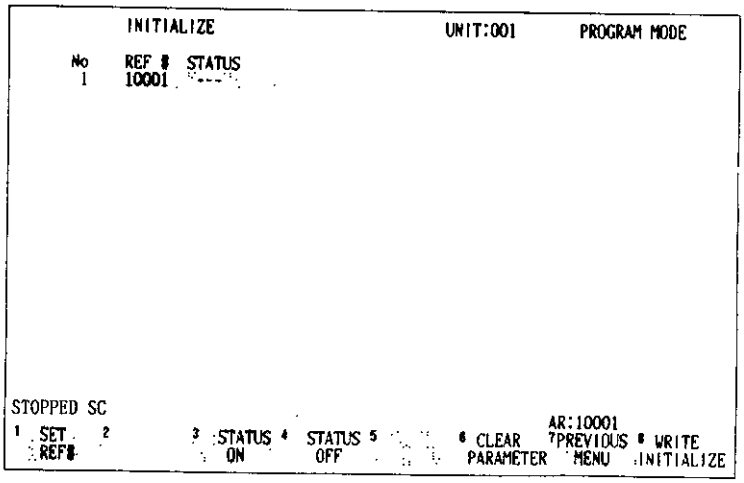


Fig. 4.4

4.1 CONDITION SETTING (Cont'd)

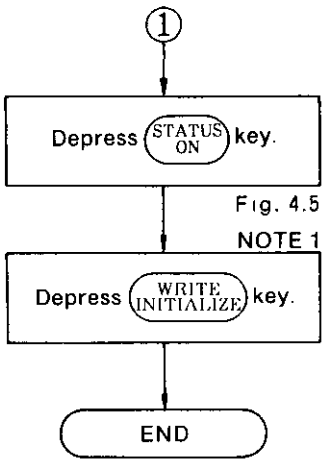


Fig. 4.5
NOTE 1

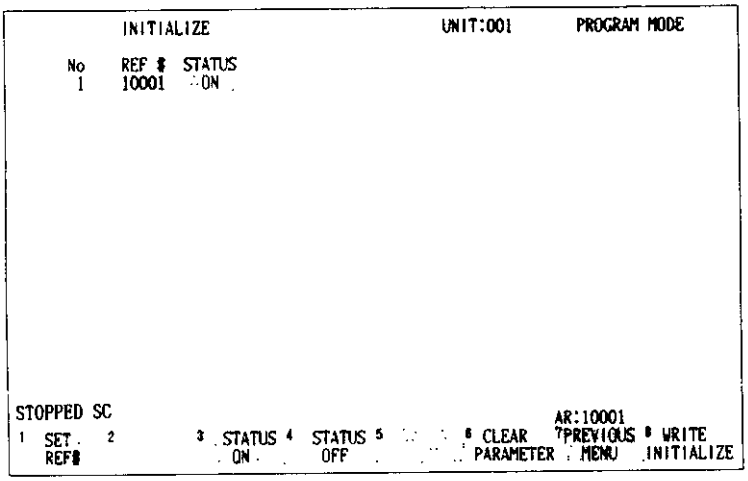


Fig. 4.5

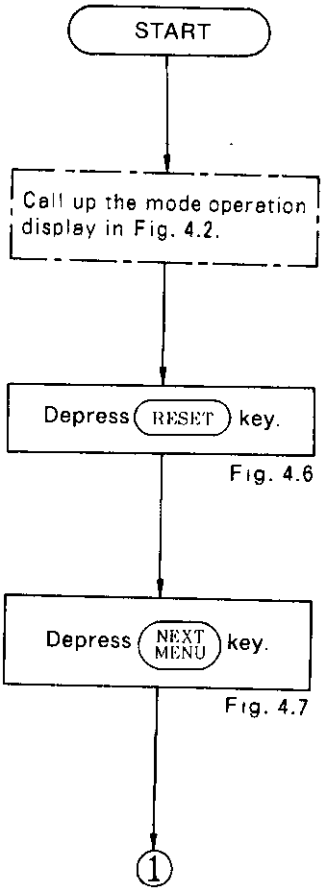
NOTE

1. No data is stored in the memory of GL60S without this operation.
2. To delete the data stored in the memory of GL60S through the above procedure, depress (CLEAR PARAMETER) and (WRITE INITIALIZE) keys in this order.
3. To return to the previous display, depress (PREVIOUS MENU) key.
4. Only one condition can be set.
5. In the monitor mode, the condition can be displayed but cannot be set.

(2) RESET

This function sets the conditions for inactivating a desired step. The reference numbers used for condition setting (shown under "REF #") are those of relays and coils. A desired step can be set by entering the step number of input register number under "STEP NO/REGISTER NO".

POINT · GL60S must be stopped in advance.



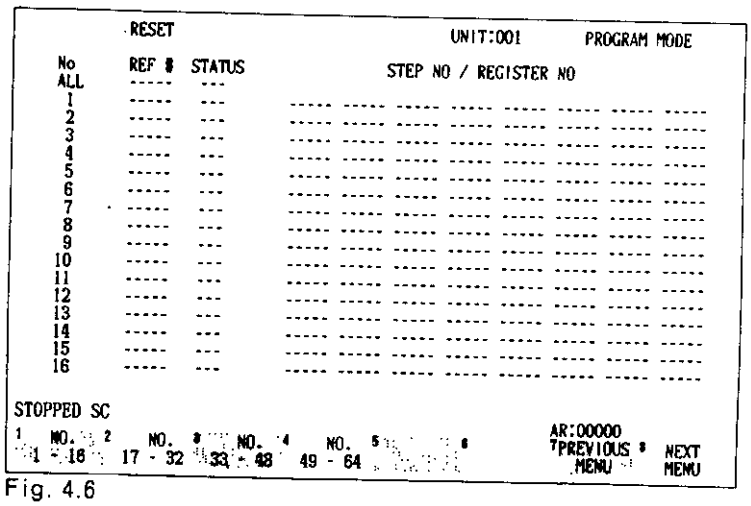


Fig. 4.6

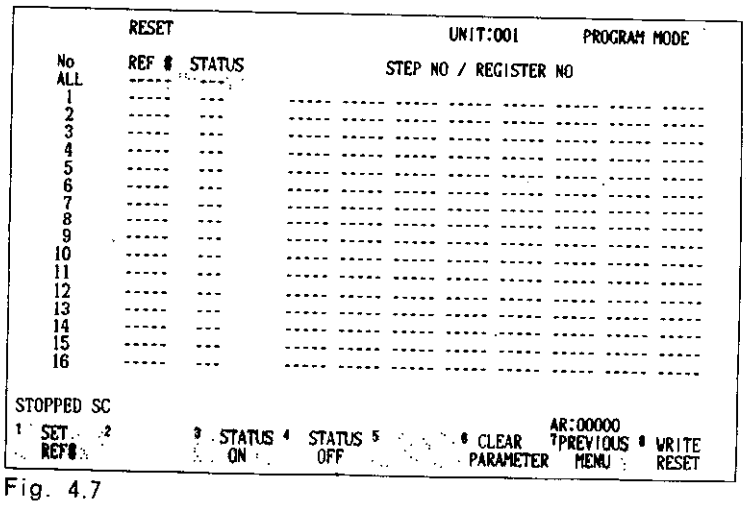
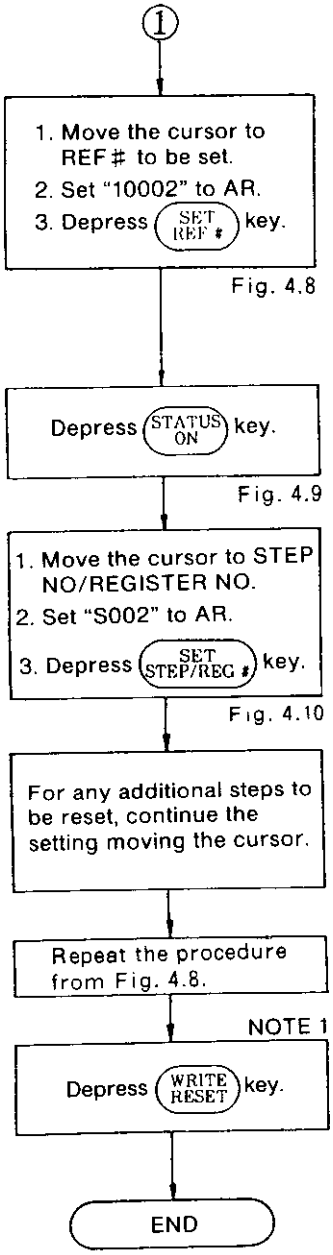


Fig. 4.7



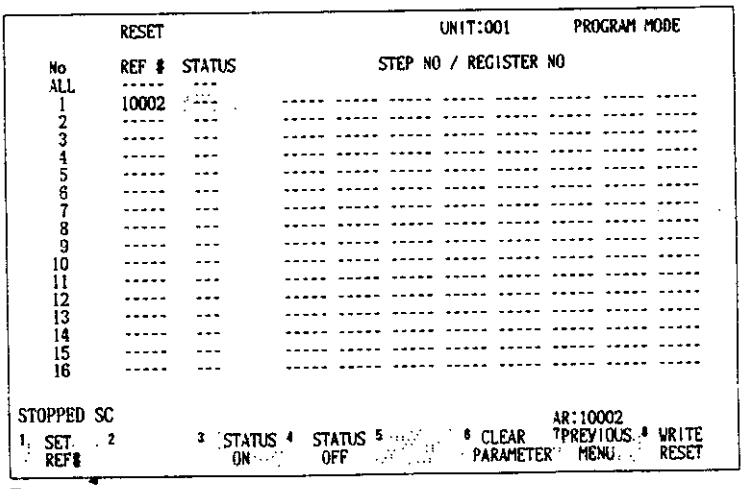


Fig. 4.8

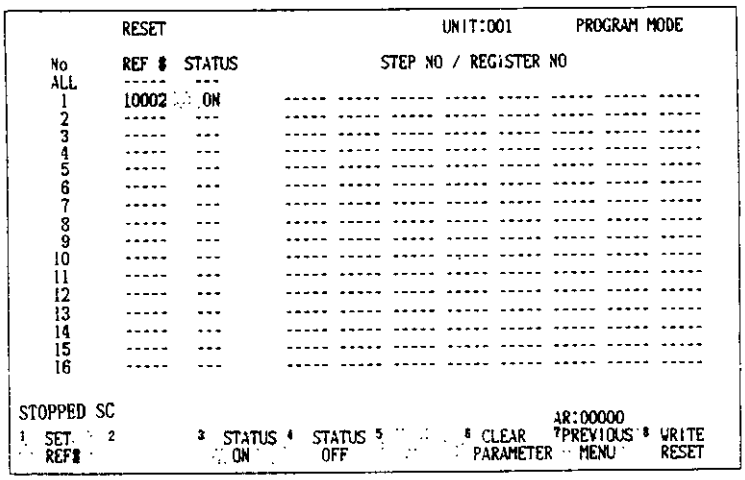


Fig. 4.9

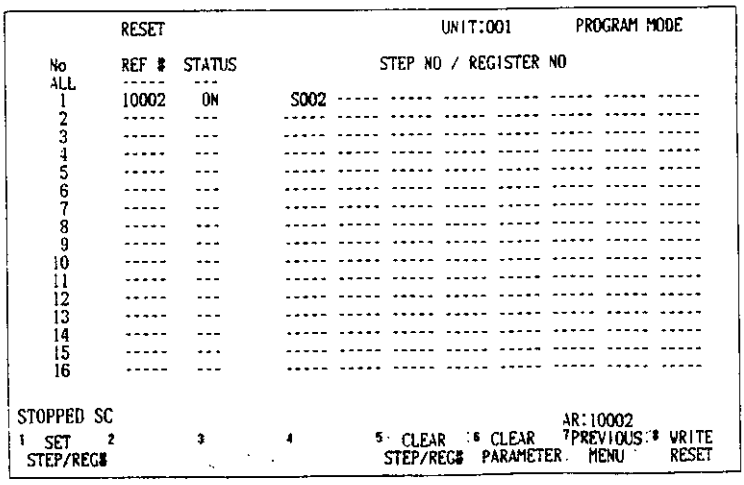
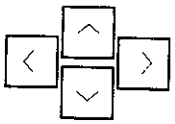


Fig. 4.10

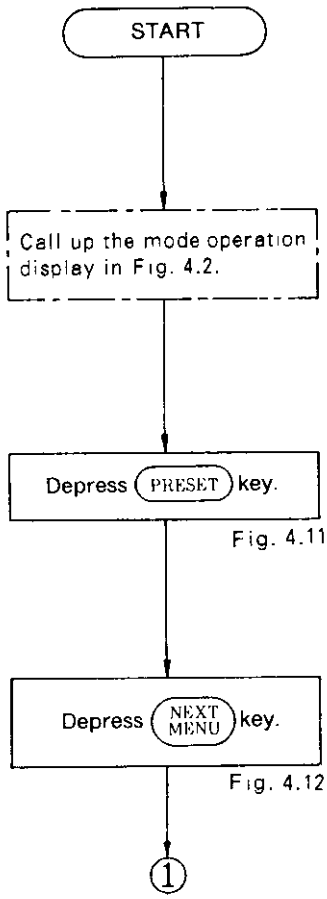
NOTE

1. No data is stored in the memory of GL60S without this operation.
2. To delete the data stored in the memory of GL60S through the above procedure, move the cursor to the number of the set (under "No" column), depress (CLEAR PARAMETER) or (CLEAR STEP/REG#) key, then depress (WRITE RESET) key.
3. To return to the previous display, depress (PREVIOUS MENU) key.
4. Up to 65 steps can be set to inactive status (under "No" column). To change the number of steps to be set on the screen, use (NO 1-16) through (NO 49-64) keys.
5. In the monitor mode, the RESET conditions can be displayed but cannot be set.
6. To move the cursor under the "No." column, use the cursor control keys  .

(3) PRESET

This function sets the conditions for activating a desired step. The reference numbers used for setting conditions (shown under "REF #") are those of relays and coils. A desired step can be set by entering the step number or input register number under "STEP NO REGISTER NO."

POINT · GL60S must be stopped in advance.

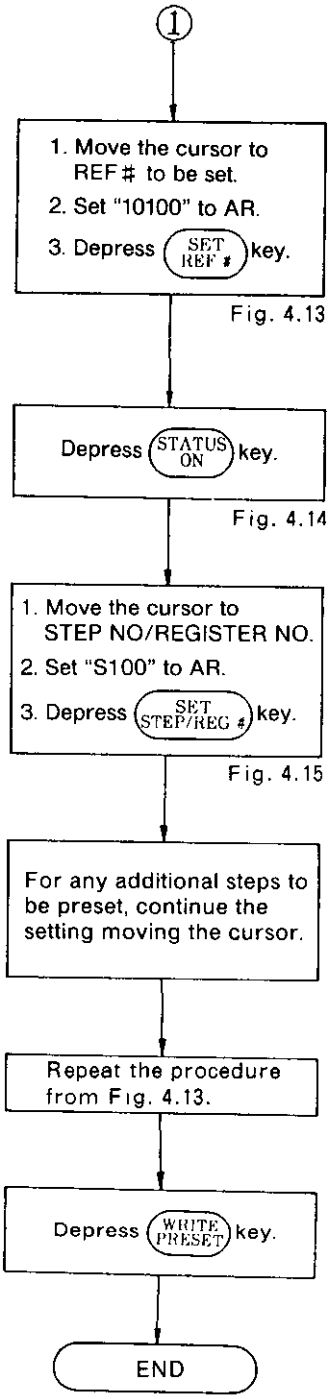



```
                PRESET                          UNIT:001        PROGRAM MODE

No      REF #   STATUS          STEP NO / REGISTER NO
1       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
2       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
3       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
4       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
5       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
6       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
7       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
8       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
9       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
10      -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
11      -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
12      -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
13      -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
14      -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
15      -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
16      -----   ---     ----- ----- ----- ----- ----- ----- ----- -----

STOPPED SC                                                      AR:00000
1 SET REF#  2           3 STATUS ON  4 STATUS OFF  5           6 CLEAR PARAMETER  7PREVIOUS MENU  8 WRITE PRESET
```

Fig. 4.11

```
                PRESET                          UNIT:001        PROGRAM MODE

No      REF #   STATUS          STEP NO / REGISTER NO
1       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
2       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
3       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
4       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
5       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
6       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
7       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
8       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
9       -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
10      -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
11      -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
12      -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
13      -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
14      -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
15      -----   ---     ----- ----- ----- ----- ----- ----- ----- -----
16      -----   ---     ----- ----- ----- ----- ----- ----- ----- -----

STOPPED SC                                                      AR:00000
1 NO. 1 - 16  2 NO. 17 - 32  3 NO. 33 - 48  4 NO. 49 - 64  5  6 CLEAR  7PREVIOUS MENU  8 NEXT MENU
```

Fig. 4.12



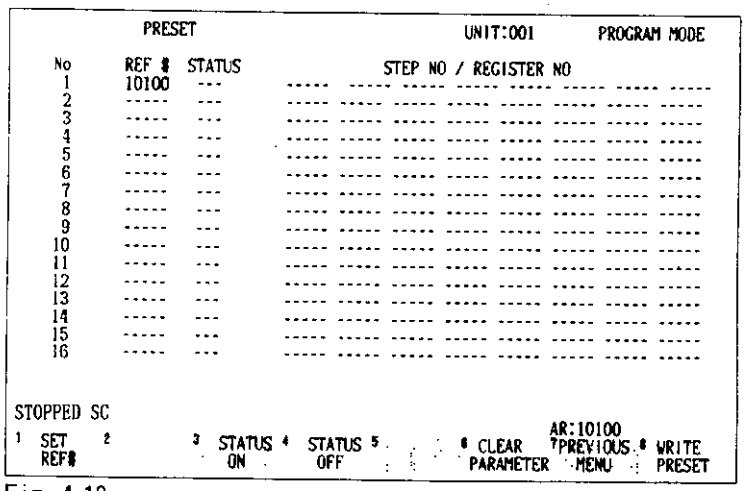


Fig. 4.13

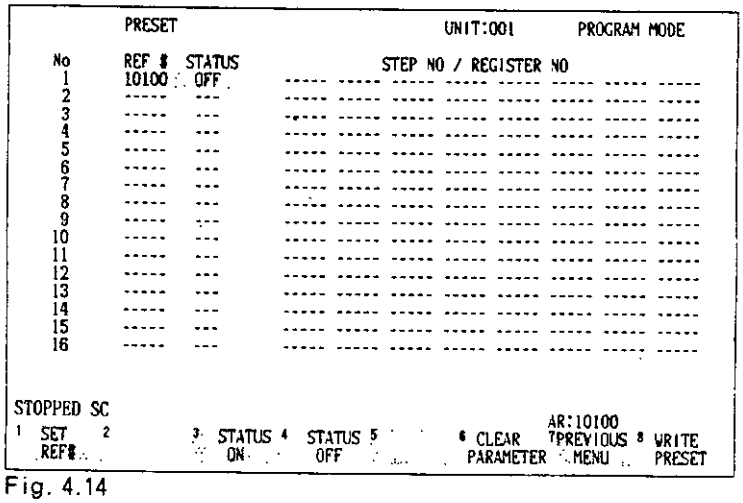


Fig. 4.14

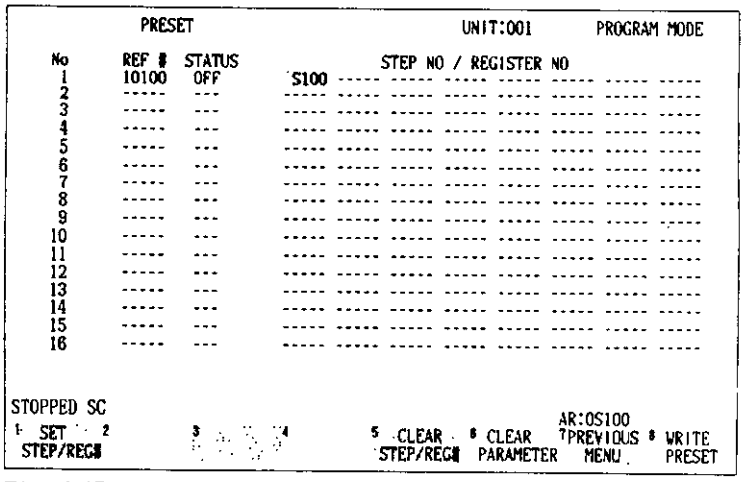
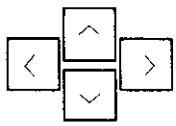


Fig. 4.15

NOTE

1. No data is stored in the memory of GL60S without this operation.
2. To delete the data stored in the memory of GL60S through the above procedure, move the cursor to the number of the set (under "No" column), depress (CLEAR PARAMETER) or (CLEAR STEP/REG) key, then depress (WRITE RESET) key.
3. To return to the previous display, depress (PREVIOUS MENU) key.
4. Up to 64 steps can be set to inactive status (under "No" column). To change the number of steps to be set on the screen use (NO 1-16) through (NO 49-64) keys.
5. In the monitor mode, the RESET conditions can be displayed but cannot be set.
6. To move the cursor under the "No." column, use the cursor control keys  .

4.2 STATUS DISPLAY

This section describes the operations to produce the following displays: the status (hold, disable, active) of a step, the elapsed time of active status for steps, and the current status of action circuits and transition condition circuits.

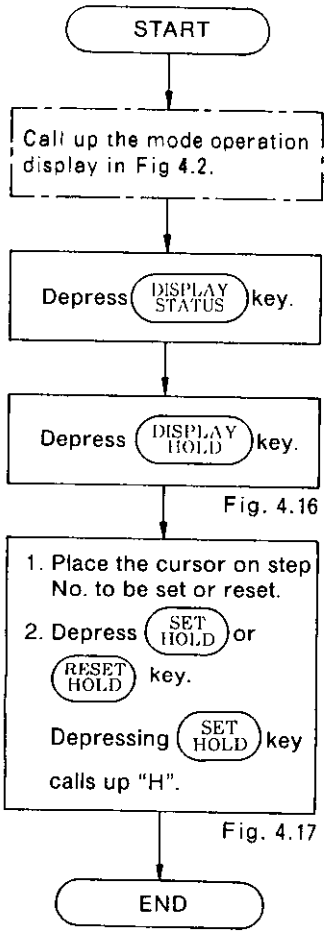
In the status display of the step, the contents can be changed.

(1) HOLD STATUS DISPLAY

This operation displays a step in hold status (i.e., one held in active status). A desired step can be set in the hold status or reset the status.

POINT

- To set a step in the hold status or reset, set the memory protect switch of GL60S to OFF.



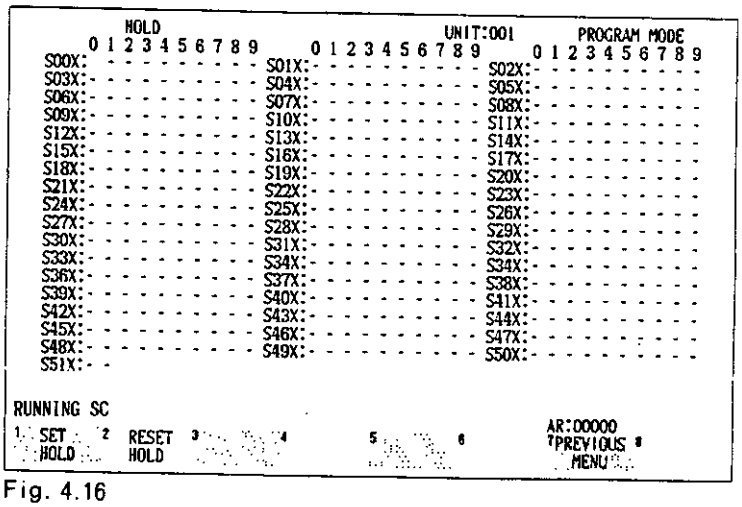


Fig. 4.16

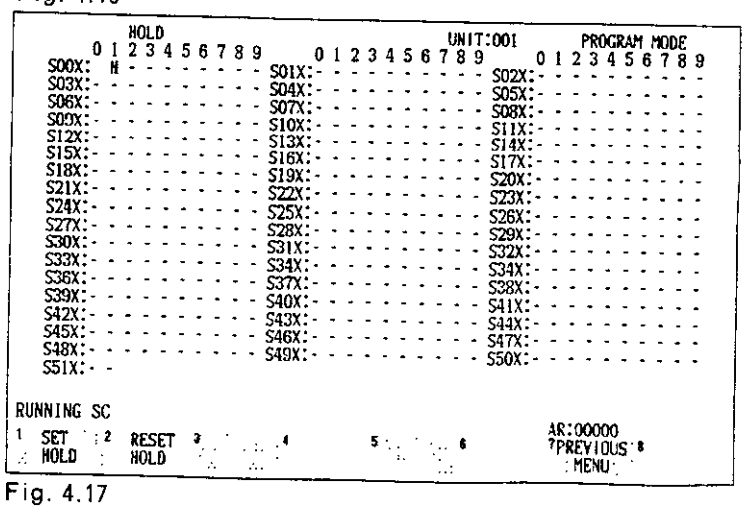


Fig. 4.17

NOTE

1. Any step set in the hold status must be reset after it no longer needs to be in the hold status.
2. The (SET HOLD) and (RESET HOLD) keys do not function in the monitor mode.
3. To return to the previous display, depress (PREVIOUS MENU) key.

4.2 STATUS DISPLAY (Cont'd)

(2) DISABLE STATUS DISPLAY

This operation displays a step in the disable status (i.e., one hold from proceeding). A desired step can be set in the disable status or reset the status.

POINT

- To set a step in the disable status or reset, set the memory protect switch of GL60S to OFF.

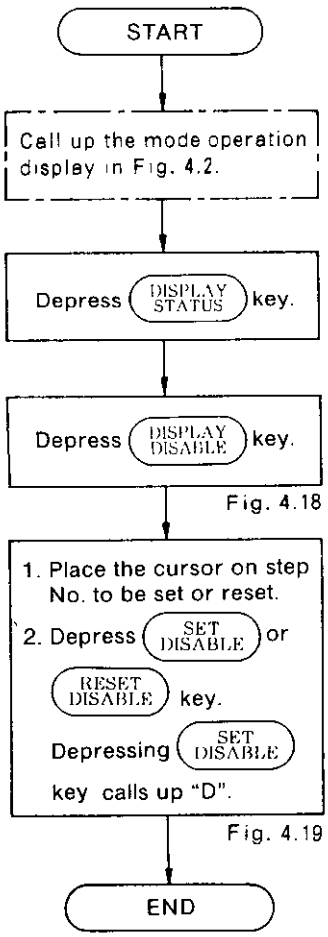


Fig. 4.18

Fig. 4.19

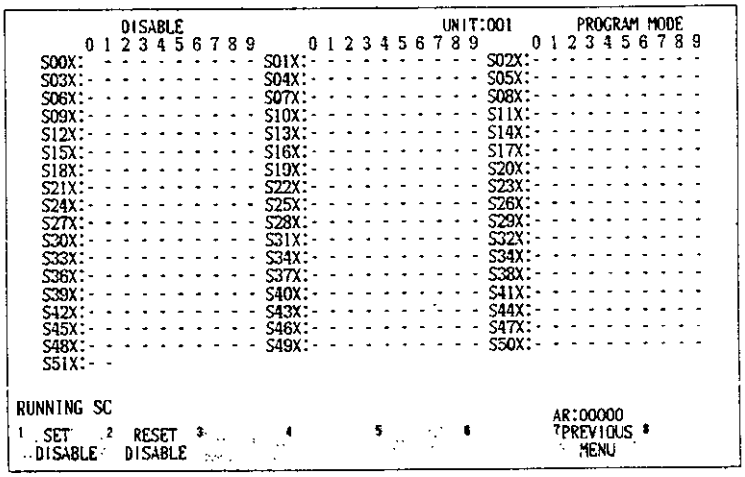


Fig. 4.18

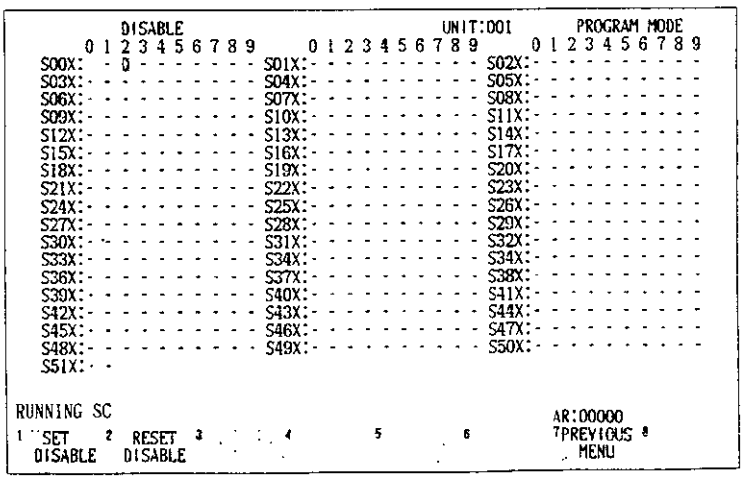


Fig. 4.19

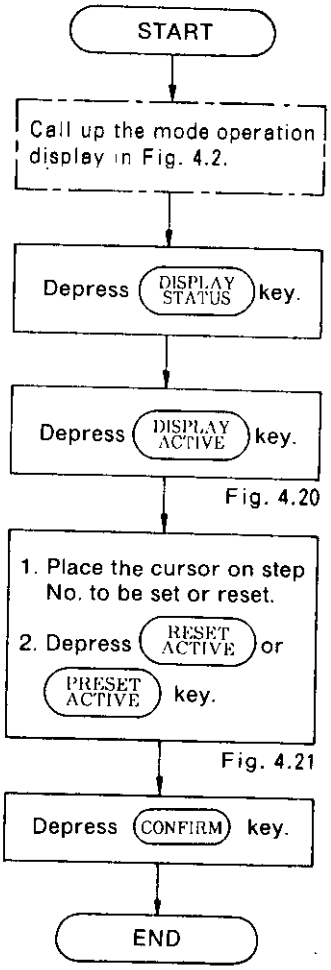
NOTE

1. Any step set in the disable status must be reset after it no longer needs to be in the disable status.
2. The SET DISABLE and RESET DISABLE keys do not function in the monitor mode.
3. To return to the previous display, depress PREVIOUS MENU key.

(3) ACTIVE STATUS DISPLAY

This operation displays a step in the active status. A desired step can be forcibly set in the active status or reset the status.

POINT · To set a step in the active status or reset, set the memory protect switch of GL60S to OFF.



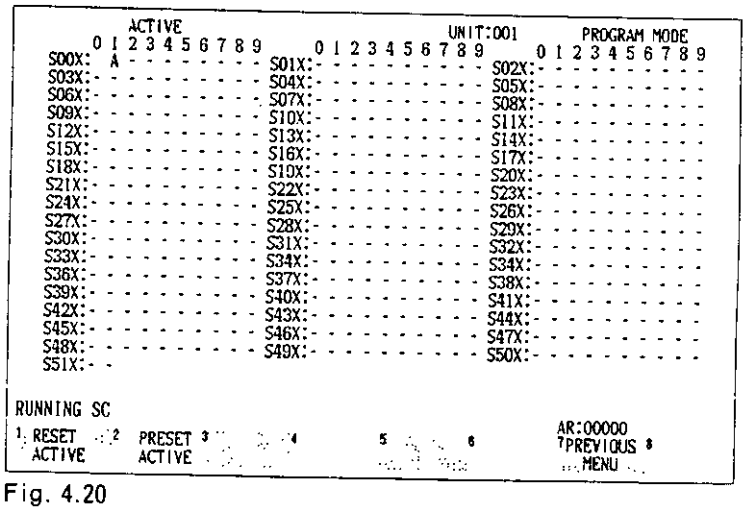


Fig. 4.20

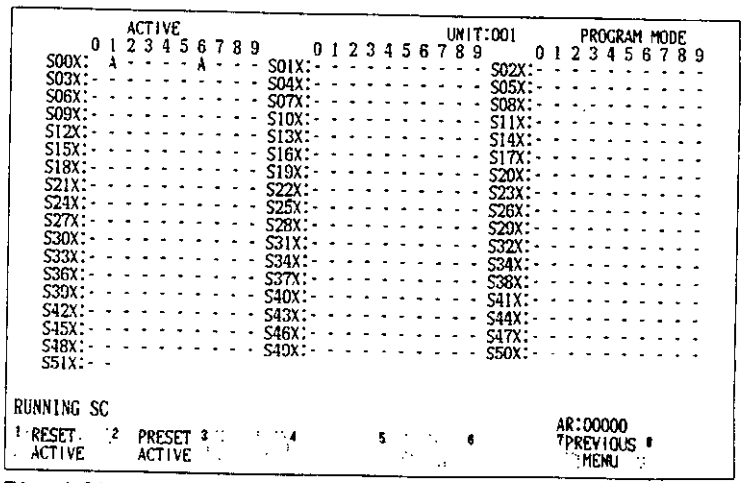


Fig. 4.21

NOTE

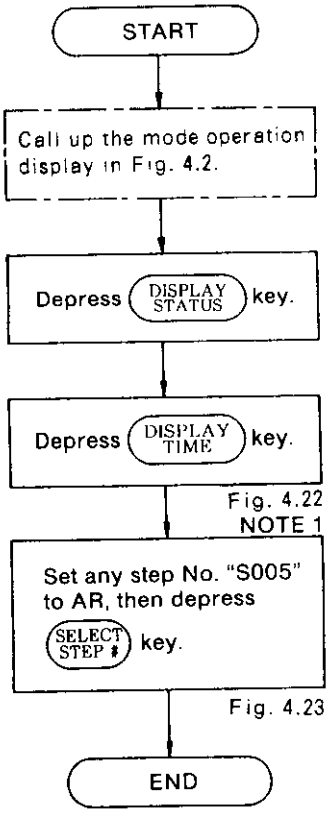
1. The RESET ACTIVE and PRESET ACTIVE keys do not function in the monitor mode.
2. Depressing PRESET ACTIVE key calls up "A".

4.2 STATUS DISPLAY (Cont'd)

(4) ELAPSED ACTIVE TIME DISPLAY

This operation displays the elapsed time afater a step becomes active until it changes to inactive status.

POINT · Enter the number of a step desired to be displayed. The display will cover the 32 consecutive steps starting with the step entered.



TIME CHART			UNIT:001		PROGRAM MODE
STEP	A/I	TIME(SEC)	STEP	A/I	TIME(SEC)
S001	I	001.0	S017	I	000.0
S002	I	010.5	S018	I	000.0
S003	A	020.0	S019	I	000.0
S004	A	030.5	S020	I	000.0
S005	A	040.0	S021	I	000.0
S006	I	050.5	S022	I	000.0
S007	I	060.0	S023	I	000.0
S008	I	070.5	S024	I	000.0
S009	I	080.0	S025	I	000.0
S010	I	090.0	S026	I	000.0
S011	I	100.5	S027	I	000.0
S012	I	110.0	S028	I	000.0
S013	I	120.5	S029	I	000.0
S014	I	130.9	S030	I	000.0
S015	I	140.0	S031	I	000.0
S016	I	150.7	S032	I	000.0

RUNNING SC
1 SELECT 2 3 4 5 6
STEP#
AR:00000
7PREVIOUS 8
MENU

Fig. 4.22

TIME CHART			UNIT:001		PROGRAM MODE
STEP	A/I	TIME(SEC)	STEP	A/I	TIME(SEC)
S005	A	040.0	S021	I	000.0
S006	I	050.5	S022	I	000.0
S007	I	060.0	S023	I	000.0
S008	I	080.0	S024	I	000.0
S009	I	090.0	S025	I	000.0
S010	I	100.5	S026	I	000.0
S011	I	110.0	S027	I	000.0
S012	I	120.5	S028	I	000.0
S013	I	130.9	S029	I	000.0
S014	I	140.0	S030	I	000.0
S015	I	150.7	S031	I	000.0
S016	I	000.0	S032	I	000.0
S017	I	000.0	S033	I	000.0
S018	I	000.0	S034	I	000.0
S019	I	000.0	S035	I	000.0
S020	I	000.0	S036	I	000.0

RUNNING SC
1 SELECT 2 3 4 5 6
STEP#
AR:0S005
7PREVIOUS 8
MENU

Fig. 4.23

NOTE

1. The display called up by this operation indicates "A" for active steps and "I" for inactive steps.
2. Time setting/resetting is not possible with this operation.
3. To return to the previous display, depress PREVIOUS MENU key.

(5) ACTION CIRCUIT STATUS DISPLAY

This operation displays the current status of the action circuit associated with each step.

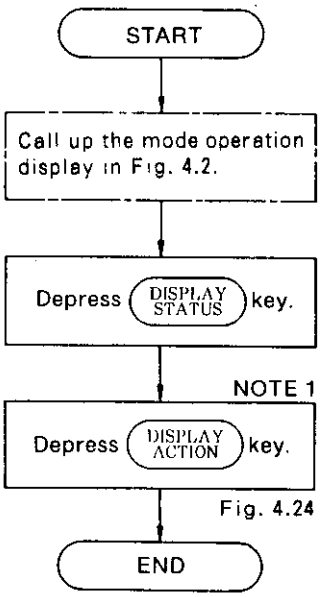


Fig. 4.24

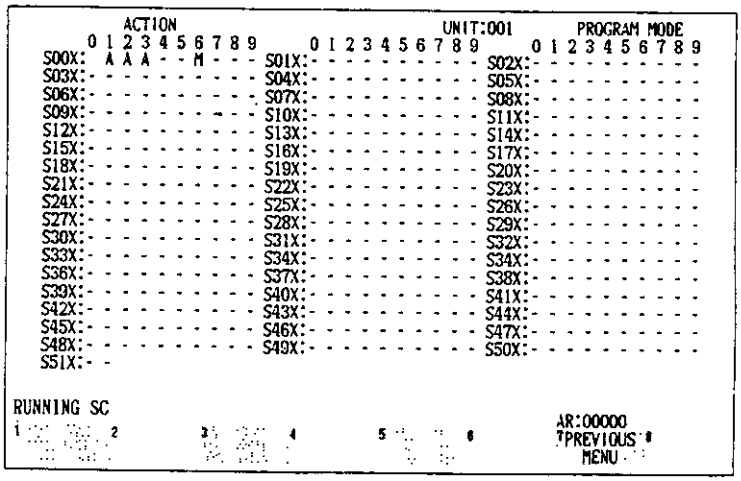


Fig. 4.24

NOTE

1. The display called up by this operation indicates:
   - "A" for the normal steps having action circuits.
   - "M" for the macro steps having expanded views.
2. To return to the previous display, depress PREVIOUS MENU key.

4.2 STATUS DISPLAY (Cont'd)

(6) TRANSITION CONDITION CIRCUIT STATUS DISPLAY

This operation displays the current status of the transition condition circuit associated with each transition.

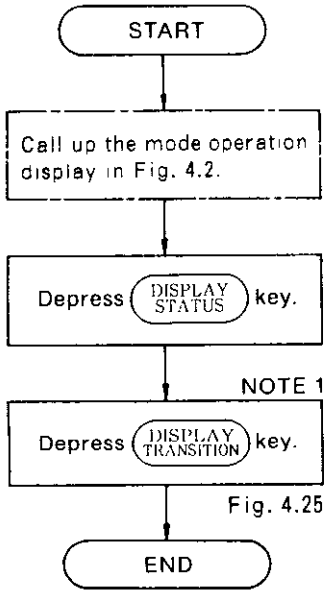


Fig. 4.25

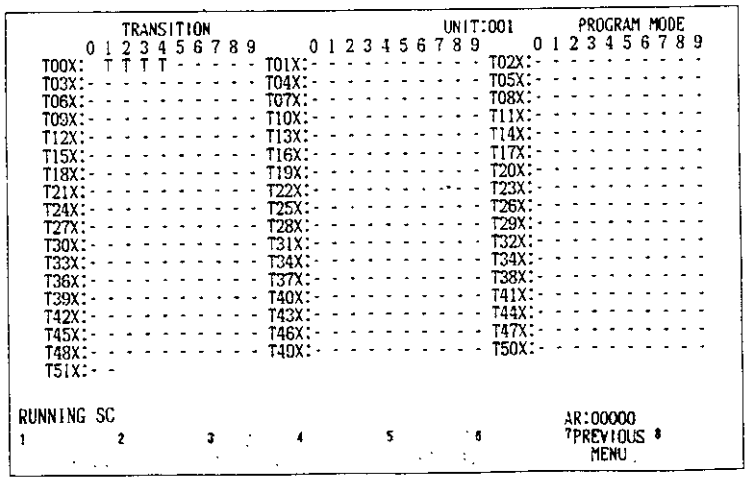


Fig. 4.25

NOTE

1. The display called up by this operation shows "T" for the transitions having transition condition circuits.
2. To return to the previous display, depress PREVIOUS MENU key.

5. SFC PROGRAMMING OPERATION

Table 5.1 shows symbols for SFC flow processing.

Table 5.1 SFC Element List

Type	Symbol	Designation	Input Example and Description
Step	SXXX	Initial Step	S001 Range of number: S001-S512
	SXXX	Step	S002 Range of number: S001-S512
	M SXXX	Macro Step	M S003 Range of number: S001-S512 (Dummy transition): Processed together with M SXXX.
Transition	TXXX	Transition	T001 Range of number: T001-T512
	TXXX	Counter Transition	T002 Range of number: T001-T512
Link	X	FROM	1 Any number of 1 to 8 may be used.
	X	TO	1 Any number of 1 to 8 may be used.
		Macro Entry	Automatically displayed by depressing START NEXT key in macro view; one macro entry is usable in expanded view.
		Macro Return	Up to eight macro returns are usable in expanded view.
		Convergence	T006 T007 Converges to bottom of transition; can also converge from left side (to left transition).
		Divergence	T001 T002 Diverges from top of transition; can also diverge to left side (from left transition).
		Simultaneous Convergence	T007 Converges to top of transition; can also converge from left side (to left transition).
		Simultaneous Divergence	T004 Diverges from bottom of transition; can also diverge to left side (from left transition).

Table 5.1 SFC Element List (Cont'd)

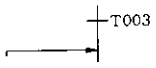
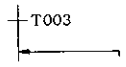
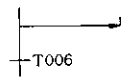
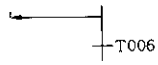
Type	Symbol	Designation	Input Example and Description
Link		Loop Input from Right	 Inputs to bottom of transition; used on input side of ⊢⌐.
		Loop Input from Left	 Inputs to bottom of transition; used on input side of ⌐⊣.
		Loop Output to Right	 Outputs from top of transition; used on output side of ⊢⌐.
		Loop Output to Left	 Outputs from top of transition; used on output side of ⌐⊣.
		Link Line	Used as downward extension line of step or transition.
		Counter Link Line	Used as vertical extension line of loop.

Table 5.2 Function Label Keys for SFC Element Deletion

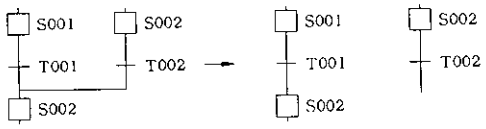
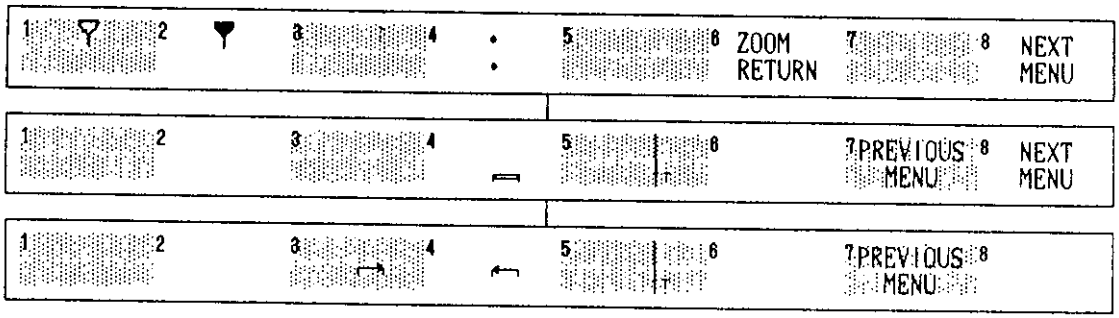
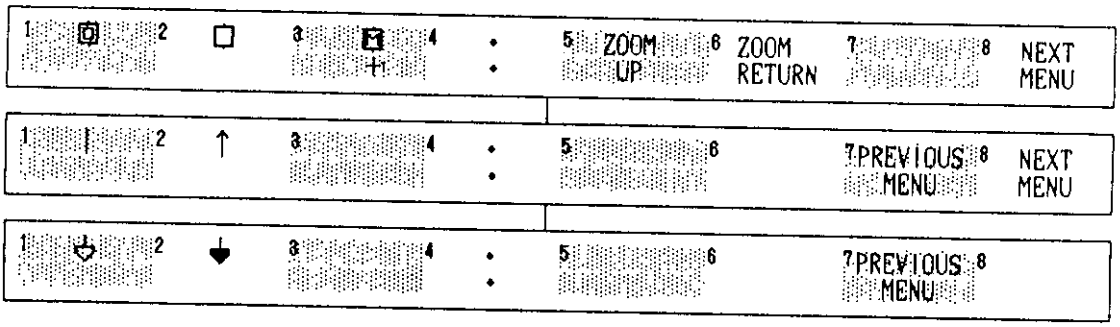
Type	Symbol	Usage	Usage Example
Element Deletion	• •	Used to delete elements, except for divergence, convergence, loop, and macro entry.	
	†•	Used on top side of transition to delete elements of divergence, convergence, and loop.	
	†•	Used on bottom side of transition to delete elements of divergence, convergence, and loop.	

Table 5.3 List of Function Label Displays (Keys)

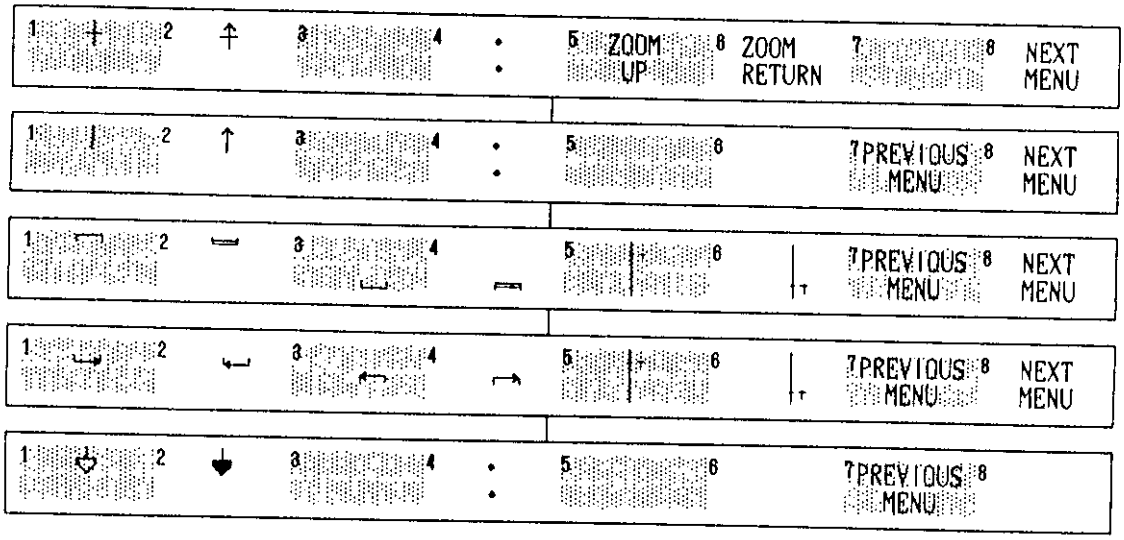
Where cursor is in FROM line:



Where cursor is in STEP line:

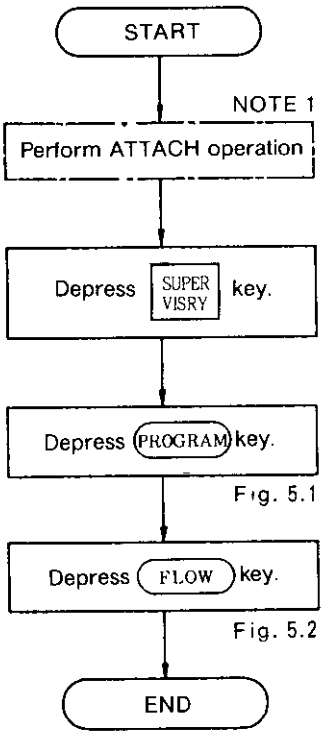


Where cursor is in TRANSITION line:



5.1 SFC FLOW PROCESSING

The SFC flow processing represents a control logic using a block diagram in a form similar to a flow chart. Shown below are the procedures down to the SFC operation display.



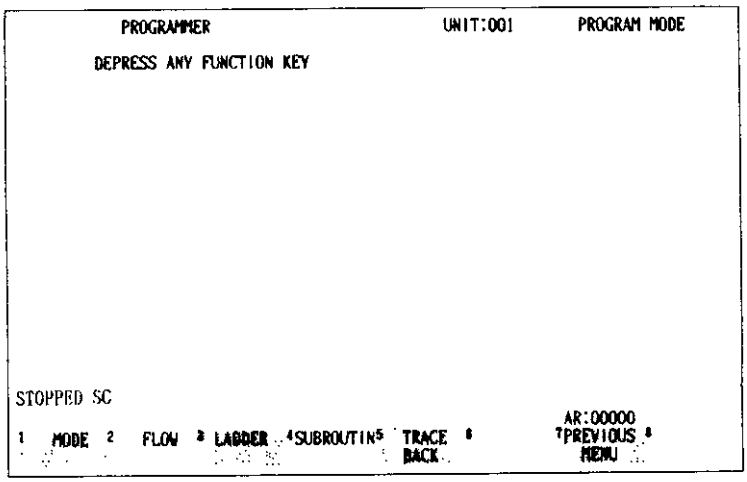


Fig. 5.1

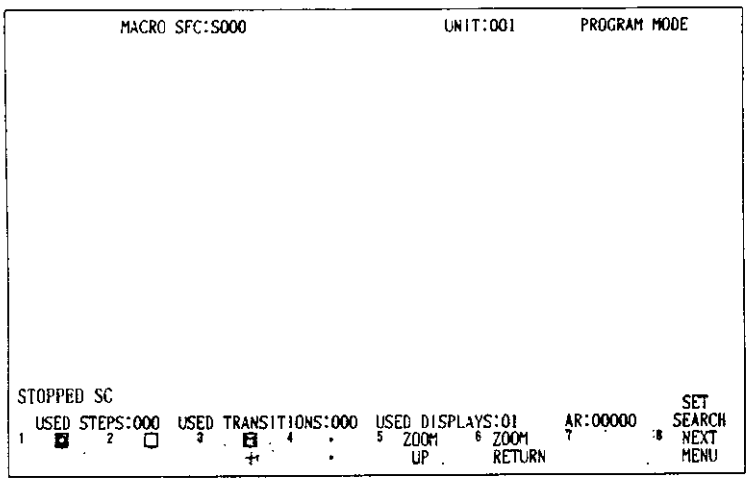


Fig. 5.2

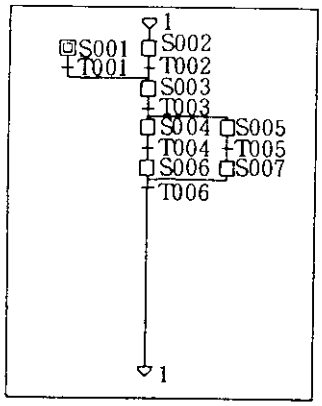
NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. To store the SFC, operation in the program mode is required.
3. The memory protect switch of GL60S should be set to OFF. It may be in the ON position in the monitor mode.

5.1.1 SFC Storing

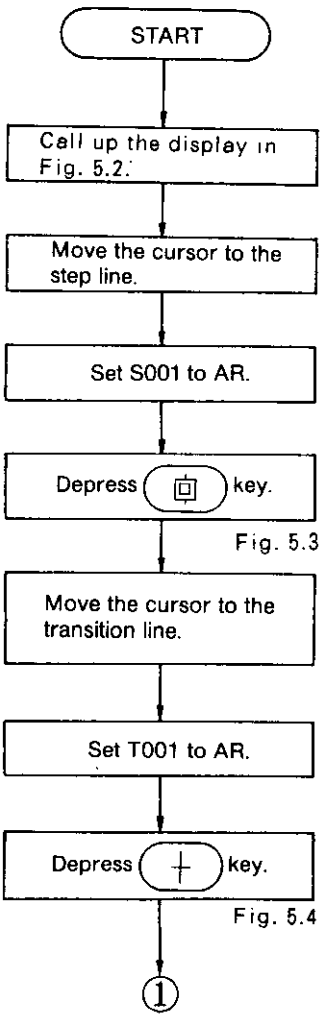
(1) SFC STORING ①

(Storing example)



POINT

- The cursor must be in the SFC area.
- Each step number and each transition number can be used only once.
- A convergence or divergence must be input in a transition line.



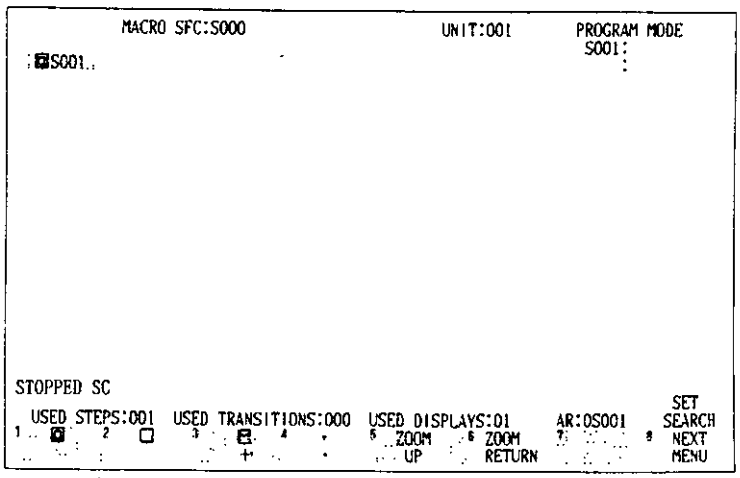


Fig. 5.3

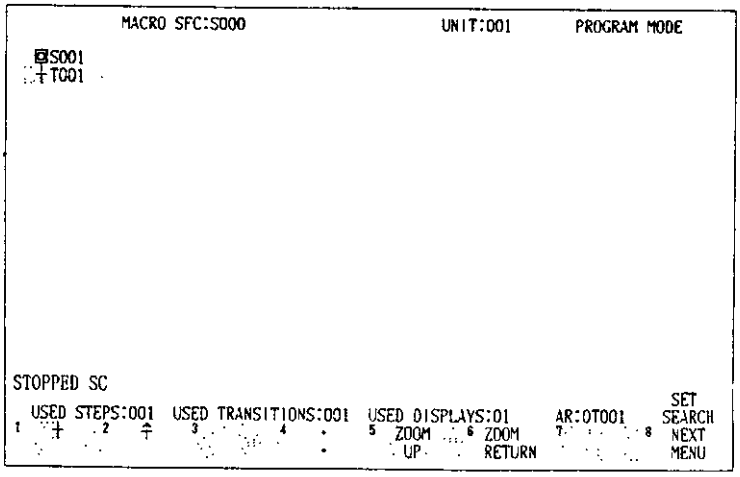
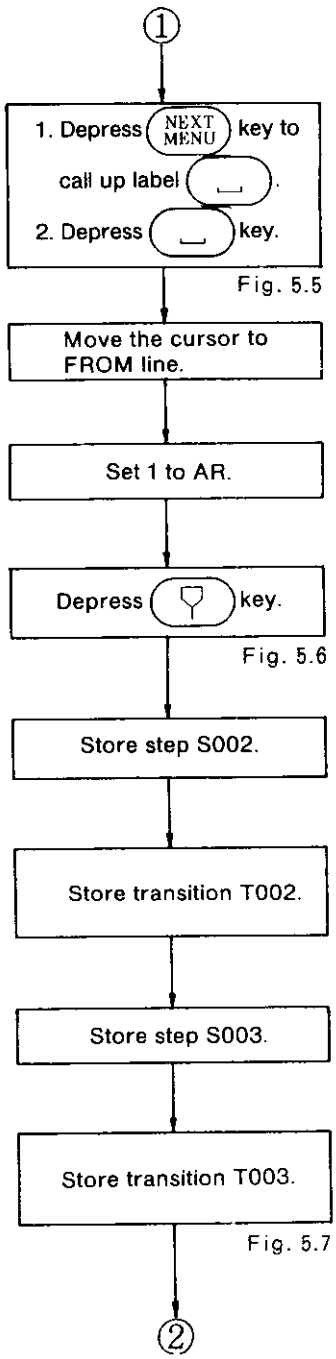


Fig. 5.4

5.1.1 SFC Storing (Cont'd)



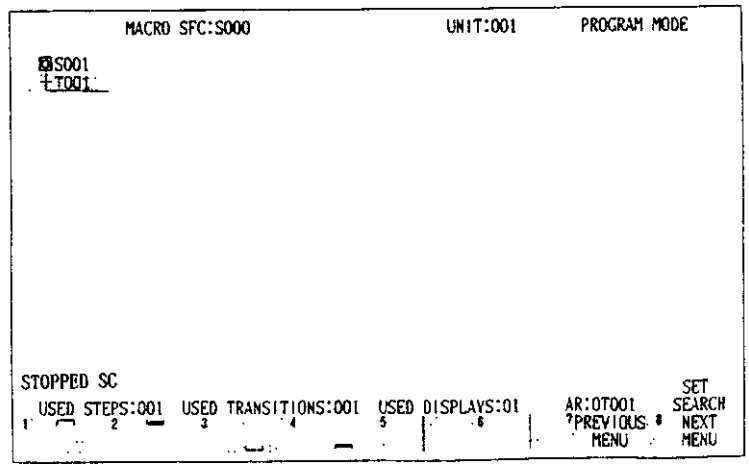


Fig. 5.5

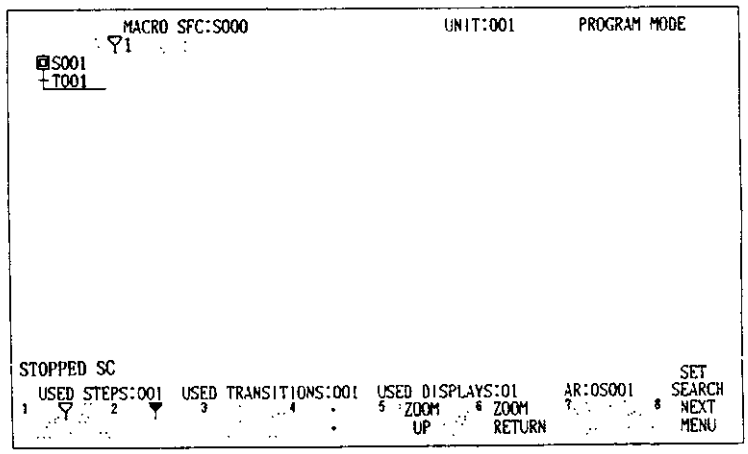


Fig. 5.6.

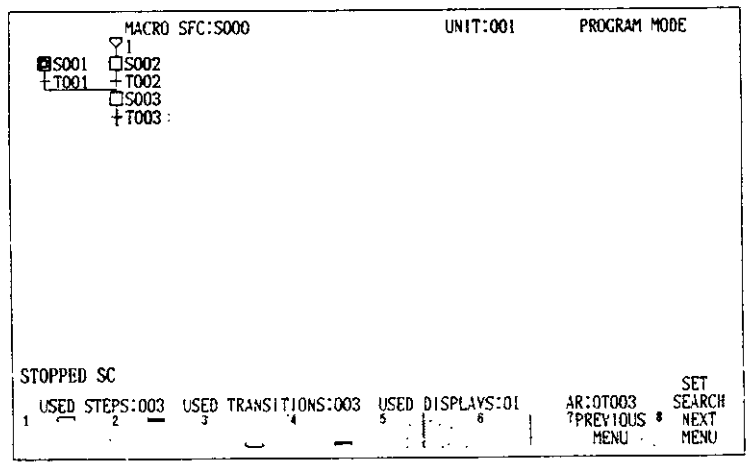
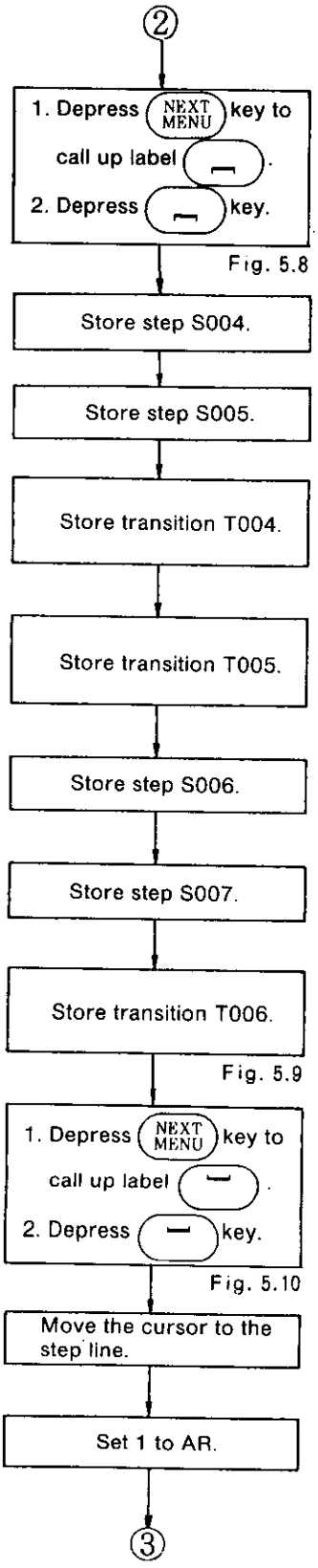


Fig. 5.7



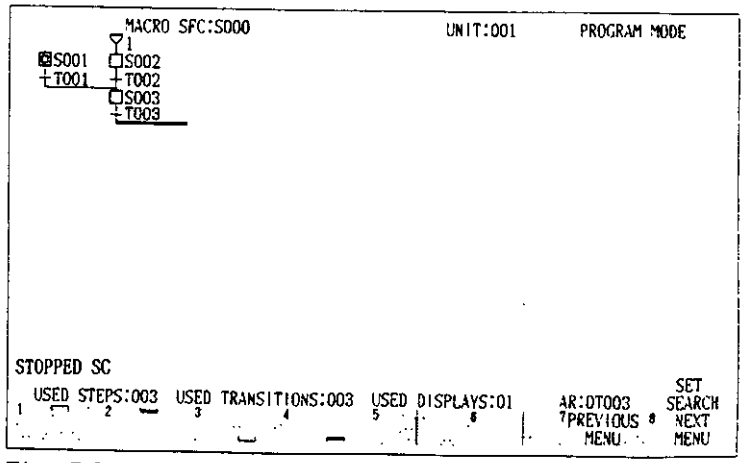


Fig. 5.8

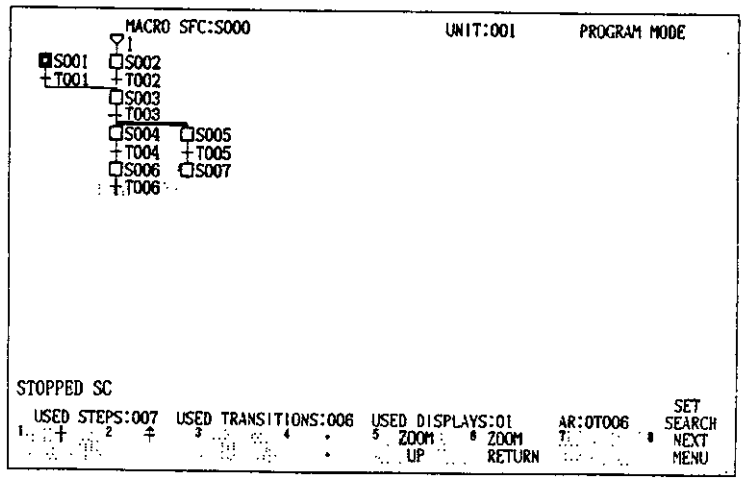


Fig. 5.9

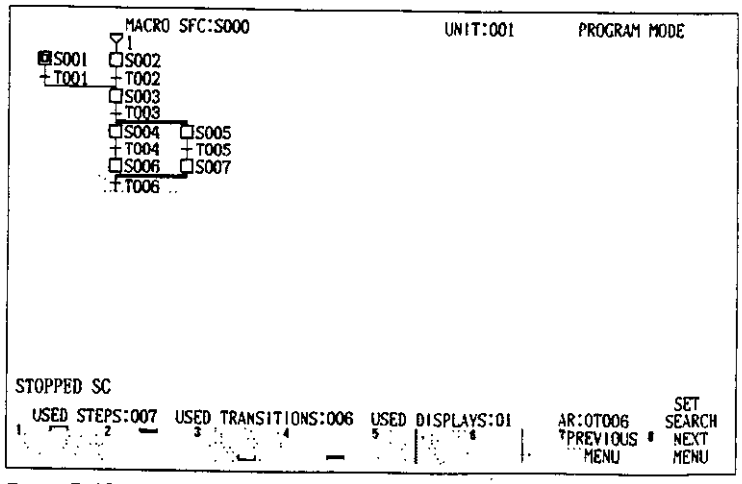
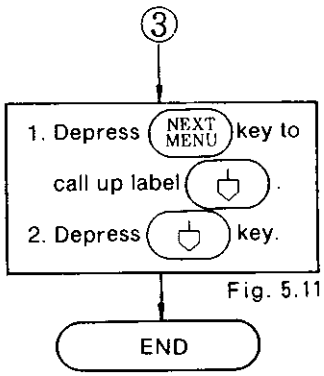


Fig. 5.10

5.1.1 SFC Storing (Cont'd)



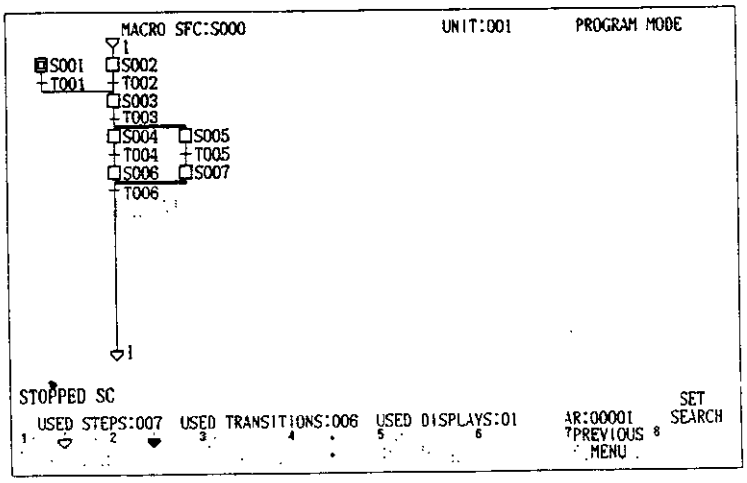


Fig. 5.11

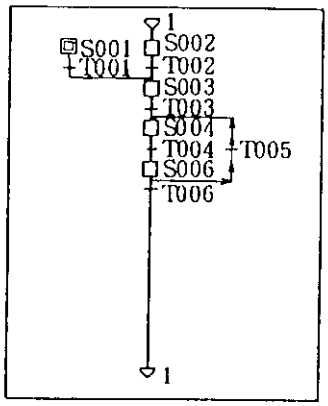
NOTE

1. Regarding the function label displays (keys) for element input, refer to Table 5.3.

2. To enter a macro step [M] , use the [M] key. A dummy transition (⊣) alone cannot be entered.

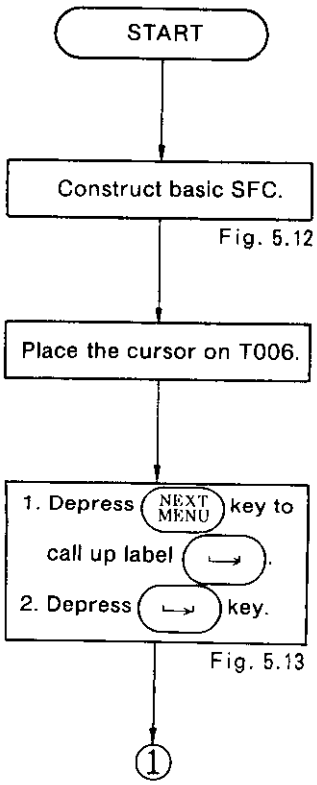
(1) SFC STORING ②

(Storing example loop)



POINT

- The cursor must be in the SFC area.
- Each step number and each transition number can be used only one.
- A loop output or loop input must be made in a transition line.



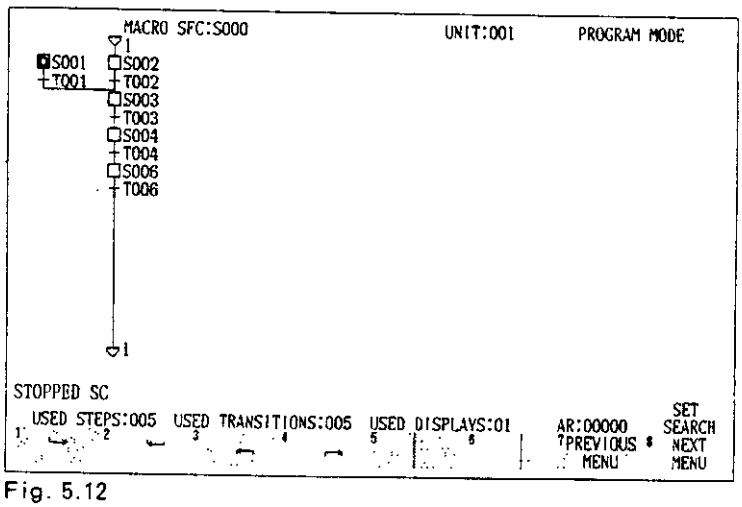


Fig. 5.12

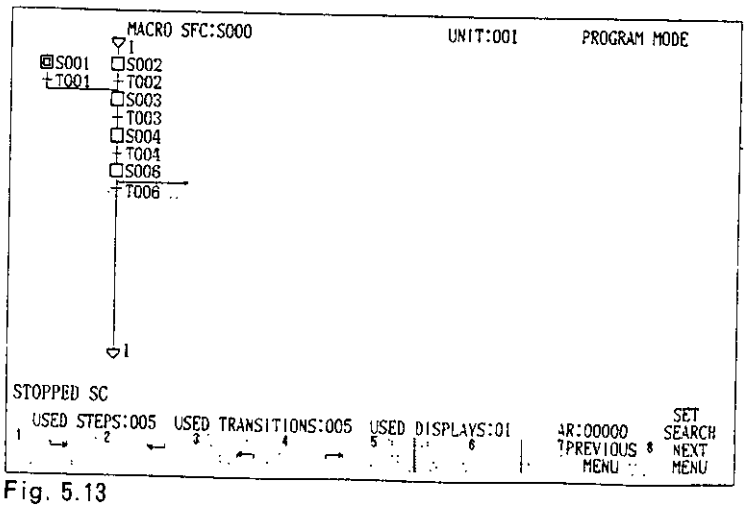
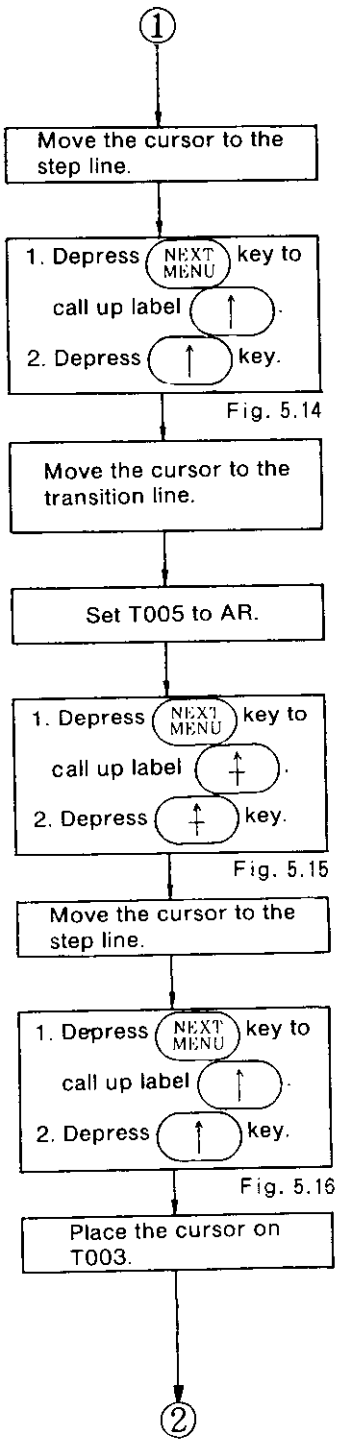


Fig. 5.13



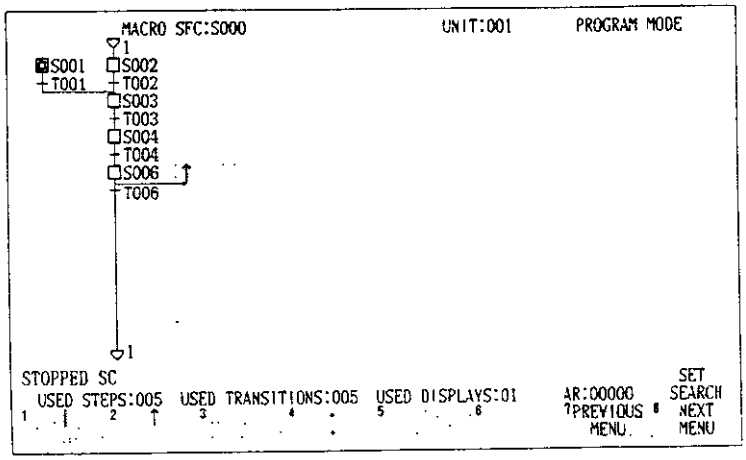


Fig. 5.14

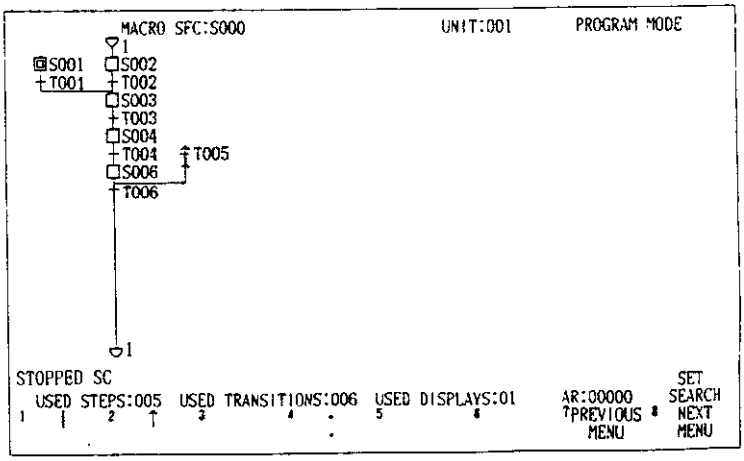


Fig. 5.15

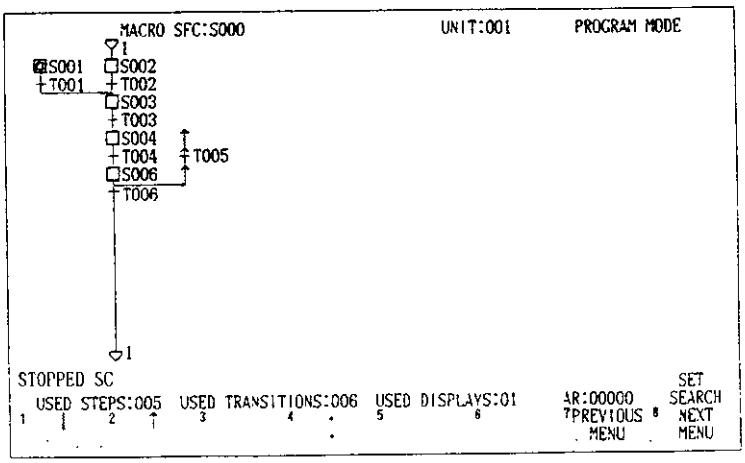


Fig. 5.16

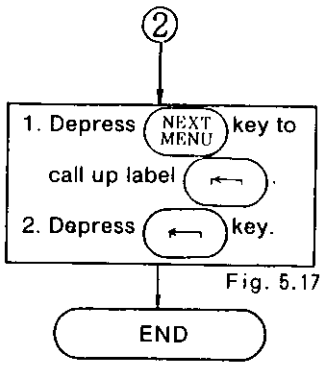


Fig. 5.17

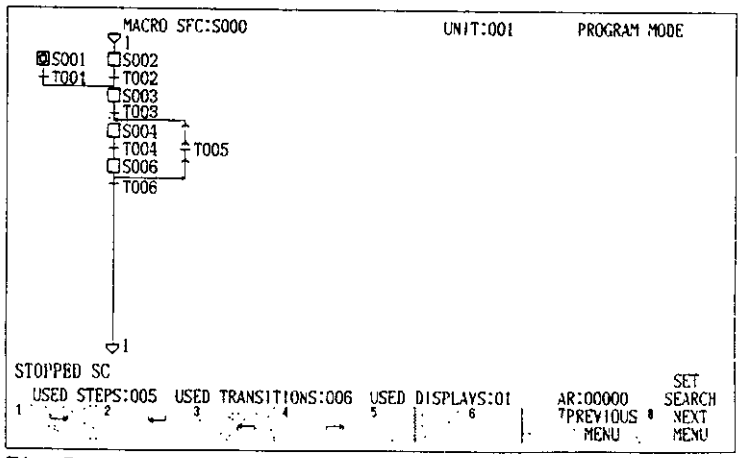
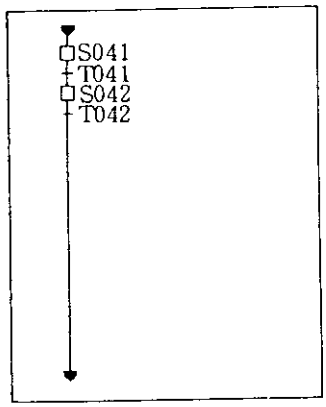


Fig. 5.17

(1) SFC STORING ③

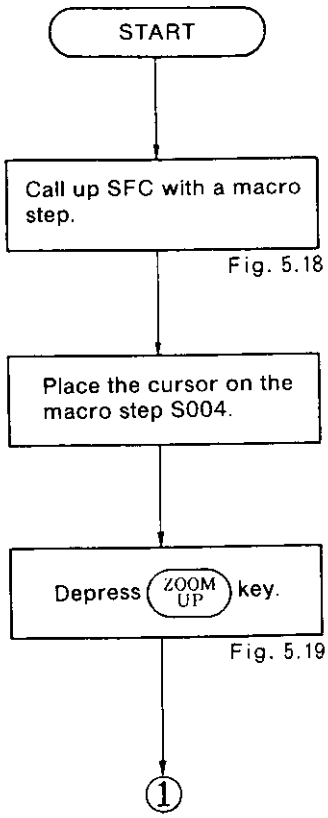
(Storing Example)
EXPANDED VIEW



POINT

- The cursor must be in the SFC area.
- Each step number and each transistion number can be used only one.
- This storing requires a macro step.

  Macro Step Symbol: 



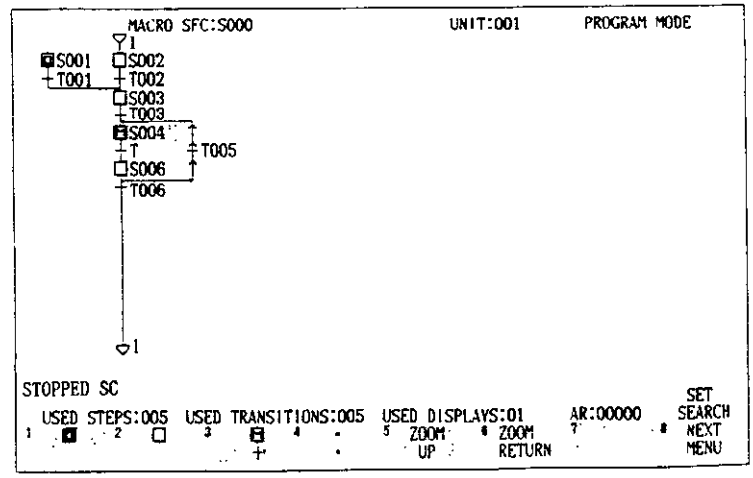


Fig. 5.18

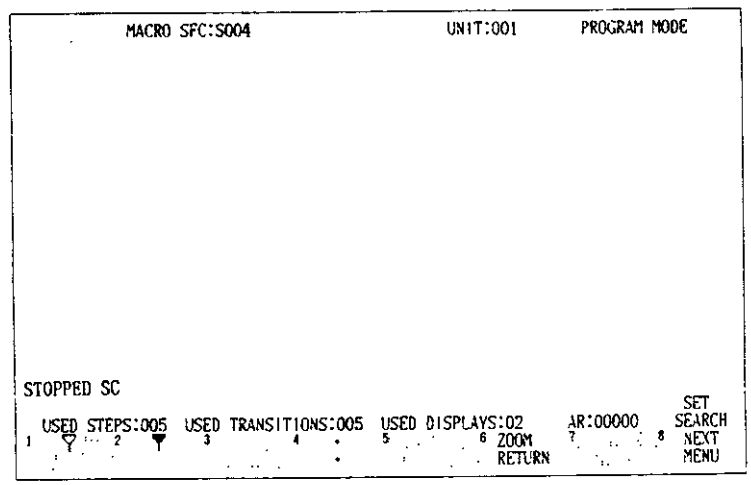
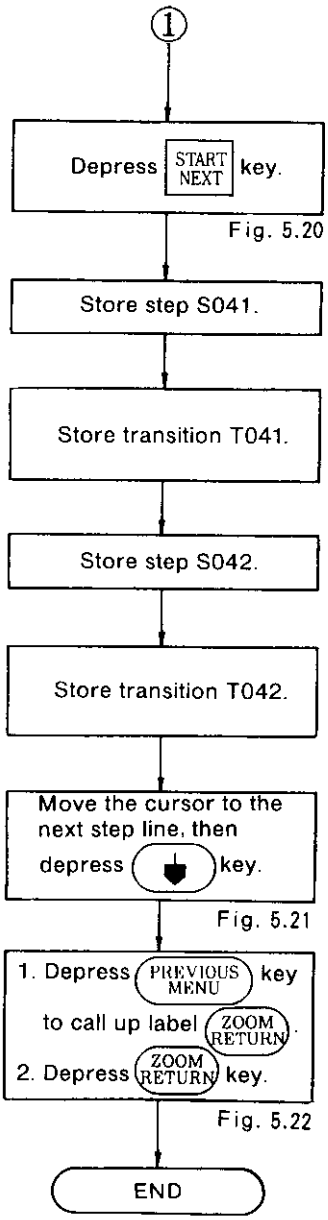


Fig. 5.19



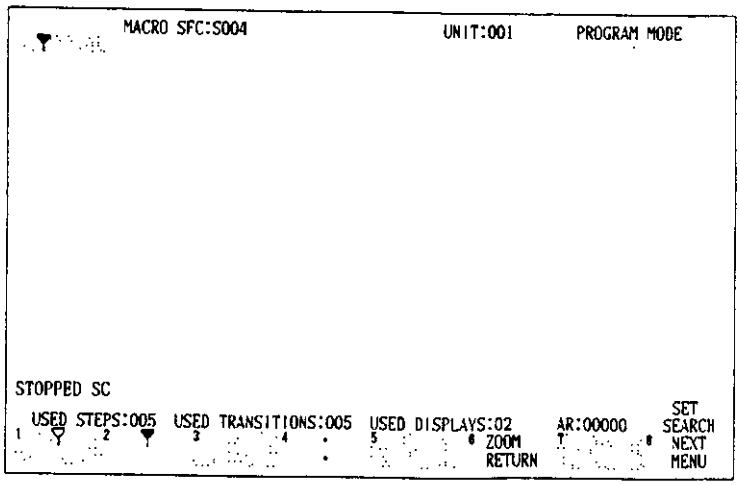


Fig. 5.20

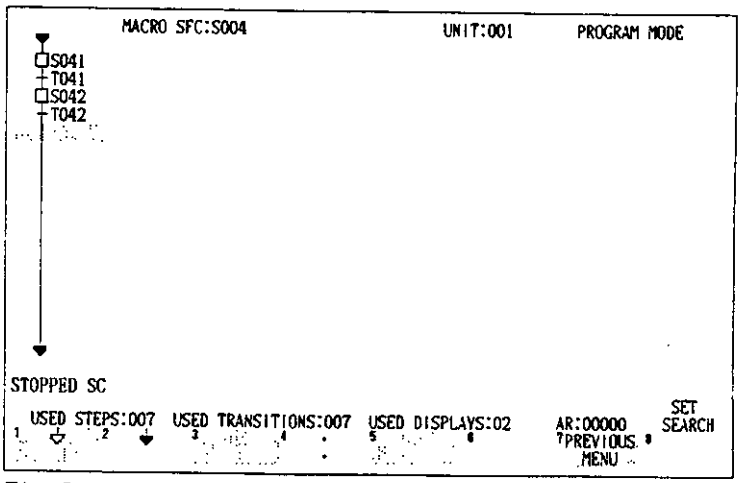


Fig. 5.21

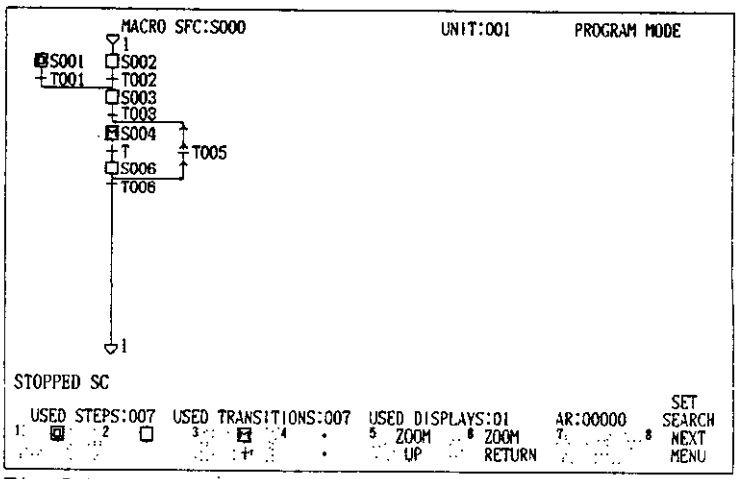


Fig. 5.22

NOTE

1. Regarding the function label displays (keys) for element input, refer to Table 5.3.

2. To enter a macro step [M], use the [M] key.

   A dummy transition (⊣⊢) alone cannot be entered.

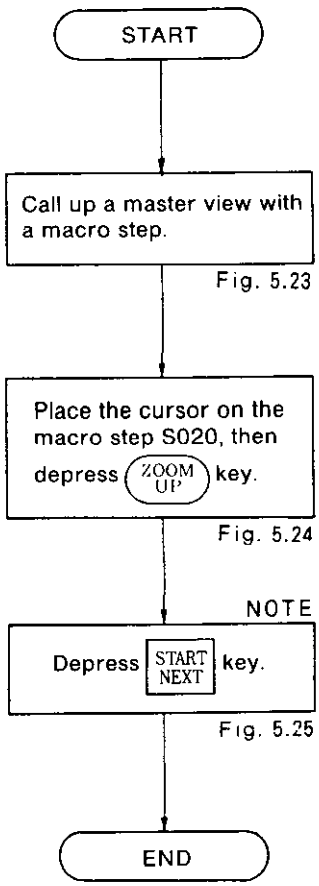
5.1.2 SFC Altering

(1) SFC ADDING

This operation creates an expanded view of SFC.

POINT

- The master view must contain a macro step (M).
- Up to 63 expanded views can be created.
- The cursor must be in the SFC area.



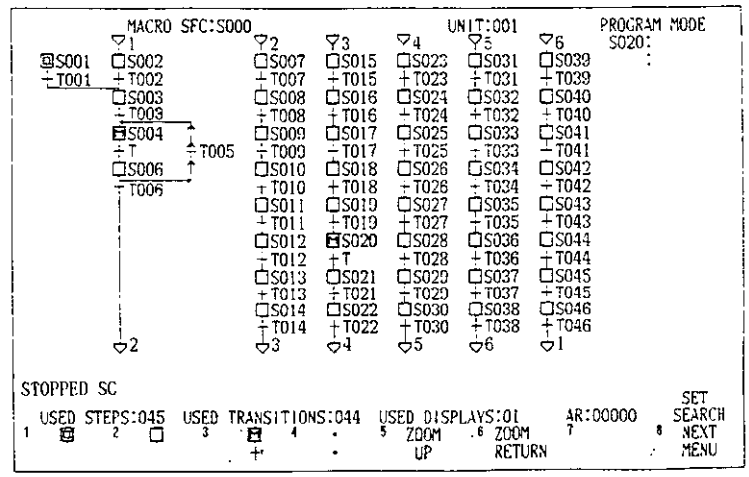


Fig. 5.23

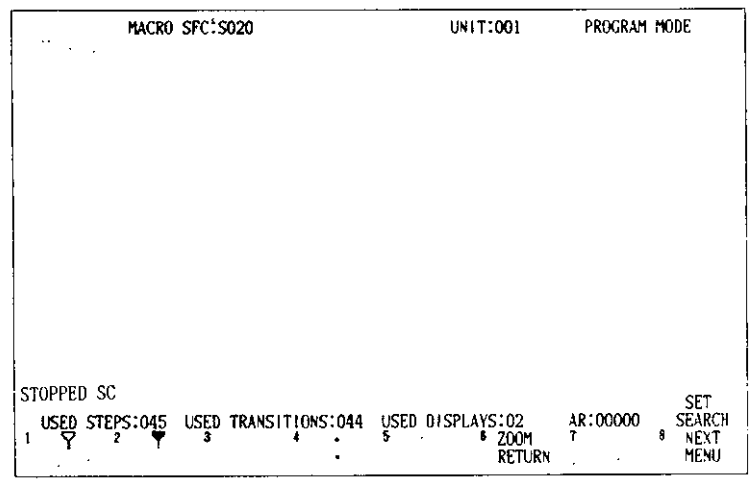


Fig. 5.24

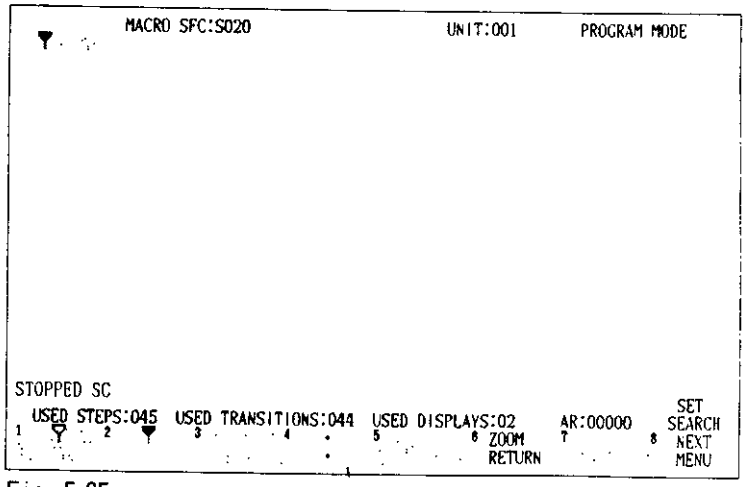


Fig. 5.25

NOTE

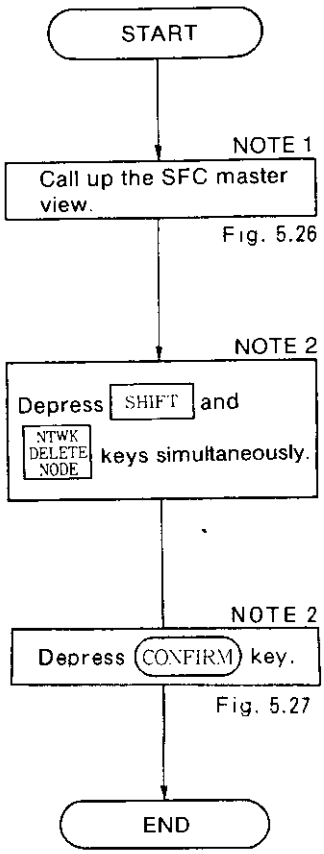
1. The SFC element storing that follows the asterisked block is performed using the same operation as described in par. 5.1.1, (1) "SFC STORING ③".
2. Expanded views can also be added from an expanded view by depressing the (ZOOM UP) key, provided that the expanded view contains a macro step.
3. Function key (ZOOM UP) is available.

5.1.2 SFC Altering (Cont'd)

(2) SFC DELETING

This operation deletes a master view or a expanded view of SFC.

POINT • The cursor must be in the SFC area.



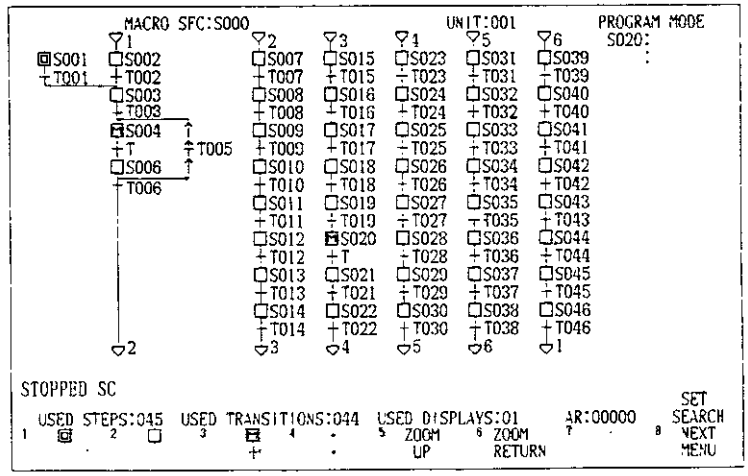


Fig. 5.26

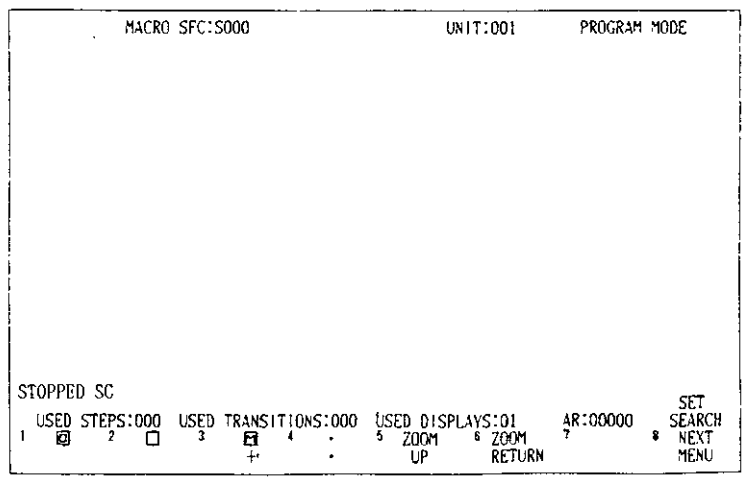


Fig. 5.27

NOTE

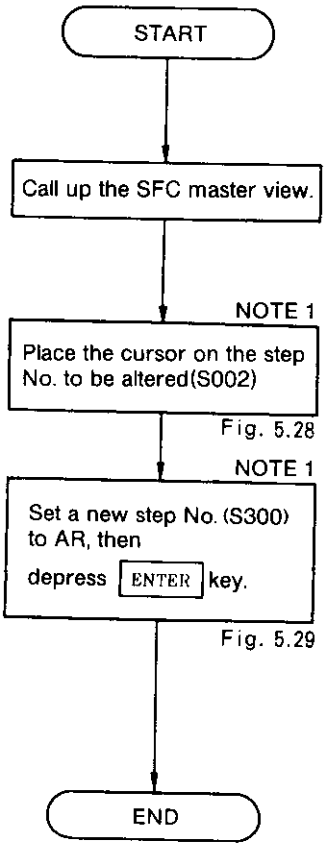
1. Where deleting the expanded views, display them by operating ZOOM UP key on the macro step of the master view.
2. Deletion of the expanded views uses the same operation as that for the master view.
3. The macro entry element (▼) for the expanded views can only be deleted through this operation.
4. If there is a macro step connected to an expanded view, deletion must begin with the expanded view.
5. This operation does not delete the action circuits for steps or the transition condition circuits.

(3) REFERENCE NUMBER ALTERING

This operation alters a step number or transition number.

POINT

- The cursor must be in the SFC area.
- Each step number and each transition number can be used only once.



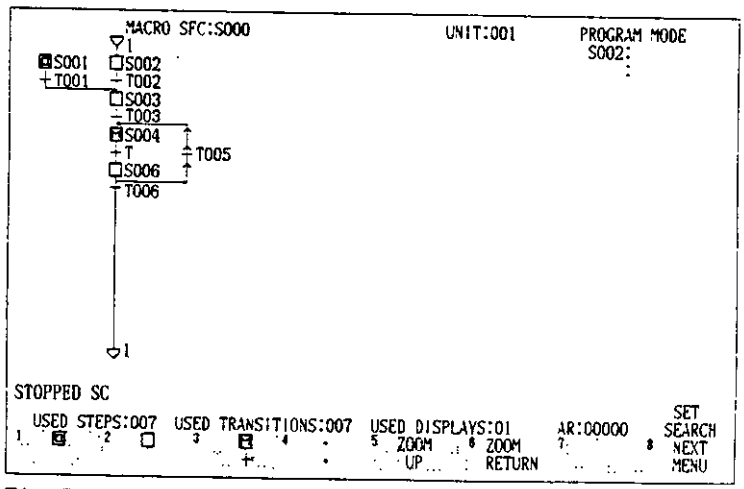


Fig. 5.28

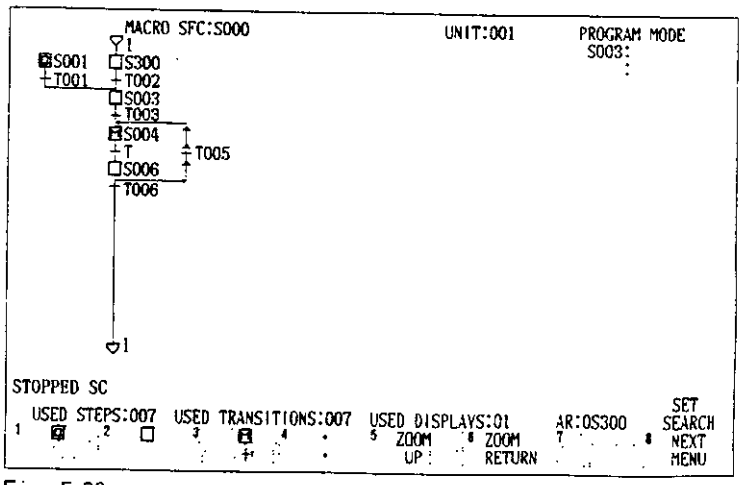


Fig. 5.29

NOTE

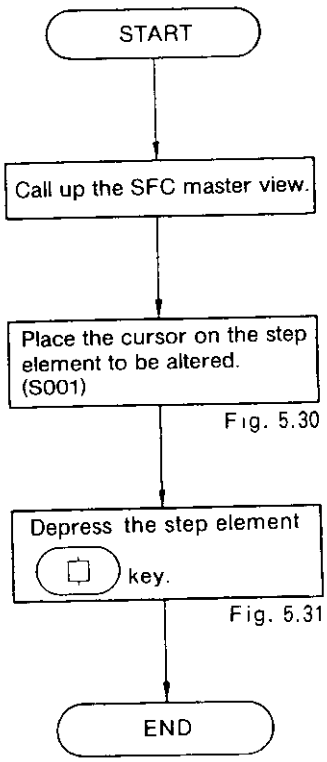
1. The same operation is also used for the expanded views or the reference number of a transition.
2. The number of a macro step ([M]) cannot be altered if an action circuit already exists for the number to be altered.

5.1.2 SFC Altering (Cont'd)

(4) ELEMENT ALTERING

This operation alters an element only. To alter the reference number as well, see (3) above, "REFERENCE NUMBER ALTERING".

POINT • The cursor must be in the SFC area.



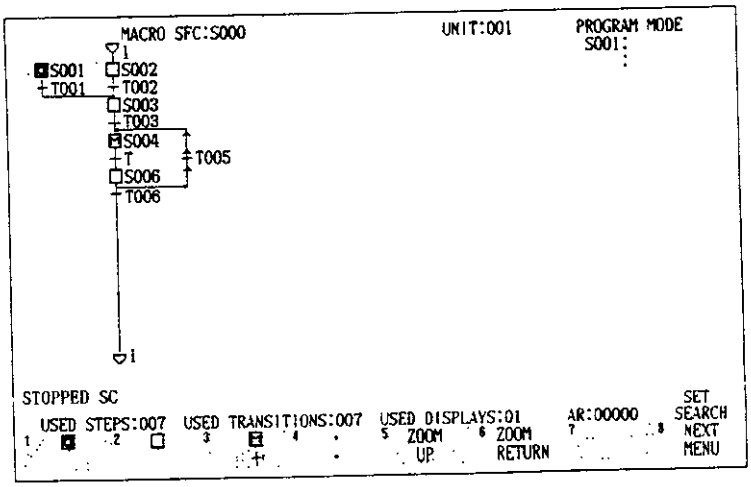


Fig. 5.30

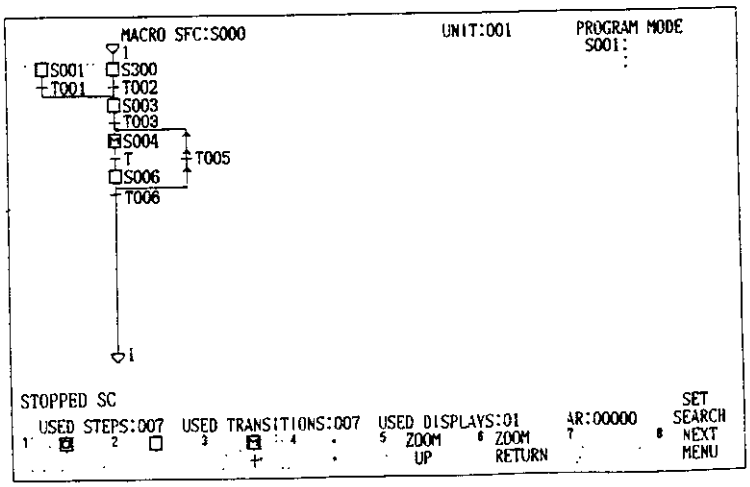
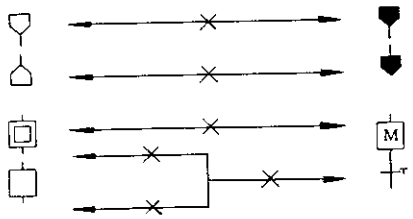


Fig. 5.31

NOTE

1. It is not possible to change an element requiring a reference number for an element not requiring a reference number, or vice versa.

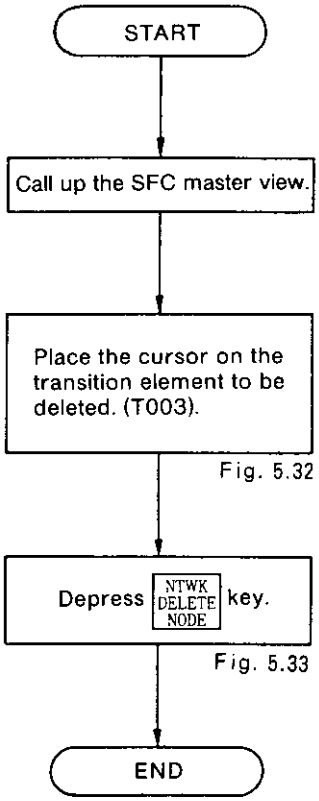


2. To alter a divergence, convergence, or loop, set the cursor at the transition element.

(5) ELEMENT DELETING ①

This operation deletes a transition, a divergence, a convergence and a loop element, one at a time.

POINT • The cursor must be in the SFC area.



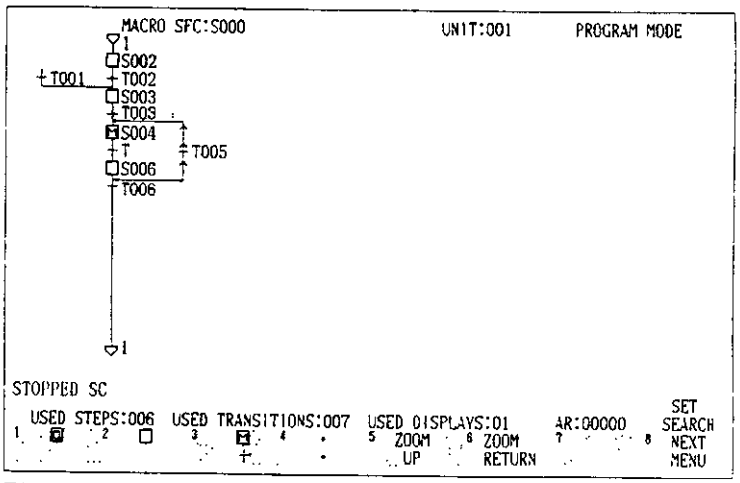


Fig. 5.32

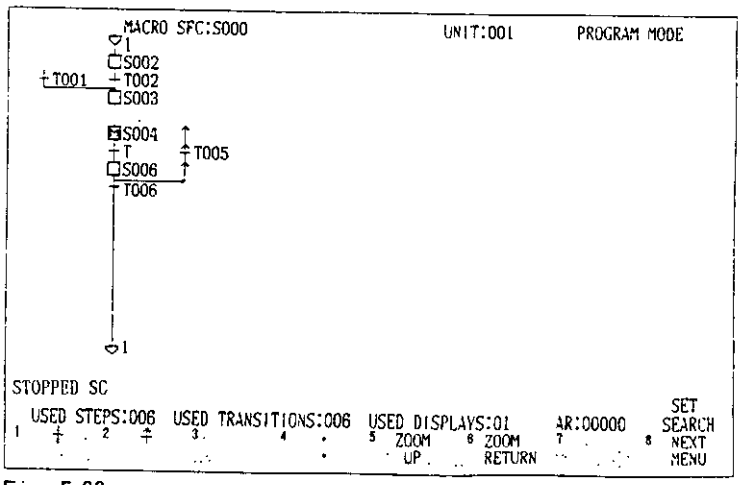


Fig. 5.33

NOTE

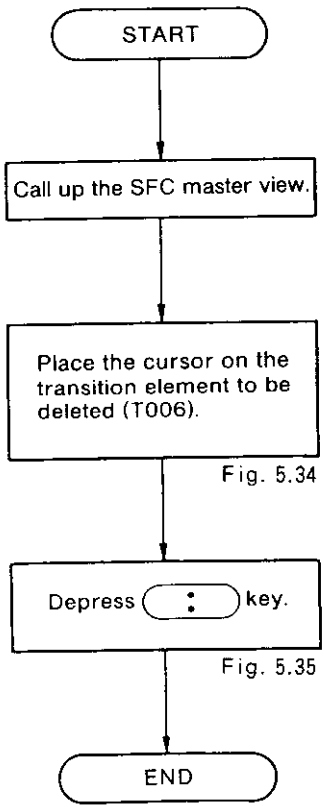
1. A macro step (M) and the associated dummy transition (⊣T) can be deleted if the cursor is set to either one.
2. If there is a macro step having an expanded view, deletion must begin with the expanded view.
3. This operation does not delete the action circuits for steps or the transition condition circuits.

(5) ELEMENT DELETING ②

This operation deletes a transition element only. The divergence, convergence or loop element cannot be deleted through this operation.

POINT

- The cursor must be in the SFC area.



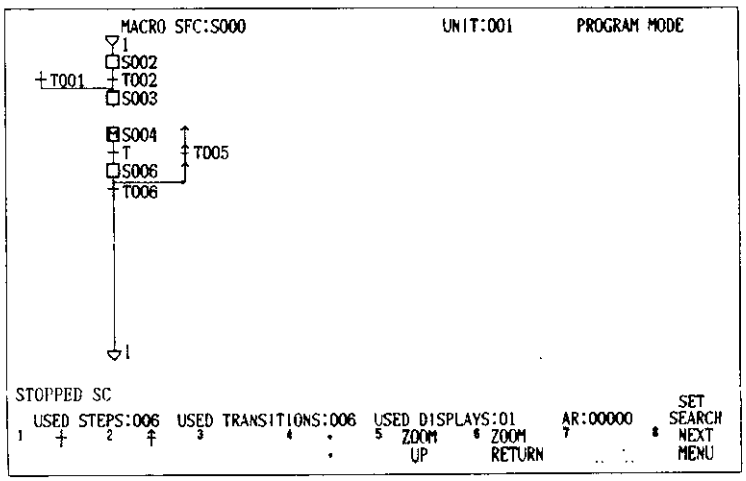


Fig. 5.34

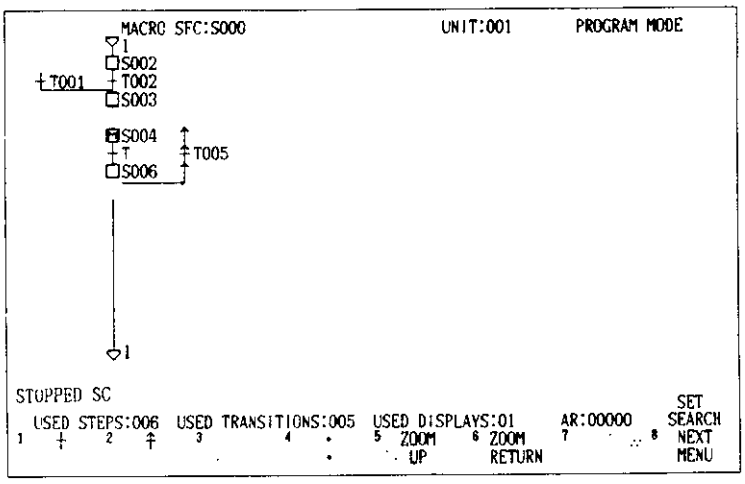


Fig. 5.35

NOTE

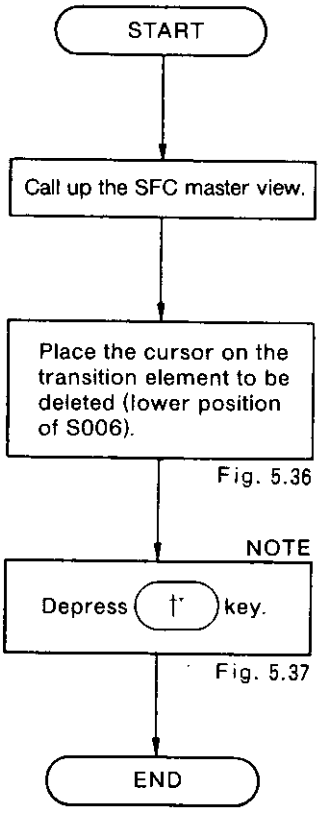
1. A macro step ([M]) and the associated dummy transition (⊣T) can be deleted if the cursor is set to either one.
2. If there is a macro step having an expanded view, deletion must begin with the expanded view.
3. This operation does not delete the action circuits for steps or the transition condition circuits.

(5) ELEMENT DELETING ③

This operation deletes only the divergence, convergence or loop element. Elements other than these cannot be deleted through this operation.

POINT

- The cursor must be in the SFC area.



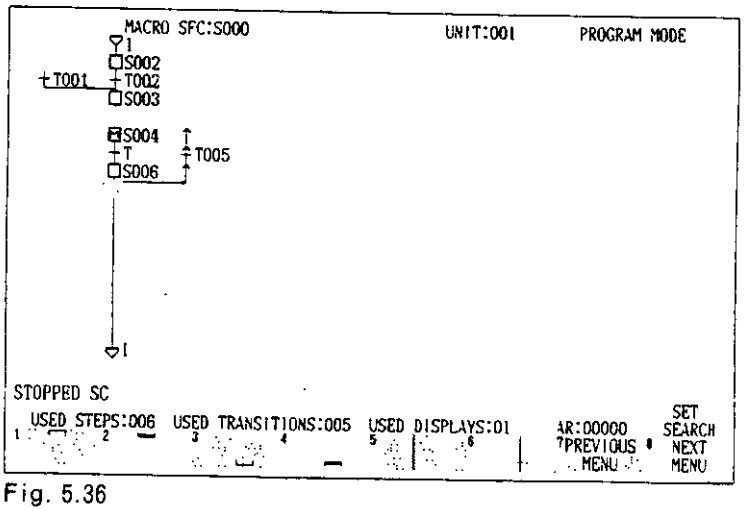


Fig. 5.36

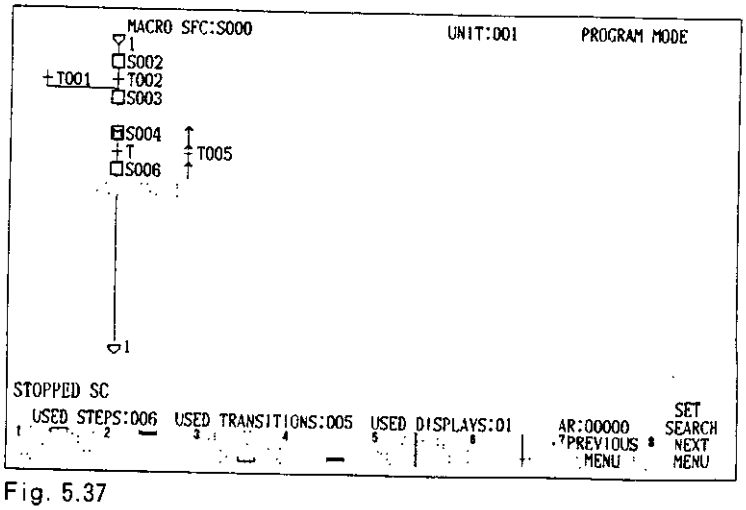


Fig. 5.37

NOTE

To delete the divergence, convergence or loop which have been input under the transition element, use ↓T .

5.1.3 SFC Display

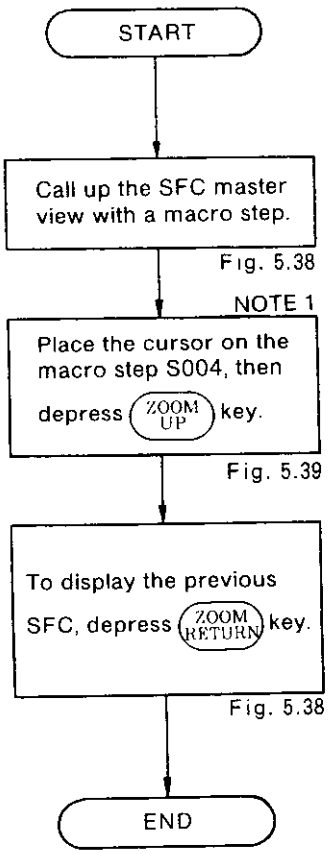
This section describes the operations to display an SFC that has been stored in memory. The procedure down to the display of the master view is the same as described in Par. 5.1 "SFC FLOW PROCESSING".

(1) ZOOM DISPLAY

This operation displays an expanded view from the macro step of the master or expanded view of an SFC. The label keys (ZOOM UP) and (ZOOM RETURN) are used in this operation.

POINT

- The master or expanded view must contain a macro step (M).
- The cursor must be in the SFC area.



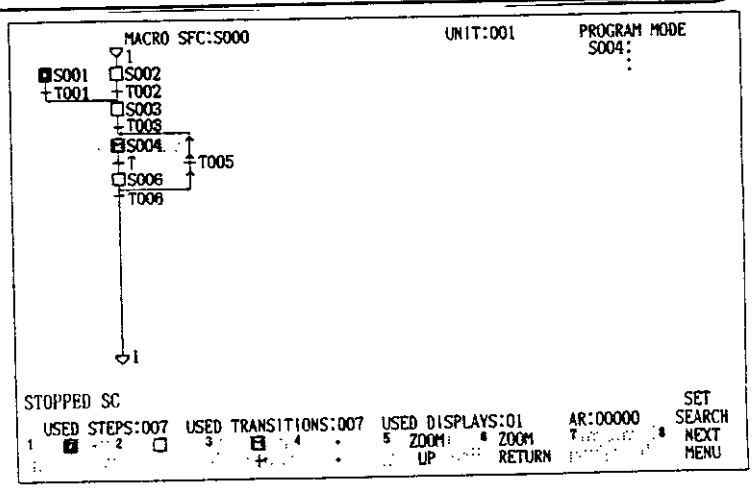


Fig. 5.38

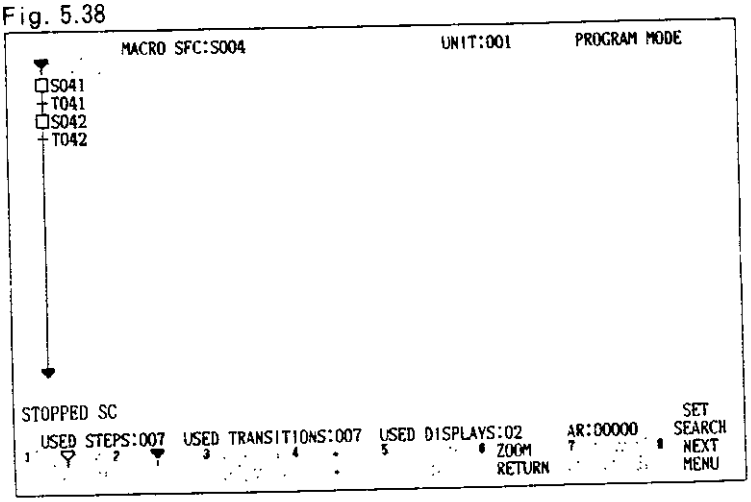


Fig. 5.39

NOTE

1. If there is no expanded view, a new expanded view is displayed. Then the SFC storing operation can be continued.
2. If a macro step is used in Fig. 5.39, continue operation with (ZOOM UP) key.
3. Function keys [ZOOM UP] and [ZOOM RETN] are also available.

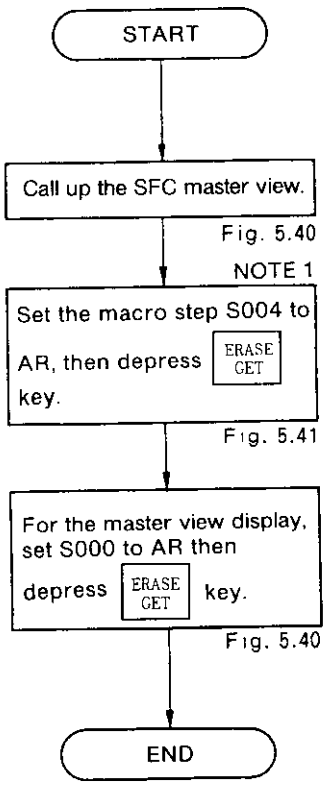
5.1.3 SFC Display (Cont'd)

(2) NUMBER ENTRY DISPLAY

In this operation, a desired step number is entered to call up the SFC screen. This involves use of the function key [ERASE GET]

POINT

- The step number for the master view is fixed at "S000".
- The cursor must be in the SFC area.



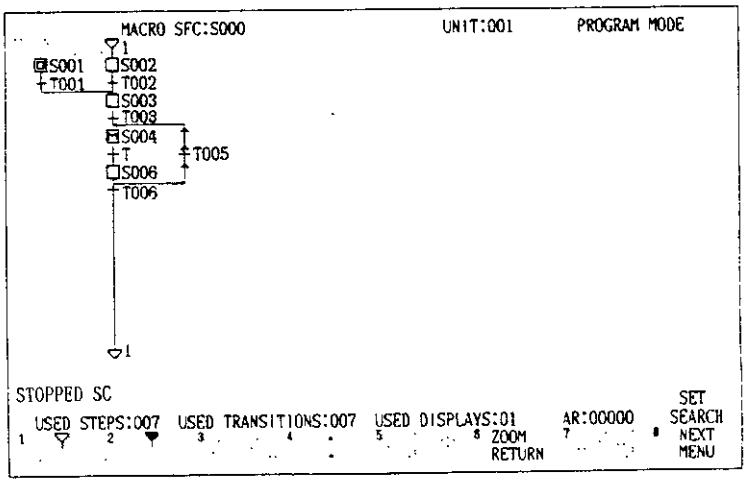


Fig. 5.40

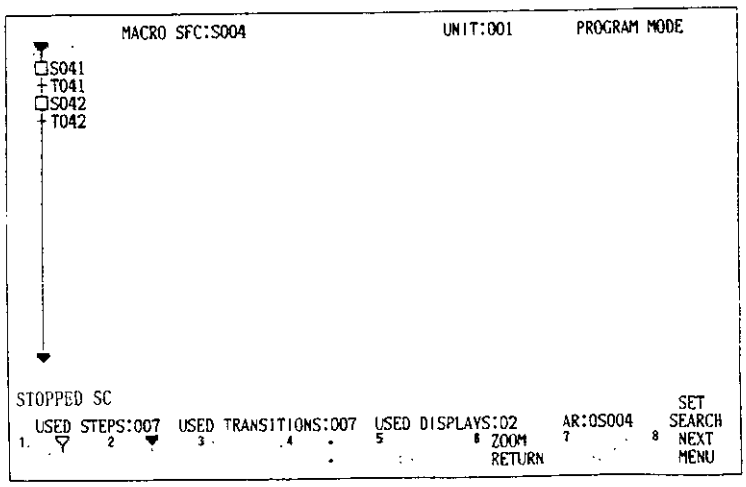


Fig. 5.41

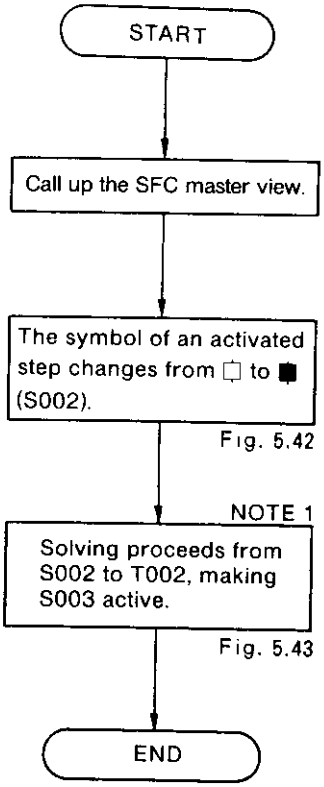
NOTE

1. If there is no expanded view, a new expanded view is displayed. Then the SFC storing operation can be continued.
2. The expanded view is called up in one of the two cases, where: the step number of the expanded view is used as a macro step, or the previous macro step screen remains when the reference number of the macro step has been altered.

(3) ACTIVE DISPLAY

This operation permits seeing how each step of SFC evolves into active status.

POINT • GL60S should be started.



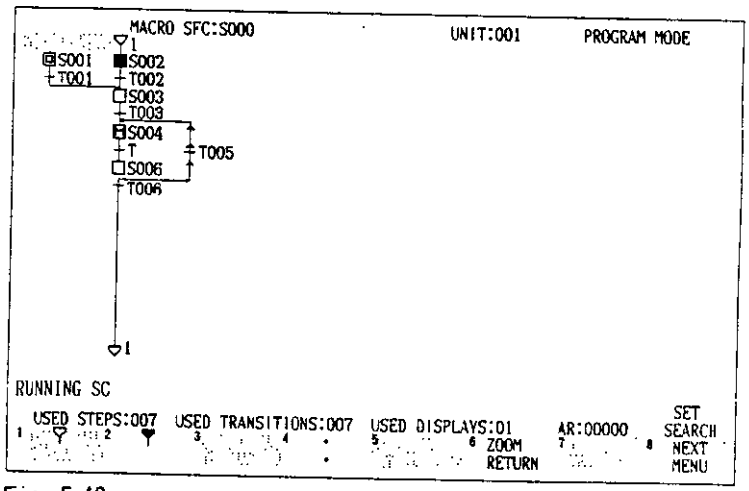


Fig. 5.42

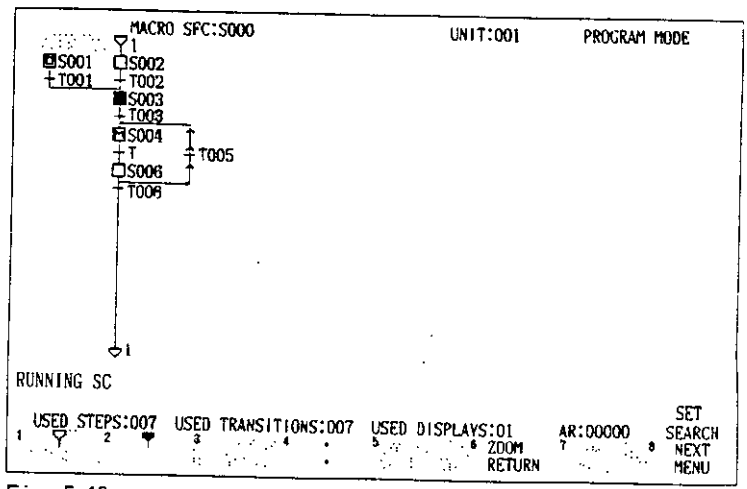


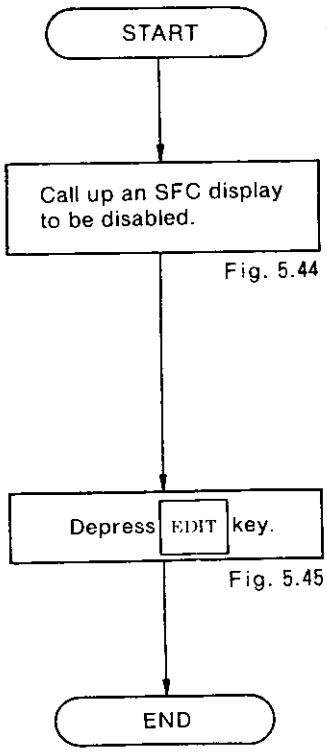
Fig. 5.43

NOTE

1. The element displayed for the active step changes from □ to ■.
2. If GL60S is out of operation, the active step remains displayed as ■, without proceeding to the next step.

5.1.4 SFC Simulation

This section illustrates how to set or reset the simulated status of a step. This operation is the same as the status altering described in Par. 4.2 "STATUS DISPLAY", except for use of the function key [EDIT]. Shown below is the procedure down to the display of the simulation screen.



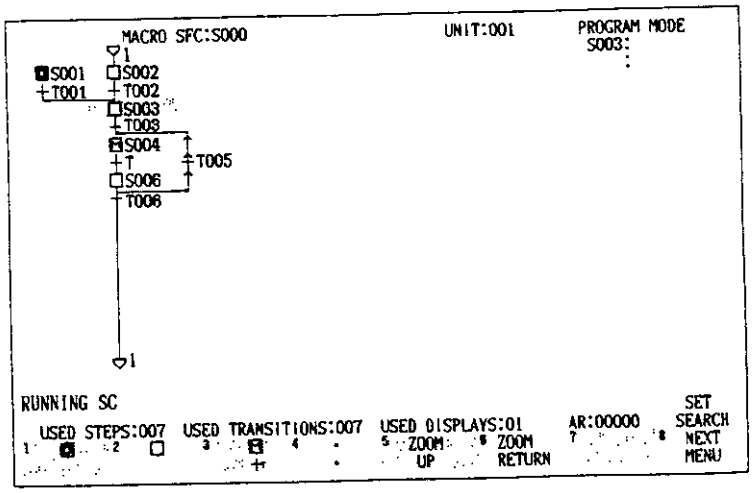


Fig. 5.44

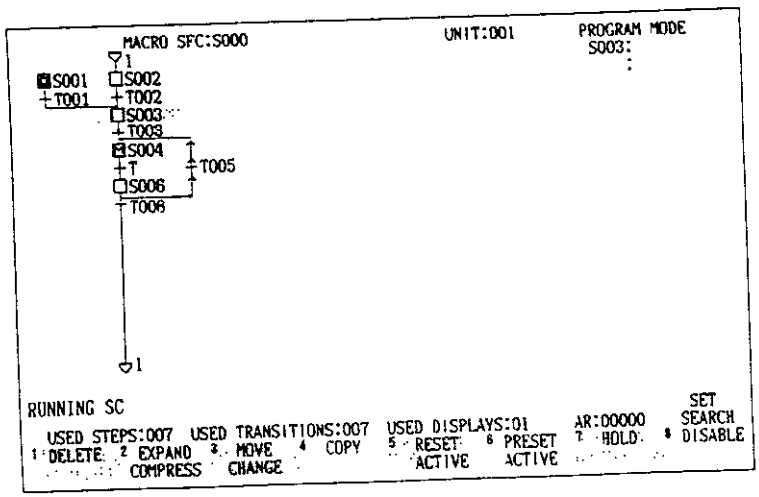


Fig. 5.45

NOTE

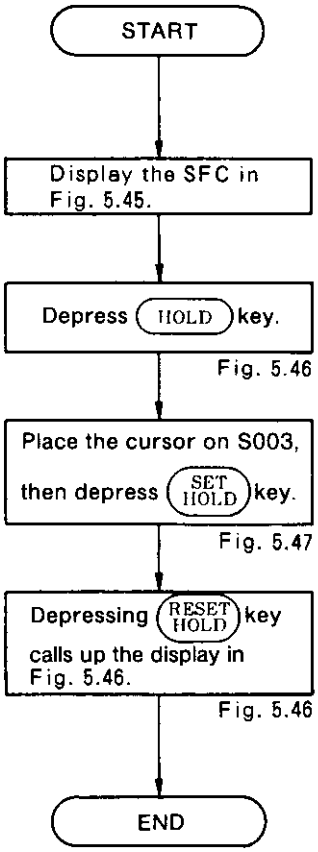
1. This operation is only available in the program mode.
2. The memory protect switch of GL60S must be set to OFF.
3. To recover the normal SFC operation after this operation, reset the hold or disable status if it has been set.
4. To recover the normal SFC operation after any simulated resetting or presetting of a step, follow NOTE 3 above, then resume operation from the initial step.
5. To return to the original label, depress [EDIT] and [CHG NODE] keys in this order.

(1) HOLD OPERATION

This operation holds a step (so the step is maintained in active status).

POINT

- The cursor must be set to the step to be altered.
- Active status does not proceed from an active-held step to the next step.



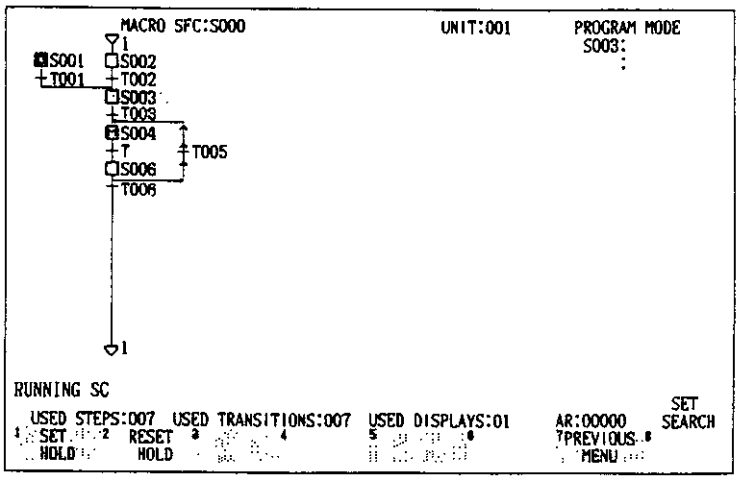


Fig. 5.46

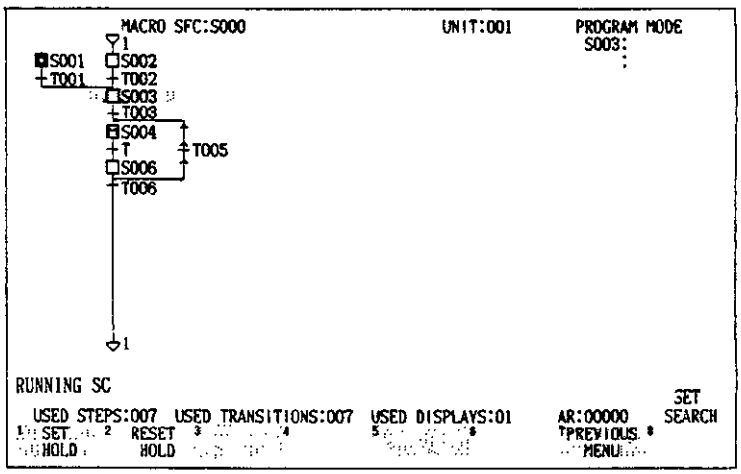


Fig. 5.47

NOTE

1. SET HOLD key is effective for an inactive step only.
2. RESET HOLD key is effective for an active step only.
3. A step in held with SET HOLD key should be reset with RESET HOLD key to clear the hold status.

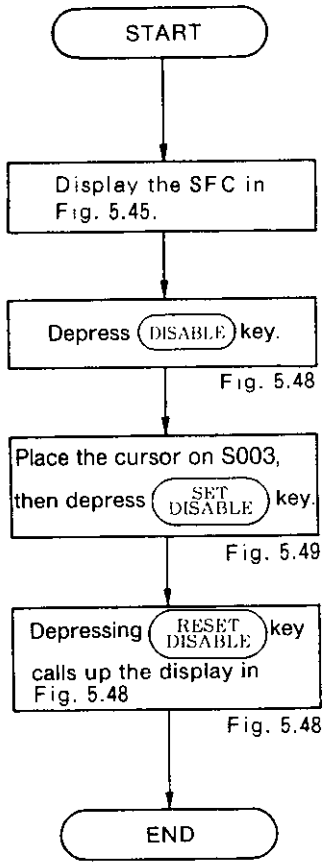
5.1.4 SFC Simulation (Cont'd)

(2) DISABLE OPERATION

This operation disables a step (so that step proceeding is disabled).

POINT

- The cursor must be set to the step to be altered.
- Active status does not proceed to a disabled step.



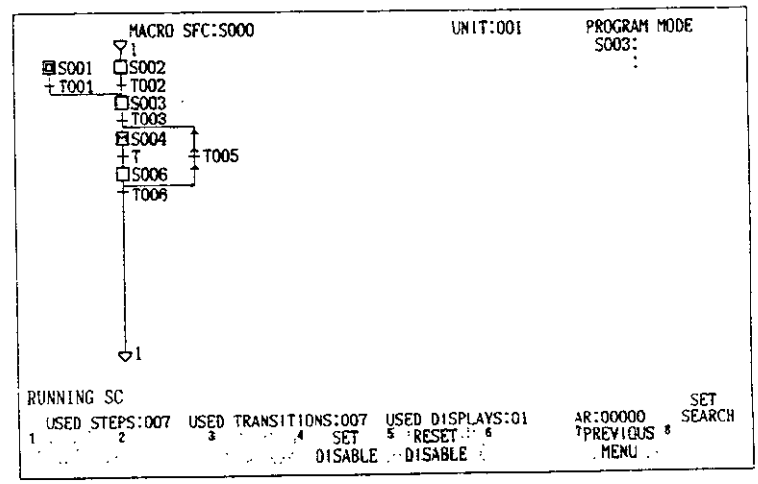


Fig. 5.48

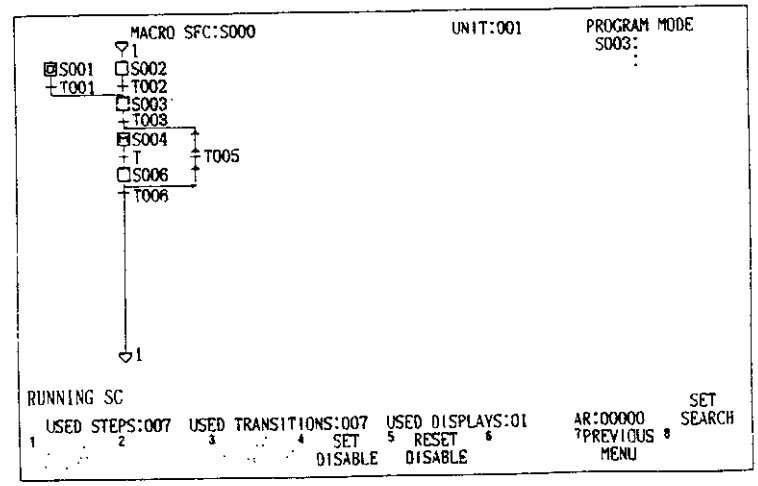


Fig. 5.49

NOTE

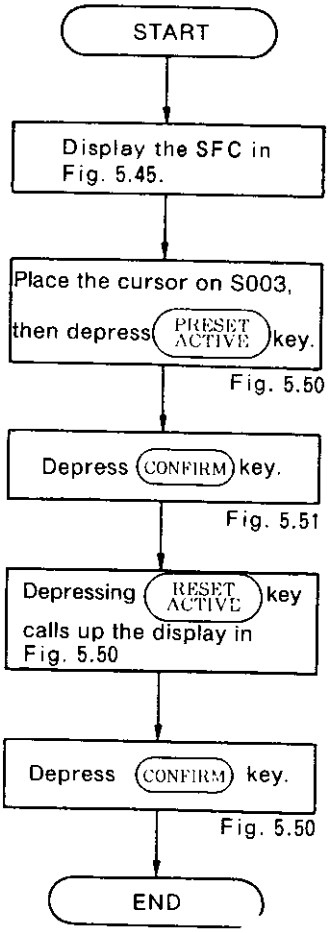
1. SET DISABLE key is not effective for a step which is in active or hold status.
2. RESET DISABLE key is not effective for a step which is in hold status.
3. A step disabled with SET DISABLE key should be reset with RESET DISABLE key to clear the disable status.

(3) PRESET/RESET OPERATION

Preset operation activates a step. Reset operation inactivates a step.

POINT

- The cursor must be set to the step to be altered.



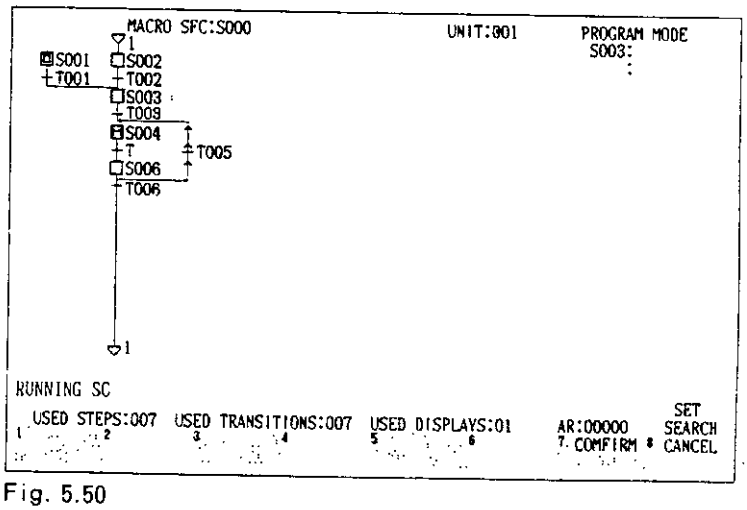


Fig. 5.50

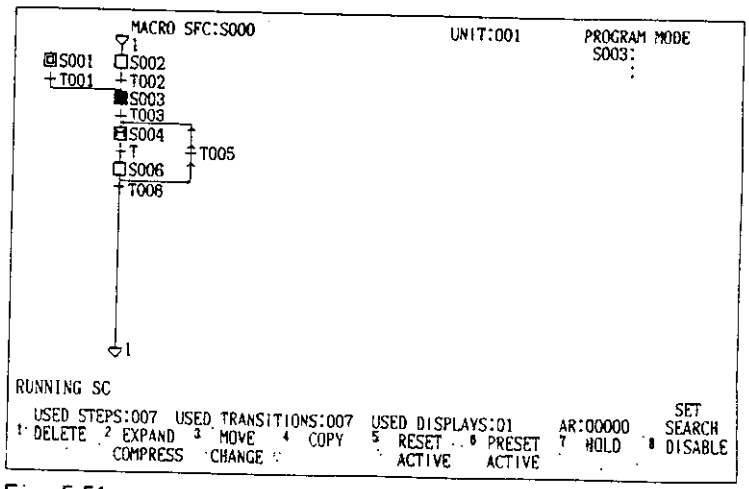


Fig. 5.51

NOTE

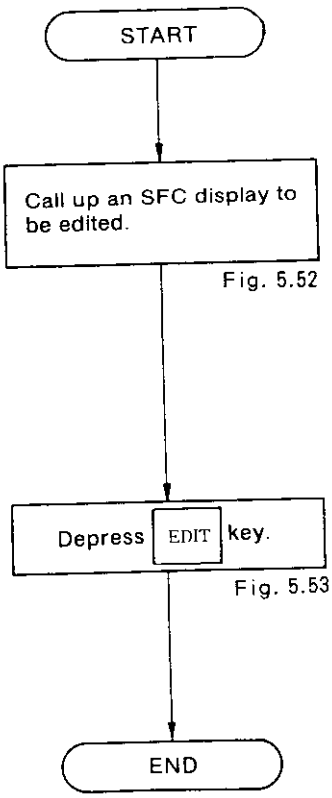
1. PRESET ACTIVE key is not effective for an active step.
2. RESET ACTIVE key is not effective for an inactive step.

5.1.5 SFC Edit Operation

This section describes the operations for editing the flow of an SFC. The editing uses the function key [EDIT].

- Simultaneously deleting an element and action circuit (transition condition circuit) of an SFC. ..... (DELETE)
- Expanding/compressing the lines or columns of an SFC flow (EXPAND COMPRESS)
- Moving an element, or changing an action circuit between steps (MOVE CHANGE)
- Copying a line or column of an SFC flow ..... (COPY)

Shown below are the procedures down to display of the edit operation screen.



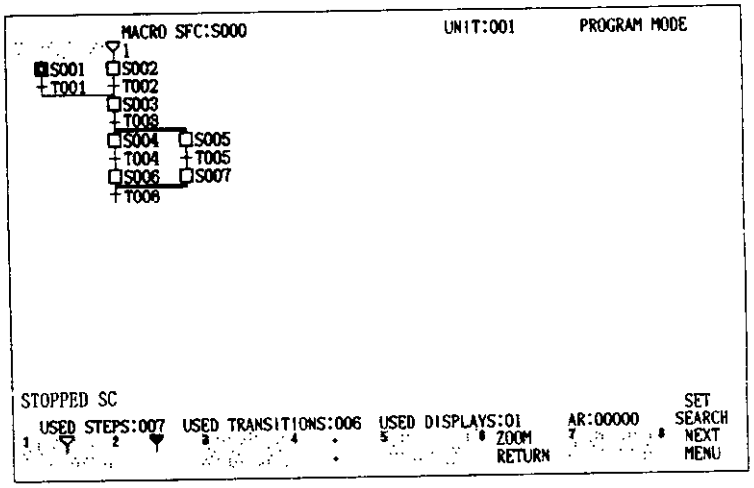


Fig. 5.52

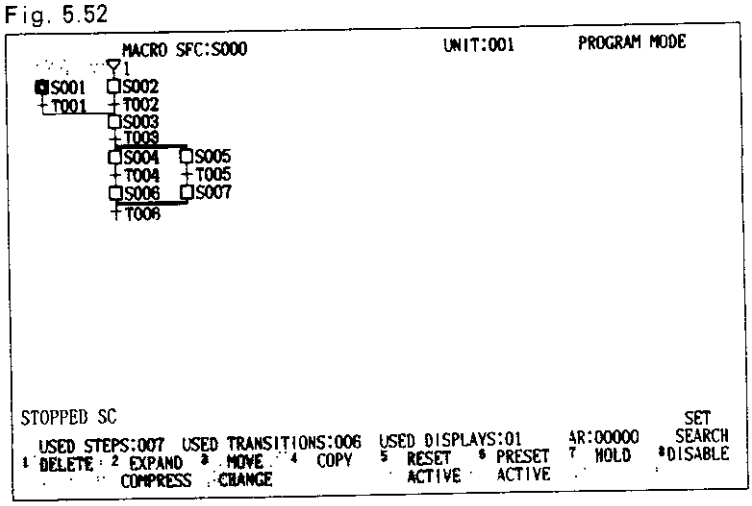


Fig. 5.53

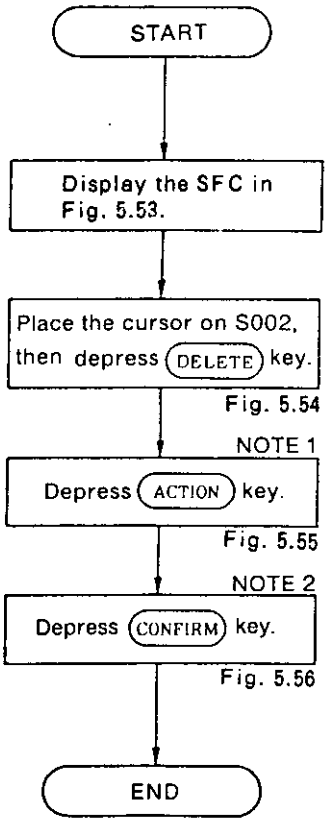
NOTE

1. This operation is only available in the program mode.
2. The memory protect switch of GL60S must be set to OFF.
3. To return to the original labels, depress [CHG NODE] key.

(1) DELETE

This operation simultaneously deletes a step element and action circuit, or a transition element and transition condition circuit, for an SFC.

POINT • The GL60S memory protect switch must be set to OFF.



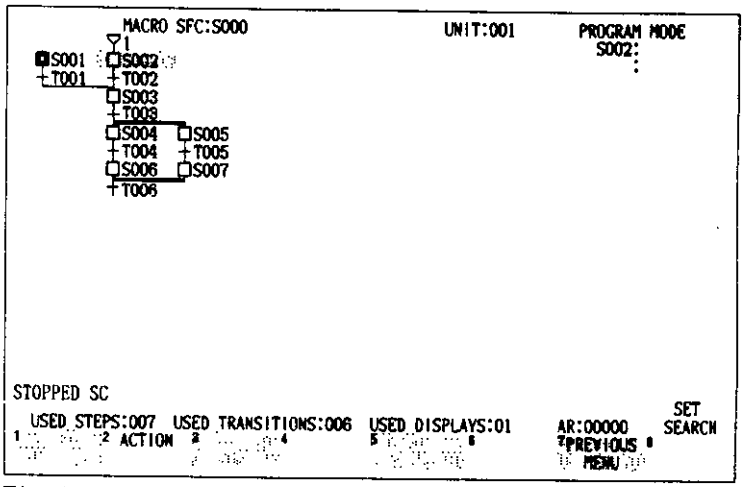


Fig. 5.54

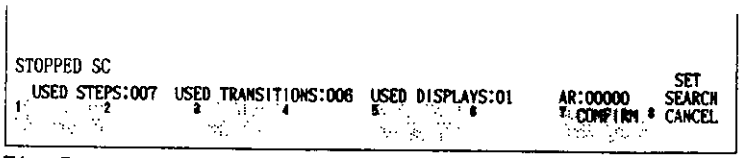


Fig. 5.55

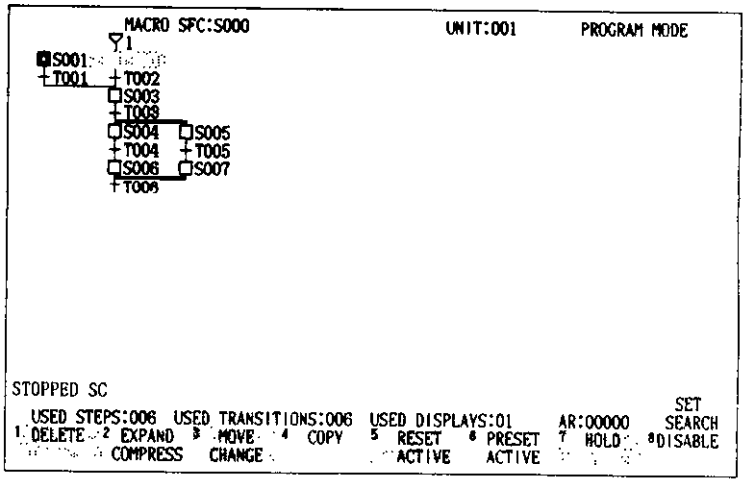


Fig. 5.56

NOTE

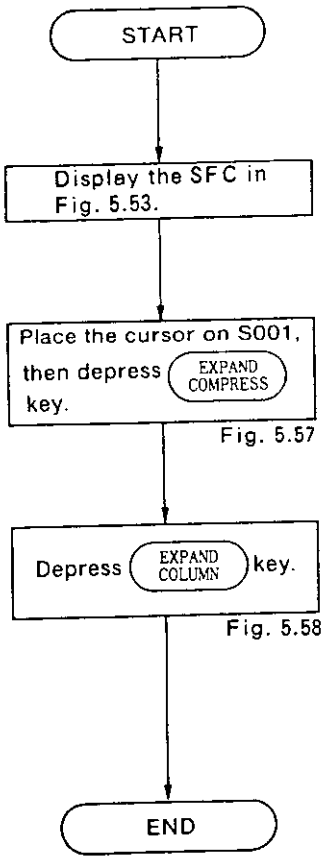
1. If the cursor is on a transition element, depress (TRANSITION) key.
2. Depressing (CANCEL) key at this point causes a return to the display of Fig. 5.54.
3. This operation is not effective for an active step.
4. For a macro step, deletion must start with the expanded view.

5.1.5 SFC Edit Operation (Cont'd)

(2) EXPAND / COMPRESS ①

This operation expands an SFC to the next column on the right. The result is a simultaneous move of all elements includidng those in the cursor-placed column.

POINT · The GL60S memory protect switch must be set to OFF.



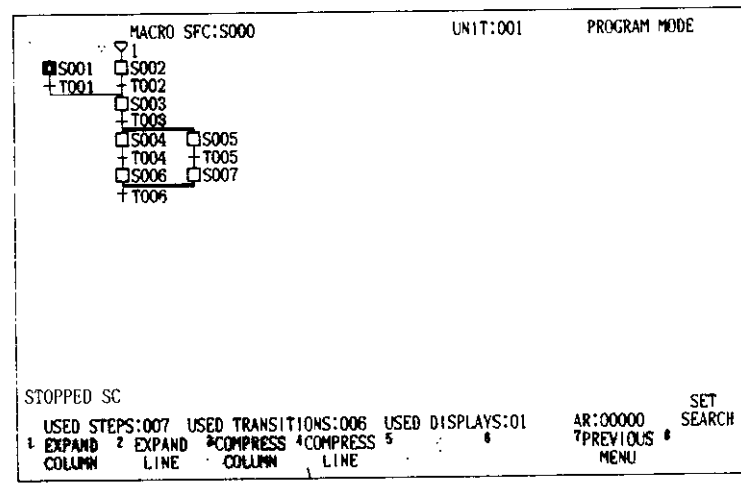


Fig. 5.57

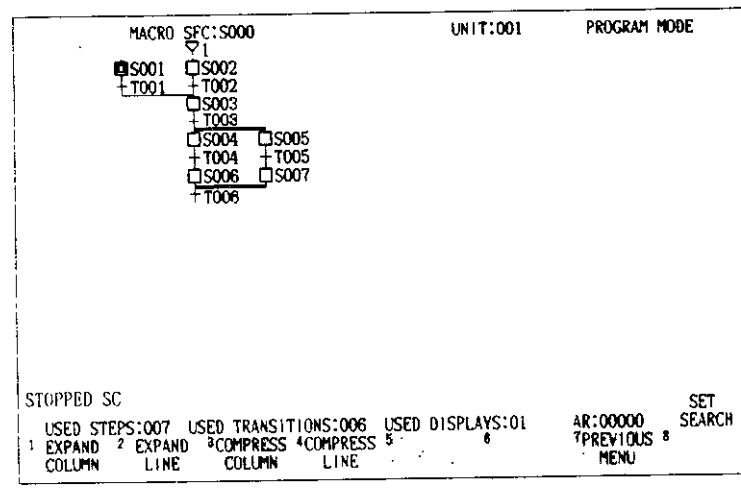


Fig. 5.58

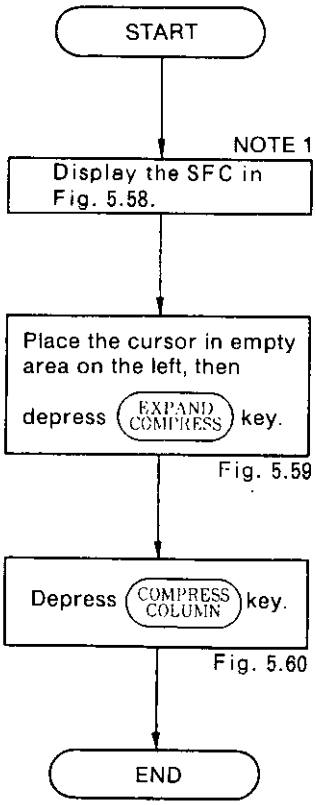
NOTE

1. The eighth column must not contain any element.
2. The seventh column must not contain a divergence, convergence, or loop.
3. This operation is not possible if there is an active step in columns to the right of the cursor-placed column.
4. To recover the label keys shown in Fig. 5.53, depress EDIT or PREVIOUS MENU key.

(2) EXPAND/COMPRESS ②

This operation compresses on SFC to the next column on the left. The result is a simultaneous move of all elements on the right from the cursor.

POINT ·The GL60S memory protect switch must be set to OFF.



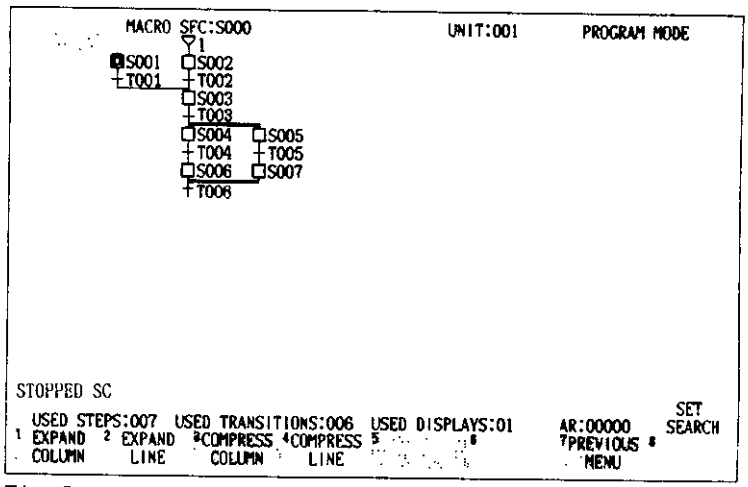


Fig. 5.59

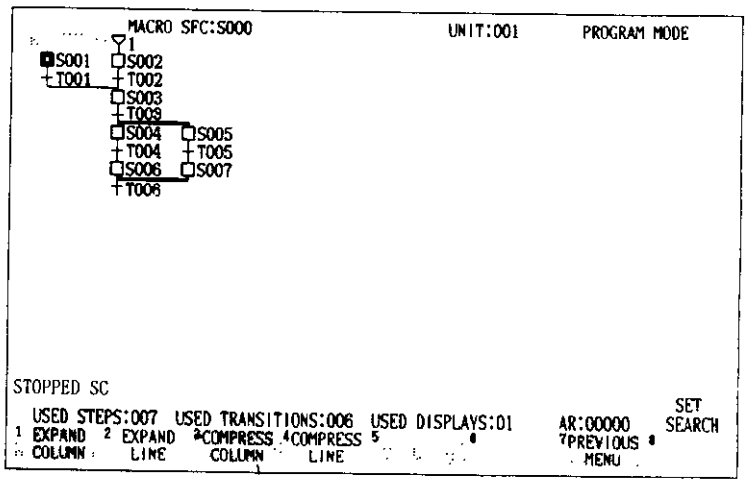


Fig. 5.60

NOTE

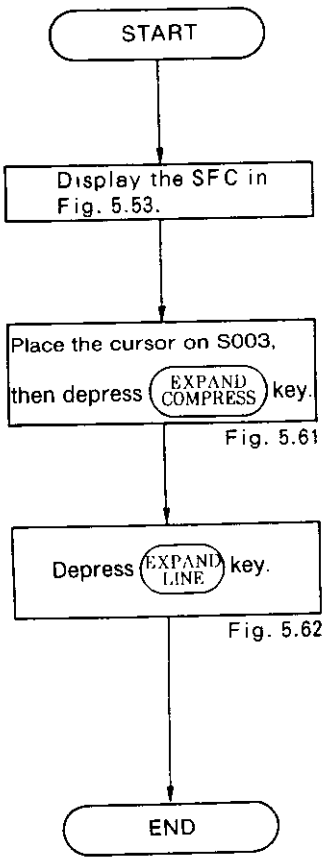
1. This block applies when the labels are as shown in Fig. 5.53.
2. There must be no element at the cursor position.
3. This operation is not possible if there is an active step in columns to the right of the cursor.
4. To recover the label keys shown in Fig. 5.53, depress EDIT or PREVIOUS MENU key.

5.1.5 SFC Edit Operation (Cont'd)

(2) EXPAND/COMPRESS ③

This operation expends an SFC to the next lower line. The result is a simultaneous move of all elements including those in the cursor-placed line.

POINT · The GL60S memory protect switch must be set to OFF.



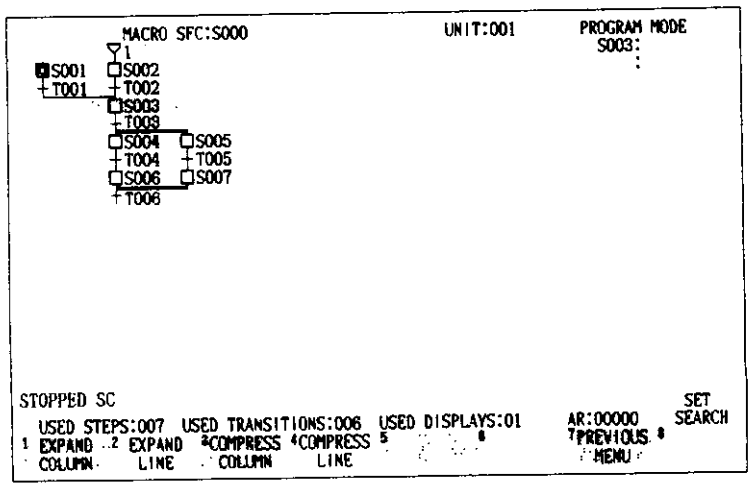


Fig. 5.61

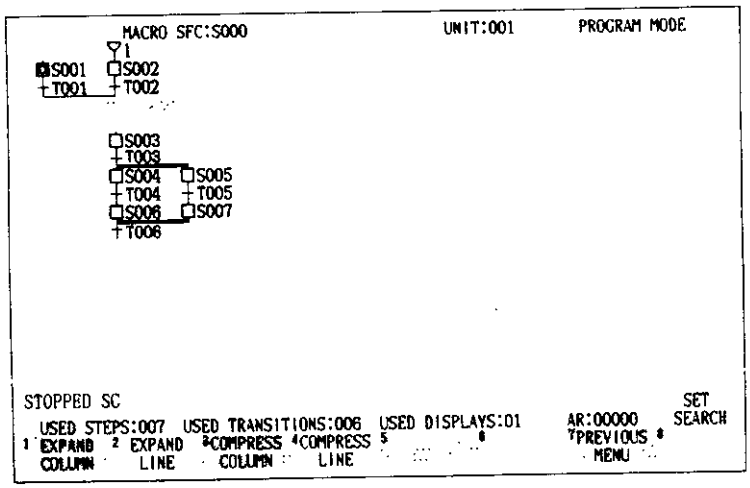


Fig. 5.62

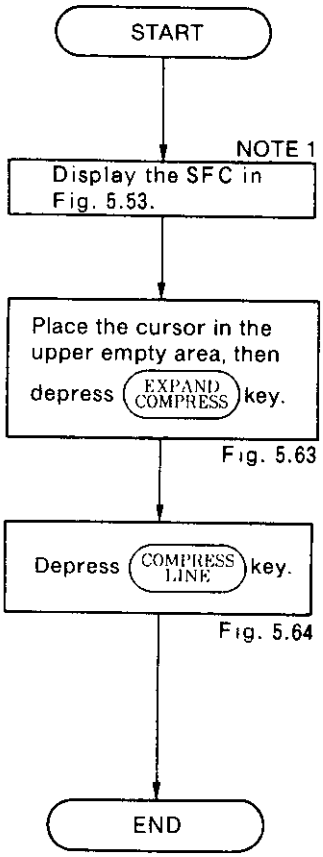
NOTE

1. There must be available the 8th step line and the 8th transition column which are empty and do not contain a TO (⏢) or macro return (⏷).
2. This operation is not possible if there is an active step in lines under the cursor-placed position.
3. To recover the label keys shown in Fig. 5.53, depress [EDIT] or PREVIOUS MENU key.
4. This operation is not possible if the cursor is on a FROM or TO line.

(2) EXPAND / COMPRESS ④

This operation compresses an SFC to the next upper line. The result is a simultaneous move of all elements under the cursor.

POINT · The GL60S memory protect switch must be set to OFF.



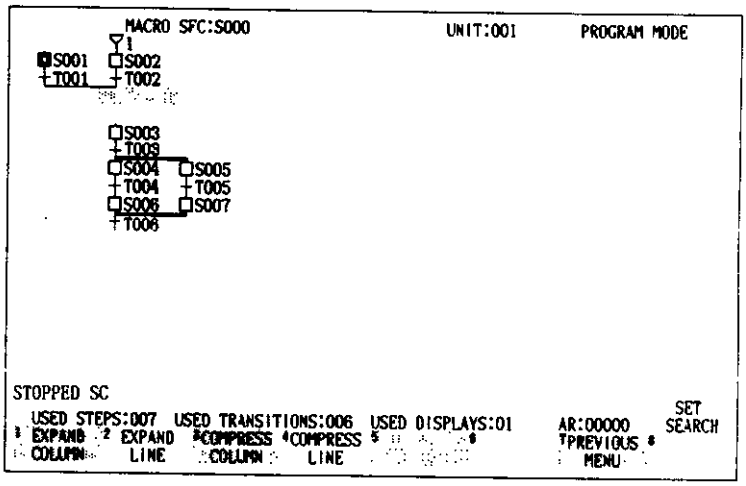


Fig. 5.63

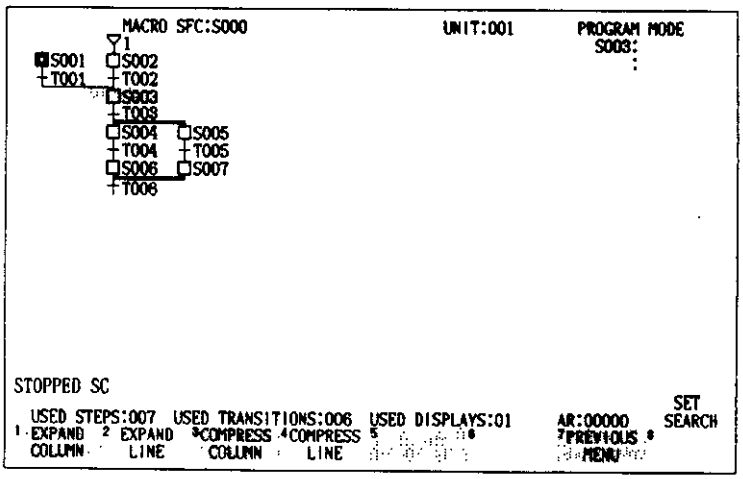


Fig. 5.64

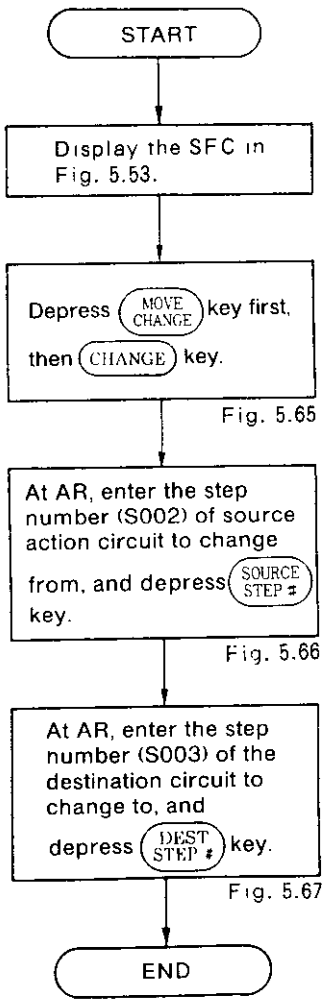
NOTE

1. This block applies when the labels are as shown in Fig. 5.53.
2. There must be no element at the cursor position.
3. This operation is not possible if there is an active step in lines under the cursor.
4. To recover the label keys shown in Fig. 5.53, depress EDIT or PREVIOUS MENU key.

(3) ACTION CIRCUIT EXCHANGE

This operation automatically changes an action circuit between two arbitrary steps. GL60 will immediately perform a solve using the action circuit that has been changed.

POINT · The GL60S memory protect switch must be set to OFF.



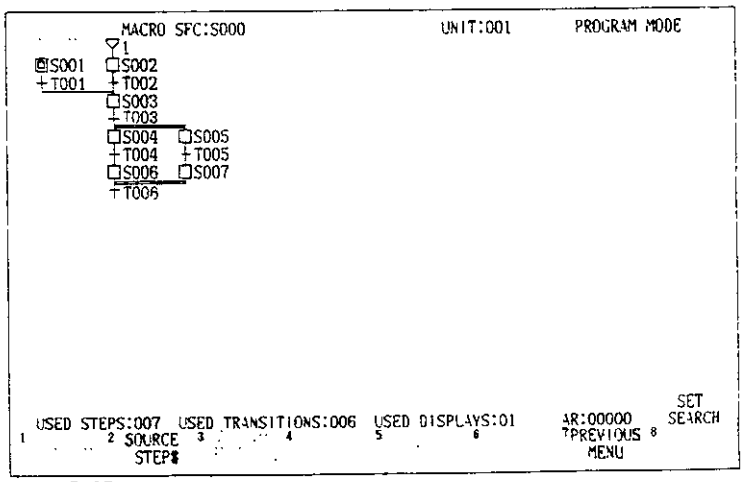


Fig. 5.65

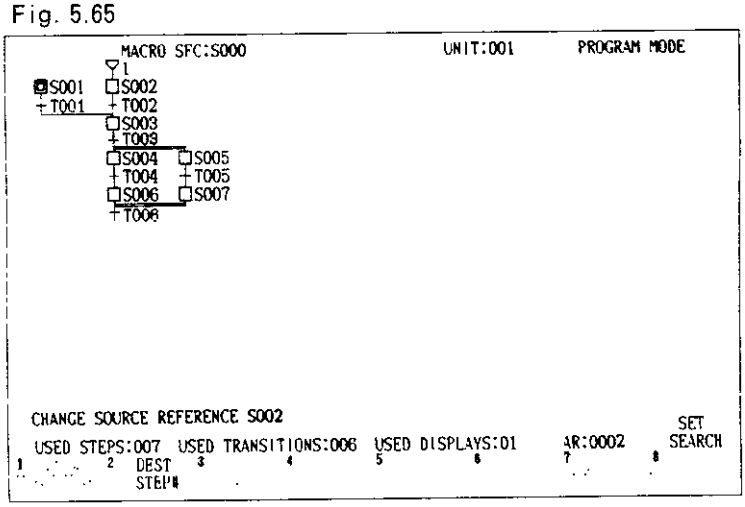


Fig. 5.66

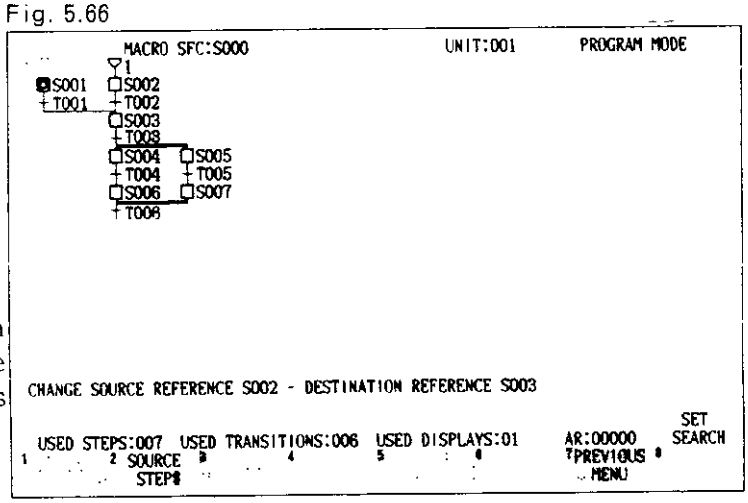


Fig. 5.67

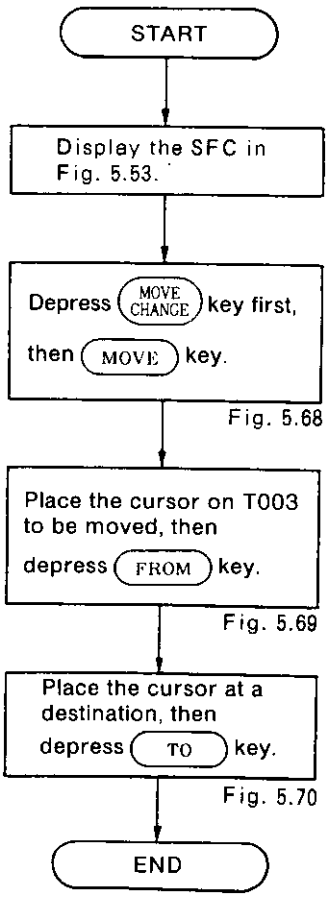
NOTE

1. Under the GL60S running, performing this operation may change the action. Care must be taken with this operation.
2. This operation is not possible on an active step.

(4) MOVE

This operation moves an SFC element within the same SFC sereen. One element is moved at a time, together with the divergence, convergence and loop which belong to the transition of the element being moved.

POINT · The GL60S memory protect switch must be set to OFF.



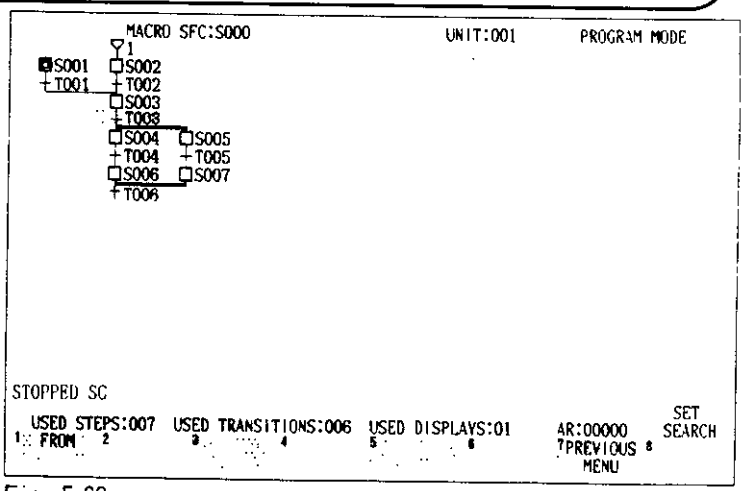


Fig. 5.68

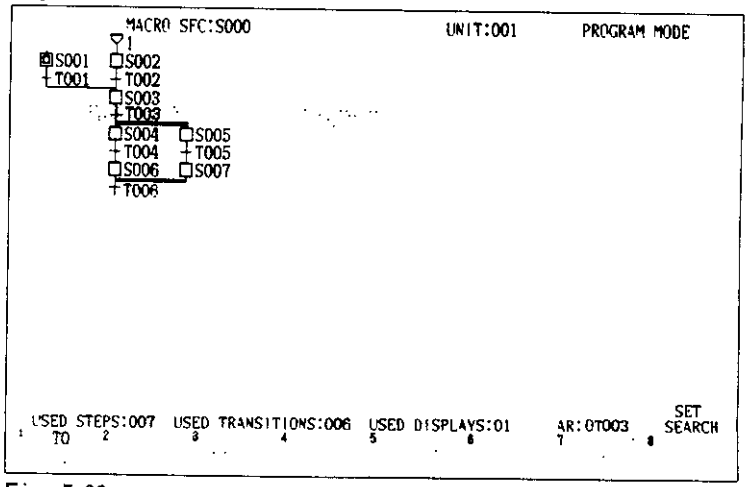


Fig. 5.69

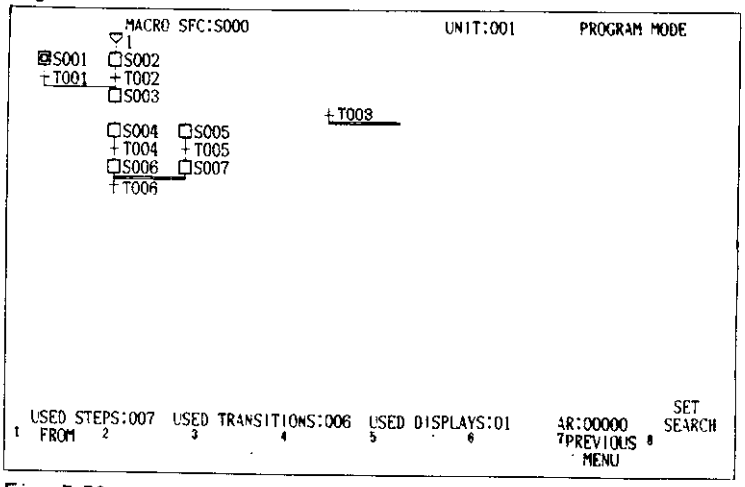


Fig. 5.70

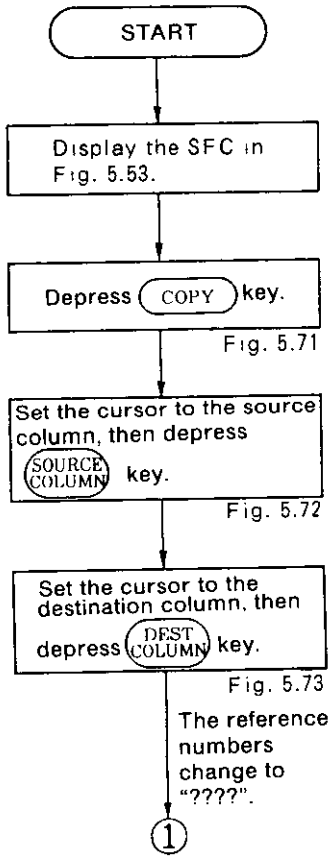
NOTE

1. This move cannot be made if the destination contains another element.
2. The destination can only be specified on the line of the same element.
3. This operation is not possible on an active step.

(5) COPY ①

This operation copies elements in a column to another column.

POINT • The GL60S memory protect switch must be set to OFF.



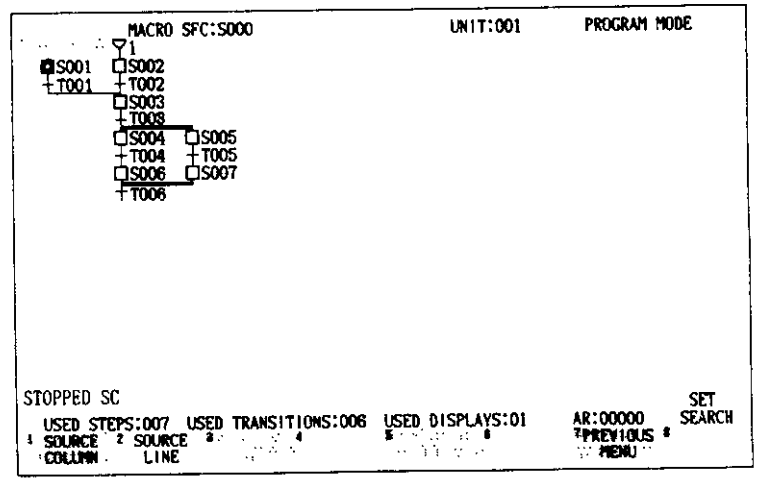


Fig. 5.71

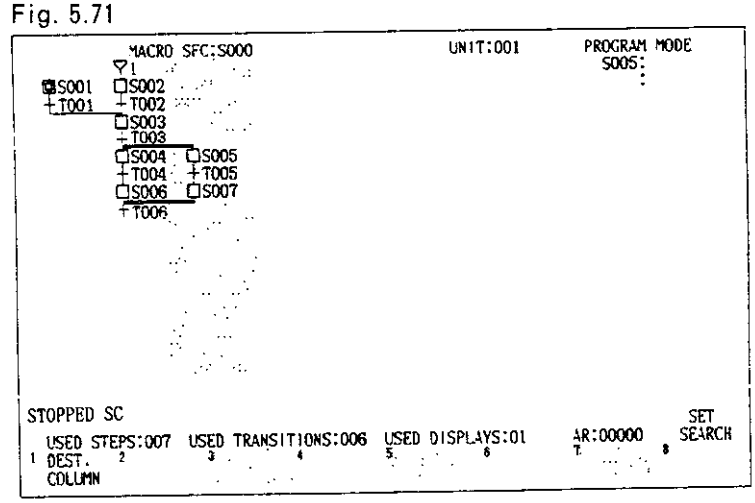


Fig. 5.72

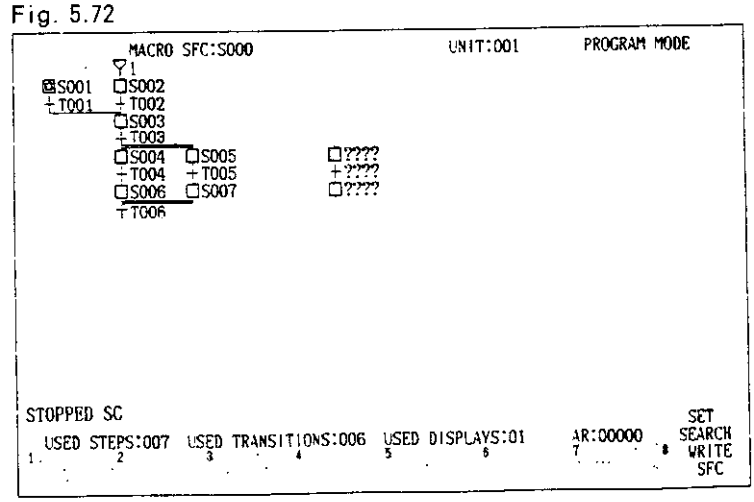
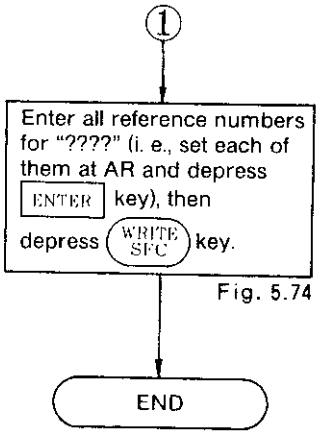


Fig. 5.73



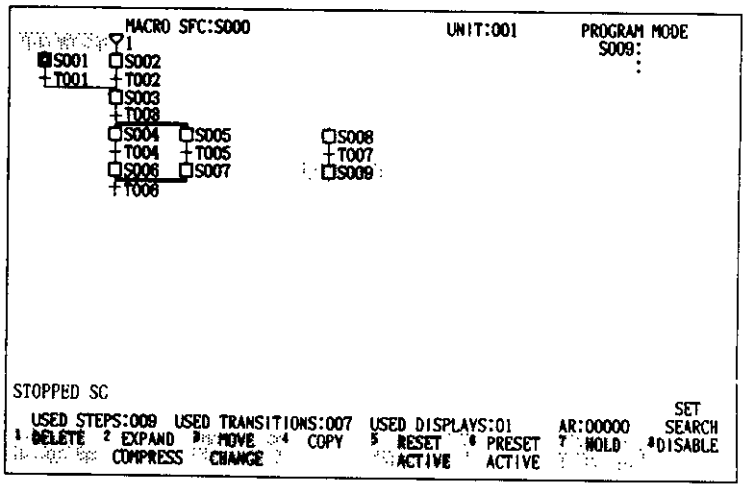


Fig. 5.74

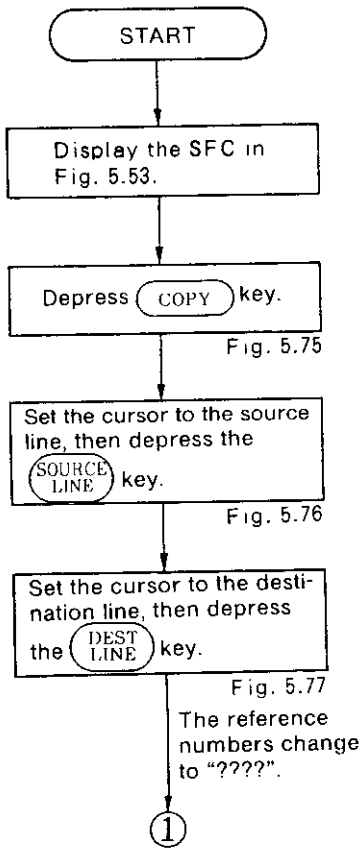
NOTE

1. The destination column must be entirely empty.
2. A macro entry (▼) that may be on the source line (FROM) is not copied to the destination.
3. An initial step (▣), if any, is not copied either.
4. The destination line is on the same line as in the original SFC.

(5) COPY ②

This operation copies elements in a line to another line.

POINT · The GL60S memory protect switch must be set to OFF.



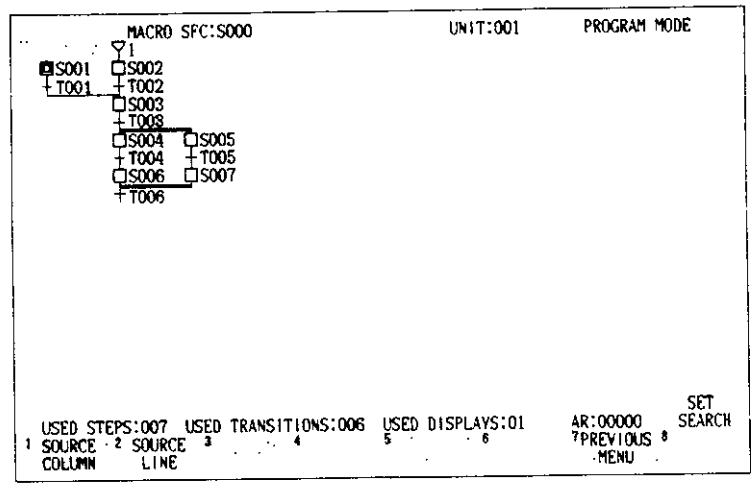


Fig. 5.75

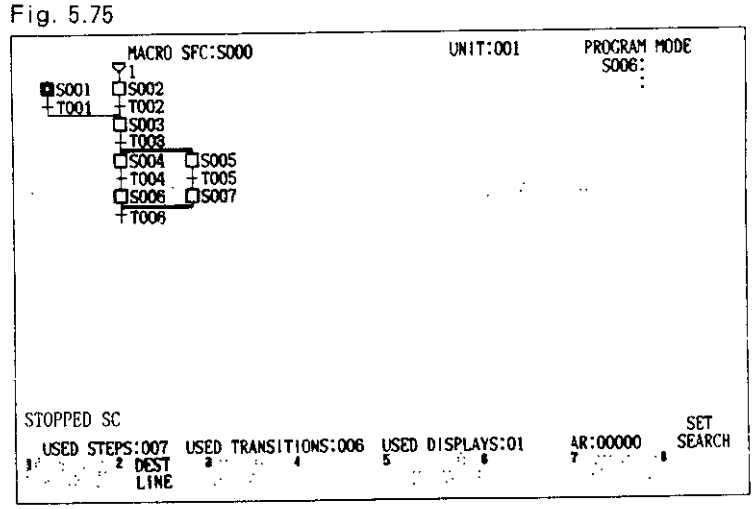


Fig. 5.76

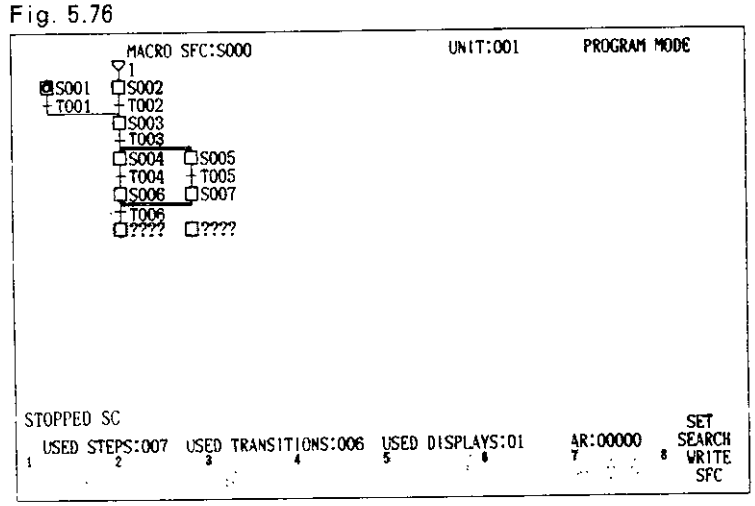


Fig. 5.77

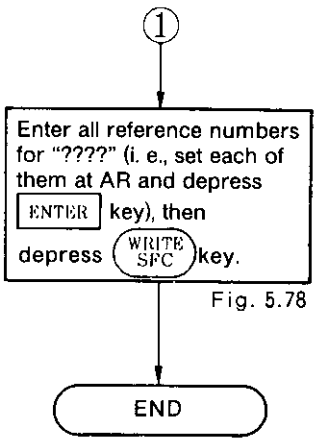


Fig. 5.78

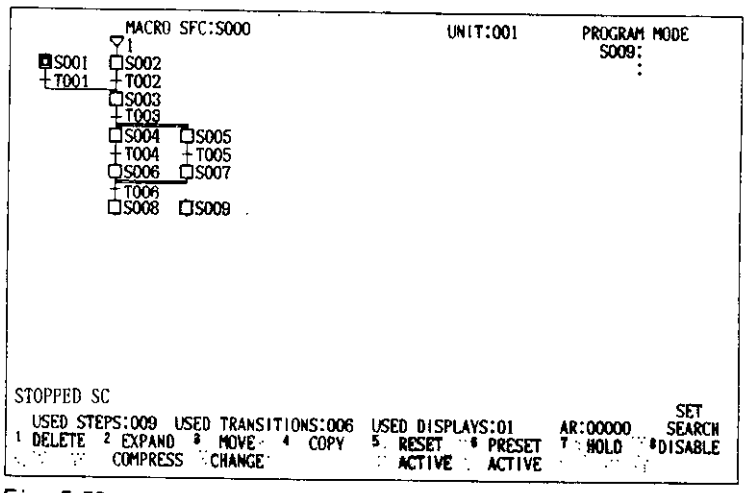


Fig. 5.78

NOTE

1. The destination line must be entirely empty.
2. A macro entry (▼), if any, cannot be copied.
3. An initial step (⊡), if any, cannot be copied either.
4. A step is copied to a step line, or a transition is copied to a transition line.

5.1.6 SFC Comment Editing

This section describes the operations for entering a comment for each step of SFC flow and for displaying the entered comments. Up to eight characters can be entered in each comment. Fig. 5.79 shows the comment editing area and an SFC flow.

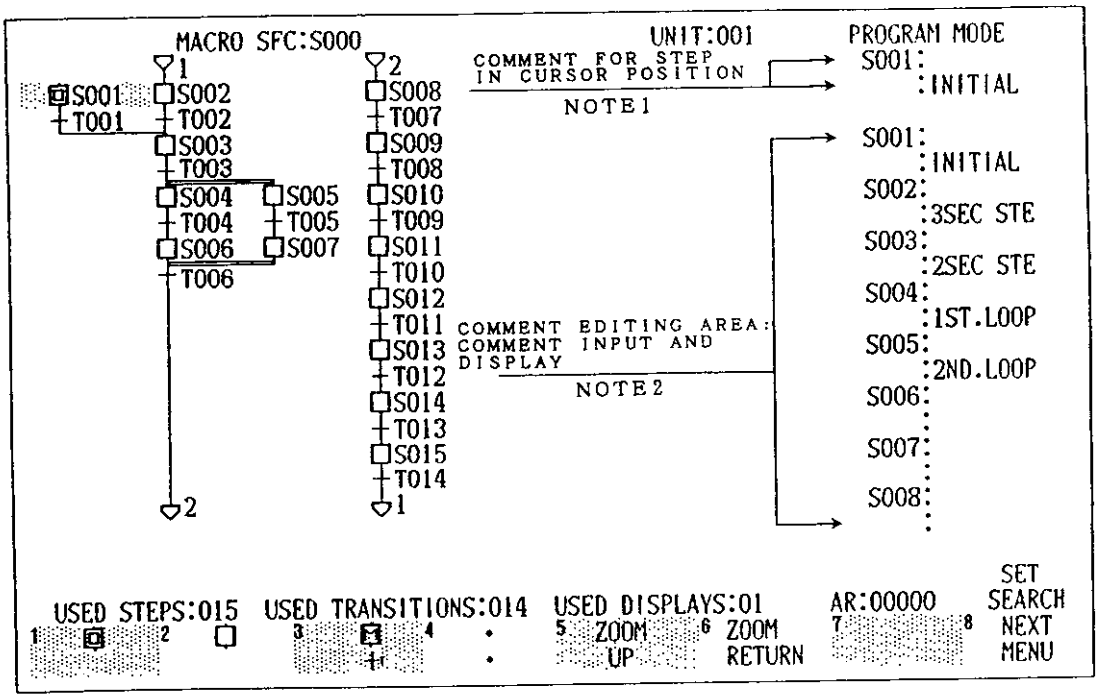


Fig. 5.79

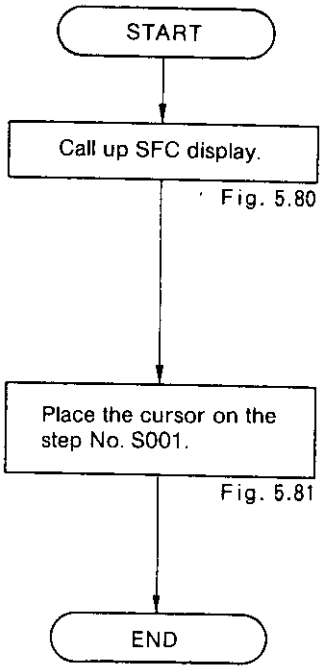
NOTE

1. A comment is only displayed when the cursor is placed on a step number of SFC flow.
2. To delete a comment for a step from the comment editing area on the screen, set the cursor to that step, then depress [SHIFT] and [ERASE GET] keys simultaneously.

(1) COMMENT DISPLAY ①

This operation displays the comment for a step of SFC flow by setting the cursor to that step.

POINT · The cursor must be set to the corresponding step number.



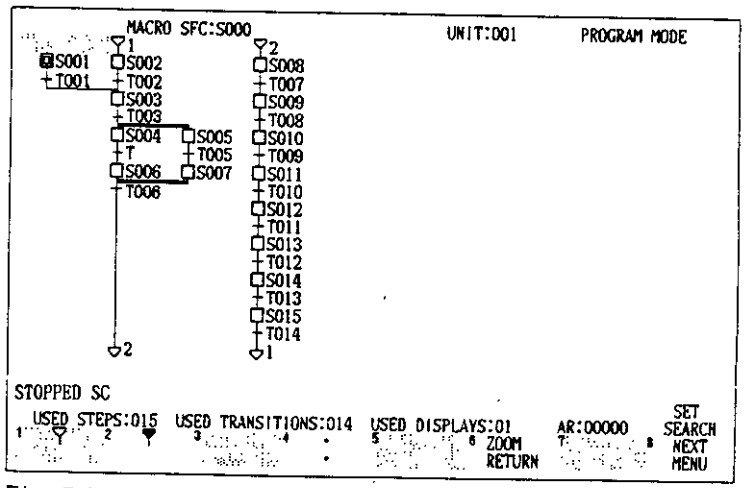


Fig. 5.80

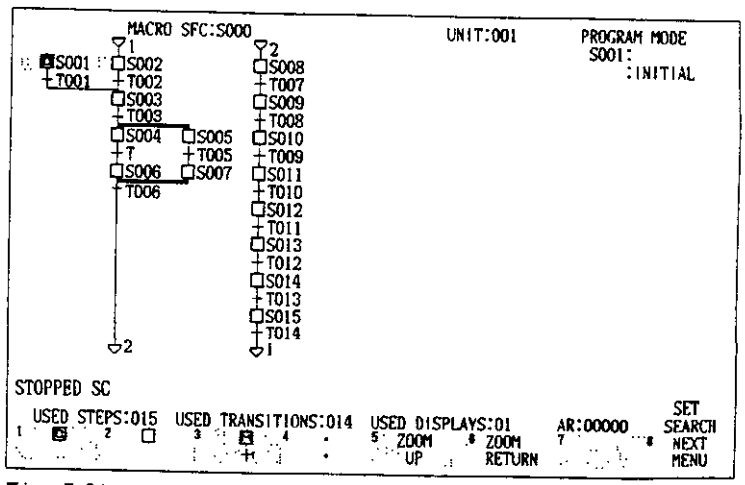


Fig. 5.81

NOTE

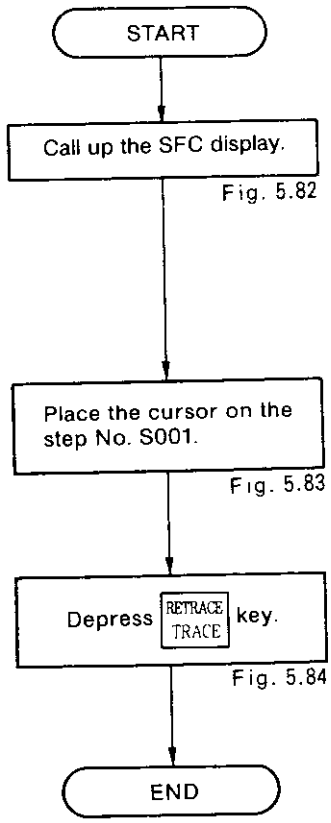
The comment area called up through this operation cannot be used for comment editing (writing/deleting).

5.1.6 SFC Comment Editing (Cont'd)

(1) COMMENT DISPLAY ②

In this operation, the comment for a step of SFC flow is displayed in the comment editing area by setting the cursor to that step number and then depressing [RETRC TRACE] key.

POINT The cursor must be set to the corresponding step number.



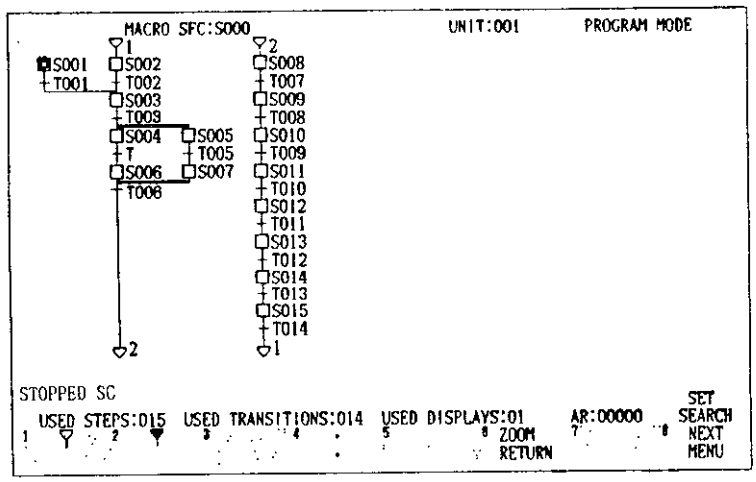


Fig. 5.82

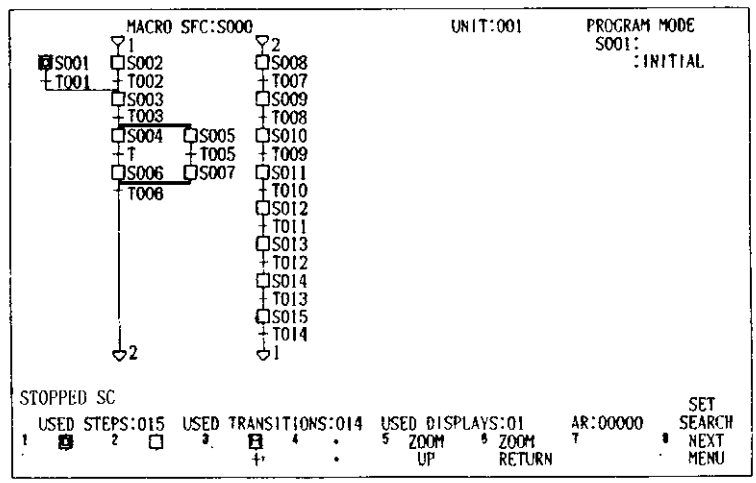


Fig. 5.83

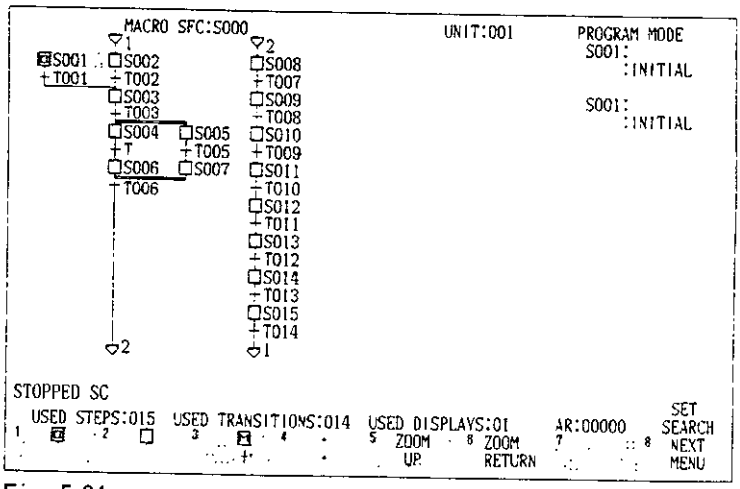


Fig. 5.84

NOTE

The comment area called up through this operation can be used for comment editing (writing/deleting).

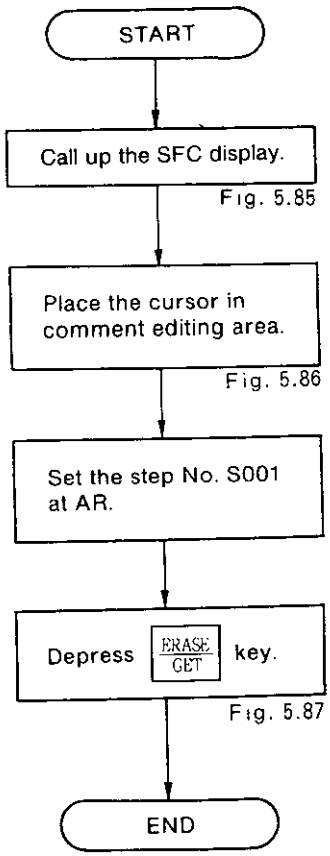
5.1.6 SFC Comment Editing (Cont'd)

(1) COMMENT DISPLAY ③

In this operation, a comment is displayed by setting the cursor in the comment editing area on the SFC screen, entering a step number and then depressing [ERASE GET] key.

POINT

· The cursor must be set in the comment editing area on the SFC display.



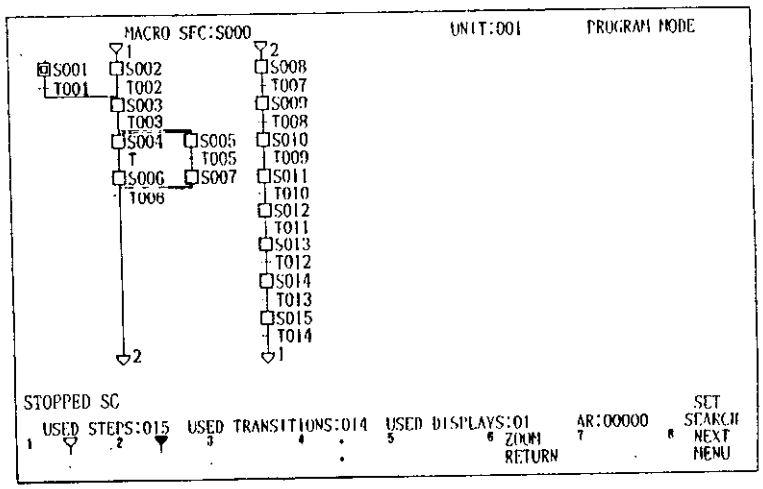


Fig. 5.85

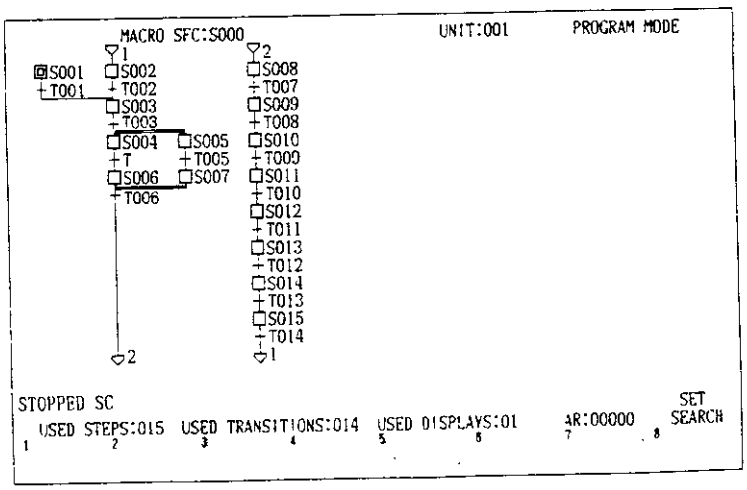


Fig. 5.86

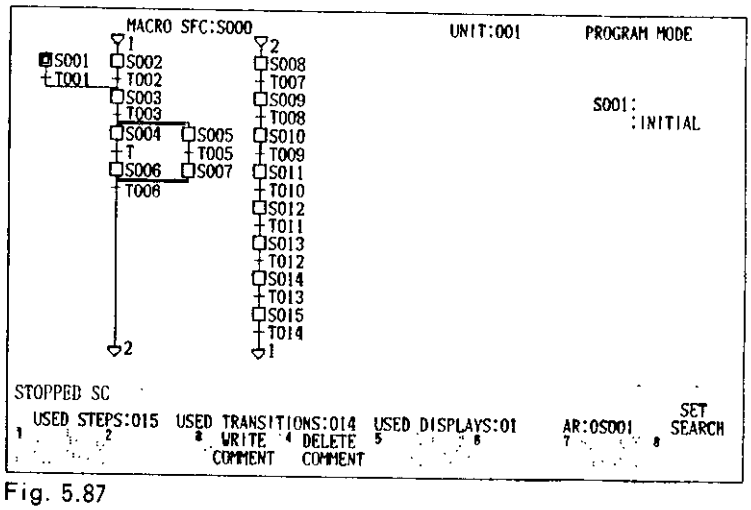


Fig. 5.87

NOTE

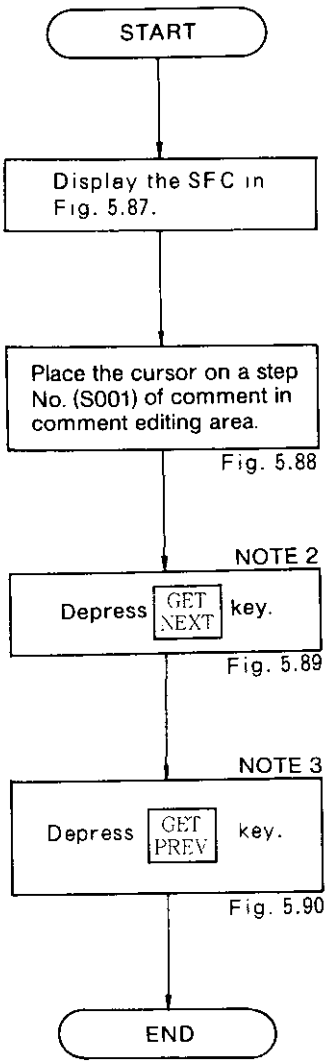
The comment area called up through this operation can be used for comment editing (writing/deleting).

5.1.6 SFC Comment Editing (Cont'd)

(1) COMMENT DISPLAY ④

This operation displays comments for each successive step in the comment editing area on the SFC screen. GET NEXT key is used alone, or together with GET PREV key.

POINT The cursor must be set in the comment editing area on the SFC display.



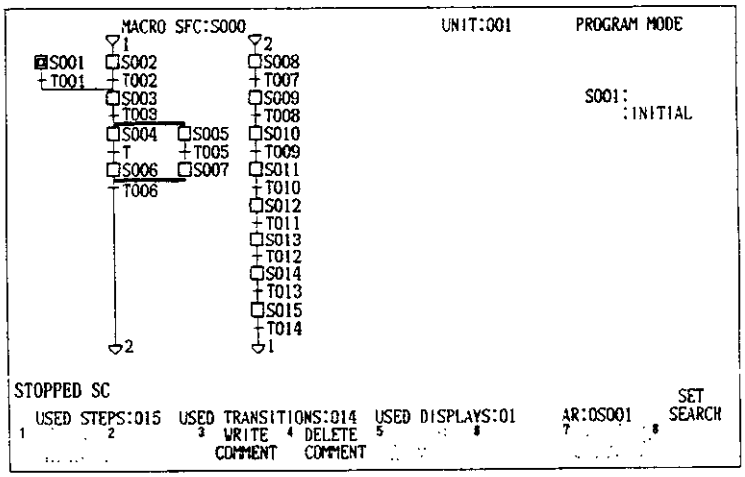


Fig. 5.88

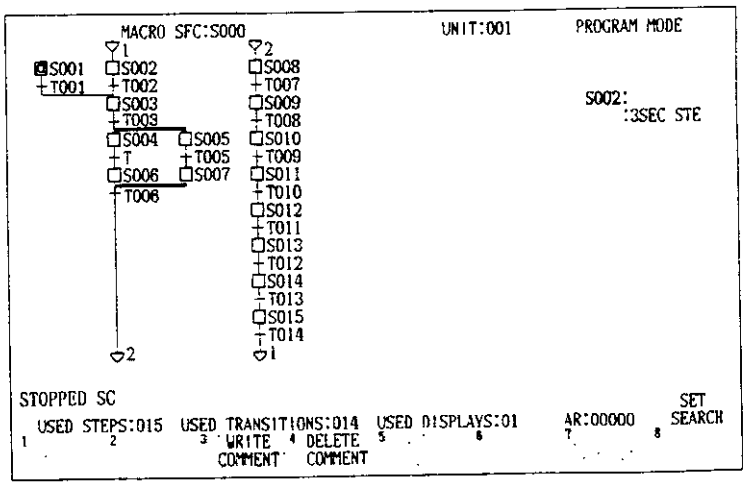


Fig. 5.89

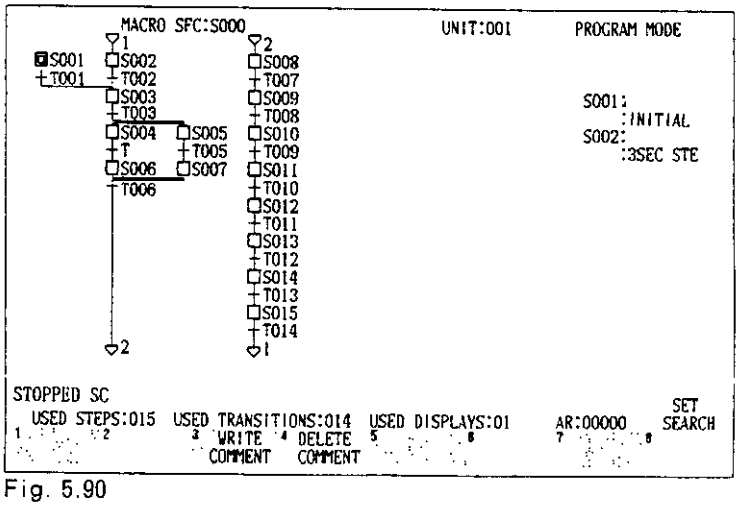


Fig. 5.90

NOTE

1. The comment area called up through this operation can be used for comment editing (writing/deleting).
2. This is to display the next step number. Only the cursor position is changed on the display.
3. This is to display the previous step number. The step number at the cursor position moves to the next lower line, with the previous step number appearing at the cursor position.

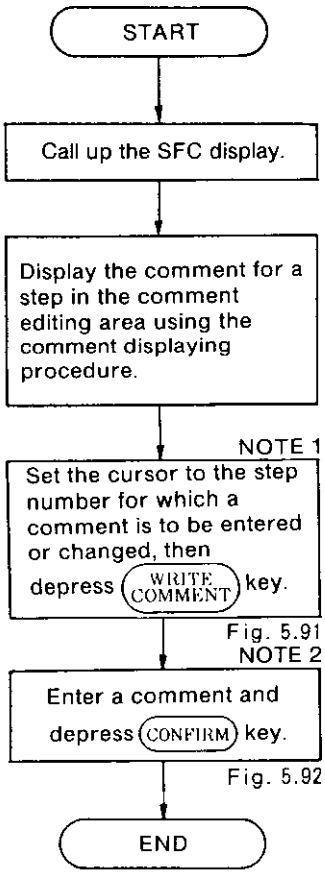
5.1.6 SFC Comment Editing (Cont'd)

(2) COMMENT WRITE

This operation enters a comment for a step.

POINT

- Up to eight characters can be entered for each comment.
- The cursor must be set in the comment editing area.
- The memory protect switch of GL60S must be set to OFF.



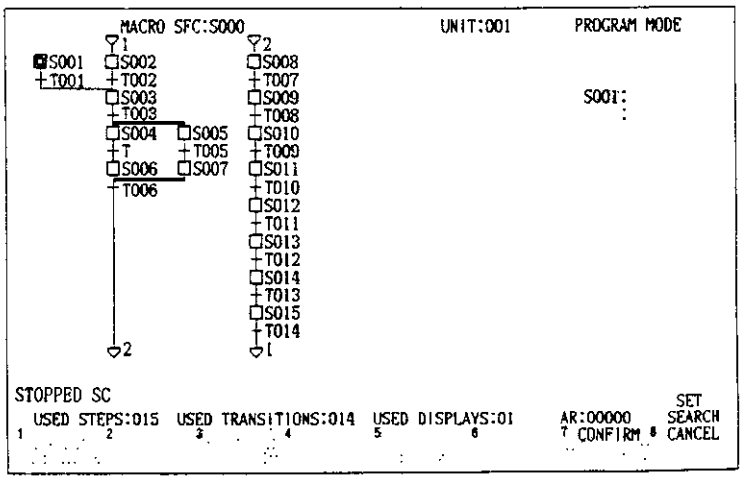


Fig. 5.91

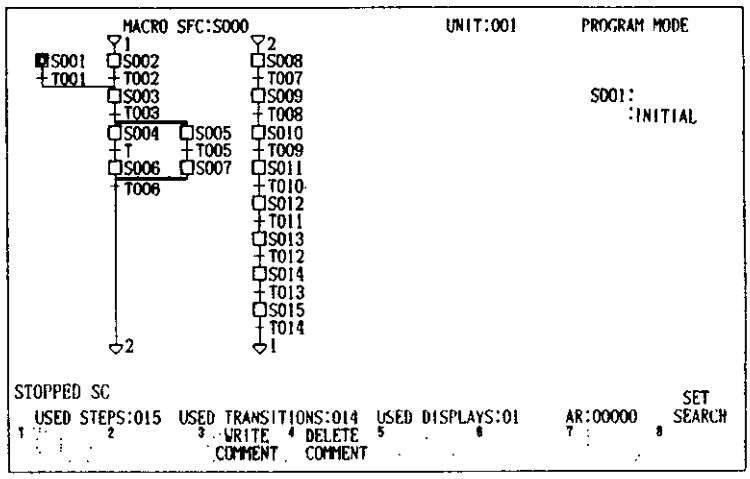
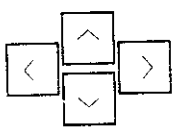
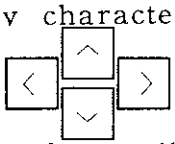


Fig. 5.92

NOTE

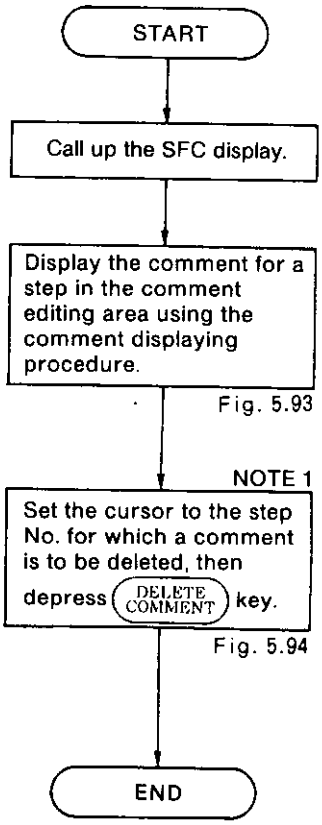
1. Move the cursor using the cursor control keys  .
2. Depressing (CANCEL) key reverts to the comment which was effective before the new comment was entered.
3. To change the comment, change any characters by moving the smaller cursor using the cursor control keys  , then depress (CONFIRM) key. (Only the characters changed at the smaller-cursor position actually are changed.)

(3) COMMENT DELETE

This operation deletes the comments for a step.

POINT

- The cursor must be set in the comment editing area.
- The memory protect switch of GL60S must be set to OFF.



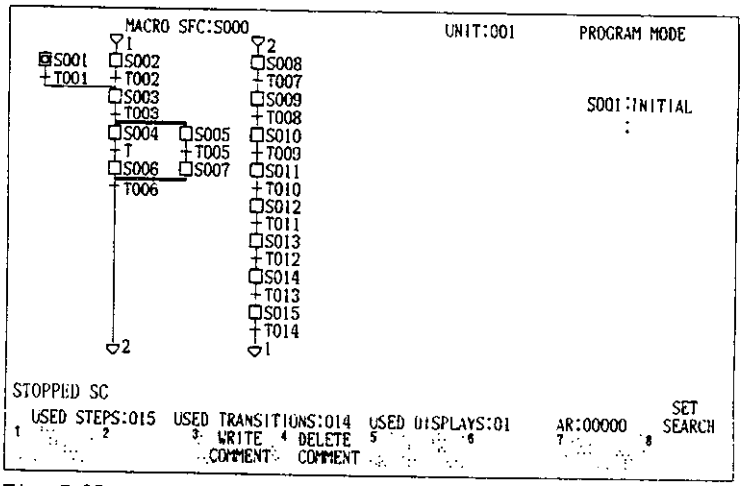


Fig. 5.93

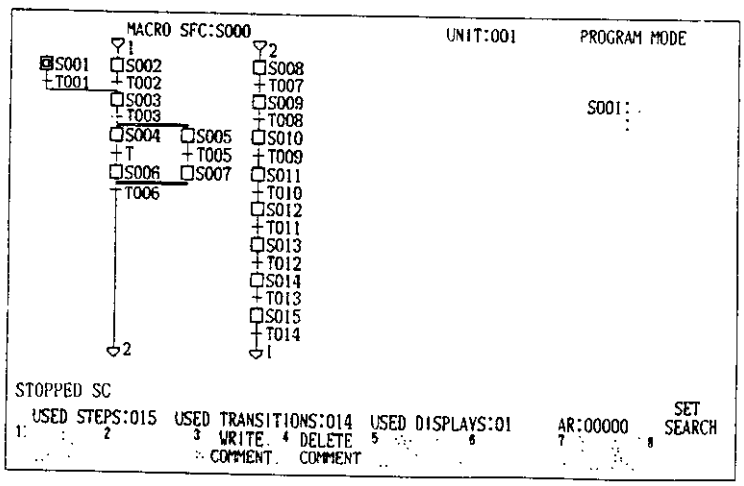
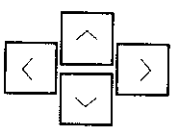


Fig. 5.94

NOTE

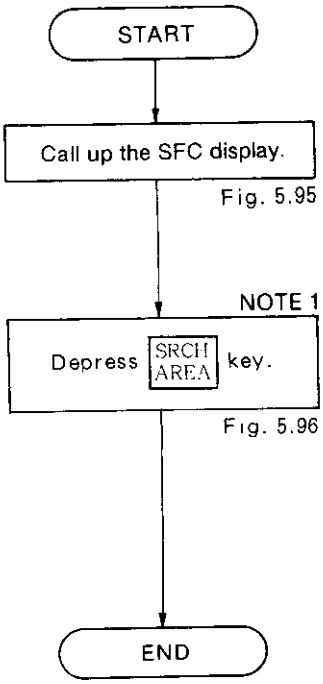
1. Move the cursor using the cursor control keys  .
2. This function is useful when deleting the entire comment for a step.

5.1.7 SFC Checking

This section describes the operation for searching the SFC elements (steps, transitions) stored in the memory. Five types of search are available:

- Search for element only
- Search for reference number only
- Search for a combination of element and reference number
- Search for hold step
- Search for disable step

Shown below are the procedures down to the cursor movement required for setting search data.



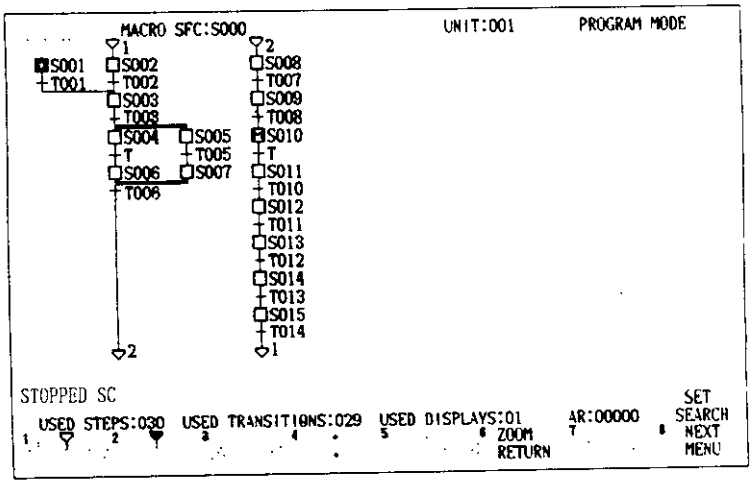


Fig. 5.95

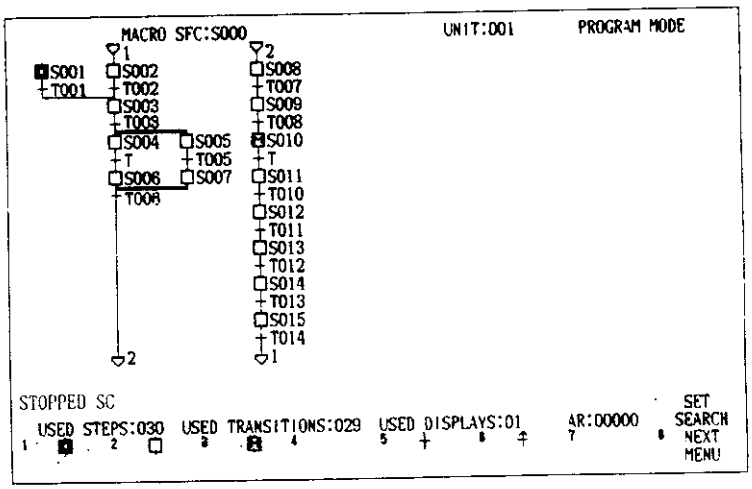


Fig. 5.96

NOTE

1. This is the only operation available for moving the cursor to the data setting position.
2. To return the cursor to the SFC flow area, depress [∧] or [∨] key.

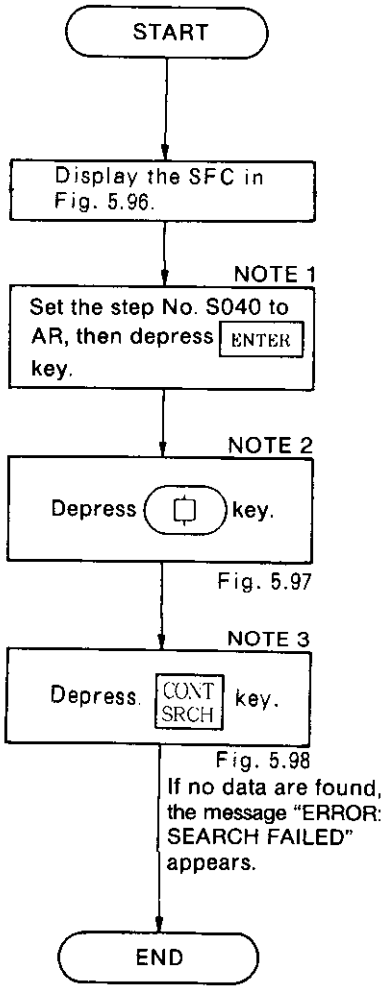
(1) SEARCH ①

This search begins by setting one of the three data types of elements listed below. Then the search seeks for the SFC screen containing the element and displays that SFC screen.

(1) Search for element only
(2) Search for reference number only
(3) Search for a combination of element and reference number

POINT

- Set search data after placing the cursor to the position. [SET SEARCH]
- Five types of elements that can be searched are: ▣, □, Ⓜ, ┼ and ╪.



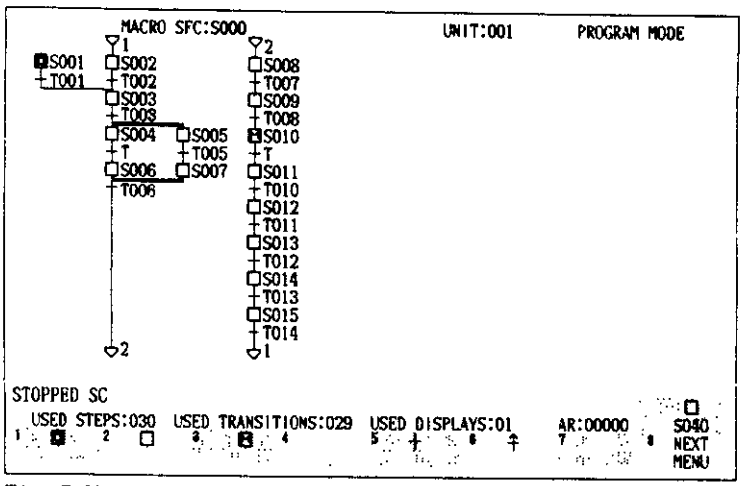


Fig. 5.97

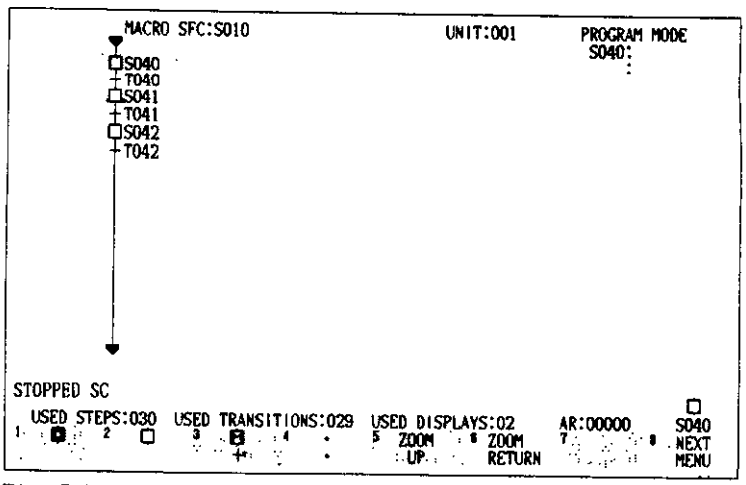


Fig. 5.98

5.1.7 SFC Checking (Cont'd)

NOTE

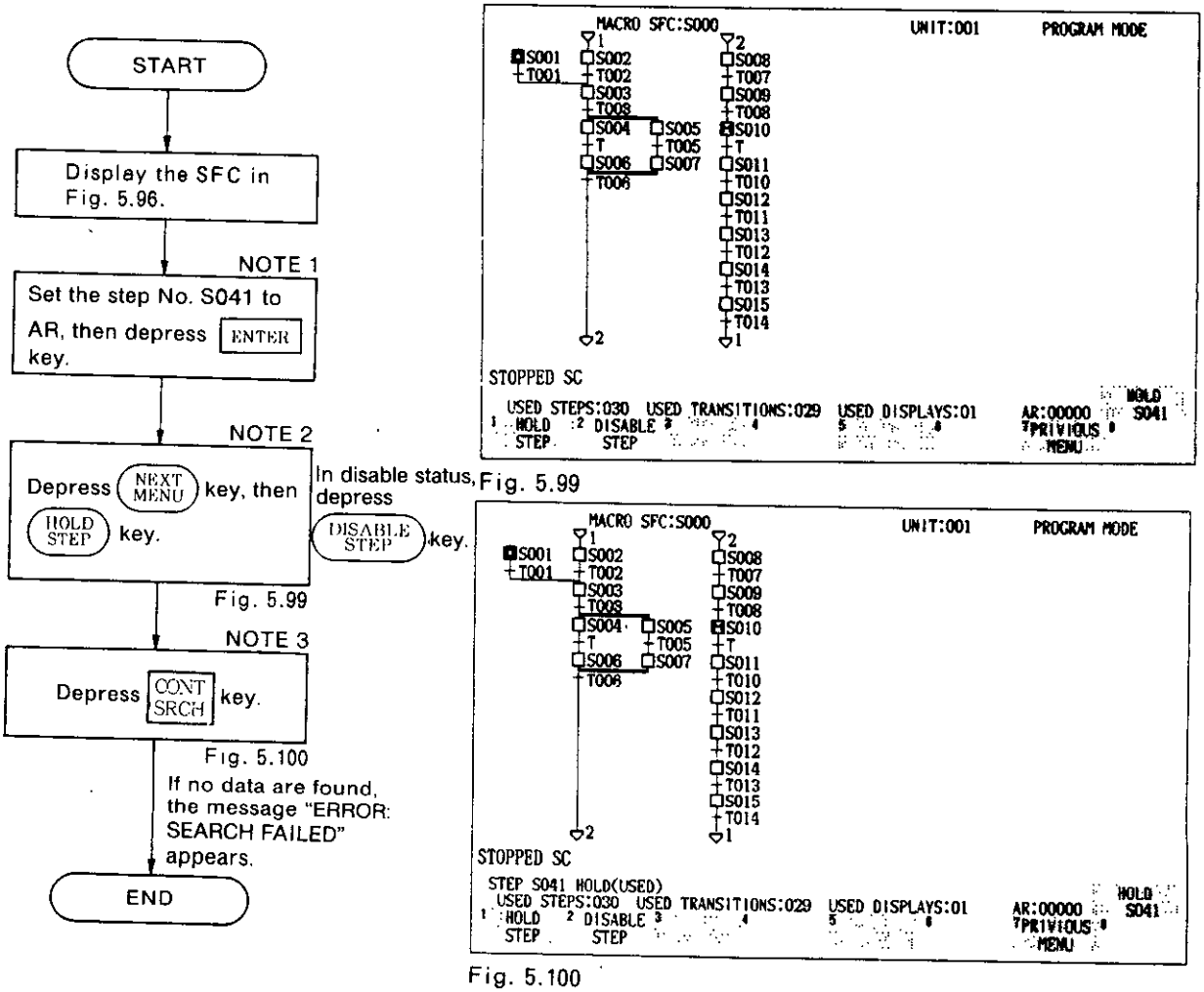
1. This operation is not required for a search of an element only.
2. This operation is not required for a search of a reference number only.
3. In a search for an element only, simultaneously depress [SHIFT] and [CONT SRCH] keys to continue the search.
4. If the search is for an element only, or if a reference number is set earlier than an element, the reference number area is indicated as [ALL].

(1) SEARCH ②

This operation searches for a step in hold or disable status, and indicates whether or not that step is used in an SFC flow. The search may be for a status only or for a combination of status and reference number. The search content is displayed in the message area.

POINT

- Set search data after placing the cursor to position. (SET SEARCH)



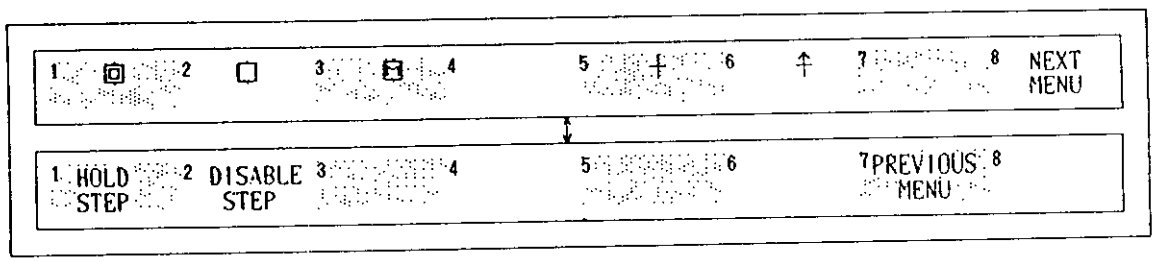
In Fig. 5.100, if the step found in the search is not used in an SFC flow and is in hold status, it is displayed as "STEP S041 HOLD (NOT USED)".

5.1.7 SFC Checking (Cont'd)

NOTE

1. This operation is not required for a search of a status only.
2. If the search is for a status, it cannot search for a reference number only.
3. To continue the search, simultaneously depress SHIFT and CONT SRCH keys.
4. If the search is for a status only, or if a reference number is set earlier than a status, the reference number area is indicated as ALL .
5. When a reference number is specified, the search seeks for the reference numbers following the specified number.

Table 5.4 List of Function Label Displays (Keys) under Search Operation



5.2 SFC ACTION CIRCUIT

An action circuit depicts the control or each step in an SFC flow, using a ladder diagram. The contents of an action circuit are the same as those handled in network processing. However, to store action circuits, a memory area for action circuits must be reserved in GL60S. This memory area is reserved in units of 1 kW.

Action circuits can contain as many networks as required for each step. The procedure for reserving the memory area for action circuits is described in the system configuration. After memory reservation, the screen should look like one shown in Fig. 5.101.

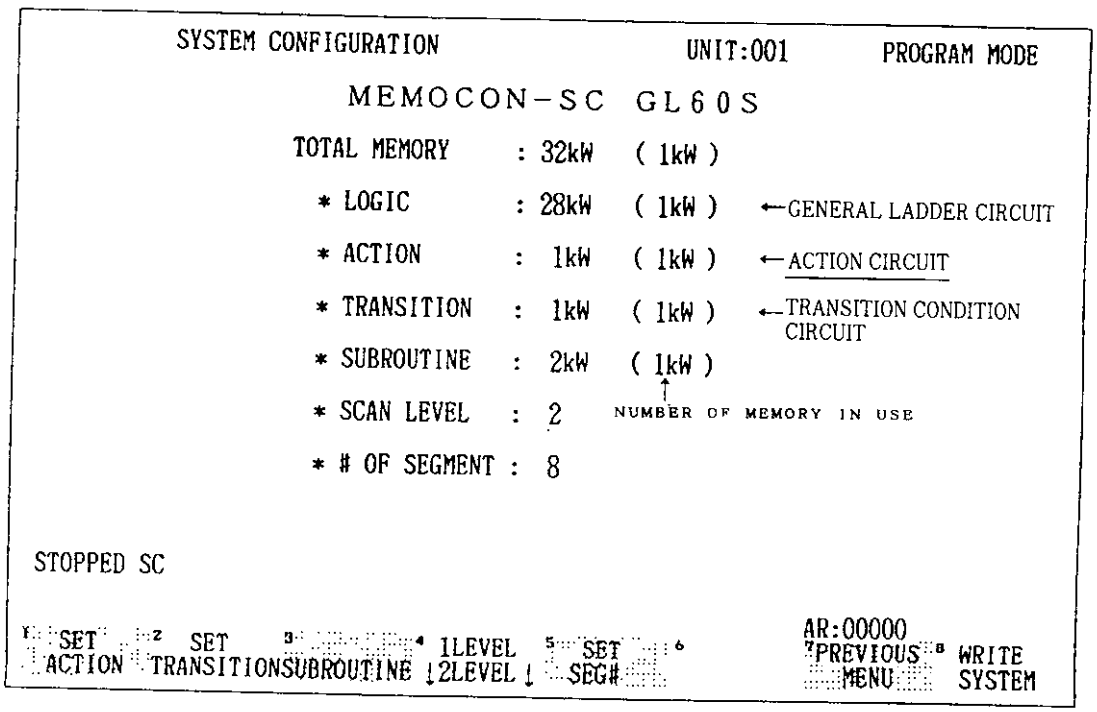


Fig. 5.101

This manual covers only a part of the procedures for action circuit displaying and network circuit storing. For fundamental procedures, read the ladder circuit section Par. 3.

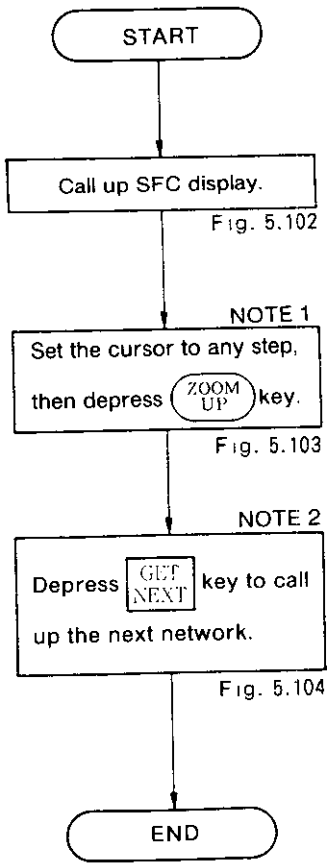
5.2.1 Action Circuit Display

Action circuits can be displayed by either of two methods: setting the cursor to a desired step in an SFC flow and depressing (ZOOM UP) key, or entering a desired step number and depressing [ERASE GET] key.

(1) ZOOM DISPLAY

Action circuits are displayed by setting the cursor to a desired step in an SFC and depressing (ZOOM UP) key.

POINT • The cursor must be set to the desired step.



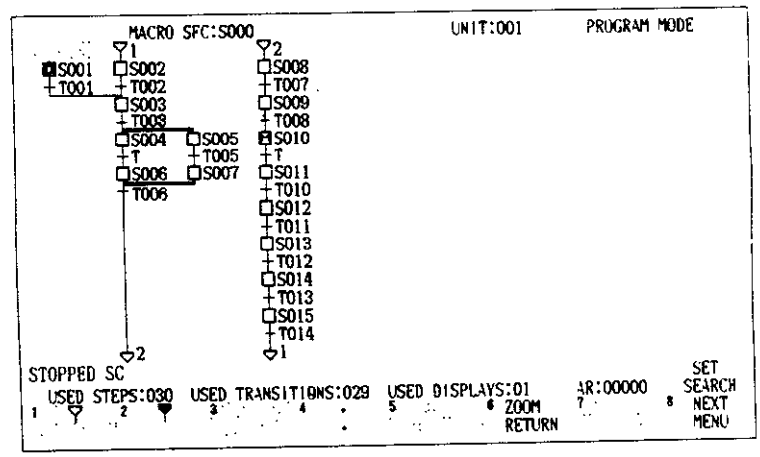


Fig. 5.102

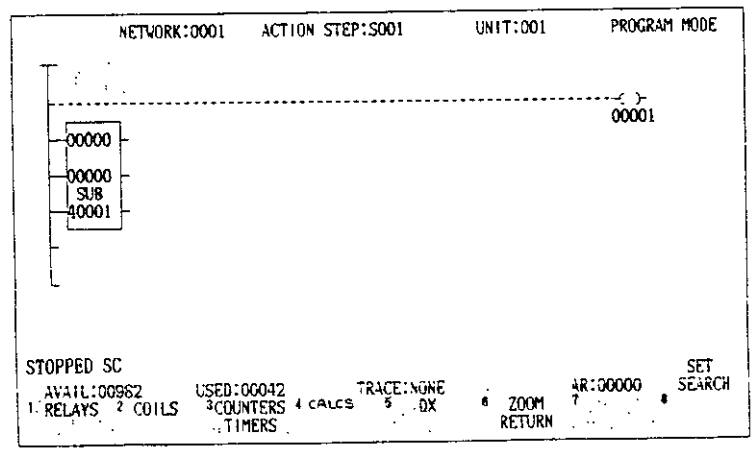


Fig. 5.103

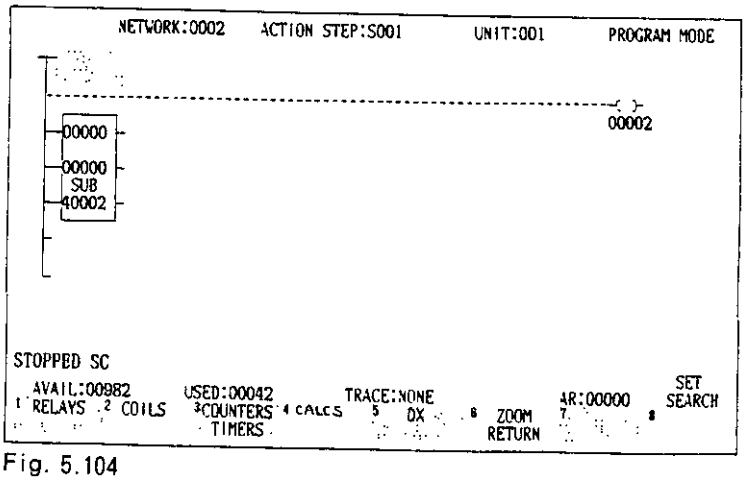


Fig. 5.104

NOTE

1. If no circuit is stored in the memory, the display shows "NETWORK:00000".
2. To call up the previous network, depress [GET PREV] key.
3. Networks for action circuits can only be called up through the operation of NOTE 1. Depressing [GET NEXT] key after merely entering a network number would read out the general network in the ladder circuit form.
4. To return to the SFC screen from the display of Fig. 5.103 or 5.104, depress (ZOOM RETURN) key.
5. Macro steps (M) do not have an action circuit. Therefore, depressing (ZOOM UP) key at a macro step will call up the SFC screen for that macro step.
6. Function keys (ZOOM UP) and (ZOOM RETURN) are also available.

5.2.1 Action Circuit Display (Cont'd)

(2) NUMBER ENTRY DISPLAY

Action circuits are displayed by entering a desired step number in an SFC and depressing [ERASE GET] key.

POINT • The cursor must be set in SFC area.

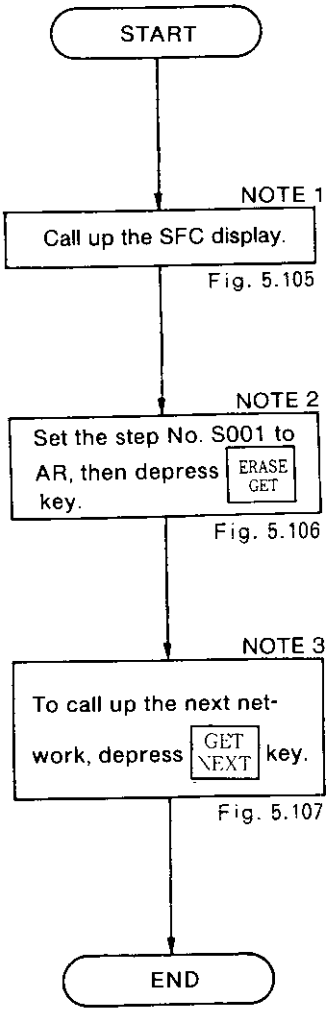


Fig. 5.105

Fig. 5.106

Fig. 5.107

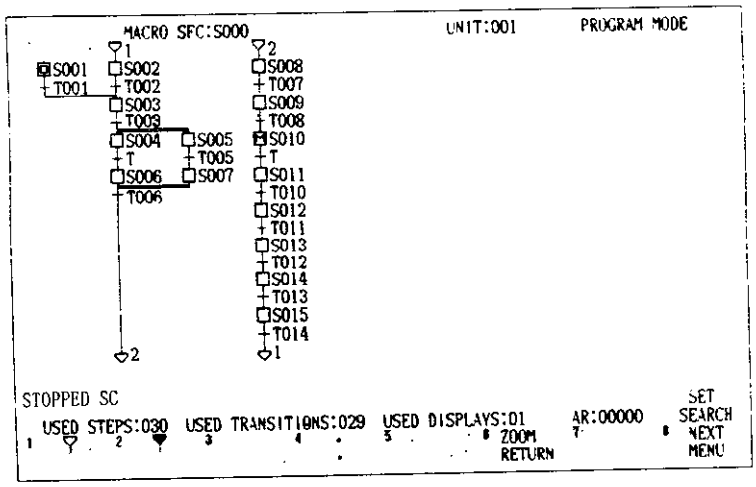


Fig. 5.105

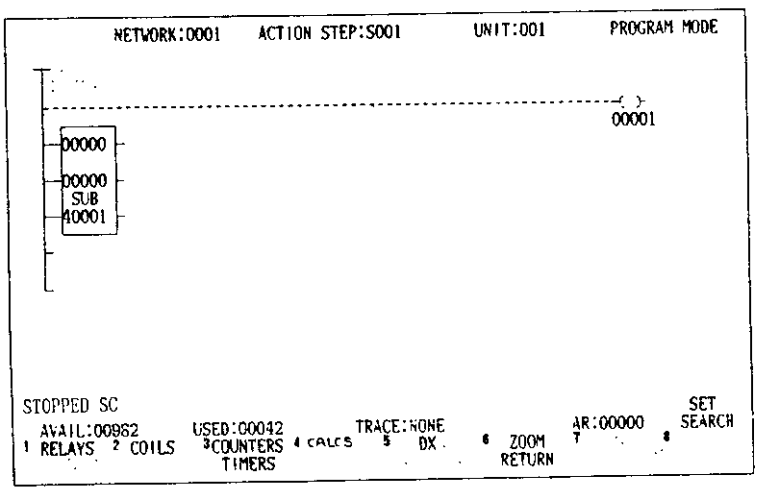


Fig. 5.106

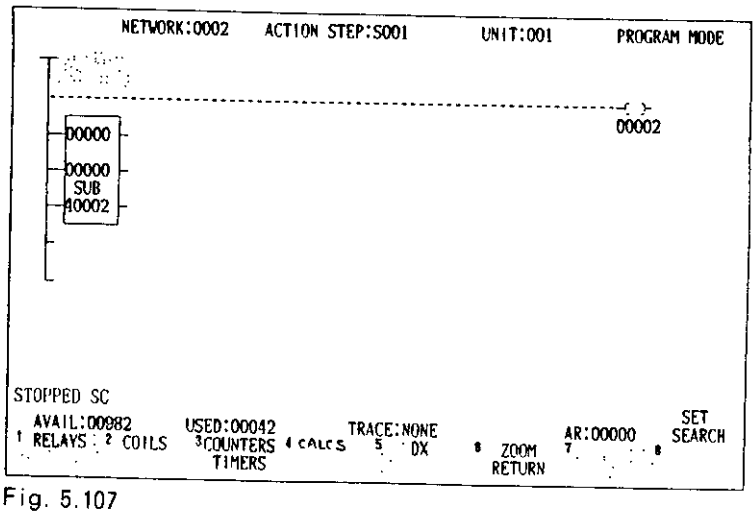


Fig. 5.107

NOTE

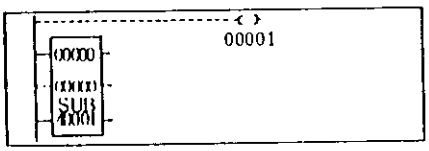
1. The general network screen for ladder circuits may be used for this purpose.
2. If no circuit is stored in the memory, the display shows "NETWORK:00000".
3. To call up the previous network, depress [GET PREV] key.
4. Networks for action circuits can only be called up through the operation of NOTE 2. Depressing [GET NEXT] key after merely entering a network number would read out the general network in the ladder circuit form.
5. To return to the SFC screen from the display of Fig. 5.106 or 5.107, enter S000 at AR and depress [ERASE GET] key to recover the master view. To recover the expanded view, enter the step number of expanded view at AR and depress [ERASE GET] key. The zoom function depressing (ZOOM RETURN) key is also available for the return.
6. Macro steps ([M]) do not have an action circuit. Therefore, if the step number entered is one for a macro step, the SFC screen for that macro step will be called up.
7. Function keys [ZOOM UP] and [ZOOM RETN] are also available.

5.2.2 Network Storing

The networks of action circuits are stored in the same way as for the general networks of ladder diagrams. The only difference is the way in which the zoom function is operated on the action circuit display.

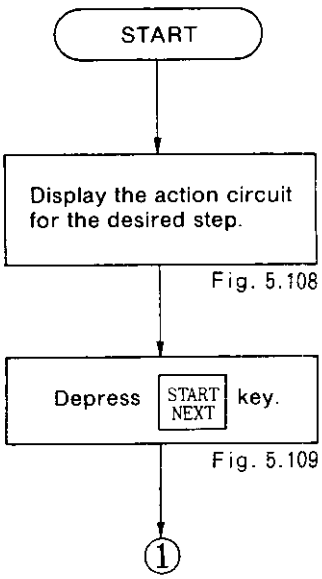
(1) NETWORK STORING

(Storing example)



POINT

- The cursor must be set at the logic area.
- The GL60S memory protect switch must be set to OFF.



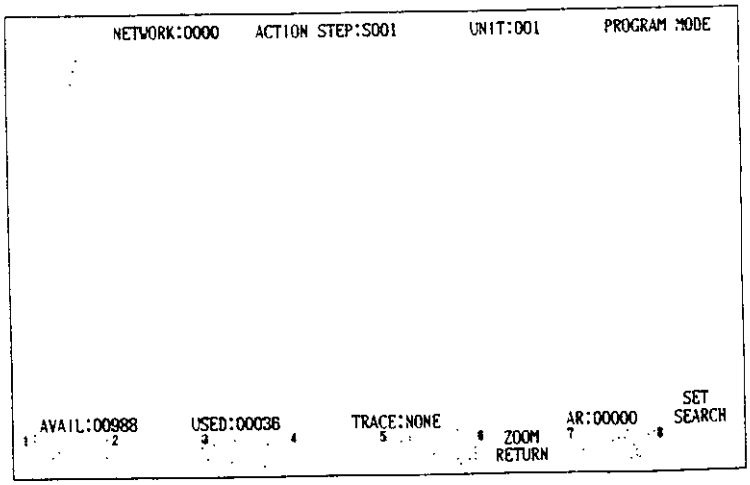


Fig. 5.108

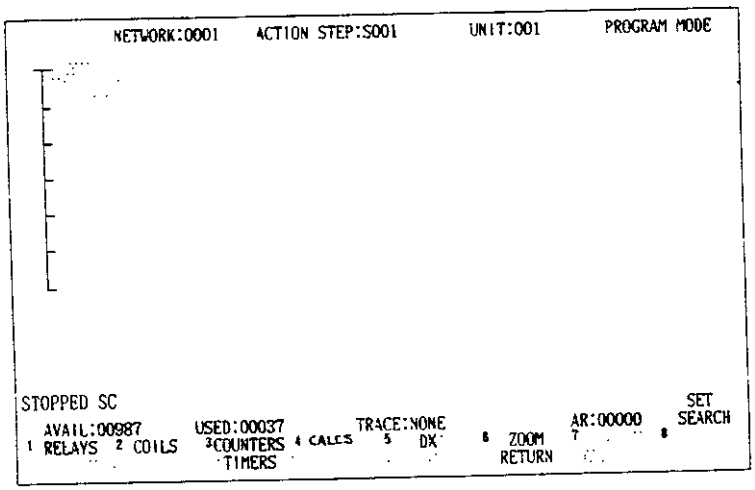


Fig. 5.109

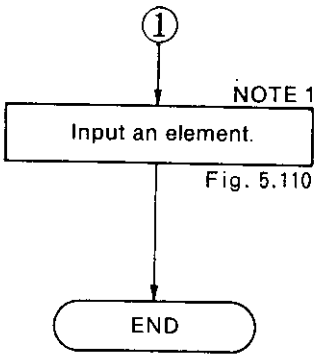


Fig. 5.110

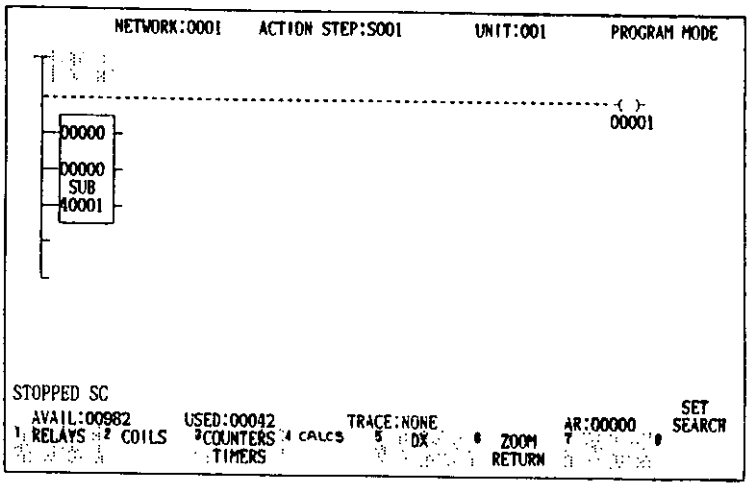


Fig. 5.110

NOTE

1. To store the next network, depress [START NEXT] key. On the screen of the next network that appears, perform network storing operation.
2. The contact of any step number can be used for the general ladder diagrams.

   Example: ⊣ ⊢ ⊣/⊢ ⊣↑⊢ ⊣↓⊢
   S001, S001, S001, S001
3. Entry of an action circuit may not be always required.
4. A search in network checking operation will not be limited to the range of action circuits, but it will cover the whole range including transition condition circuits and general ladder circuits.

5.3 SFC TRANSITION CONDITION CIRCUIT

A transition circuit is one in which a higher step proceeds to the lower step on a transition in an SFC flow. Transition circuits are described in the ladder diagram. The contents of a transition condition circuit is the same as those handled in network processing.
However, to store transition condition circuits, a memory area for action circuits must be reserved in GL60S. This memory area is reserved in units of 1 kW.

A transition condition circuit consists of one network for each transition. This circuit must be stored for each transition.

The procedure for reserving the memory area for transition condition circuits is described in the system configuration. After memory reservation, the screen should look like one shown in Fig. 5.111.

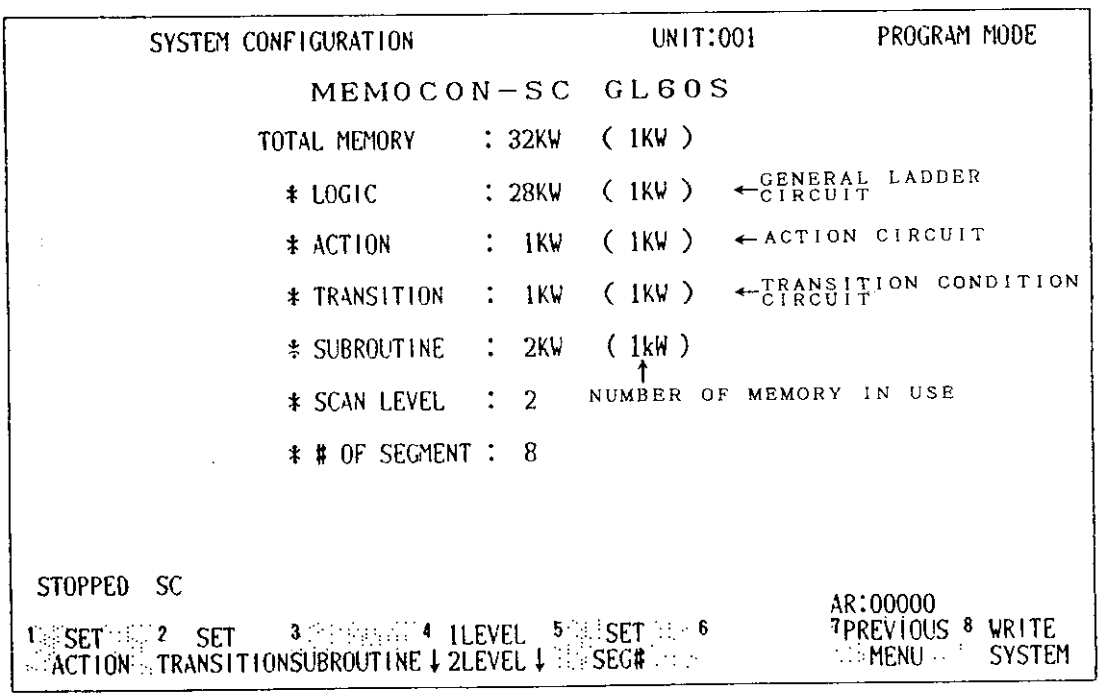


Fig. 5.111

This manual covers only a part of the procedures for transition condition circuit displaying and network circuit storing. For fundamental procedures, read the ladder circuit section Par. 3.

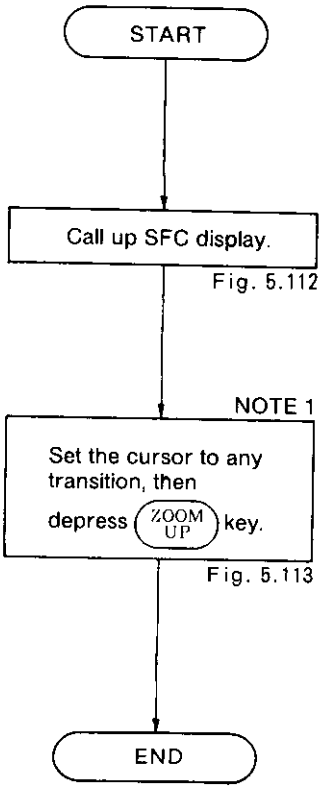
5.3.1 Transition Condition Circuit Display

Transition condition circuits can be displayed by either of two methods; setting the cursor to a desired transition in an SFC flow and depressing [ZOOM UP] key, or entering a desired transition number and depressing [ERASE GET] key.

(1) ZOOM DISPLAY

Transition condition circuits are displayed by setting the cursor to a desired transition in an SFC and depressing (ZOOM UP) key.

POINT • The cursor must be set to the desired step.



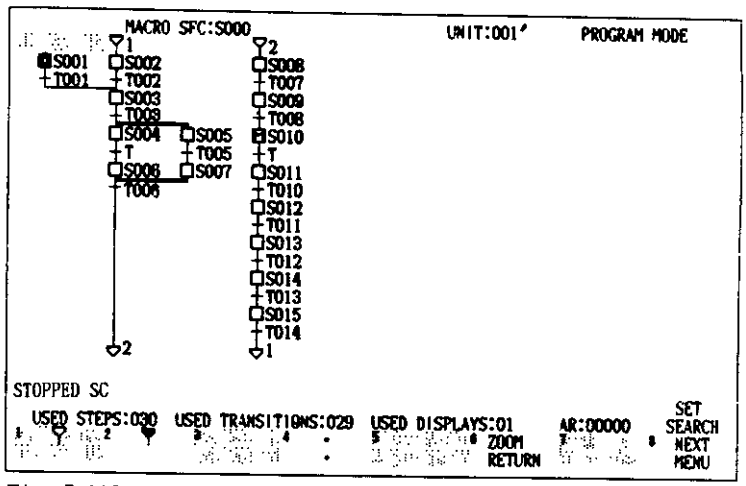


Fig. 5.112

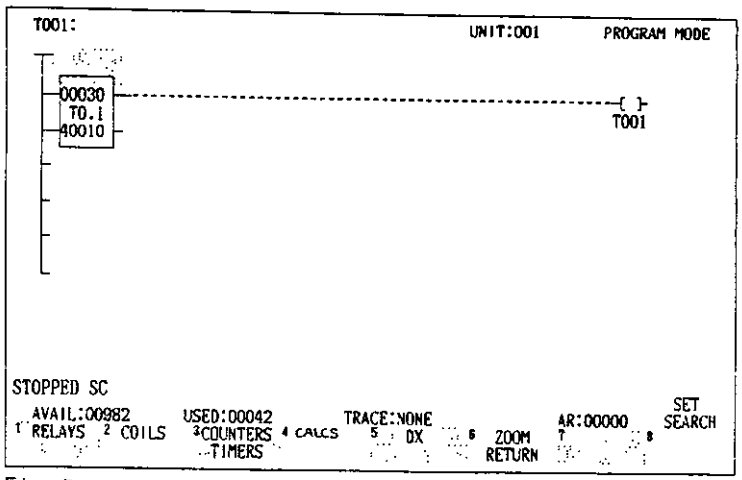


Fig. 5.113

5.3.1 Transition Condition Circuit Display (Cont'd)

NOTE

1. If no circuit is stored in the memory, the screen for storing the transition circuit appears.
2. To return to the SFC screen from the display of Fig. 5.113, depress (ZOOM RETURN) keys.
3. Dummy transitions (⊣⊢) do not have a transition condition circuit.
4. Function keys [ZOOM UP] and [ZOOM RETN] are also available.

(2) NUMBER ENTRY DISPLAY

Transition condition circuits are displayed by entering a desired transition number in an SFC and depressing [ERASE GET] key.

POINT

- The cursor must be set in SFC area.

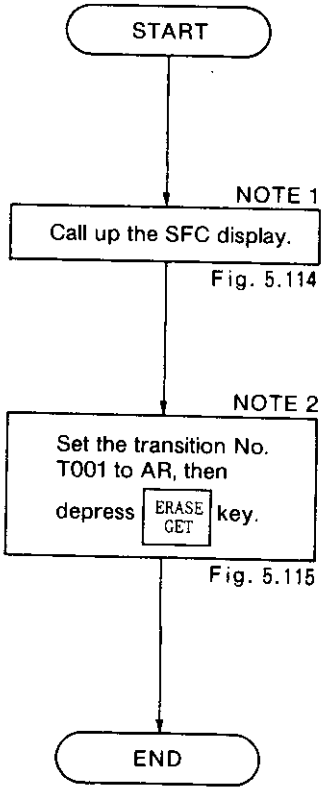


Fig. 5.114

Fig. 5.115

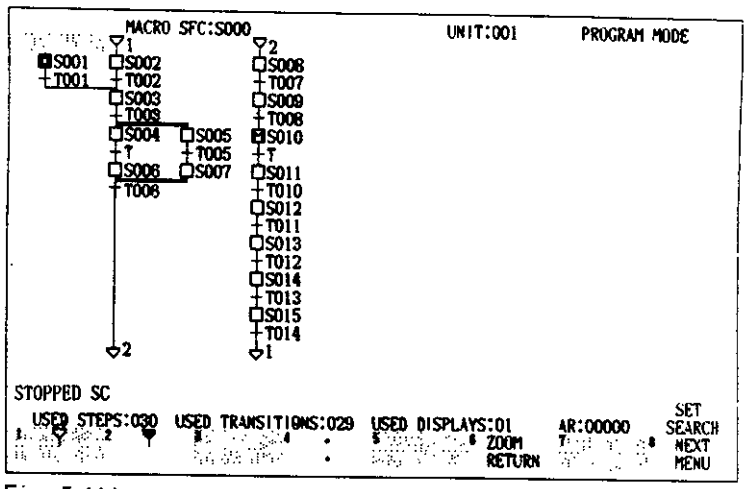


Fig. 5.114

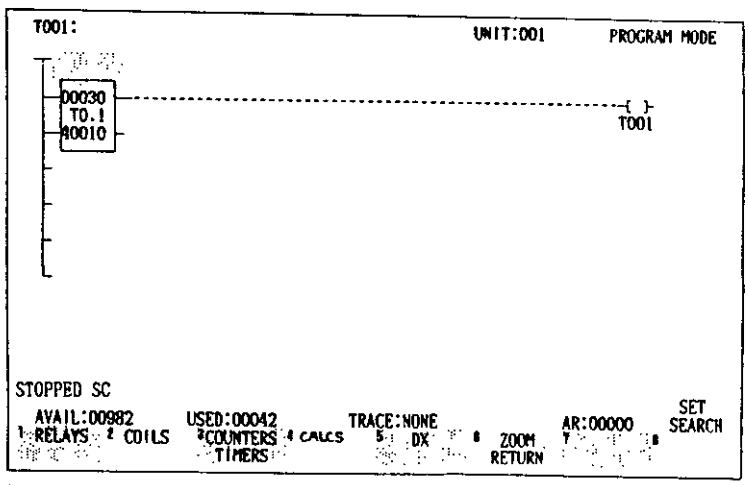


Fig. 5.115

5.3.1 Transition Condition Circuit Display (Cont'd)

NOTE

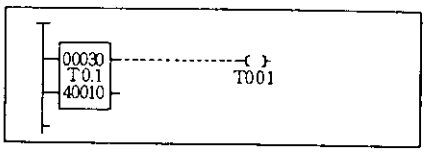
1. The general network screen for ladder circuits may be used for this purpose.
2. If no circuit is stored in the memory, the screen for storing the transition circuit appears.
3. To return to the SFC screen from the display of Fig. 5.115, enter S000 at AR and depress [ERASE GET] key to recover the master view. To recover the expanded view, enter the step number of the expanded view at AR and depress [ERASE GET] key. The zoom function (depressing (ZOOM RETURN)) key is also available for the return.
4. Function keys [ZOOM UP] and [ZOOM RETN] are also available.

5.3.2 Network Storing

The networks of transition condition circuits are stored in the same way as for the general networks of ladder diagrams. The only difference is the way in which the zoom function is operated on the transition condition circuit display.

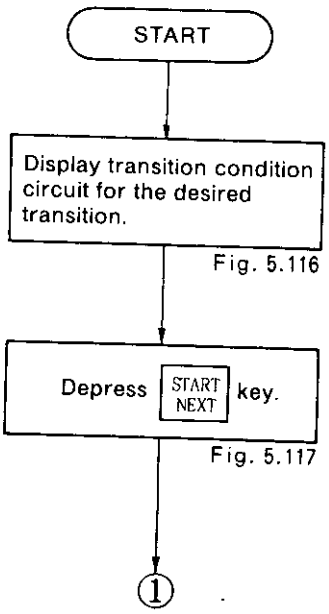
(1) NETWORK STORING

(Storing example)



POINT

- The cursor must be set in logic area.
- The GL60S memory protect switch must be set to OFF.



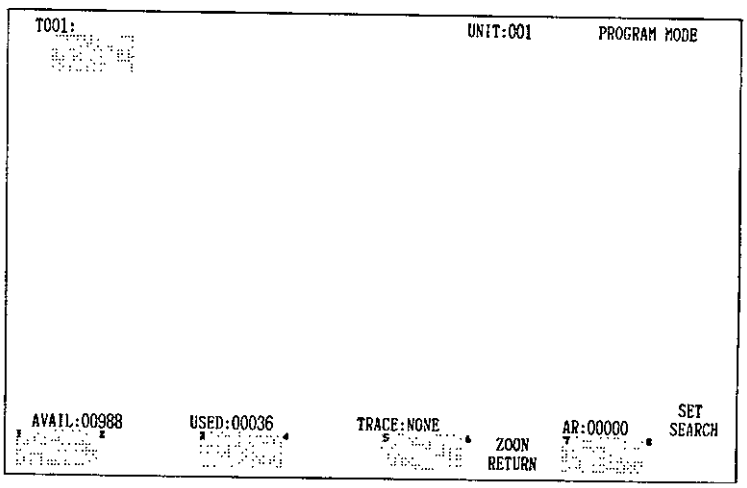


Fig. 5.116

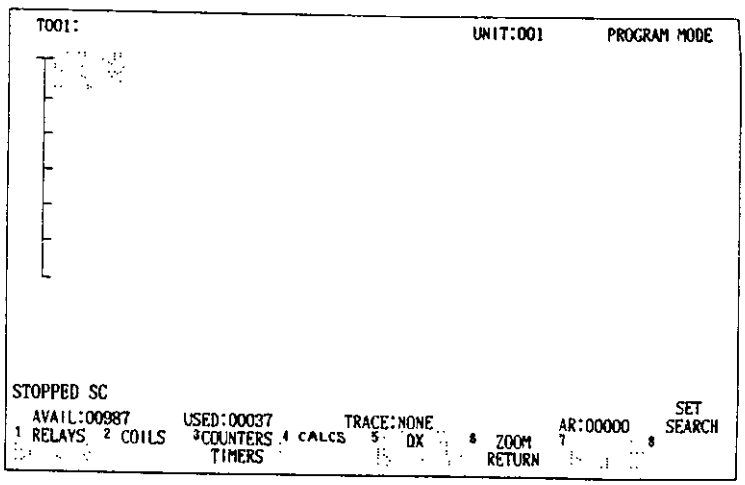
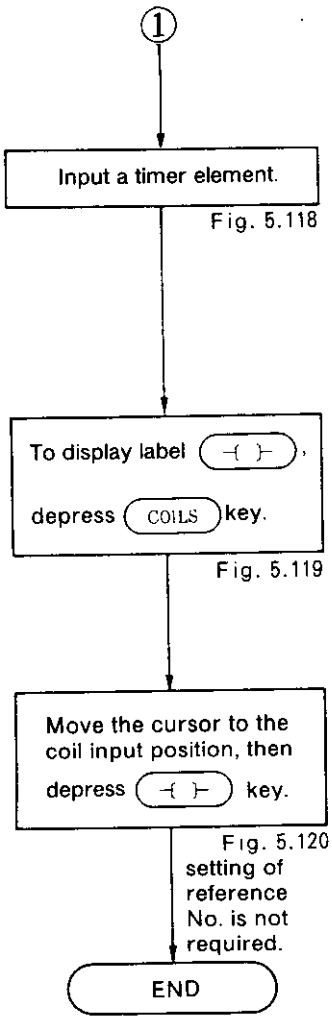


Fig. 5.117

5.3.2 Network Storing (Cont'd)



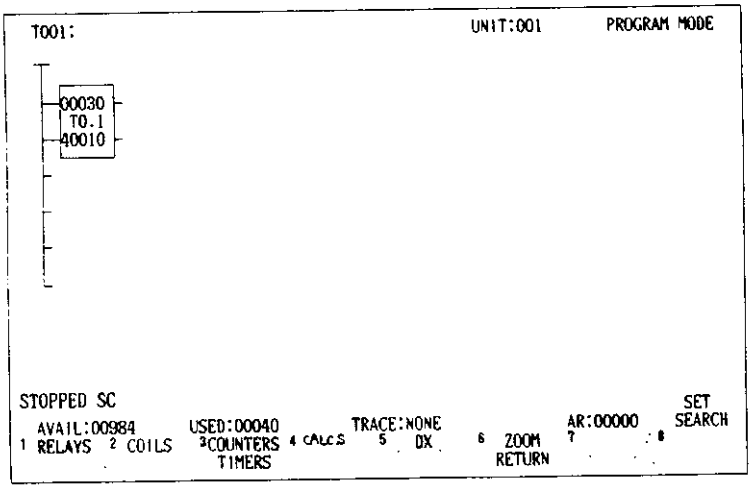


Fig. 5.118

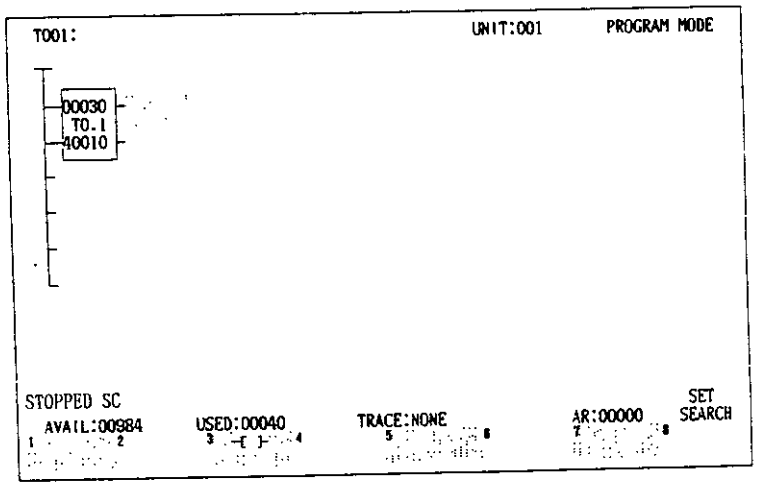


Fig. 5.119

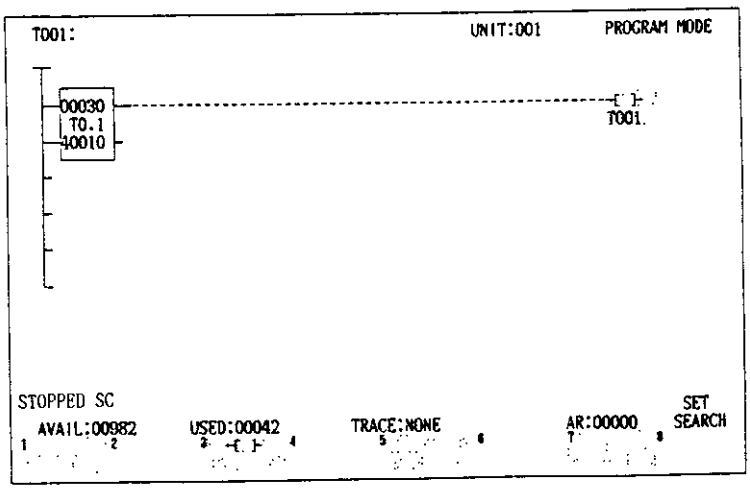


Fig. 5.120

NOTE

1. When a transition coil is entered, a reference number need not be entered. Reference numbers are fixed for the corresponding transitions.
2. The general coils: -[ ]- or -[L]- cannot be entered.
3. Transition condition circuits are necessary for the transitions used in the SFC flow. Be sure to enter transition coils even if transition condition circuits may not be necessary.
4. A search will not be limited to the range of transition condition circuits, but it will cover the whole range including action circuits and ladder circuits.
5. Once a transition coil is solved in a transition condition circuit, this prevents solving of the elements in the columns to the right of the transition coil and in the lines under the transition coil. Refer to Fig. 5.121.

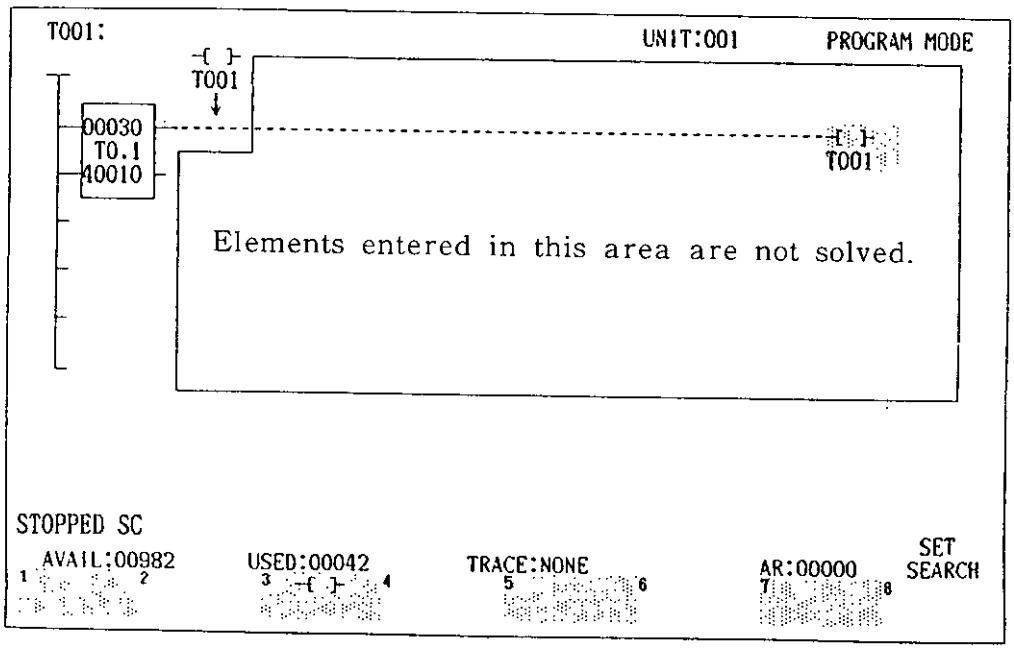


Fig. 5.121

6. COMMENT SYMBOL

The GL60S3 allows display, writing, and deletion of symbols in accordance with the references shown in Table 6.1.

Note that step comments can be manipulated with any CPU module: GL60S, GL60S0, GL60S1, GL60S2, or GL60S3.

Table 6.1 List of Comments and Symbols

Type	Reference	Symbol	Comment
Coil	00001-08182	Within 6 alphanumeric or kana characters	Within 16 alphanumeric or kana characters
Input Relay	10001-14096	Within 6 alphanumeric or kana characters	Within 16 alphanumeric or kana characters
Link Relay	D0001-D1024	Within 6 alphanumeric or kana characters	Within 16 alphanumeric or kana characters
Step	S001-S512	Within 6 alphanumeric or kana characters	Within 8 alphanumeric or kana characters
Input Register	30001-30512	None	Within 16 alphanumeric or kana characters
Hold Register	40001-40512	None	Within 16 alphanumeric or kana characters
Link Register	R0001-R1024	None	Within 16 alphanumeric or kana characters
Network (Note)	L0001-L4096	None	Within 16 alphanumeric or kana characters

NOTE : The applied network number can also be input for comments on the network. However, no comments can be input for more than 4097 networks if more than 4096 networks are used.

Step symbols and comments, logic network comments, and coil comments are displayed on the P140 screen. Other comments and symbols are printed when outputting those drawn from the ladder lister.

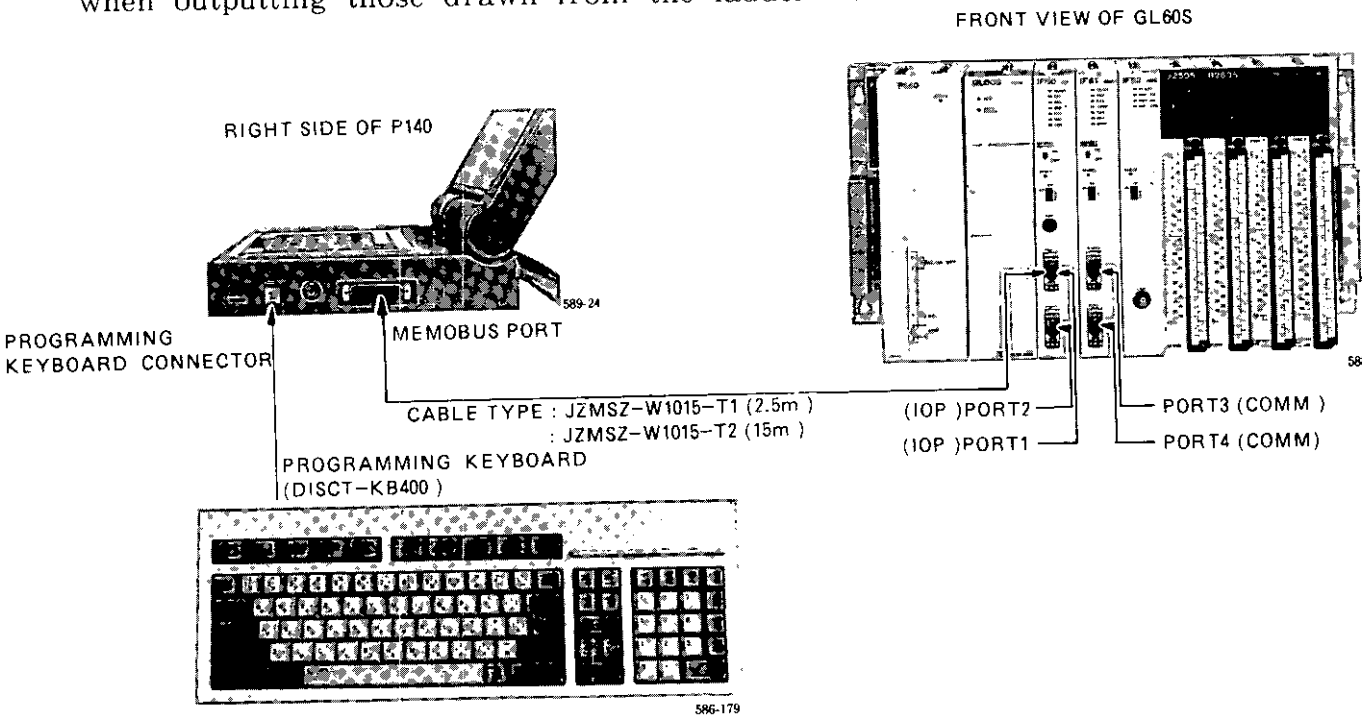


Fig. 6.1 Devices and connection

6.1 COMMENT AREA

The comment area on the P140 screen has three types of comment areas: the SFC screen step, the comment area of the logic screen coil, and the extension comment area.

Refer to par. 5.1.6 "SFC Comment Editing" for details on the comment area of the SFC screen step and the comment manipulation.

(1) COIL COMMENT AND NETWORK COMMENT ON LOGIC SCREEN

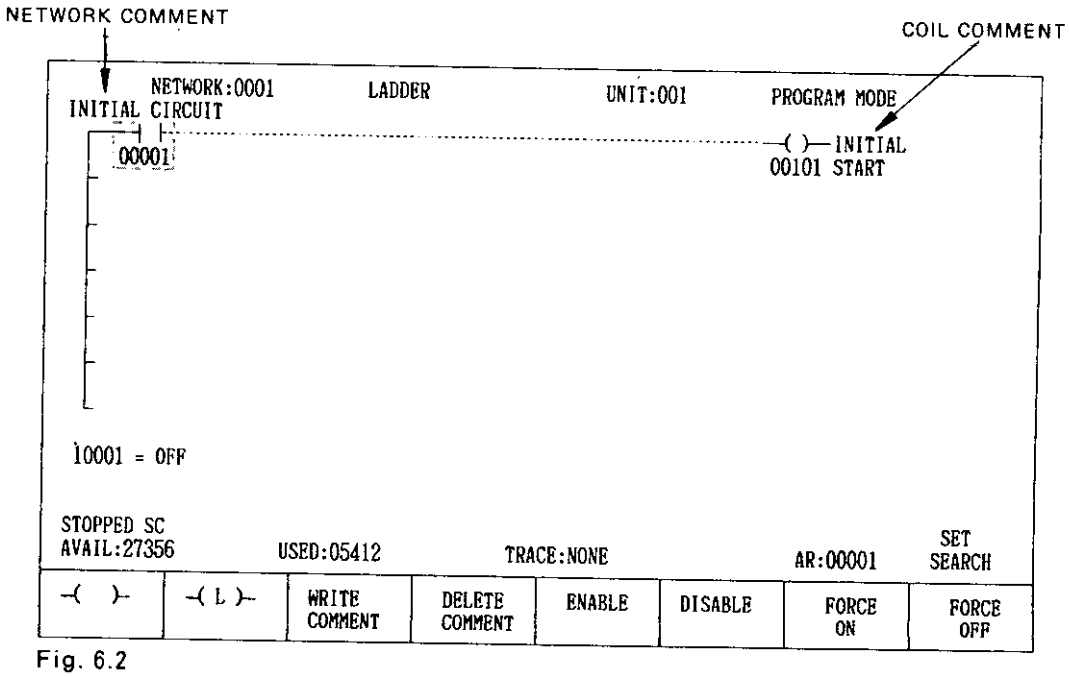


Fig. 6.2

NOTE

Only the coil comment and the network comment are displayed on the logic screen.

6.1 COMMENT AREA (Cont'd)

(2) EXTENSION COMMENT AREA

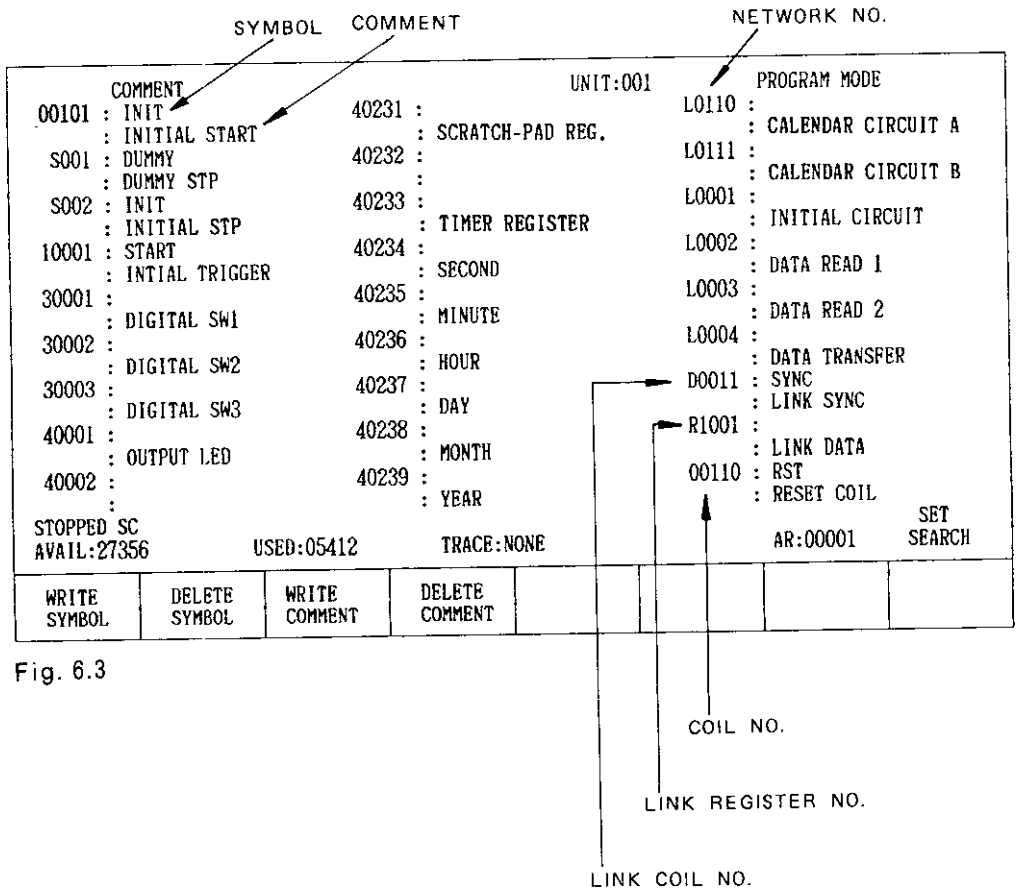
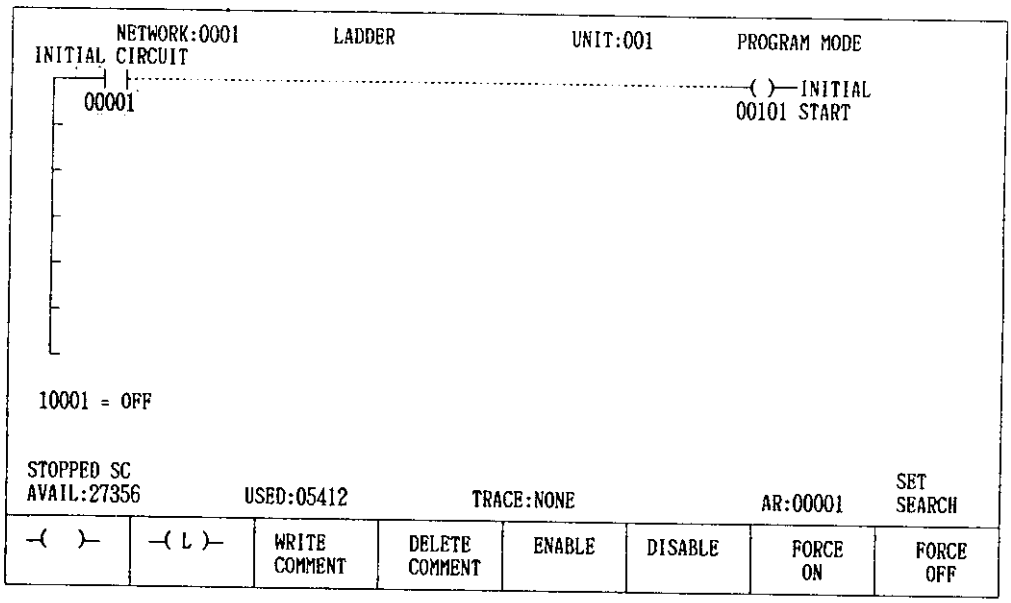


Fig. 6.3

6.2 COMMENT MANIPULATION

When displaying a network with coil, the comment is displayed on the right side of the coil. The network comment is also displayed above the network. The coil comment can be written and deleted.

(1) COMMENT MANIPULATION ON LOGIC SCREEN



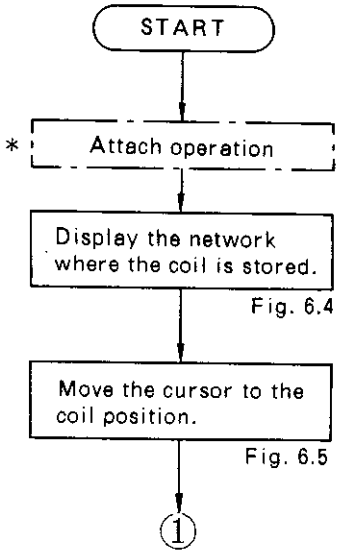


Fig. 6.4

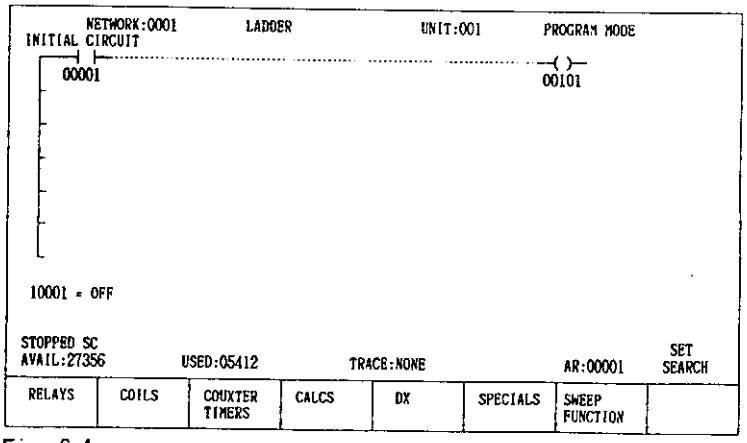


Fig. 6.4

Fig. 6.5

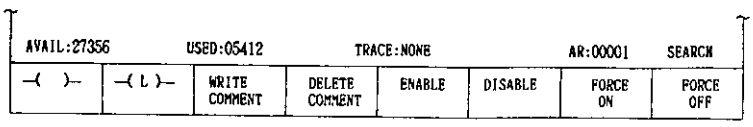
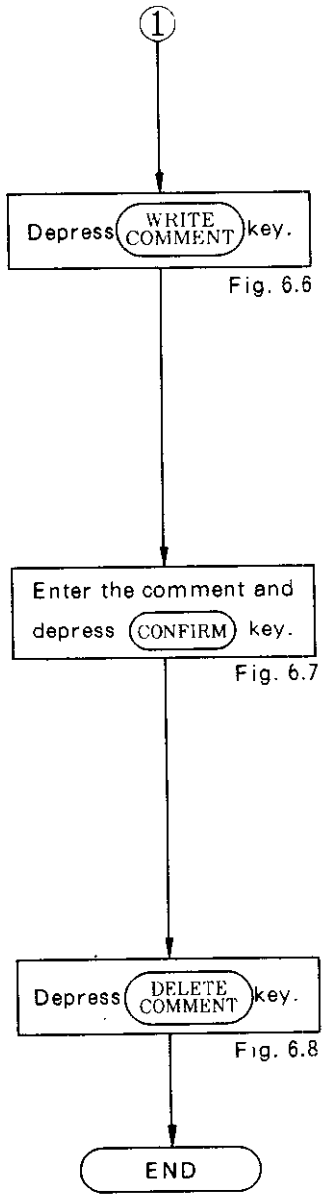


Fig. 6.5

6.2 COMMENT MANIPULATION (Cont'd)



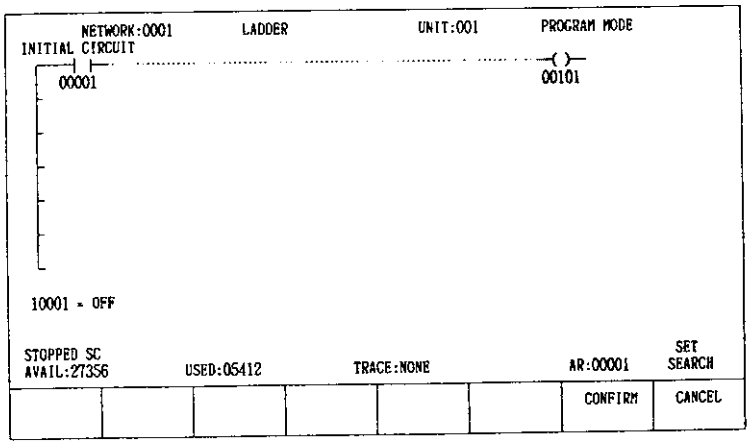


Fig. 6.6

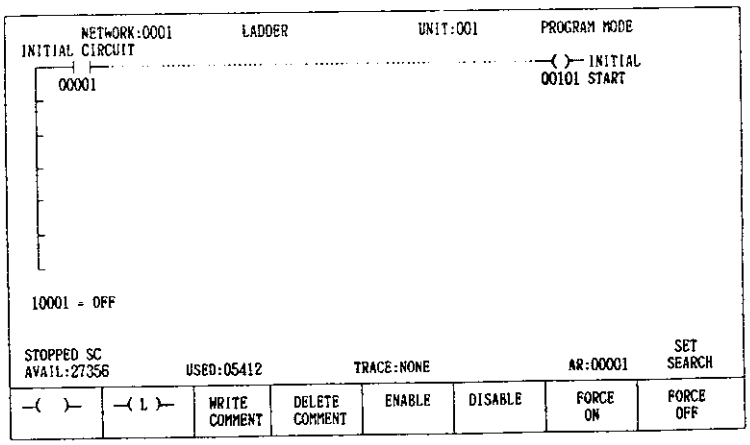


Fig. 6.7

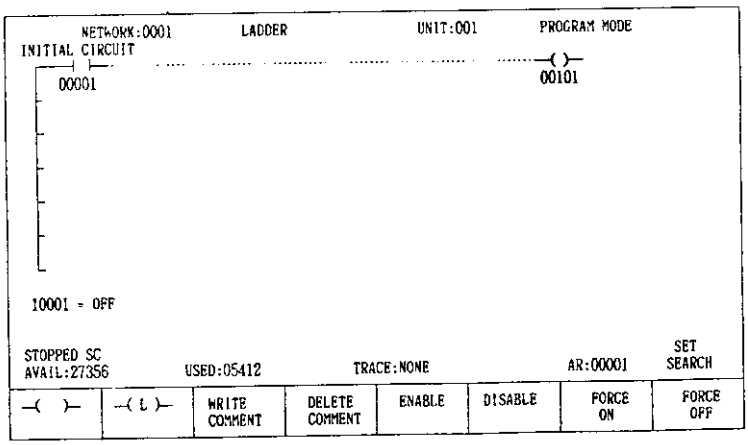


Fig. 6.8

NOTE

1. * can be omitted if the attach operation is completed.
2. Depressing (CANCEL) instead of (CONFIRM) after inputting the comment will return the display to the original condition, without storing the input comment.
3. The coil comment is displayed in two lines.
4. The cursor in the comment section can be moved by the [⇦] and [⇨] keys on the full keyboard or the [<] and [>] keys the P140.
5. Depress the [BS] on the full keyboard or the [BACK SPACE] on the P140 to delete one comment character immediately before the cursor.
6. To change an optional character of the registered coil comment, move the cursor to the desired position, and input the desired characters.

6.2 COMMENT MANIPULATION (Cont'd)

In the extension comment area the following can be displayed, written, or deleted: the coil, input relay, link relay, step symbols and comments, the input register, hold register, link register, network comment.

(2) COMMENT MANIPULATION IN EXTENSION COMMENT AREA

```
      COMMENT                    UNIT:001          PROGRAM MODE
00101 : INIT                 40231 :             L0110 :
      : INITIAL START              : SCRATCH-PAD REG.   : CALENDAR CIRCUIT A
 S001 : DUMMY                40232 :             L0111 :
      : DUMMY STP                  :                    : CALENDAR CIRCUIT B
 S002 : INIT                 40233 :             L0001 :
      : INITIAL STP                : TIMER REGISTER     : INITIAL CIRCUIT
10001 : START                40234 :             L0002 :
      : INTIAL TRIGGER             : SECOND             : DATA READ 1
30001 :                      40235 :             L0003 :
      : DIGITAL SW1                : MINUTE             : DATA READ 2
30002 :                      40236 :             L0004 :
      : DIGITAL SW2                : HOUR               : DATA TRANSFER
30003 :                      40237 :             D0011 : SYNC
      : DIGITAL SW3                : DAY                : LINK SYNC
40001 :                      40238 :             R1001 :
      : OUTPUT LED                 : MONTH              : LINK DATA
40002 :                      40239 :             00110 : RST
      :                            : YEAR               : RESET COIL

AVAIL:27356        USED:05412        TRACE:NONE        AR:00001   SET SEARCH

| WRITE SYMBOL | DELETE SYMBOL | WRITE COMMENT | DELETE COMMENT | | | | |
```

POINT

- A maximum of 27 comments (3 lines * 3 columns) can be displayed on the extension comment area.

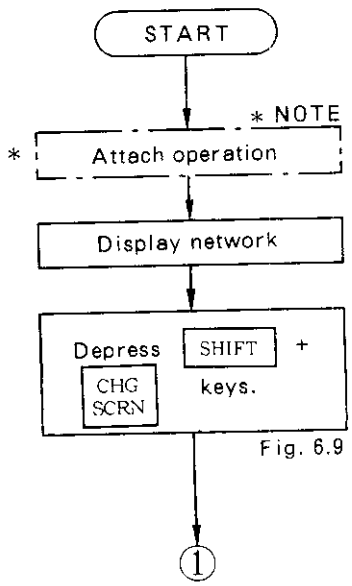


Fig. 6.9

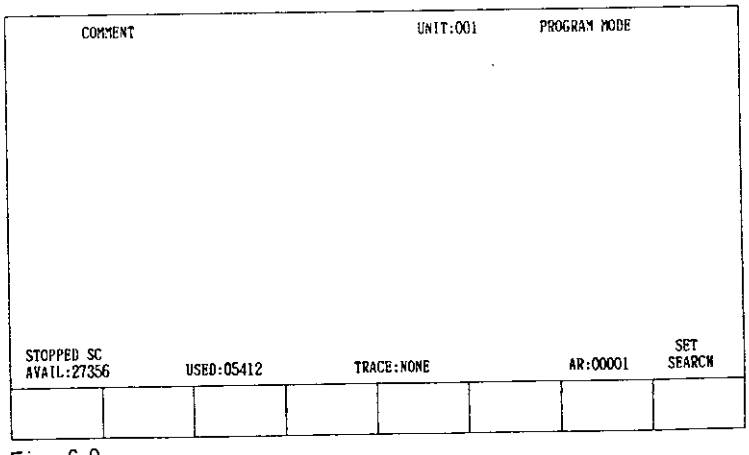
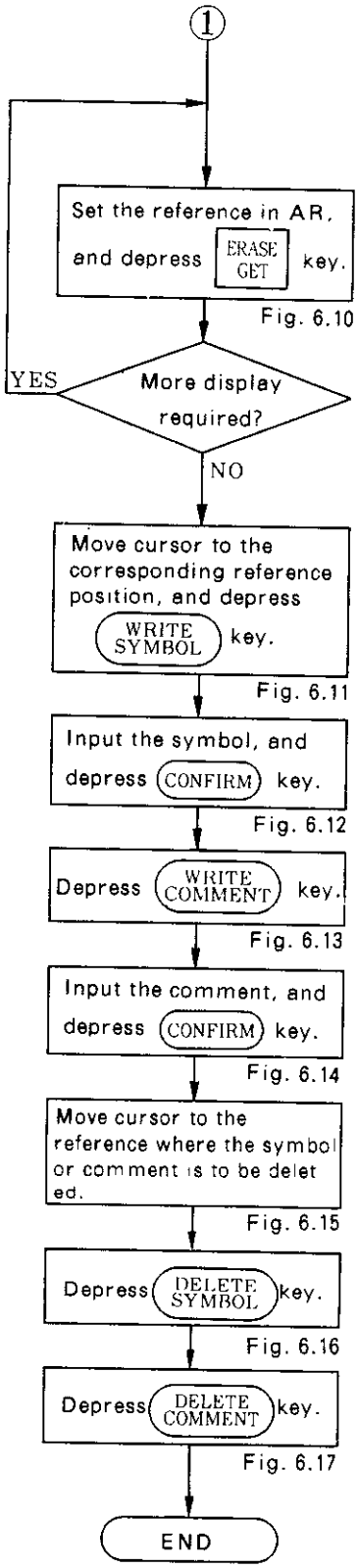


Fig. 6.9



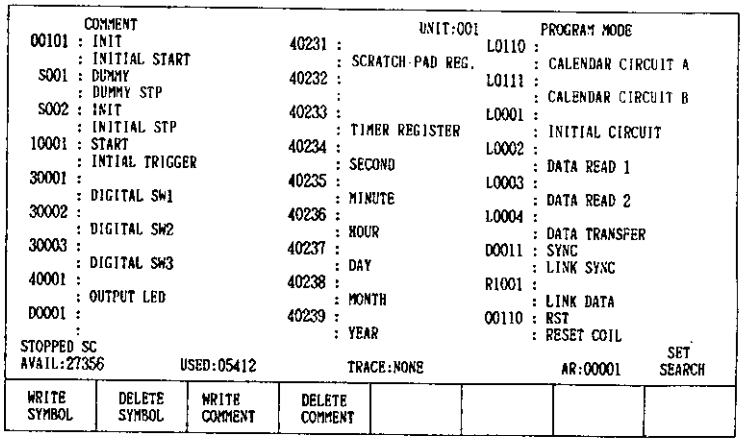


Fig. 6.10

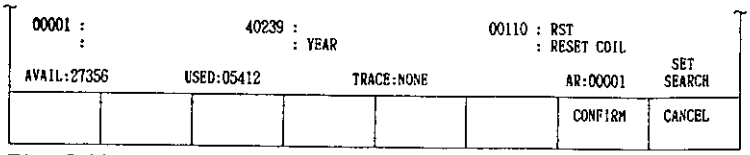


Fig. 6.11

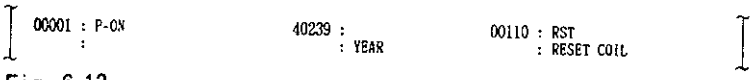


Fig. 6.12

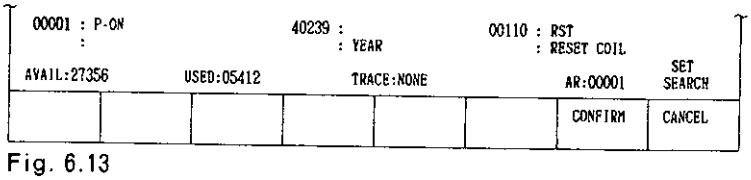


Fig. 6.13

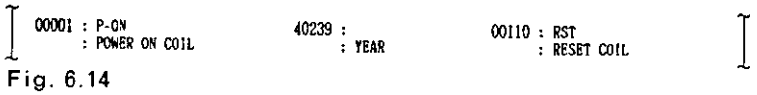


Fig. 6.14

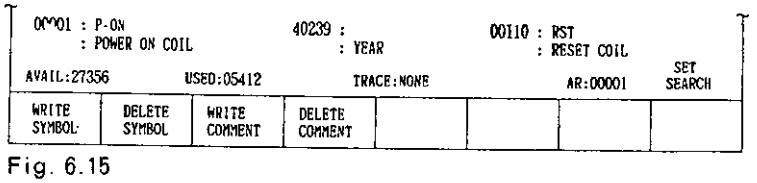


Fig. 6.15

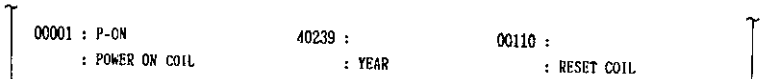


Fig. 6.16

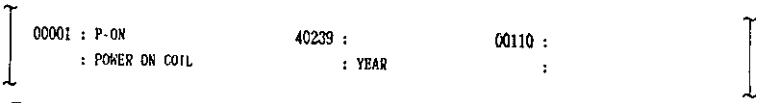


Fig. 6.17

6.2 COMMENT MANIPULATION (Cont'd)

NOTE

1. * can be omitted when the attach operation is already completed.
2. Depress (CANCEL) instead of (CONFIRM) after inputting the comment to return the display to the original condition, without storing the input comment.
3. Continuous display (example of 1 to 9 sequential coil comments)

GET NEXT	Move the cursor to the bottom line of the extension comment area to display the symbol and comment of coil "1"; then depress this key 8 times.
GET PREV	Move the cursor to the top line of the extension comment area to display the symbol and comment of coil "9"; then depress this key 8 times.

4. The (WRITE SYMBOL) and (DELETE SYMBOL) label display cannot be made for registers and networks.
5. The (WRITE SYMBOL) · (DELETE SYMBOL) · (WRITE COMMENT) and (DELETE COMMENT) label display cannot be made under the monitor mode.
6. The cursor in the comment section can be moved by the [⇦] and [⇨] keys on the full keyboard or the [<] and [>] keys on the P140.
7. Depress the [BS] on the full keyboard or the [BACK SPACE] on the P140 to delete one comment character immediately before the cursor.
8. To change an optional character of the registered comment or symbol, move the cursor to the desired position, and input the desired character.

7. FILE MANAGEMENT OPERATION

The file control is used for operation of data disk files (user files), disk formatting and P140 communication parameter settings, as listed below:

The operation can be executed by connecting the P140 and the floppy disk unit (DISCT-FD400).
The file name can be changed by inputting the new file name via the full keyboard.

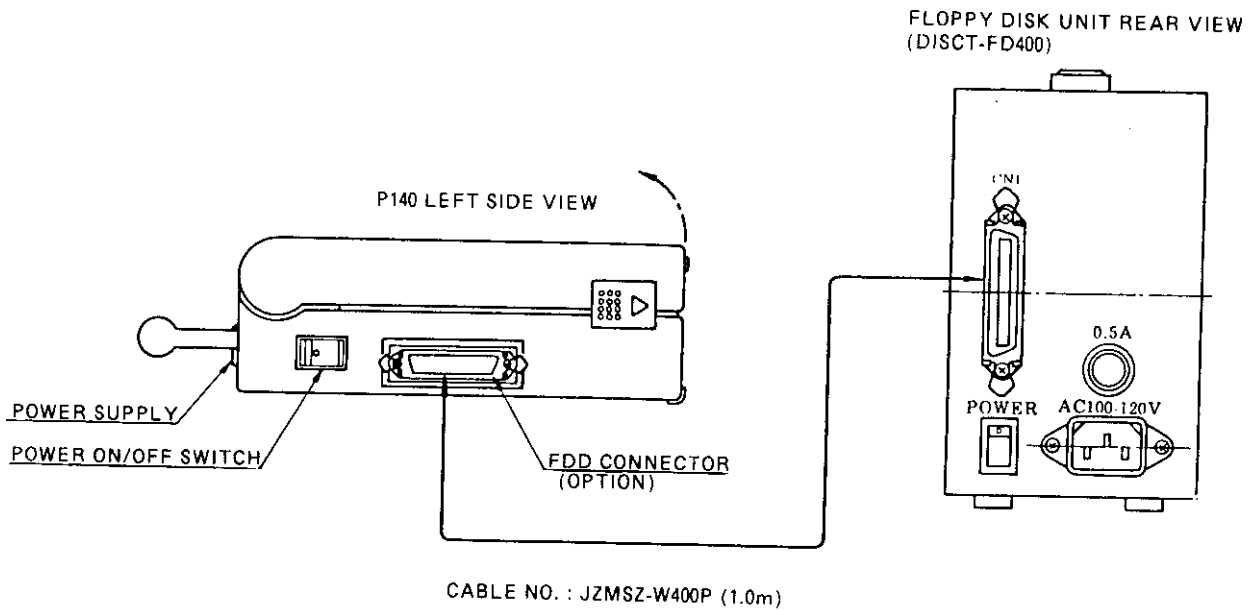
FILE CONTROL

- Directory: File names are displayed.
- File delete: Unnecessary files are deleted.
- File rename: File names are altered.
- File format: New disks are formatted (initialized).
- File copy: From the source disk, specified files are copied onto the destination disk.
- Set port parameter: The communication parameters for PORT 1 and PORT 2 of P140 are set.

These operations can be executed with P140 alone (off-line).

POINT

Before starting operation, insert the correct disks as instructed by the display in drive.



CABLE NO. : JZMSZ-W400P (1.0m)

7. FILE MANAGEMENT OPERATION (Cont'd)

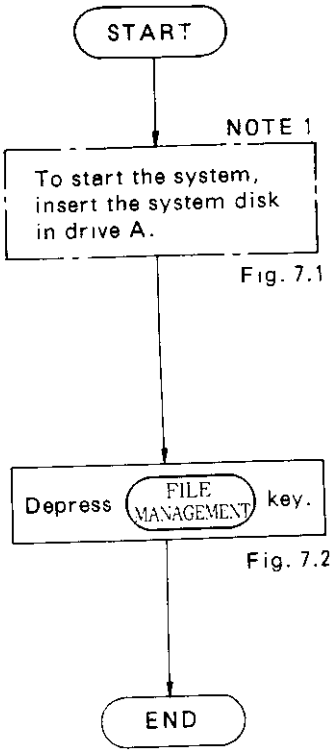


Fig. 7.1

Fig. 7.2

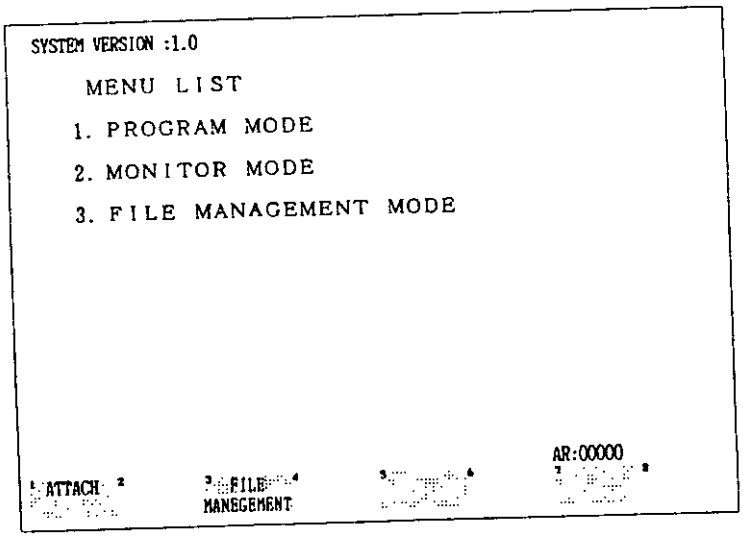


Fig. 7.1

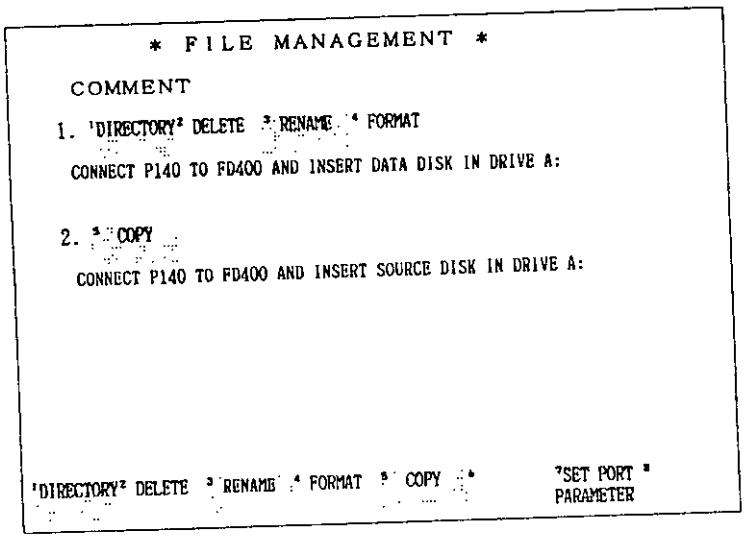


Fig. 7.2

NOTE

1. When ATTACH operation has already been completed, depress SUPER VISRY key and then depress (INITIAL DISPLAY) key, or depress SHIFT and SUPER VISRY keys simultaneously to return the operation menu display.
2. Depressing (INITIAL DISPLAY) key shown in Fig. 7.2 also calls up the operation menu display.

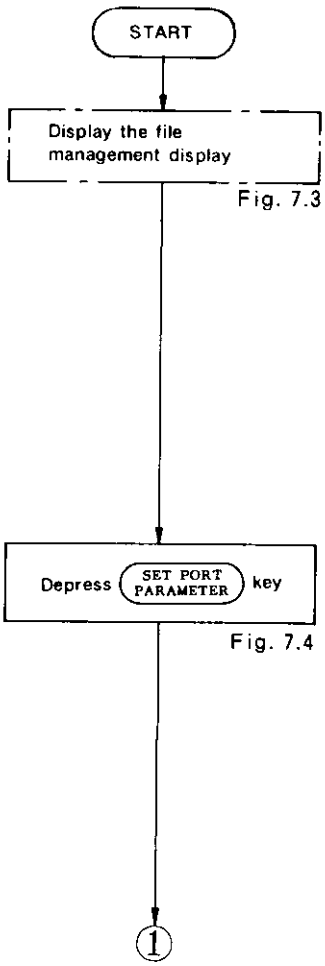
7.1 P140 PORT PARAMETERS

(1) SET PORT PARAMETER

When using the P140 serial port (RS-232C), set the transmission conditions on the port where the GL60S is to be connected.

POINT

- If the GL60S is connected to PORT 1, and its port parameters to be set are the same as those set before shipping, port parameter setting is not required.



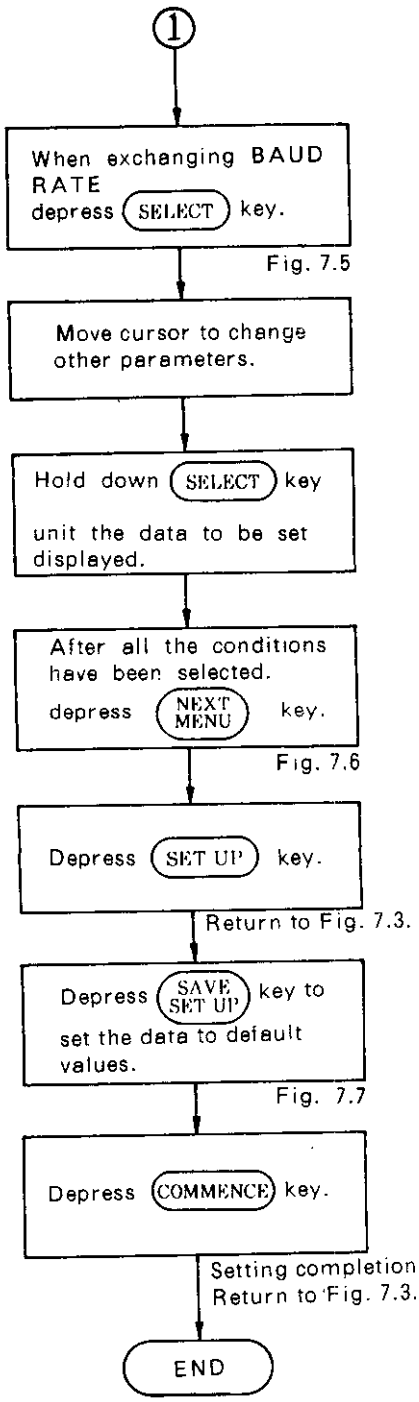

```
          * FILE MANAGEMENT *
  COMMENT
1. 1DIRECTORY 2 DELETE  3 RENAME  4 FORMAT
   CONNECT P140 TO FD400 AND INSERT DATA DISK IN DRIVE A:

2. 5 COPY
   CONNECT P140 TO FD400 AND INSERT SOURCE DISK IN DRIVE A:

1DIRECTORY 2 DELETE  3 RENAME  4 FORMAT  5 COPY  6        7SET PORT 8
                                                          PARAMETER
```

Fig. 7.3

```
          * SET PORT PARAMETER *
                              PORT
BAUD RATE          :          9600
PARITY CHECK       :          EVEN
STOP BIT           :          1 STOP BIT
DATA LENGTH        :          8 BIT DATA

1 SELECT 2   3   4   5   6   7   8 NEXT
                                    MENU
```

Fig. 7.4

7.1 P140 PORT PARAMETERS (Cont'd)



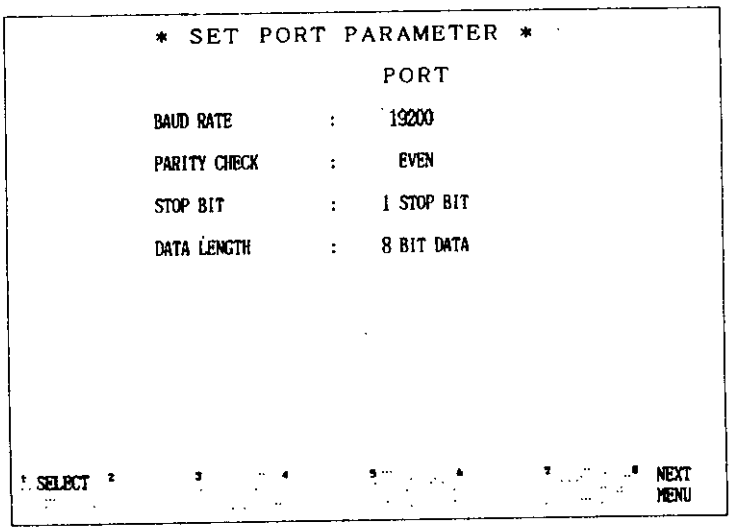


Fig. 7.5

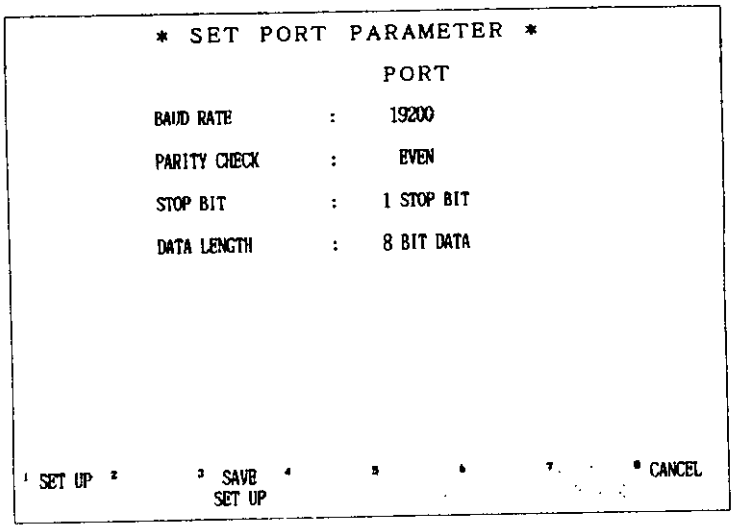


Fig. 7.6

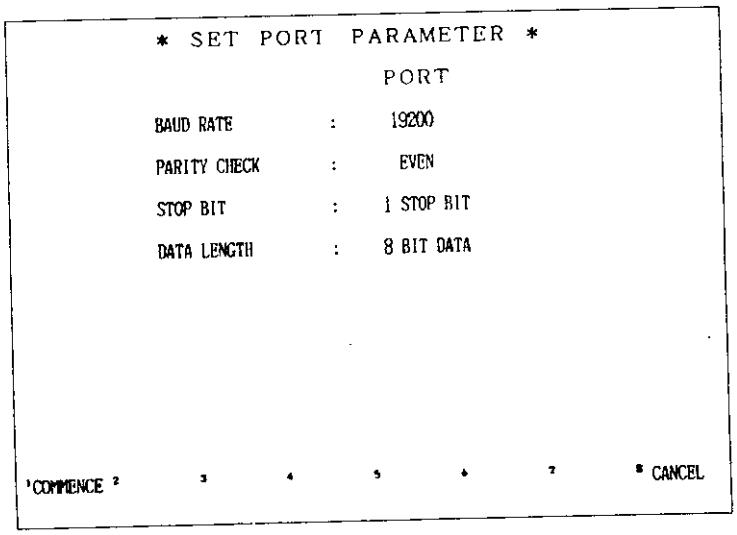


Fig. 7.7

NOTE

1. P140 has a communication parameter file in the system disk, the default values (initial values) shown in Fig. 7.4.

Table 7.1 Change of Setting Value at (SELECT) key Depression

Item	Setting Value
BAUD RATE	→ 110 → 150 → 300 → 600 → 19200 ← 9600 ← 4800 ← 2400 ← 1200 ←
PARITY CHECK	→ DISABLE → ODD → EVEN →
STOP BIT	→ 1 STOP BIT → 2 STOP BIT →
DATA LENGTH	→ 7 BIT DATA → 8 BIT DATA →

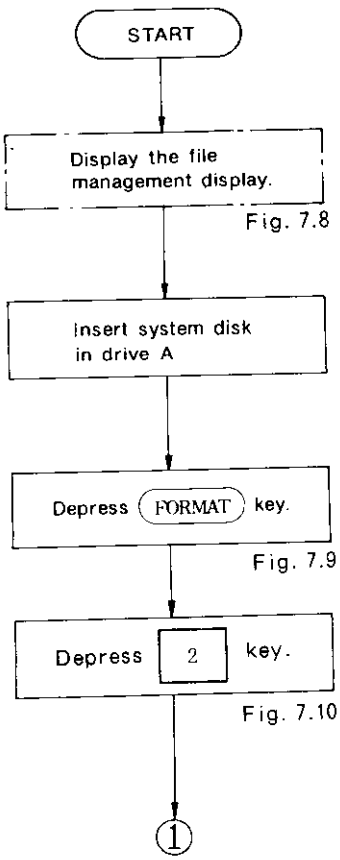
7.2 DISK OPERATION

(1) DISK FORMAT

The disks are formatted by this procedure. Through this operation disks become usable with P140.

POINT

- Blank disks (model F150-000) are delivered in the formatted state. This operation is not required.
- When disks purchased on the market are used, format the disks with writable state before using. (Media type; 2DD, 2HD)



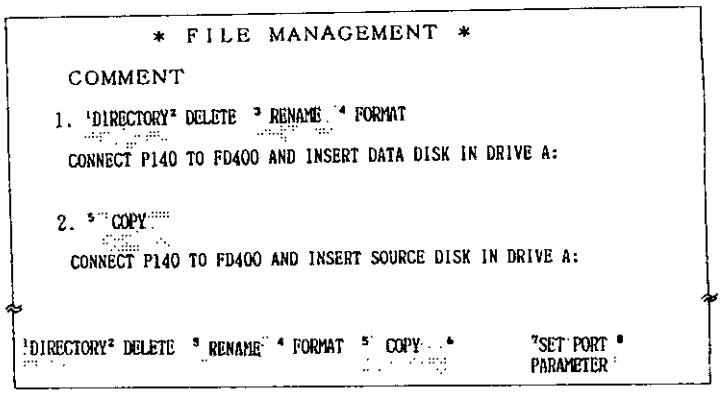


Fig. 7.8

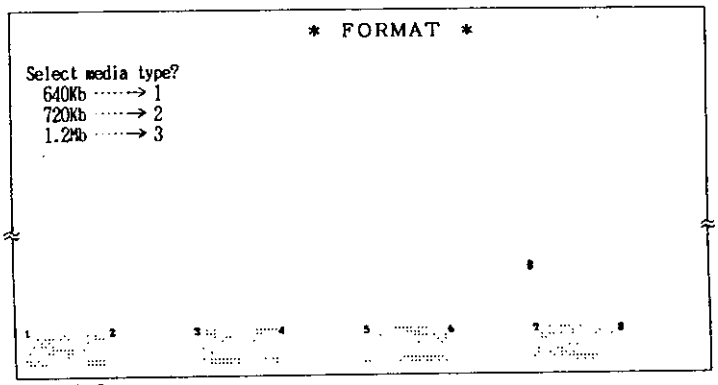


Fig. 7.9

POINT

· For media type, three types (640kb to 1.2Mb) can be selected. Media types 2DD and 2HD are available.

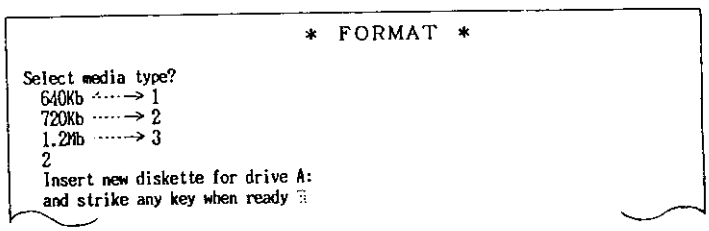
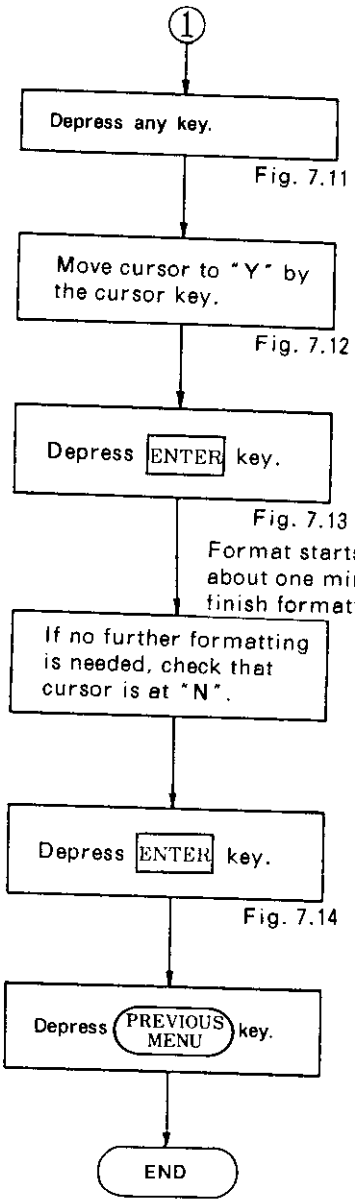


Fig. 7.10




```
                    * FORMAT *

Select media type?
  640Kb ·····→ 1
  720Kb ·····→ 2
  1.2Mb ·····→ 3
  2
  Insert new diskette for drive A:
  and strike any key when ready

  All data in disk of drive B: are cleared. Are you sure <Y/N> ?
```

Fig. 7.11

```
                    * FORMAT *

Select media type?
  640Kb ·····→ 1
  720Kb ·····→ 2
  1.2Mb ·····→ 3
  2
  Insert new diskette for drive A:
  and strike any key when ready

  All data in disk of drive B: are cleared. Are you sure <Y/N> ?
```

Fig. 7.12

```
                    * FORMAT *

Select media type?
  640Kb ·····→ 1
  720Kb ·····→ 2
  1.2Mb ·····→ 3
  2
  Insert new diskette for drive A:
  and strike any key when ready

  All data in disk of drive B: are cleared. Are you sure <Y/N> ?

  Formatting · · ·
```

Fig. 7.13

```
                    * FORMAT *

Select media type?
  640Kb ·····→ 1
  720Kb ·····→ 2
  1.2Mb ·····→ 3
  2
  Insert new diskette for drive A:
  and strike any key when ready

  All data in disk of drive B: are cleared. Are you sure <Y/N> ?

  Formatting · · ·

   730112 bytes total disk space
   730112 bytes available on disk

  Format another <Y/N> ?

1       2       3       4       5       6       7PREVIOUS 8
                                                MENU
```

Fig. 7.14

NOTE

1. Depressing [N] key in the display of Fig. 7.12 displays (PREVIOUS MENU) label.

   Then depressing the key returns to display of Fig. 7.8.

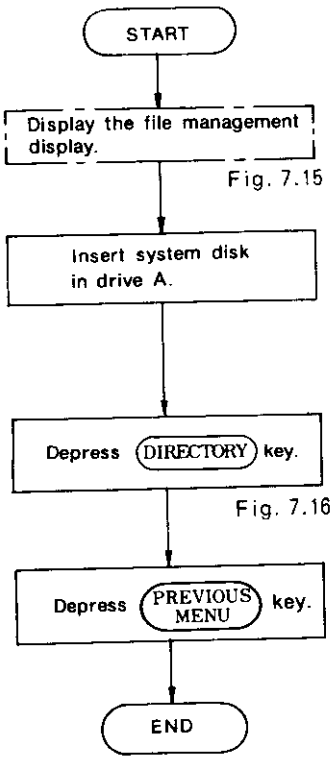
IMPORTANT

When disks are formatted, all the contained data are deleted. To empty formatted disks, use the file deletion function.

7.3 FILE OPERATION

(1) DIRECTORY

Data disk directory information contains by this operation. The directory is recorded file names, sizes, and the data of creation and updating.




```
            * FILE MANAGEMENT *

   COMMENT

1. 'DIRECTORY² DELETE ³ RENAME ⁴ FORMAT

   CONNECT P140 TO FD400 AND INSERT DATA DISK IN DRIVE A:


2. ⁵ COPY

   CONNECT P140 TO FD400 AND INSERT SOURCE DISK IN DRIVE A:




'DIRECTORY² DELETE ³ RENAME ⁴ FORMAT ⁵ COPY ⁶          'SET PORT ⁸
                                                      PARAMETER
```

Fig. 7.15

```
                * DIRECTORY *

   Volume in drive A: has no label
   Directory of ¥

TEST              29575  86-01-27   3:26a
CHKLDR     1      78713  85-10-31  17:10a
CHKLDR     2     103289  85-11-07  11:19a
PROG       U84    78713  85-11-07  10:16a
COMMAND    COM    17190  86-01-07   9:00a
        5 File(s)     378880 bytes free




¹      ²      ³      ⁴      ⁵      ⁶      ?PREVIOUS ⁸
                                          MENU
```

Fig. 7.16

NOTE

1. The file name format is: file name (8 characters max.), escape character (3 characters max.). The escape character may be omitted. When it is used, a period (.) must be put in front of it.
   For file names and expanders, the following characters are usable:

   A to Z 0 to 9 $ & #
   % / ( ) - @ _
   ^ { } ~ !

Although file names are written in both capital letters and small letters, P140 converts all characters into capital letters. However, following file names can not be used because they are used in the system.

AUX

CON

LST

PRN

NUL

IO. SYS

MSDOS. SYS

COMMAND. COM

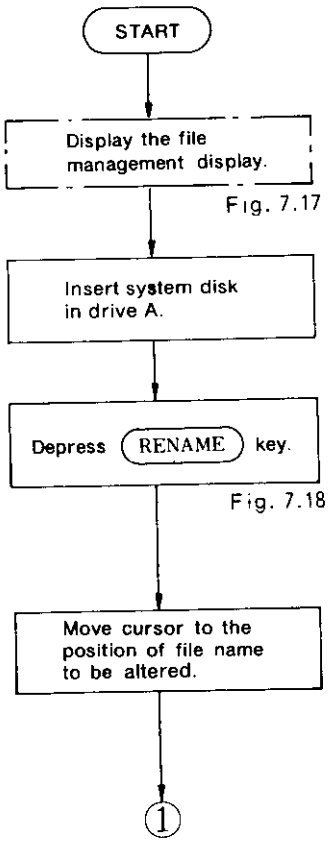
7.3 FILE OPERATION (Cont'd)

(2) FILE RENAME

The file names on the data disks can be altered. However, if the same name is already present on the disk, that name can not be used again.

POINT

Make the data disk writable in advance.



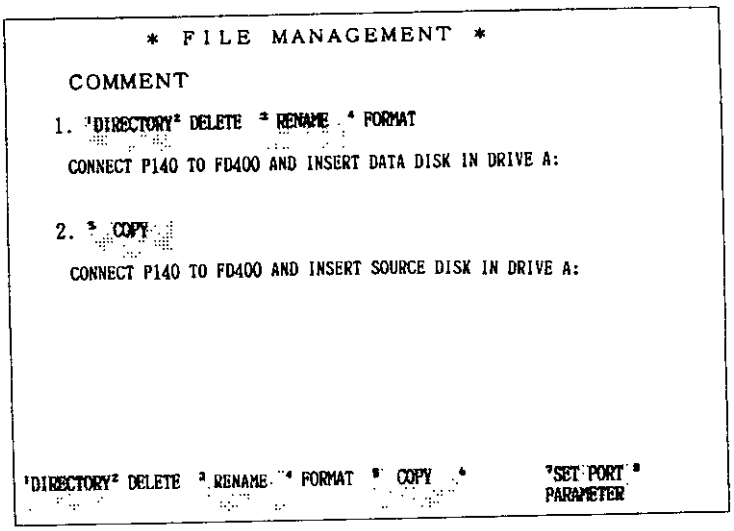


Fig. 7.17

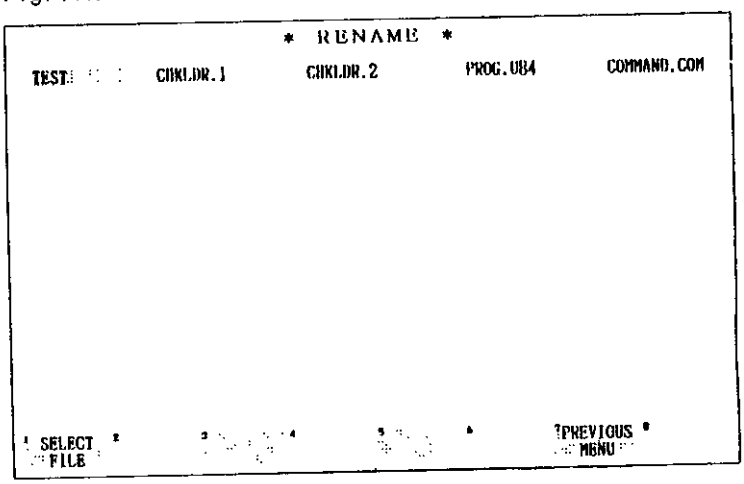
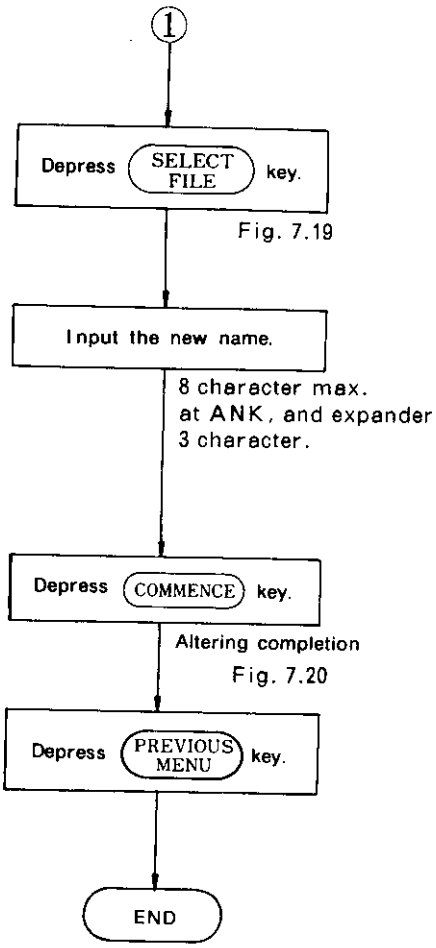


Fig. 7.18



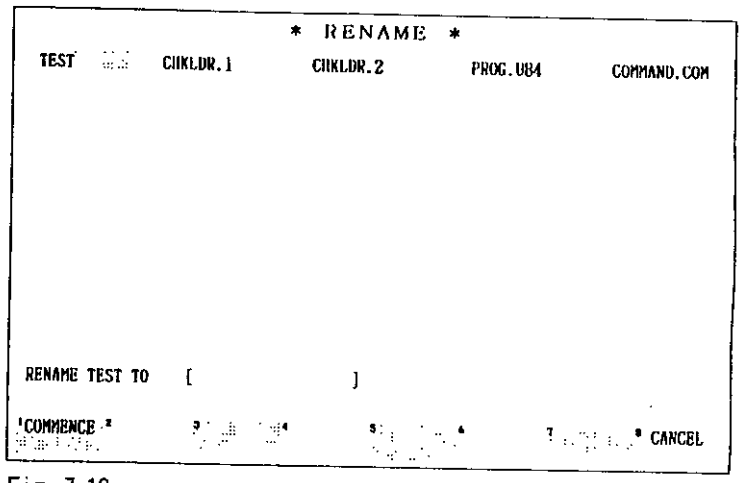


Fig. 7.19

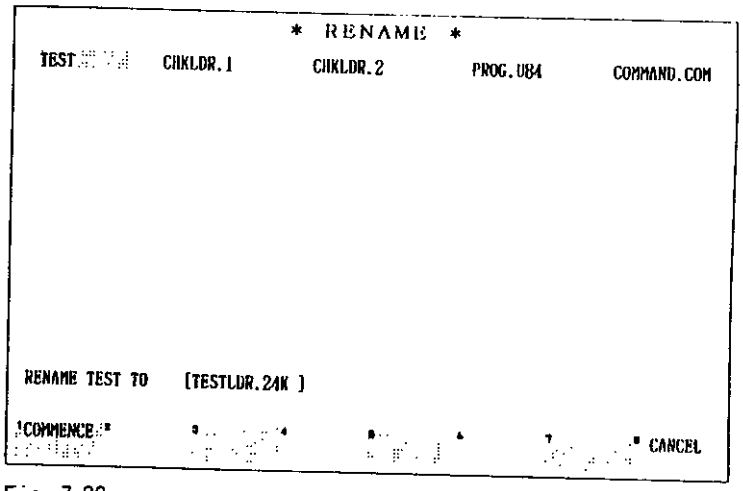


Fig. 7.20

NOTE

1. Depressing (CANCEL) key (in the display of Fig. 7.20) calls up the display in Fig. 7.18.

7.3 FILE OPERATION (Cont'd)

(3) FILE COPY

The specified files or all the files can be copied from the disk in drive A.

POINT

Make the destination disk writable in advance.
Write-protect the source disk.

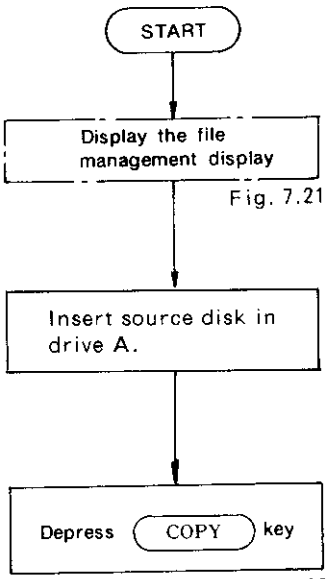


Fig. 7.21

Fig. 7.22

```
          * FILE MANAGEMENT *
   COMMENT
1. 1DIRECTORY 2 DELETE 3 RENAME 4 FORMAT
   CONNECT P140 TO FD400 AND INSERT DATA DISK IN DRIVE A:

2. 5 COPY
   CONNECT P140 TO FD400 AND INSERT SOURCE DISK IN DRIVE A:

1DIRECTORY 2 DELETE 3 RENAME 4 FORMAT 5 COPY 6      7SET PORT 8
                                                    PARAMETER
```

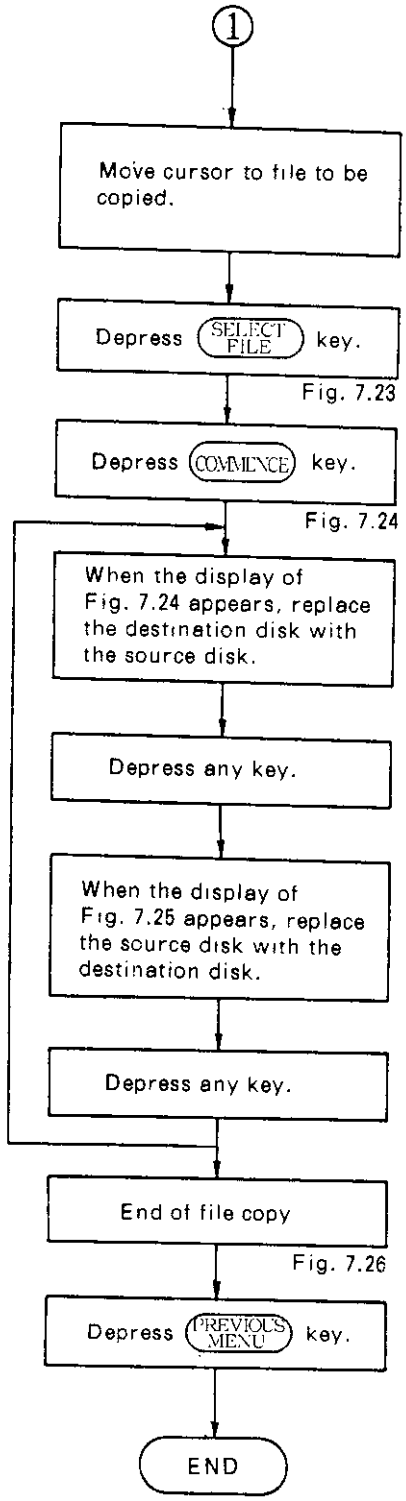
Fig. 7.21

```
          * FILE COPY *
TEST    CHKLDR.1    CHKLDR.2    PROG.60S    COMMAND.COM

1 SELECT 2   3   4   5   6   7   8 END
  FILE
```

Fig. 7.22

NOTE

It is recommended that all the disks (especially important ones) are copied for backup purposes, as a safety measure against accidental damage or deletion of files.



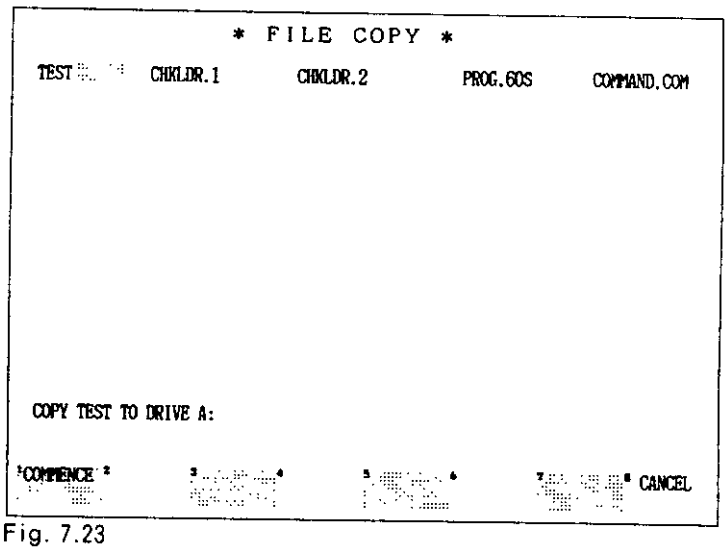


Fig. 7.23

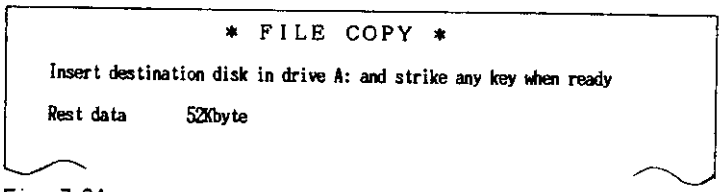


Fig. 7.24

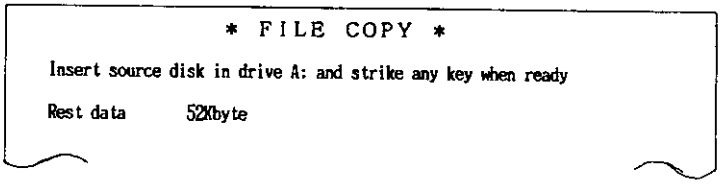


Fig. 7.25

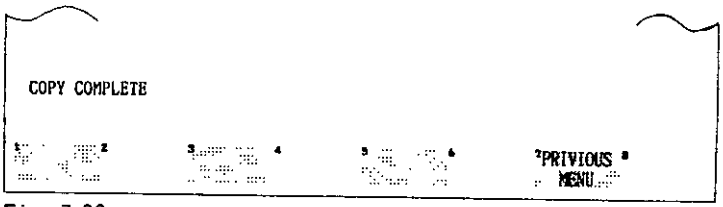


Fig. 7.26

NOTE

1. Make the destination disk writable in advance.
2. Depressing (CANCEL) key (Fig. 7.23) calls up the display in Fig. 7.22.

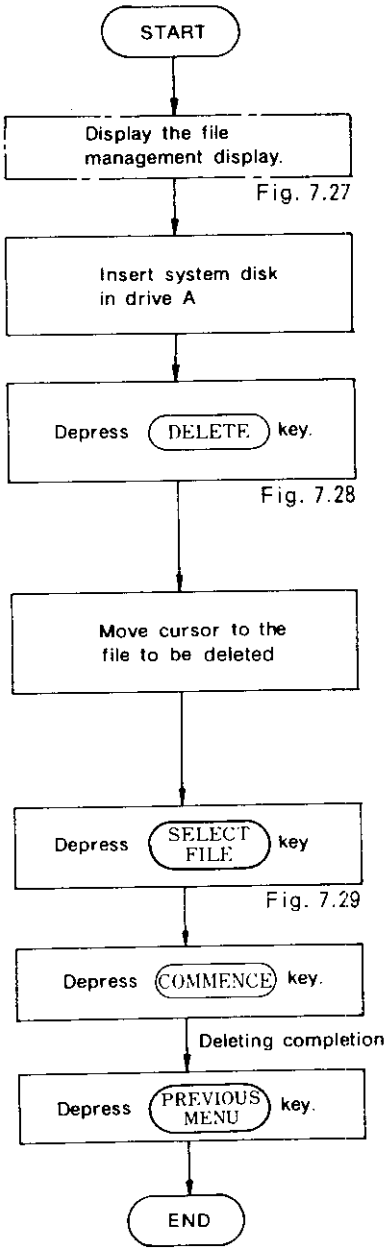
7.3 FILE OPERATION (Cont'd)

(4) FILE DELETE

Deleting unnecessary files in the data disk.

POINT

- Make the data disk writable in advance.



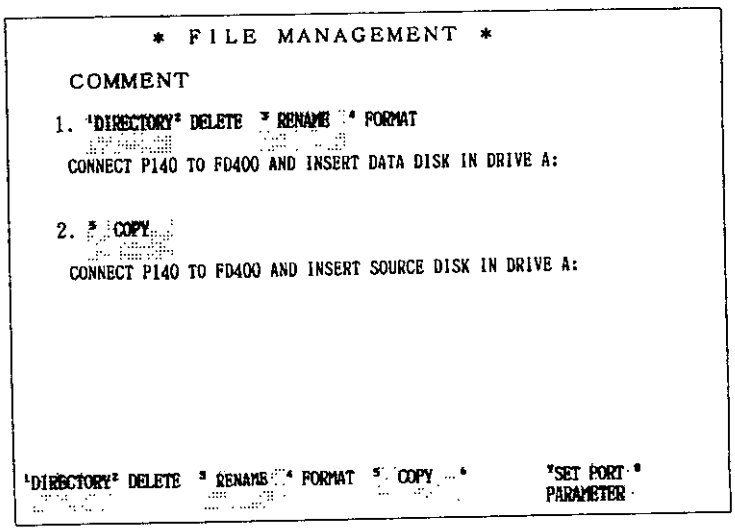


Fig. 7.27

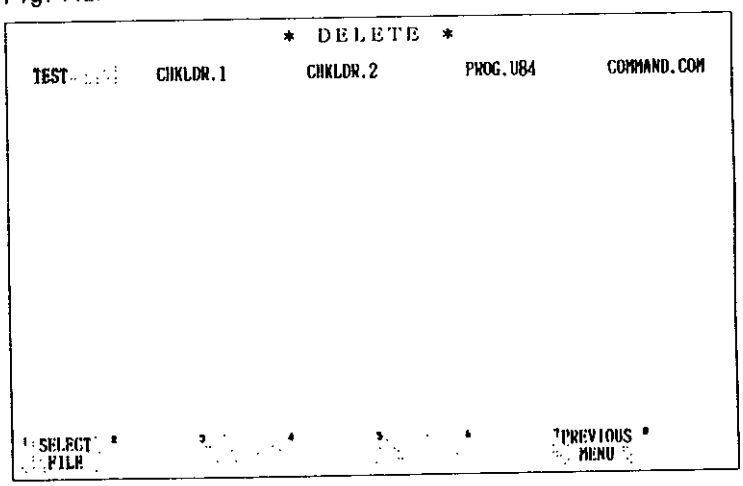


Fig. 7.28

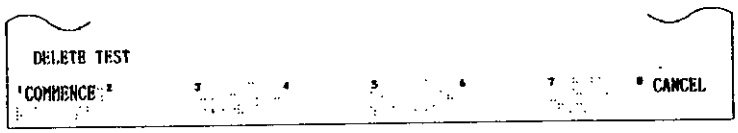


Fig. 7.29

NOTE

1. Depressing (CANCEL) key (Fig. 7.29) calls up the display in Fig. 7.28.

IMPORTANT

Be sure to make disks important to write disable state.

8. MESSAGES

8.1 ERROR MESSAGES FOR OPERATION

Table 8.1 Error Messages for Operation

Error Message	Description	Action
# OF COIL MUST BE MULTIPLES OF 16	The first reference number or the number of references in the discrete for the high speed station allocation is invalid.	A reference number must be multiple of 16 plus 1, and the number of references must be multiple of 16.
# OF COIL MUST BE MULTIPLES OF 8	The first reference number or the number of references in the discrete for the I/O allocation is invalid.	A reference number must be multiple of 8 plus 1, and the number of references must be multiple of 8.
* * CAUTION: REFERENCE MULTIPLY IN TRAFFIC COP * *	The reference number already exists.	If the number may be set, depress (PROCEED) key ; if not, select another number.
ADDRESS LIMIT	The reference number, the number of references, or the size exceeds the limit.	Select a valid number.
ANOTHER SC SAVED FILE	In load or verify operation, the file type is wrong.	Depress [SHIFT] and [ERROR CLR AR] keys.
AR NOT DECIMAL	Data format is not of decimal type.	Enter decimal data.
CAN NOT COPY SYSTEM DISK	The system disk was inserted in drive B, and (FILE COPY) key was depressed.	Insert a disk in drive B.
CAN NOT CREATE FILE	In save operation, a file creation error occurred.	Perfom a disk check operation. Change the data disk.
CAN NOT DELETE SYSTEM FILE	The system disk was inserted in drive B, and (DELETE) key was depressed.	Insert a data in drive B.
CAN NOT DELETE	In delete operation, "COMMAND. COM" was selected.	Select a correct file.
CAN NOT DISPLAY SYSTEM FILE	The system disk was inserted in drive B, and (DIRECTORY) key was depressed.	Insert a data disk in drive B.
CAN NOT LOGIN-UNIT HAS PROGRAMMER ATTACHED	Only one programming panel may be attached to a GL60S at a time in write mode.	Attach one programming panel in monitor mode.
CAN NOT READ DISK	In load or verify operation, a disk data read error occurred.	Depress [SHIFT] and [ERROR CLR AR] keys.
CAN NOT RENAME SYSTEM FILE	The system disk was inserted in drive B, and the (RENAME) key was depressed.	Insert a data disk in drive B.
CAN NOT RENAME	The "COMMAND. COM" file cannot be renamed.	Select a correct file.
CAN NOT USED THE DISK	An unfomatted disk was inserted in drive B, and a disk or a file operation other than formatting was attempted.	Insert a correct disk.
CAN NOT WRITE TO DISK	In save operation, a disk data write error occurred.	Depress [SHIFT] and [ERROR CLR AR] keys.
COIL NOT ALLOWED HERE	A coil cannot be placed on the left side of another element.	Place the coil in the correct position.
COIL NOT IN A NETWORK	The rquested coil has not yet been used.	Depress [SHIFT] and [ERROR CLR AR] keys.

Error Message	Description	Action
COIL NOT DISABLED	The (FORCE ON) or (FORCE OFF) key was depressed when the coil had not been disabled.	Disable the coil.
COIL USED	The requested coil has already been programmed.	Change the reference number of the coil.
COMPRESS NOT ALLOWED DUE TO LINE #8	(COMPRESS LINE) was attempted when the cursor was on line 8 (line 8S or 8T) of the SFC screen.	Depress [SHIFT] and [ERROR CLR AR] keys.
COMPRESS NOT ALLOWED DUE TO COLUMN #8	(COMPRESS COLUMN) was attempted when the cursor was in column 8 of the SFC screen.	Depress [SHIFT] and [ERROR CLR AR] keys.
COMPRESS NOT ALLOWED DUE TO ROW #7	(COMPRESS HORIZONTAL) was attempted when the cursor was on line 7 of the network screen.	Depress [SHIFT] and [ERROR CLR AR] keys.
CONTROLLER RUNNING LOAD NOT ALLOWED	An attempt to load save data was made when the GL60S was running.	Stop the GL60S and try again.
CONTROLLER RUNNING	The attempted action is not allowed when the controller is running.	Stop the controller and try again.
DISK NOT INSERTED OR DISK ERROR	The disk is not in the drive, or is defective.	Insert or change the disk.
DISK WRITE PROTECTED	A file operation or save operation was attempted to the write-protected data disk.	Make the disk write-permitted.
DUMMY TRANSITION NOT ALLOWED TO COPY	Copying a line is not allowed when the line where the cursor is positioned contains only a dummy transition condition (+) on the SFC screen.	Depress [SHIFT] and [ERROR CLR AR] keys.
DUMMY TRANSITION NOT ALLOWED TO MOVE	Moving a dummy transition condition is not allowed when the cursor is positioned at it on the SFC screen.	Depress [SHIFT] and [ERROR CLR AR] keys.
END OF LOGIC MEMORY	[GET NEXT] key was depressed when the last network was displayed on the screen.	Depress [SHIFT] and [ERROR CLR AR] keys.
EXIST ACTION LADDER	A macro step cannot be stored in the area with the specified step number because the area already contains an ACTION circuit.	Change the step number.
EXIST MACRO SFC	A step or an initial step cannot be stored in the area with the specified step number because the area already contains an expanded view.	Change the step number.
EXPAND NOT ALLOWED DUE TO COLUMN #8	(EXPAND COLUMN) was attempted when the cursor was in column 8 on the SFC screen.	Depress [SHIFT] and [ERROR CLR AR] keys.
EXPAND NOT ALLOWED DUE TO LINE #8	(EXPAND LINE) was attempted when the cursor was on line 8 (line 8S or 8T) of the SFC screen.	Depress [SHIFT] and [ERROR CLR AR] keys.

Table 8.1 Error Messages for Operation (Cont'd)

Error Message	Description	Action
FILE ALREADY EXIST. OVERWRITE OK ?	An attempt was made to save the file whose file name already exists on the data disk.	Depress (COMMENCE) or (CANCEL) key.
FILE NOT FOUND	In load or verify operation, a file name which does not exist was specified.	Enter a correct file name.
FROM USED	On the SFC screen, an attempt was made to store a connector with the duplicate number.	Change the connector number.
FUNCTION NOT ALLOWED	A wrong function key was depressed.	Depress a correct key.
GOSUB NOT USED	An attempt was made to perform ZOOM RETURN from the subroutine circuit when the "GOSUB" had not been stored.	Depress [SHIFT] and [ERROR CLR AR] keys.
I/O ALLOCATION FULL	The number of I/O allocation points for the discrete I/O modules exceeded 4096, or the points for the register input and output modules exceeded 512.	Reallocation is required.
I/O SLOT FULL	The number of slots for the discrete I/O module, or that for register I/O module exceeded 256.	Reallocation is required.
ILLEGAL CHANNEL NUMBER	To display the I/O allocation, a number other than 1, 2 or 3 was set to AR, and (SELECT CHANNEL) was depressed.	Set a correct channel number.
ILLEGAL LINE	Copying or moving to the line is not allowed.	Depress [SHIFT] and [ERROR CLR AR] keys.
ILLEGAL POINTS	In I/O allocation, the number of points per slot exceeds 129, and in high speed station allocation, the number of points per station exceeds 4097.	Change the number of points.
ILLEGAL PORT PARAMETER	The port parameter setting is wrong (baud rate, device, address or delay).	Change the parameter setting.
ILLEGAL RACK NUMBER	When the I/O allocation was to be displayed, an illegal rack number was specified before (SELEDT RACR) key was depressed.	Set a correct rack number.
ILLEGAL SEGMENT NUMBER	When the number of segments was to be set, or when the segment boundaries were to be displayed, an illegal number (other than a number in the range of 1 to 8) was set before (SET SEG#) or (SELECT SEGMENT) key was depressed.	Set a correct number.
ILLEGAL SIZE	The size of the LADDER area must be greater than that of the USED area.	Depress [SHIFT] and [ERROR CLR AR] keys.
ILLEGAL STATION NUMBER	When the I/O allocation was to be displayed, an illegal station number was set before (SELECT STATION) key was depressed.	Set a correct station number.
ILLEGAL STEP NUMBER	When the mode step elasped time was to be displayed, an illegal step number(other than a number in the range of S001 to S512) was set before (SELECT STEP#) key was depressed.	Set a correct step number.
ILLEGAL STEP OR REGISTER NUMBER	When the mode was to be reset or preset, illegal step number or register number was set before (SET STEP/REG#) key was depressed.	Set a correct step or register number.
INITIAL STEP NOT ALLOWED EXCEPT S000	An attempt was made to store an initial step in an expanded view.	Depress [SHIFT] and [ERROR CLR AR] keys.

Error Message	Description	Action
INITIAL STEP USED	The initial step is already in use.	Depress SHIFT and ERROR CLR AR keys.
INVALID DATA	Decimal data exceeding 9999 or hexadecimal data exceeding FFFF cannot be stored in the register.	Change the value.
INVALID DATE	In load operation, an attempt was made to enter a date in the wrong format.	Enter the date correctly.
INVALID FILE NAME	The specified file name does not exist on the disk or cannot be used.	Change the file name.
INVAID MENU NO.	An invalid menu number was entered.	Reenter a valid menu number (1, 2, or 3).
INVALID NETWORK NUMBER	A non-existing network number was specified for move segment operation.	Depress SHIFT and ERROR CLR AR keys.
INVALID REFERENCE NUMBER	The specified reference number is out of range.	Change the number.
INVALID REPLACEMENT	Alteration of an element, as from timer to ADD, is not allowed.	Depress SHIFT and ERROR CLR AR keys.
INVALID UNIT NUMBER	An invalid unit number was set and an attach operation was performed.	Select a number in the range of 1 to 247.
LAST NETWORK IN SEGMENT X	The number of segments must not less than m because segment m contains a network.	Depress SHIFT and ERROR CLR AR keys.
LIMIT OF INPUT ASSIGNMENT	Input allocation exceeds the limit.	Reallocate the input modules.
LIMIT OF OUTPUT ASSIGNMENT	Output allocation exceeds the limit.	Reallocate the output modules.
MACRO ENTRY NOT ALLOWED TO COPY	An attempt to copy a macro entry was made.	Depress SHIFT and ERROR CLR AR keys.
MEMORY PROTECT ON	The memory size cannot be altered when the IOP. COM memory protect switch is on.	Turn off the memory protect switch.
MISCOMPARE IN PROGRAM AREA	A verify error was detected in the program area.	Retry the operation from the first step.
MISCOMPARE IN SYSTEM AREA	A verify error was detected in the system area.	Retry the operation from the first step.
MISCOMPARE IN TRAFFIC COP AREA	A verify error was detected in the T-COP area.	Retry the operation from the first step.
MISCOMPARE PROGRAM SIZE	The size of the file being verified is inconsistent with that of SC program memory.	Depress SHIFT and ERROR CLR AR keys.

Table 8.1 Error Messages for Operation (Cont'd)

Error Message	Description	Action
MISCOMPARE SAVE DATA SIZE	The size of the saved data is inconsistent with that of SC memory.	Depress SHIFT and ERROR CLR AR keys.
MOVE NOT ALLOWED DUE TO COLUMN # 8	Branches or loops cannot be moved to column 8 on the SFC screen.	Depress SHIFT and ERROR CLR AR keys.
NETWORK NOT FOUND HIGHEST # : XXXXX	A non-existing network number was set.	Set a correct network number.
NO AVAIL MEMORY	There is not enough space to store the element.	Depress SHIFT and ERROR CLR AR keys.
NO CONDITION DATA	An attempt to perform a trace back operation was made without setting conditions.	Set the conditions.
NO ELEMENT AT CURSOR COLUMN	Copying a column is not allowed when no element is in the column where the cursor positioned.	Depress SHIFT and ERROR CLR AR keys.
NO ELEMENT AT CURSOR LINE	Copying a line is not allowed when no element is on the line where the cursor is positioned.	Depress SHIFT and ERROR CLR AR keys.
NO ELEMENT AT CURSOR	An operation such as deletion cannot be performed when there is no element at the cursor position.	Depress SHIFT and ERROR CLR AR keys.
NO ELEMENT TO COMPRESS	When editing the SFCs or networks, compression is not allowed if there is no element on the lines or in the columns subsequent to the cursor.	Depress SHIFT and ERROR CLR AR keys.
NO ELEMENT TO EXPAND	When editing the SFCs, expansion is not allowed if there is no element on the lines or in the columns subsequent to the cursor.	Depress SHIFT and ERROR CLR AR keys.
NO EMPTY SPACE	When there is no available space in the reference area, tracing was attempted by moving the cursor to the register position. Or when there is on available space in the comment area on the SFC screen, tracing was attempted by moving the cursor to the step position.	Depress SHIFT and ERROR CLR AR keys.
NO NETWORK IN THE CONTROLLER	ERASE GET or GET NEXT key was depressed when no network was stored in ladder area of the GL60S.	Depress SHIFT and ERROR CLR AR keys.
NO NETWORK ON SCREEN	Deleting a network cannot be performed when no network is displayed.	Depress SHIFT and ERROR CLR AR keys.
NO SEARCH PARAMETERS	A search operation was attempted without setting the search parameters.	Set the search parameters.
NO SYSTEM DISK	The system disk is not in drive A.	Insert the system disk in drive A.
NOT ALLOWED DUE TO COIL	An element or a vertical shunt cannot be stored on the break line for the coil.	Depress SHIFT and ERROR CLR AR keys.
NOT ATTACHED TO THE CONTROLLER	The attempted operation must be performed after an attach operation.	Perform an attach operation.
NOT COMMENT FILE	In load or verify operation, the specified file is not the comment file.	Select a correct file.

Error Message	Description	Action
NOT CONNECTED FD400	FD400 is not connected or its power off.	Connect FD400 and perform operation after power ON.
NOT CPU FILE	In load or verify operation, the specified file is not for the CPU.	Select a correct file.
NOT DATA IN THE DISK (ACTION)	In load or verify operation, data in the area indicated by parentheses does not exist in the disk file.	Retry the operation.
NOT DATA IN THE DISK (LADDER)	In load or verify operation, data in the area indicated by parentheses does not exist in the disk file.	Retry the operation.
NOT DATA IN THE DISK (SFC TABLE)	In load or verify operation, data in the area indicated by parentheses does not exist in the disk file.	Retry the operation.
NOT DATA IN THE DISK (SUBROUTINE)	In laod or verify operation, data in the area indicated by parentheses does not exist in the disk file.	Retry the operation.
NOT DATA IN THE DISK (TOTAL SUM)	In load or verify operation, data in the area indicated by parentheses does not exist in the disk file.	Retry the operation.
NOT DATA IN THE DISK (TRANSITION)	In load or verify operation, data in the area indicated by parentheses does not exist in the disk file.	Retry the operation.
NOT DATA IN THE DISK (ENTRY TABLE)	In load or verify operation, data in the area indicated by parentheses does not exist in the disk file.	Retry the operation.
NOT DATA IN THE DISK (EXPAND DATA)	In load or verify operation, data in the area indicated by parentheses does not exist in the disk file.	Retry the operation.
NOT DATA IN THE DISK (TRACE BACK)	In load or verify operation, data in the area indicated by parentheses does not exist in the disk file.	Retry the operation.
NOT DATA IN THE DISK (USER STATUS)	In load or verify operation, data in the area indicated by parentheses does not exist in the disk file.	Retry the operation.
NOT DATA IN THE DISK (CONFIGURATION)	In load or verify operation, data in the area indicated by parentheses does not exist in the disk file.	Retry the operation.
NOT DATA IN THE DISK (MACHINE TABLE)	In load or verify operation, data in the area indicated by parentheses does not exist in the disk file.	Retry the operation.
NOT DATA IN THE DISK (SYSTEM STATUS)	In load or verify operation, data in the area indicated by parentheses does not exist in the disk file.	Retry the operation.
NOT DATA IN THE DISK (EXPAND COMMENT)	In load or verify operation, data in the area indicated by parentheses does not exist in the disk file.	Retry the operation.
NOT ENOUGH MEMORY	There is not enough space on the data disk to save or copy data.	Use a new data disk.
NOT ENOUGH ROOM TO COMPRESS	There is not enough space for a compression operation.	Depress [SHIFT] and [ERROR CLR AR] keys.

Table 8.1 Error Messages for Operation (Cont'd)

Error Message	Description	Action
NOT ENOUGH ROOM TO COPY	There is not enough space for copying data.	Depress SHIFT and ERROR CLR AR keys.
NOT ENOUGH ROOM TO EXPAND	There is not enough space for an expansion operation.	Depress SHIFT and ERROR CLR AR keys.
NOT ENOUGH ROOM TO MOVE	There is not enough space for moving an SFC.	Depress SHIFT and ERROR CLR AR keys.
NOT EXPAND DATA FILE	In load or verify operation, the specified file is not for the EXPAND DATA.	Select a correct file.
NOT IN PROGRAM MODE	Program alteration cannot be performe in the monitor mode.	Select the program mode.
NOT SAVED FILE	The specified file was not saved by the loader.	Depress SHIFT and ERROR CLR AR keys.
ONLY DECIMAL OR HEXADECIMAL CHARACTERS ALLOWED IN AR	A character other than 0 to 9, A to F, S, T or R was set to AR.	Depress SHIFT and ERROR CLR AR keys.
OTHER PP HAS ATTACHED IN PROGRAM MODE	Other PP has already attached.	Determine if forced attachment is acceptable after considering the system
PROGRAMMING GOING ON	The network cannot be displayed in the monitor mode.	Retry the operation from the first step.
REF # NOT SET UP	When setting the trace back parameter ON or OFF cannot be set without setting a reference number.	Set a reference number.
REFERENCE ON ALTERNATE SCREEN	Tracing was performed when the input relay or the status of the register was displayed at the cursor position in the expanding reference area.	Display the expanding reference area.
SC NOT CONNECTED OR POWER OFF	The SC is not connected to the GL60S, or an attach operation was attempted when the power to the GL60S was not on	Connect to the GL60S, or turn on the GL60S.
SC SAMPLING BUSY	The waveform cannot be displayed when the trace back conditions have not yet been established.	Depress SHIFT and ERROR CLR AR keys.
SEARCH FAILED	The searched parameter is not found.	Depress SHIFT and ERROR CLR AR keys.
SFC FLOW ERROR	When an SFC was stored, an unallowable connection was attempted.	Connect correctly.
SFC MEMORY FULL	A new expanded view cannot be created exceeding 64 displays.	Depress SHIFT and ERROR CLR AR keys.
SPECIFY CH # OR ST #	In high speed station allocation, PREVIOVS MENU key was depressed when the channel or station number has not yet been set.	Set the channel or station number.

Error Message	Description	Action
SPECIFY POINTS OR SIZE PARAMETER	in allocation, (PREVIOUS MENU) was depressrd when the number of points or the size has not been set.	Set the number of points or the size.
SPECIFY REF # PARAMETER	In allocation, the number of points or the size cannot be set prior to the reference number.	Set the reference number.
SPECIFY STATUS OR STEP/REGISTER NO PARAMETER	When resetting or presetting the mode, (PREVIOUS MENU) key was depressed without setting the step number or the register number.	Set the step number or the register number.
SPECIFY TIME IN MULTIPLES OF 10	A multiple of 10 must be set for the constant sweep time.	Change the value to a multiple of 10.
SPECIFY TIME PARAMETER	(COMMENCE) key was depressed without setting the constant sweep time.	Set the time.
START OF LOGIC MEMORY	[GET NEXT] key was depressed when the first network was displayed.	Depress [SHIFT] and [ERROR CLR AR] keys.
STEP ACTIVE	On the SFC screen, attempt to delete or move an active step was made.	Depress [SHIFT] and [ERROR CLR AR] keys.
STEP HOLD	Steps in the hold cannot be disabled.	Cancel the hold mode.
STEP DISABLED	The mode of the steps cannot be changed from the disable mode to the hold mode without cancelling the disable mode.	Cancel the disable mode.
STEP NOT USED	When the step had not been stored, a zoom return from the action circuit was attempted.	Depress [SHIFT] and [ERROR CLR AR] keys.
STEP USED	The specified step number is already in use.	Specify another step number.
TIMEOUT ERROR-PRINTER	Communication time ran out when data was being output to a printer.	Depress [SHIFT] and [ERROR CLR AR] keys.
TRACE STACK EMPTY	Retracing was performed when the status display for TRACE was "NOTE".	Depress [SHIFT] and [ERROR CLR AR] keys.
TRANSITION NOT USED	When the transition condition had not been stored, a zoom return from the transition circuit was attempted.	Depress [SHIFT] and [ERROR CLR AR] keys.
TRANSITION USED	The specified transition condition number is already in use.	Change the transition condition number.
VERTICAL NOT ALLOWED IN THIS ROW	A vertical shunt cannot be stored on line 7.	Depress [SHIFT] and [ERROR CLR AR] keys.

Table 8.1 Error Messages for Operation (Cont'd)

Error Message	Description	Action
E2ROM READ ERROR	The P140 transmission parameter cannot be read.	External noise may be the cause. Turn off the power, and pull out the ROM pack. Insert the ROM pack once more, and turn on the power. Start from the beginning once more
E2ROM WRITE ERROR	The P140 transmission parameter cannot be written.	
INVALID FUNCTION (FD400)	Illegal data exchange with the FD400.	External noise may be the cause. Check the cable between the P140 and FD400. Then, turn off and on the power of the P140 and FD400, and try the operation from the beginning once more.

8.2 MESSAGES FOR OPERATION

Message	Message	Message
ATTACHING	SC ALL COMMENT MEMORY CLEAR REQUESTED	VERIFY REQUESTED
CONSTANT SWEEP CANCEL	SC ALL DATA MEMORY CLEAR REQUESTED	XXXXX MISCOMPARE : VERIFY COMPLETE
CONSTANT SWEEP INVOKED	SC ALL SFC MEMORY CLEAR REQUESTED	DELETE XXX-XX
CONSTANT TIME : XXXXX	SC ALL TRAFFIC COP MEMORY CLEAR REQUESTED	RENAME XXX-XX TO { }
DISCRETE XXXXX DISABLED (NOT USED)	SC ASCII T-COP MEMORY CLEAR REQUESTED	COPY XXX-XX TO DRIVE A :
DISCRETE XXXXX DISABLED (USED)	SC CONSTANT REGISTER DATA MEMORY CLEAR REQUESTED	NO OTHER COIL DISABLED
DISCRETE XXXXX DISABLED	SC HOLD REGISTER DATA MEMORY CLEAR REQUESTED	COPY COMPLETE
DISKCOPY REQUESTED	SC I/O T-COP MEMORY CLEAR REQUESTED	
FD DATA SIZE (XXXXX) W BIGGER THAN SC' S	SC LADDER MEMORY CLEAR REQUESTED	
FD DATA SIZE (XXXXX) W SMALLER THAN SC' S	SC MODE MEMORY CLEAR REQUESTED	
LOAD COMPLETE	SC SFC COMMENT MEMORY CLEAR REQUESTED	
LOAD REQUESTED	SC SFC GRAPH MEMORY CLEAR REQUESTED	
POWER DISPLAY INVALID-NETWORK SKIPPED	SC H SPEED ST T-COP MEMORY CLEAR REQUESTED	
READING HOLD	SC SUBROUTINE MEMORY CLEAR REQUESTED	
READING DISABLE	SC TRANSITION MEMORY CLEAR REQUESTED	
READING ACTIVE	SEARCHING	
READING TIME CHART	SEGMENT BOUNDARY CROSSED	
READING ACTION	SINGLE SWEEP TRIGGERED	
READING TRANSITION	STEP SXXX DISABLED (NOT USED)	
READING TRAFFIC COP	STEP SXXX DISABLED (USED)	
RUNNING SC	STEP SXXX HOLD (NOT USED)	
SAVE COMPLETE	STEP SXXX HOLD (USED)	
SAVE REQUESTED	STOPPED SC	
SC START REQUESTED	SYSTEM CONFIGURATION WRITTEN	
SC STOP REQUESTED	TRACE BACK COMPLETE	
SC ACTION MEMORY CLEAR REQUESTED	VERIFY COMPLETE	

8.3 ERROR MESSAGES FOR SYSTEM

Error Message	Description	Action
CRC FAILURE	An error was found in the data received from the GL60S. (CRC check error)	Retry the operation from the first step.
INVALID ADDRESS	An error was found in the data received from the GL60S. A wrong floppy disk was used.	Retry the operation from the first step. Use the floppy disk for the GL60S.
INVALID CHARACTER	An error was found in the data received from the GL60S. A wrong floppy disk was used.	Retry the operation from the first step. Use the floppy disk for the GL60S.
INVALID COMMAND	An error was found in the data received from the GL60S. A wrong floppy disk was used.	Retry the operation from the first step. Use the floppy disk for the GL60S.
INVALID NODE	An error was found in the data received from the GL60S. A wrong floppy disk was used.	Retry the operation from the first step. Use the floppy disk for the GL60S.
INVALID PAGE	An error was found in the data received from the GL60S. A wrong floppy disk was used.	Retry the operation from the first step. Use the floppy disk for the GL60S.
INVALID PARAMETER	An error was found in the data received from the GL60S. A wrong floppy disk was used.	Retry the operation from the first step. Use the floppy disk for the GL60S.
INVALID RANGE	An error was found in the data received from the GL60S. A wrong floppy disk was used.	Retry the operation from the first step. Use the floppy disk for the GL60S.
INVALID TYPE	An error was found in the data received from the GL60S. A wrong floppy disk was used.	Retry the operation from the first step. Use the floppy disk for the GL60S.
NO END OF LOGIC MEMORY	Data indicating the end of the program (EOL) does not exist.	Refer to the user's manual.
P150 UART STATUS ERROR	An error was found in the data received by the P140. (This error may be caused by external noise.)	Retry the operation from the first step. (Keep the device away from the source of the noise.)
SC CRC FAILURE	The P140 received a response from the GL60S that an error was found in the received data. (This error may be caused by external noise.)	Retry the operation from the first step.
SC UART STATUS ERROR	The P140 received a response from the GL60S that an error was found in the received data. (This error may be caused by external noise.)	Retry the operation from the first step.
STOPPED SC SYSTEM ERROR : XXX-XXX	Displays the GL60S stop status in hexadecimal notation.	Refer to the user' s manual.
TIMEOUT ERROR-COMMUNICATIONS DOWN	This message is displayed when the P140 does not receive a response after transmitting a signal to the GL60S.	Check the parameters (P140 and GL60S) and cables. Check the GL60S by turning the power swith ON and OFF and then ON again.
FATAL I/O ERROR MUST INITIALIZE RESET SEQUENCE	Another operation was performed after an error occurred during data communication with the GL60S.	Retry the operation from the first step.
COM FATAL ERROR	The P140 received a response from the GL60S that an error was found in the received data.	Retry the operation from the first step.

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