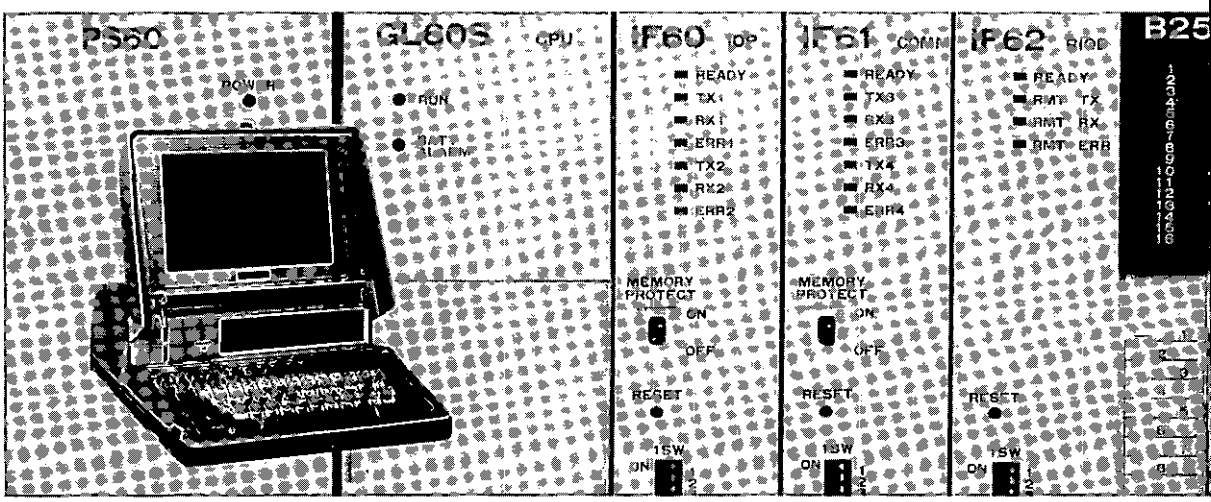
P150 PROGRAMMING PANEL
DESCRIPTIVE INFORMATION

PROGRAMMABLE CONTROLLER: MEMOCON-SC GL60S



YASKAWA

MANUAL NO. SIE-C815-14.2C

NOTES FOR SAFE OPERATION

Read these manuals thoroughly before use of MEMOCON-SC GL60S. In these manuals, NOTES FOR SAFE OPERATION are classified as "WARNING" and "CAUTION."

⚠ WARNING : Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to personnel.

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

Even items described in ⚠CAUTION may result in a vital accident in some situations. In either case, follow these important notes.

The following shows the symbols of prohibition and mandatory action.

⃠ PROHIBITION : Specifies prohibited handling.

● MANDATORY ACTION : Specifies actions that must be taken.

After reading these manuals, keep them readily available for those using the equipment.

1 WIRING

INSERT THE INTERFACE CABLES PROPERLY

· Insert the connectors of the various interface cables that are connected to MEMOCON-SC into the communication parts and secure them properly. Failure to observe this instruction may result in malfunctions.

2 PRECAUTION UPON USE

⚠ CAUTION

· Operations such as RUN, STOP, forced output, and program change during operation must be carried out with care. Operational errors may damage the machine or cause accidents.

WHEN USING A MODEM, TURN THE POWER SUPPLY OFF OR ON CAREFULLY

· If the power supply of a slave machine is turned ON or OFF while the modem power supply is ON, the modem will output unnecessary signals to the twisted-pair cable for several tens of milliseconds. If any messages are being transmitted at this time, a transmission error will occur. To avoid problems, turn ON the power supply of a slave machine before turning ON the power supply of the modem and turn OFF the power supply of the modem before turning OFF the power supply of the slave machine. Alternatively, turn ON and OFF the power supplies of a slave machine and a modem simultaneously.

PROGRAMMING PANEL OPERATING PRECAUTIONS

· Be sure not to use the single sweep function while the machine is operating. Do not use the single sweep for testing purposes, once machinery, processes, or conveyor equipment has begun operating. On completion of decoding, the MEMOCON-SC will stop after output has been sent. Subsequent decoding will not be executed, so all further input signals will be ignored resulting in the likelihood of severe damage to any machine connected to the MEMOCON-SC.

3 GENERAL PRECAUTION

- MEMOCON-SC was not designed or manufactured for use in devices or systems that concern peoples' lives.
  Users who intend to use the product described in this manual for special purposes such as devices or systems relating to transportaion, medical, space aviation, atomic power control, or underwater use must contact YASKAWA representatives beforehand.
- This product has been manufactured under strict quality control guidelines. However, if this product is to be installed in any location in which a failure of MEMOCON-SC involves a life and death situation or in a facility where failure may cause a serious accident, safety devices must be installed to minimize the likelihood of any accident.
- Any illustrations, photographs, or example used in this manual are provided as examples only and may not apply to all product to which this manual is applicable.
- The products and specifications described in this manual or the content and presentation of the manual may be changed without notice to improve the product and/or the manual.
  A new version of the manual will be re-released under a revised document number when any changes are made.
- Contact your YASKAWA representative listed on the back of this manual to order a new manual whenever this manual is damaged or lost.
  Please provide the document number listed on the front cover of this manual when ordering.
- Contact your YASKAWA representative listed on the back of this manual to order new nameplates whenever a nameplate becomes worn or damaged.
- YASKAWA cannot make any guarantee for products which have been modified.
  YASKAWA assumes no responsibility for any injury or damage caused by a modified product.

OVERVIEW OF MANUAL

- This manual describes functions, specifications, and application methods of the MEMOCON-SC, GL60S, P150 Programming Panel.

- Read this manual carefully in order to use the Programming Panel properly. Also, keep it in a safe place so that it can be used whenever necessary.

- Refer to the following manuals as necessary.

	Document Title	Document Number	Content
CPU Module	MEMOCON-SC GL60S DESCRIPTIVE INFORMATION	SIE-C815-14.1	Describes system configuration devices and their functions, specifications, application methods, etc., for the MEMOCON-SC GL60S.
Man/ Machine Interface	MEMOCON-SC GL60S P150 PROGRAMMING PANEL DESCRIPTIVE INFORMATION	SIE-C815-14.3	Describes the SFC functions, specifications, application methods, etc., for the P150 Programming Panel.

- Throughly check the specifications and conditions or restriction of the product before use.

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1. INTRODUCTION

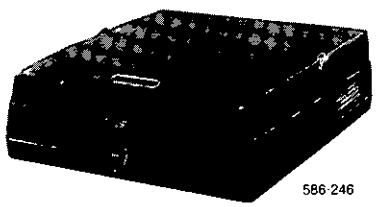
The P150 programming panel is a high-performance portable programming panel incorporating a high-performance microprocessor IAPX-186 (using MS-DOS* V2.11 for OS†), and is applicable to all the programmable controllers in the Memocon-SC series.

The P150 is a user-friendly man-machine interface featuring a large easy-to-read plasma display and two 3.5-inch floppy disk drives, using various system disks.

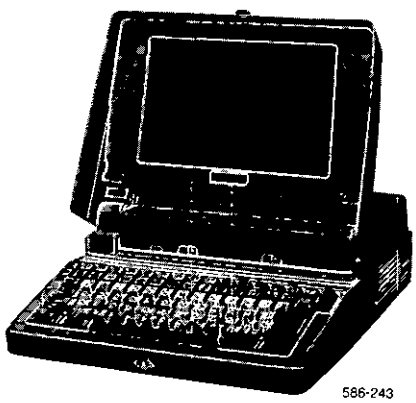
2. P150 CONSTRUCTION

2.1 P150 CONSTRUCTION

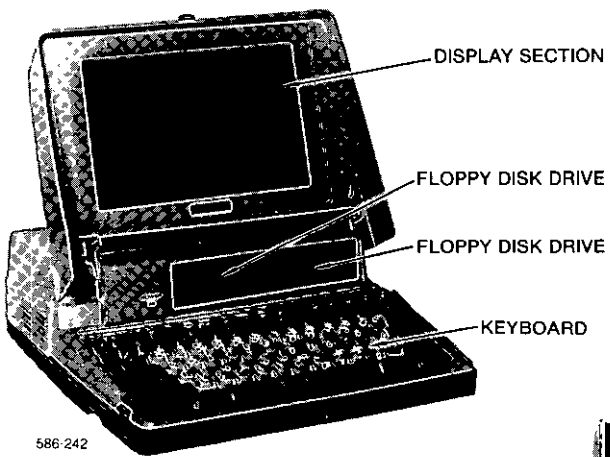
(1) With Display Section Closed



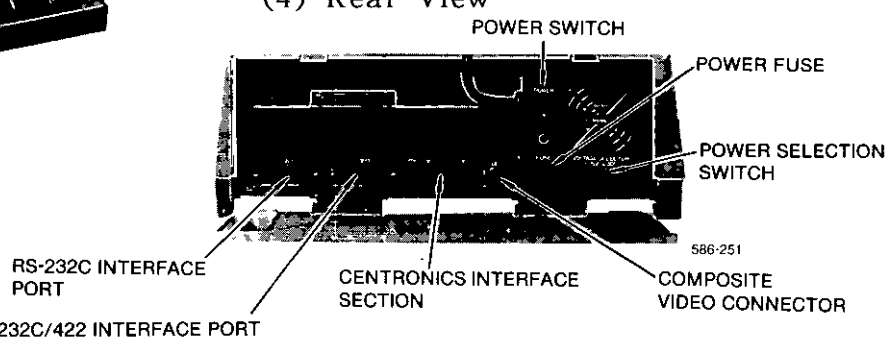
(2) With Display Section Open



(3) Front View



(4) Rear View



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

Fig. 2.1 P150 Construction

2. 2 P150 DISPLAY DESIGN

2. 2. 1 SFC (Sequential Function Chart) Display

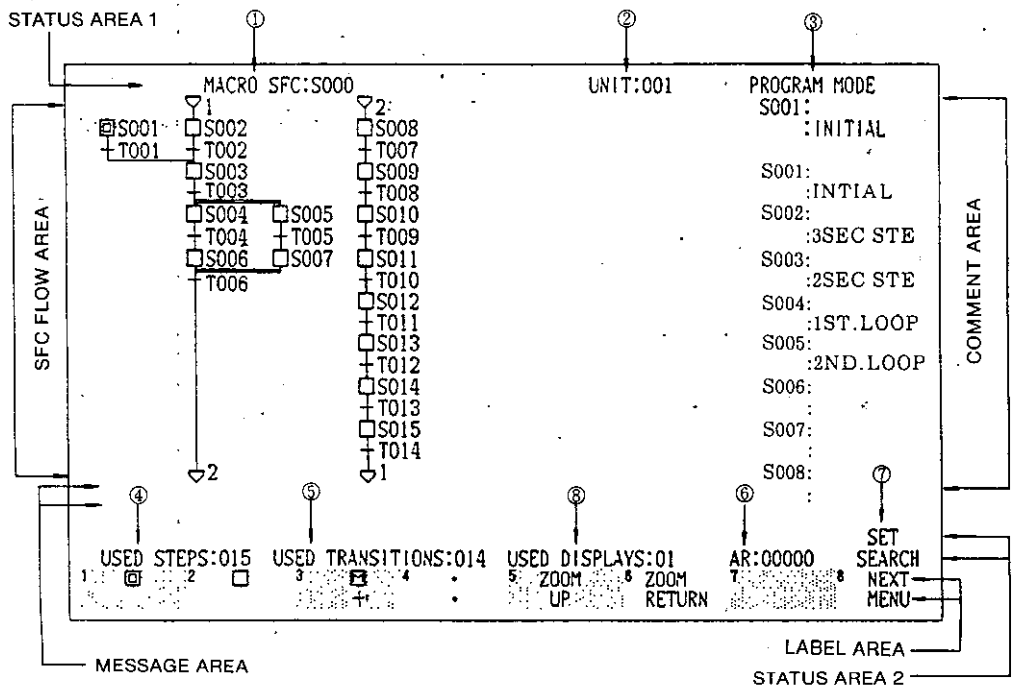


Fig. 2. 2 SFC Display

(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 P150, 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.

2. 2. 2 Ladder Diagram Display

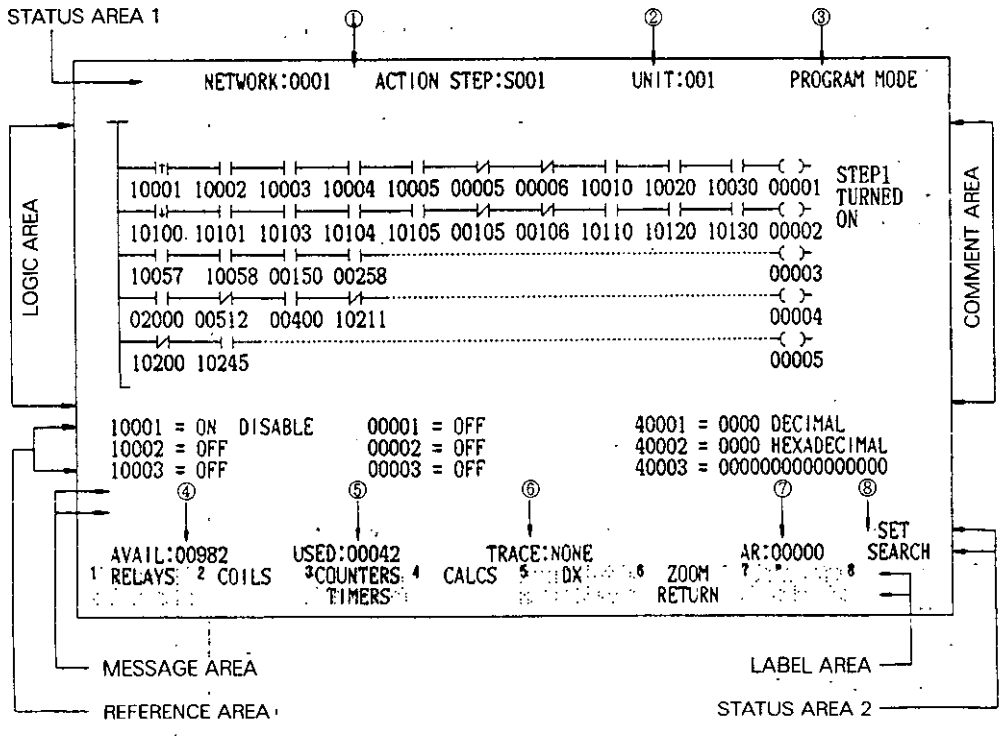


Fig. 2. 3 Ladder Diagram Display

(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 2.1 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)

(4) MESSAGE AREA

Various messages for giving instructions to the operator and to indicate the operating state of P150, 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.

2. 3 KEYBOARD

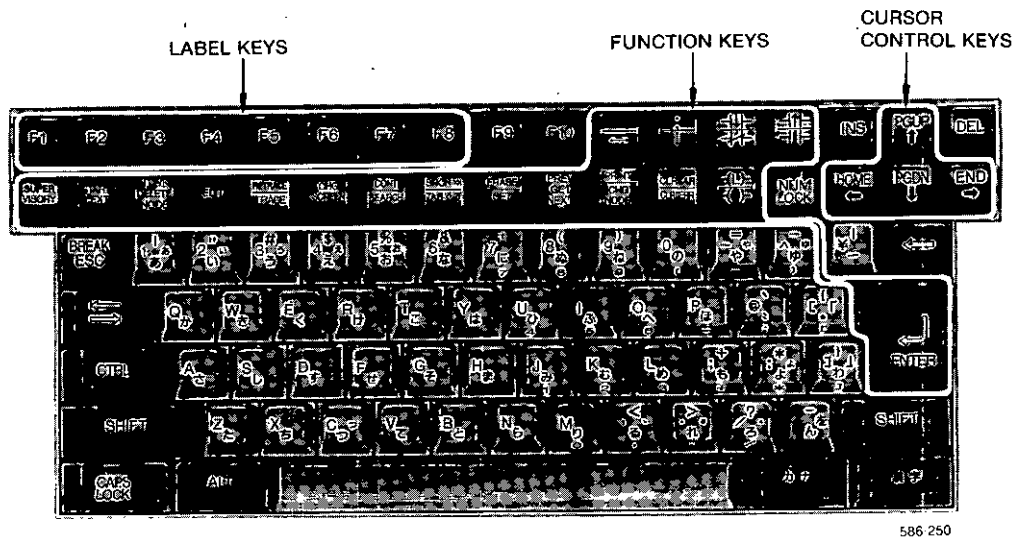


Fig. 2.4 Keyboard

(1) Cursor control keys

PGUP ↑	The cursor is shifted one position upward when this key is depressed.
PGDN ↓	The cursor is shifted one position downward when this key is depressed.
HOME ←	The cursor is shifted one position leftward when this key is depressed.
END →	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.
F9 and F10	These two keys are not used.

(3) Function keys

Table 2. 1 Function List of Function Keys

Key Designation	Function
SUPER VISORY	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 VISORY	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 DELETE 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 DELETE 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. • 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.
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.
RETRACE 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 + RETRACE 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 2.1 Function List of Function Keys (Cont'd)

Key Designation	Function
CHG / SCREEN	Derpessing this key switches the display mode. The logic and comment display screen is switched to the extended reference display screen.
SHIFT + CHG / SCREEN	The logic and extended reference display screen is switched to the comment display screen.
CONT / SEARCH	Derpessing 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 / SEARCH	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.
SRCH⇨ / TAB⇩⇧	Depressing this key moves the cursor to other areas. It also moves the cursor from the search data area to the logic area or the SFC area.
SHIFT + SRCH⇨ / TAB⇩⇧	Depressing these keys 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 P150 panel screen only; it does not affect the memory of the attached controller.
PREV G E T 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.
SHIFT + PREV G E T NEXT	The network or reference before the one currently displayed on the screen is displayed by depressing these keys simultaneously. • When the cursor is in the logic area, previous network is displayed. • When the cursor is in the reference area, previous reference is displayed.
PRINT / 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.
SHIFT + PRINT / CHG NODE	Depressing these keys simultaneously produces a hard copy of the current display. (A specified printer should be connected to the parallel port.)

Table 2. 1 Function List of Function Keys (Cont'd)

Key Designation	Function
CLR AR / CLR ERR	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.
SHIFT + CLR AR / CLR ERR	Depressing these keys simultaneously clears the assembly register (AR) to 0. These keys can 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.
⊣⊢ *	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.
—(L)— / —( )— *	Selects —( )— (coil) of coil.
SHIFT + —(L)— / —( )— *	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 DELETE NODE key.

*The GL60S programmer disk (Model: F60S-E001) provides the same function keys as the above. Any key of the same function can be used.

2. 3 KEYBOARD (Cont'd)

(4) ASCII keys

These keys are used to input numerals, alphabet, codes and other ASCII characters, when inputting numerical data, file name, etc. These keys are operational while the カナ key is unlocked. While the カナ key is locked KATAKANA is input.

(5) Special keys

CAPS LOCK

CAPITAL LOCK KEY

When this key is depressed and locked, all the alphabet keying afterward is made in capital letters. Depressing it again unlocks it.

カナ

KANA KEY

When this key is depressed and locked, all the alphabet keying afterward are converted into KANA. Depressing it again unlocks it.

SHIFT

SHIFT KEY

This key is depressed when the characters in the shift positions of all the keys are to be input. The two shift keys have identical function.

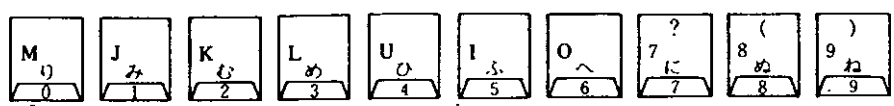
BACK SPACE KEY

This key is used to correct on input character.

NUM LOCK

NUMBER LOCK KEY

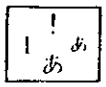
When this key is depressed and locked, all the keys shown below serve as digit keys.



When it is locked, other keys (0 , P , etc.) are used to input the symbols ["(," "-," etc.]. Note that while this key is locked, the shift key is disable.

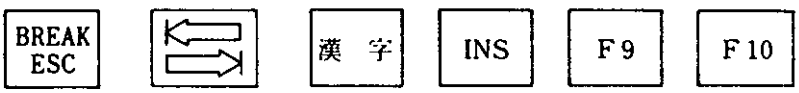
NOTE

(1) Example of keying



- To input "1" at the middle left, simply depress this key.
- To input "!" at the top, depress this key while depressing SHIFT key.
- To input "ア" at the bottom, depress カナ key, and then depress this key.
- To input "ア" at the middle right, depress カナ key, and then, depress the SHIFT key and this key simultaneously.

(2) Unused keys



(3) HIRAGANA and KATAKANA

Although the keys are labeled with HIRAGANA, actually KATAKANA is input. No HIRAGANA can be input.

3. P150 SPECIFICATION

3.1 BASIC SPECIFICATION

Table 3.1 Basic Specifications

Item	Specifications
Power Supply*	85 to 132 VAC/195 to 265 VAC (Selectable), single phase, at 47.5 to 63 Hz.
Dissipated Power*	120 VA
Ambient Temperature†	+5 to +45°C
Storage Temperature†	−20 to +60°C
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 min ,at 500 VDC

*Data measured with disk inserted in P150.
†Data measured with no disk inserted in P150.

3.2 PERFORMANCE SPECIFICATION

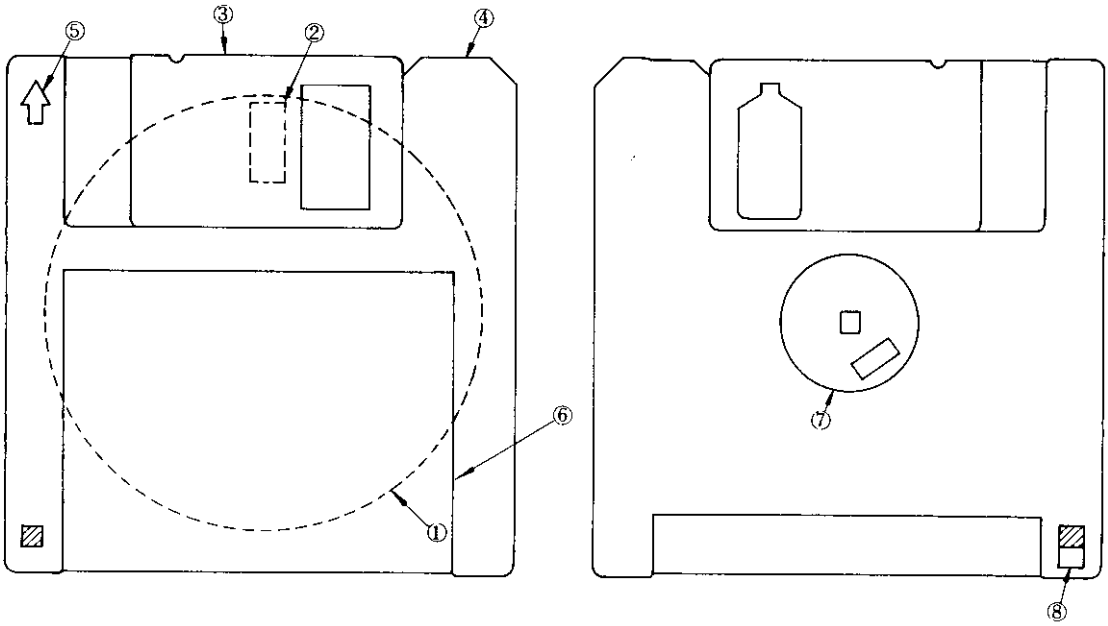
Table 3.2 Performance Specifications

Item		Specifications
Type		DISCT-P150-10
CPU		IAPX 186 (8 M Hz)
ROM		16 k bytes (bootstrap and diagnostic)
Display Screen		Plazma display, orange, size 230 × 144 mm
Display Capability	Text Display	AN*: 25 lines × 80 words
	Dot Matrix	AN*: 8 × 16 dots (25 lines)
	Character Attribute	Reverse, blink, under line, blind
	Graphic Display	640 × 400 dots
Keyboard		94 keys, sculpture type
Floppy Disk Drive		Built-in two 3.5-inch floppy disks (double sided double density)
Serial Interface		One RS-232C and one RS-232C/422 port
Parallel Interface		A Centronics spec port
Composite Video Signal Interface		For connection of external CRT
Calender Watch		Battery back-up
OS†		MS-DOS V 2.11
Dimensions in mm		348 (W) × 121 (H) × 435 (D)
Approx Weight		9 kg

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

3. 3 SPECIFICATION OF FLOPPY DISK DRIVE

(1) Parts Name of Floppy Disk



① DISK
② HEAD WINDOW
③ SHUTTER
④ CARTRIDGE
⑤ INSERTING DIRECTION
⑥ LABEL
⑦ METAL HUB
⑧ PROTECT SWITCH*

*Protect Switch Usage

(a) Write Disable (b) Write Enable

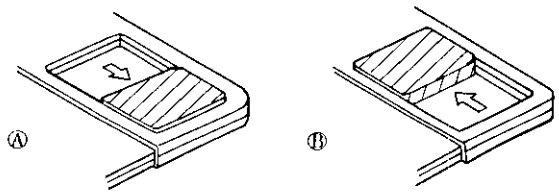


Fig. 3. 1 Parts Name of Floppy Disk

3. 3 SPECIFICATION OF FLOPPY DISK DRIVE (Cont'd)

(2) Handing Floppy Disks

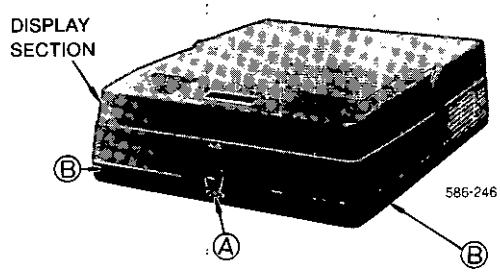
- Don't open the shutter and touch the disk surface by hand.
- Don't bring the disk close to a motor, transformer or other source of strong magnetic fields.
- Don't bring alcohol, thinner, beverages, etc. into contact with the disk.
- Don't place heavy objects on the disk.
- Don't bend or fold the disk.
- Don't expose the disk to direct sunlight or heat.
- Be sure the disk is fully inserted.
- To protect the files (avoiding damage and magnetization), remove the disk from the drive after use and store it in the case in the specified storage area.

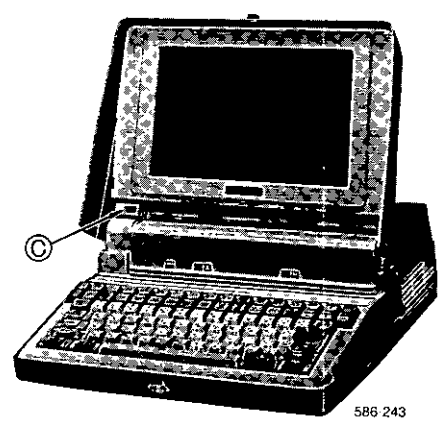
Table 3. 3 Applicable Floppy Disk for P150

Model	Name	Function and Application
F60S-E001	GL60S programmer	GL60S I/O allocation; program storing, altering, monitoring, loading, saving, verifying, etc.
F60S-E002	GL60S ladder lister	Printing out of ladder diagram and program documentation for GL60S by using printer
F150-000	Blank disk	Blank disk for saving GL60S program, formated (initialized).

(3) Openning P150

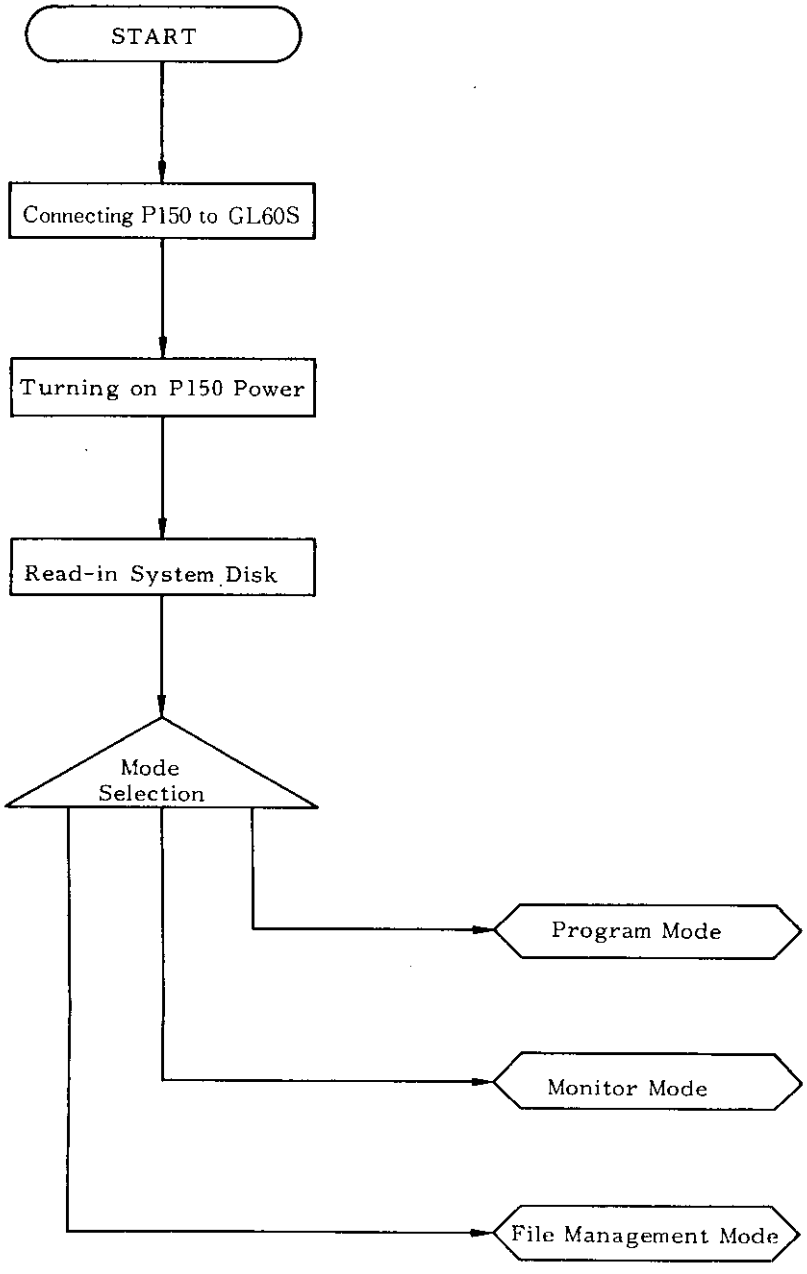
1. Release lock Ⓐ.
2. Fully push the release latches of part Ⓑ to disengage the display section locks.
3. Lift open the display section until it locks into position with part Ⓒ.



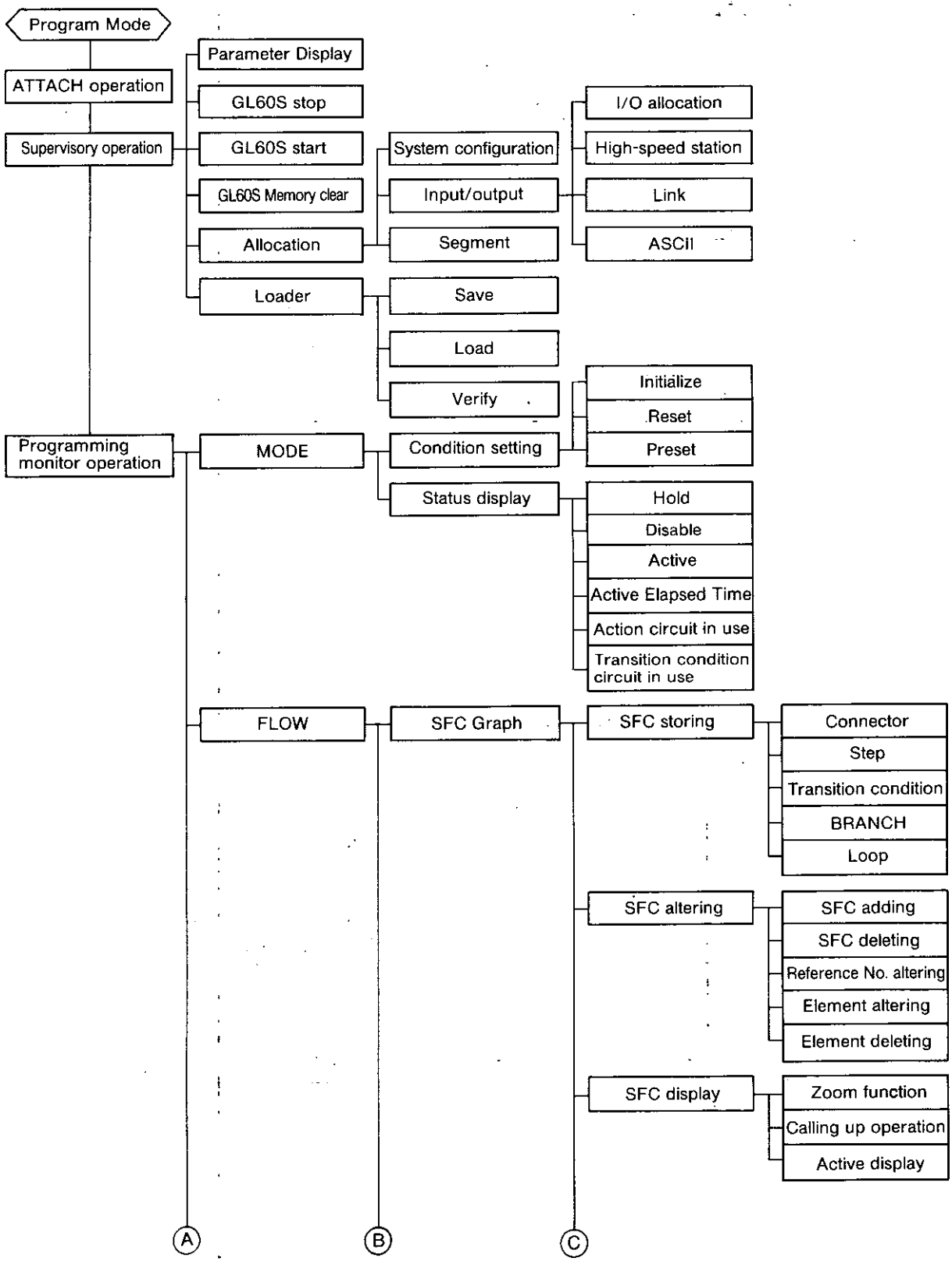


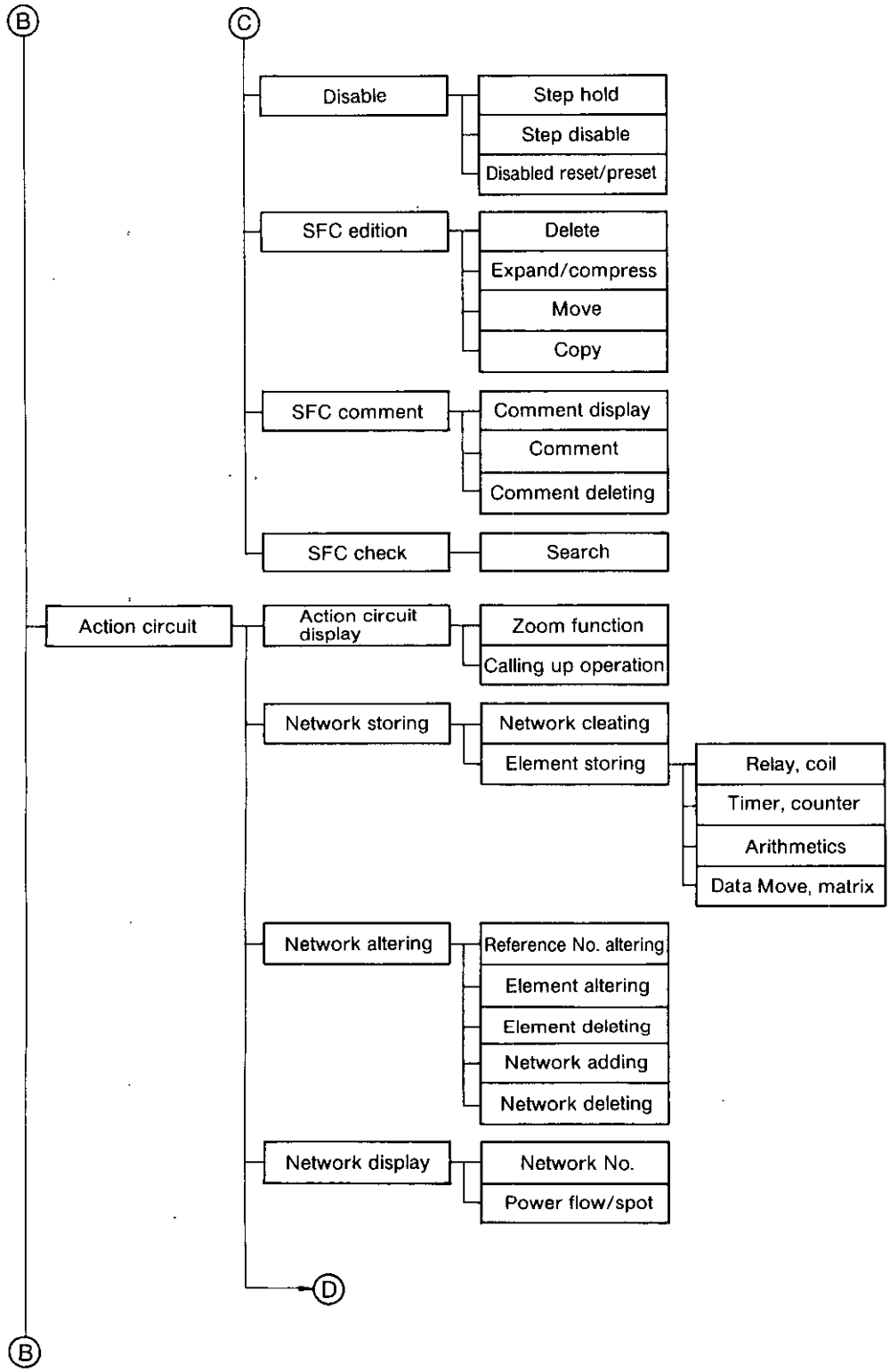
4. PROGRAMMING

4.1 PROGRAMMING TREE

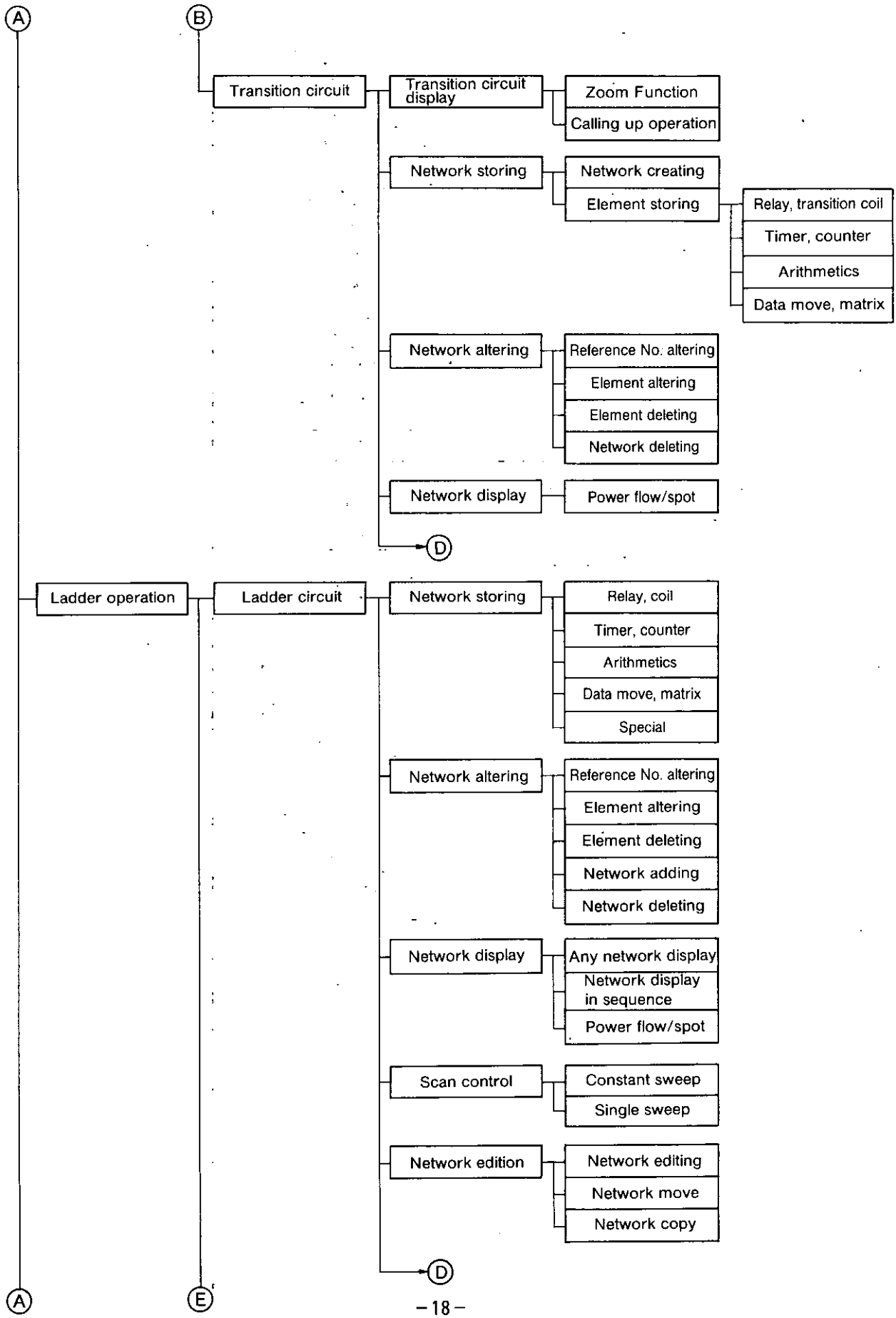


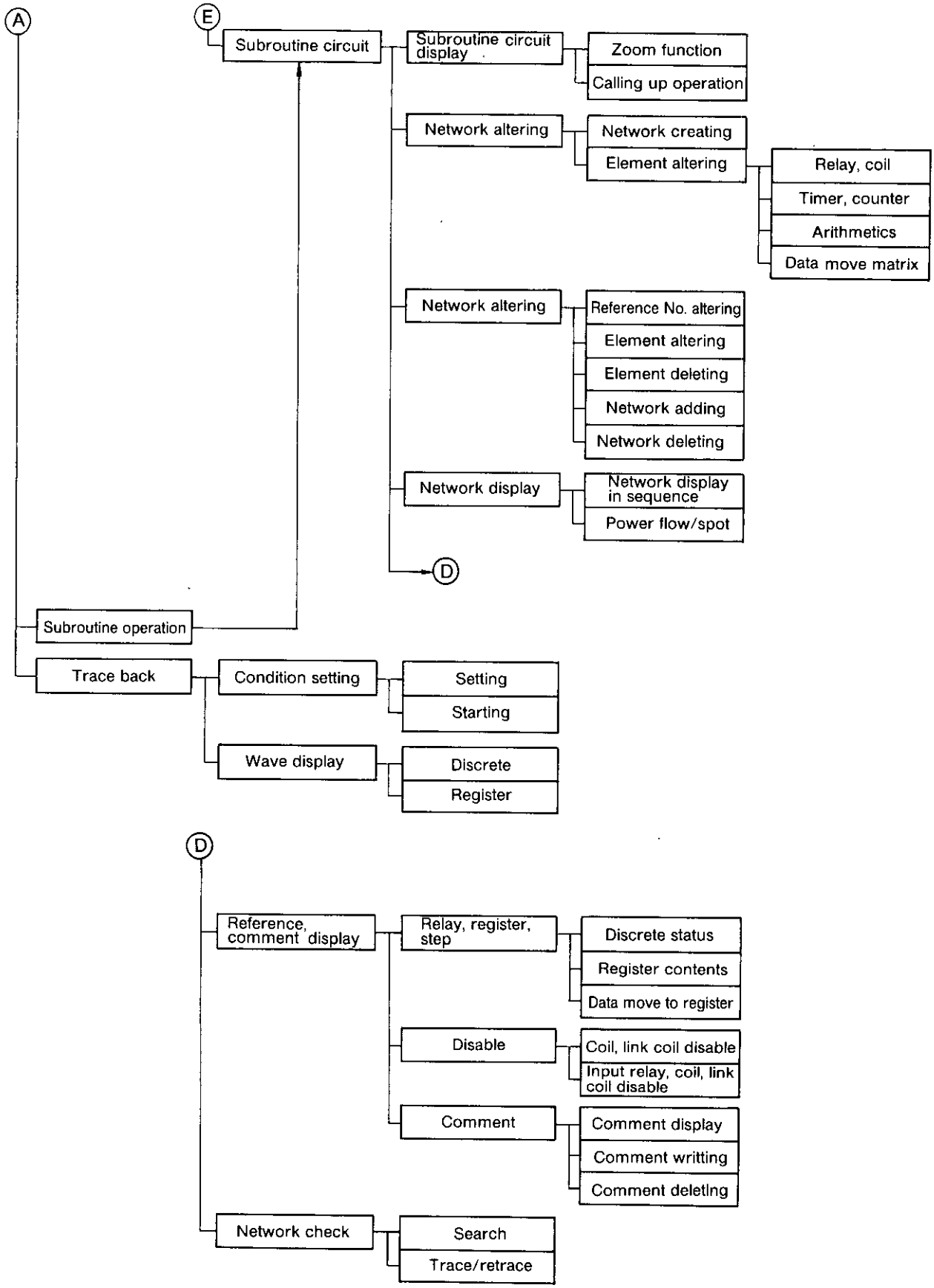
4. 1 PROGRAMMING TREE (Cont'd)



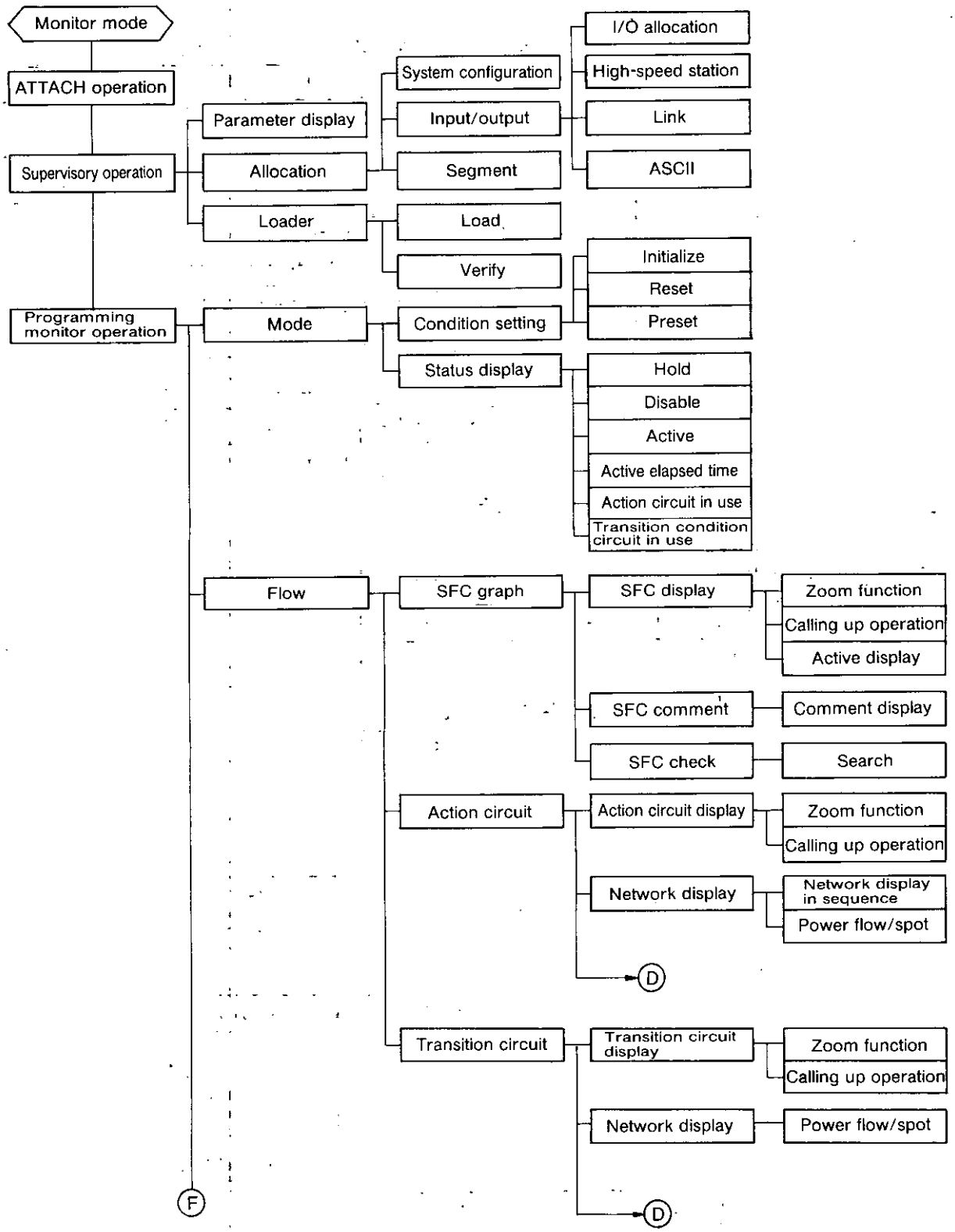

Ⓑ
Ⓒ
Disable
Step hold
Step disable
Disabled reset/preset
SFC edition
Delete
Expand/compress
Move
Copy
SFC comment
Comment display
Comment
Comment deleting
SFC check
Search
Action circuit
Action circuit display
Zoom function
Calling up operation
Network storing
Network cleating
Element storing
Relay, coil
Timer, counter
Arithmetics
Data Move, matrix
Network altering
Reference No. altering
Element altering
Element deleting
Network adding
Network deleting
Network display
Network No.
Power flow/spot
Ⓓ
Ⓑ

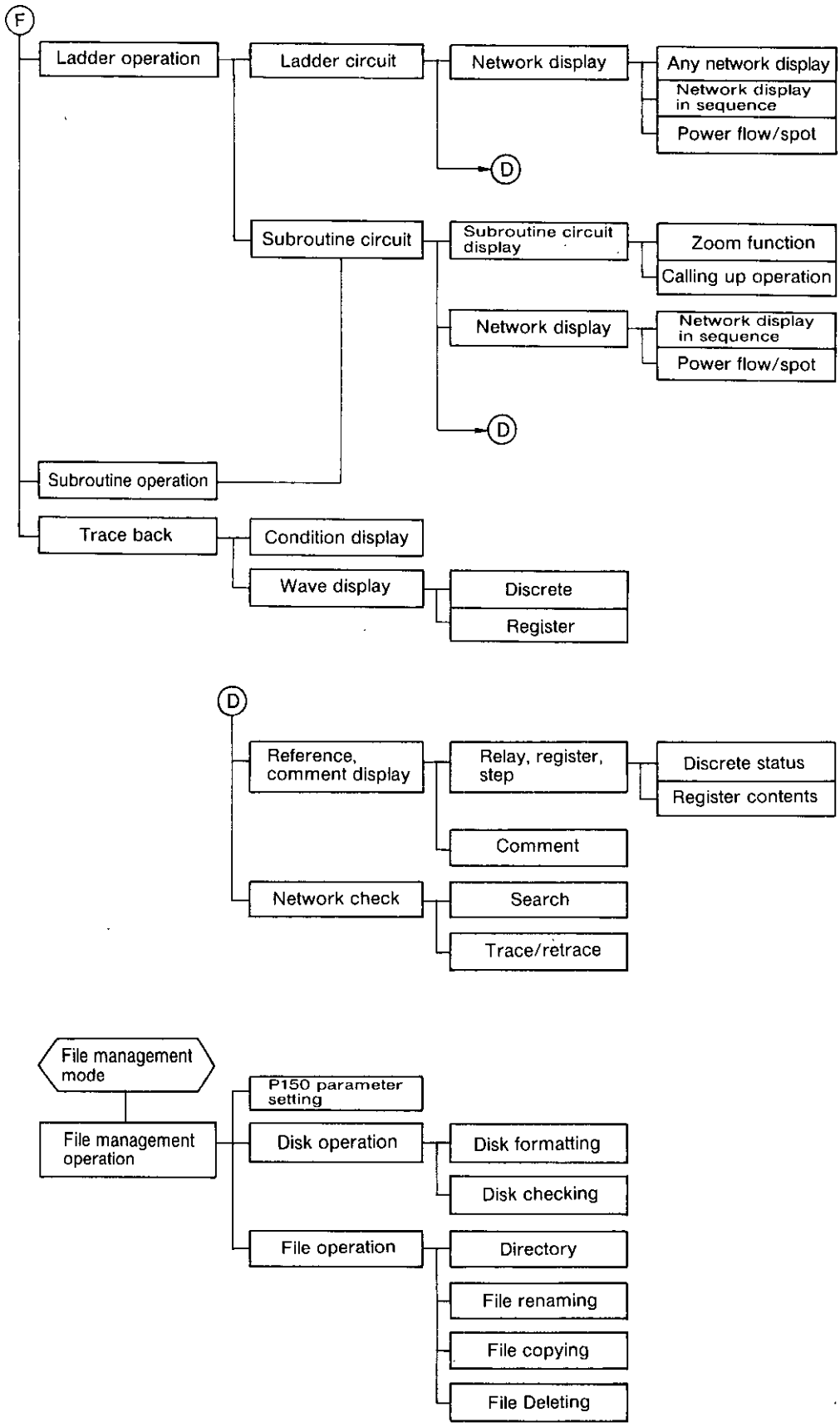
4. 1 PROGRAMMING TREE (Cont'd)




A
E
Subroutine circuit
Subroutine circuit display
Zoom function
Calling up operation
Network altering
Network creating
Element altering
Relay, coil
Timer, counter
Arithmetics
Data move matrix
Network altering
Reference No. altering
Element altering
Element deleting
Network adding
Network deleting
Network display
Network display in sequence
Power flow/spot
D
Subroutine operation
Trace back
Condition setting
Setting
Starting
Wave display
Discrete
Register
D
Reference, comment display
Relay, register, step
Discrete status
Register contents
Data move to register
Disable
Coil, link coil disable
Input relay, coil, link coil disable
Comment
Comment display
Comment writting
Comment deletlng
Network check
Search
Trace/retrace

4. 1 PROGRAMMING TREE (Cont'd)



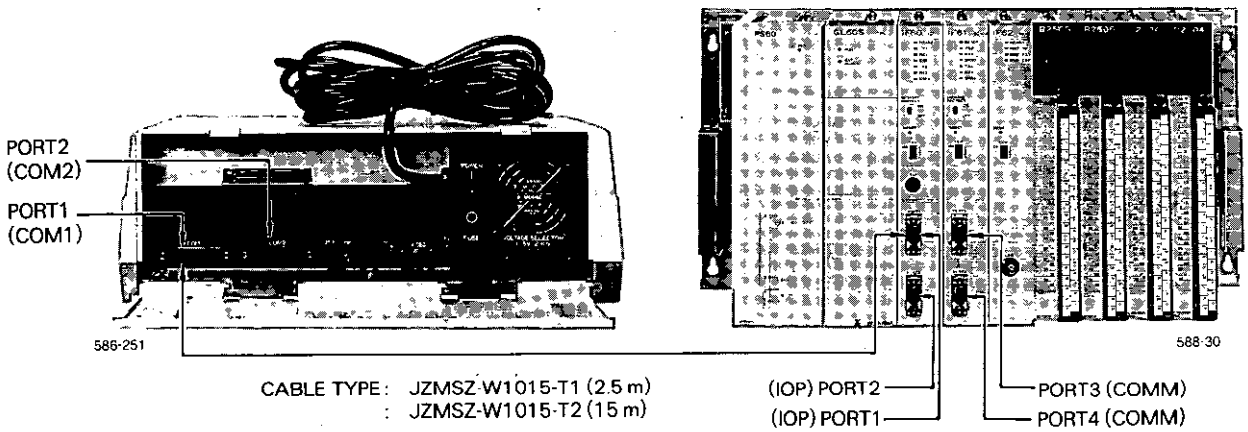

F
Ladder operation
Ladder circuit
Network display
Any network display
Network display in sequence
Power flow/spot
D
Subroutine circuit
Subroutine circuit display
Zoom function
Calling up operation
Network display
Network display in sequence
Power flow/spot
D
Subroutine operation
Trace back
Condition display
Wave display
Discrete
Register
D
Reference, comment display
Relay, register, step
Discrete status
Register contents
Comment
Network check
Search
Trace/retrace
File management mode
File management operation
P150 parameter setting
Disk operation
Disk formatting
Disk checking
File operation
Directory
File renaming
File copying
File Deleting

4. 2 PREPARATION

4. 2. 1 Connecting P150 to GL60S

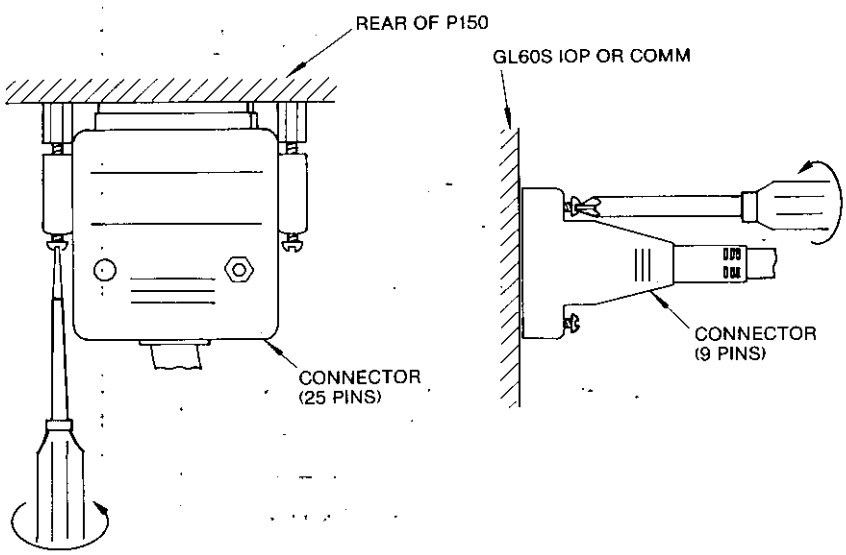
P150 is connected to GL60S using specified cable as follows:

- Across PORT1 (COM 1) of P150 and PORT 1 or 2 of I/O processor module (IOP)
- Across PORT1 (COM 1) of P150 and PORT 3 or 4 of communication module (COMM)



POINT

- Be sure to turn off the power supply to P150 before connecting or disconnecting the cable.
- If cable disconnection is required, be sure to remove the disk from P150, then turn off the power to P150 in the initial display. The cable disconnection is available.



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

Fig. 4. 1 Connection of P150 and GL60S

4. 2. 2 GL60S Port Parameter Setting

- The procedure for setting the transmission parameters for exchange communications with host computer, P150 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 P150, making setting correction unnecessary. However, be sure to check for correct setting.
- Without depressing [ENTER] key, the contents cannot be changed.

Table 4. 1 Setting Item of Communication Parameters by RAP

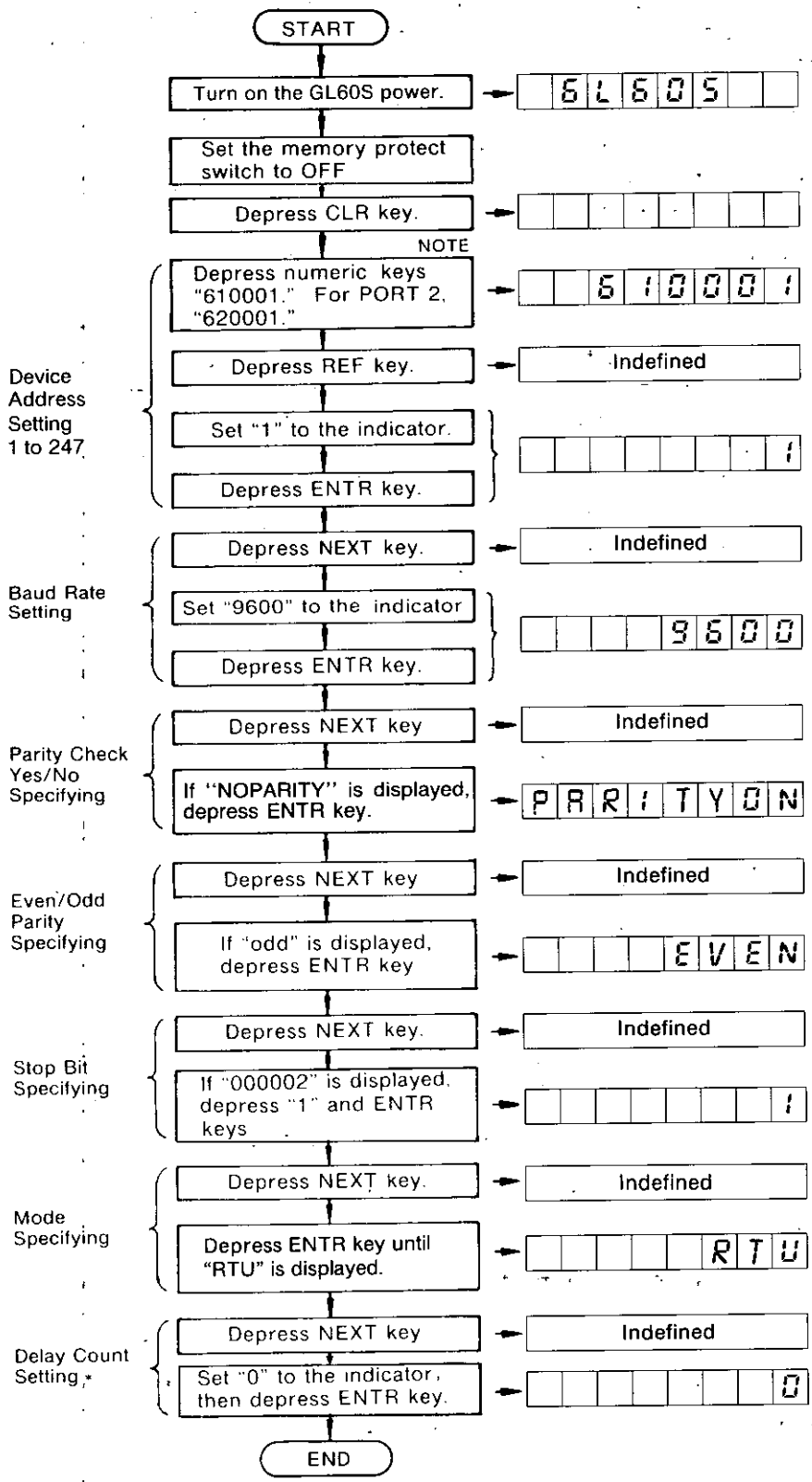
Items	Description	Indication	Initial Setting
6×0001	Device address	1	1
6×0002	Baud rate	9600	9600
6×0003	Parity check enable	ENABLE	Yes
	Parity check disable	DISABLE	
6×0004	Even parity	EVEN	Even
	Odd parity	ODD	
6×0005	1-stop bit	1	1
	2-stop bit	2	
6×0006	RTU mode (8-bit data)	RTU	RTU
	ASCII mode (7-bit 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.

4. 2. 2 GL60S Port Parameter Setting (Cont'd)

Example of GL60S Communication Parameter Setting for Connecting to P150 (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.

4. 2. 3 Turning on P150 Power

1. Turn on GL60S power.

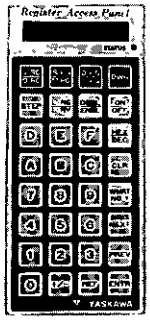


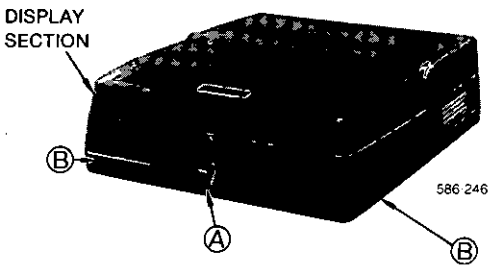
Fig. 4. 2 GL60S RAP Display

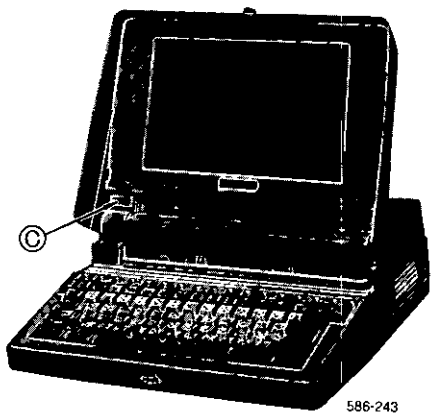
- "GL60S" is displayed on the Register Access Panel (RAP).

- After 5 to 10 seconds, RUN indicator lights.

2. Set the P150 as follows:

(1) Release lock Ⓐ .
(2) Fully push the release latches of part Ⓑ to disengage the display section locks.
(3) Lift open the display section until it locks into position with part Ⓒ .





3. Turn on P150 power.

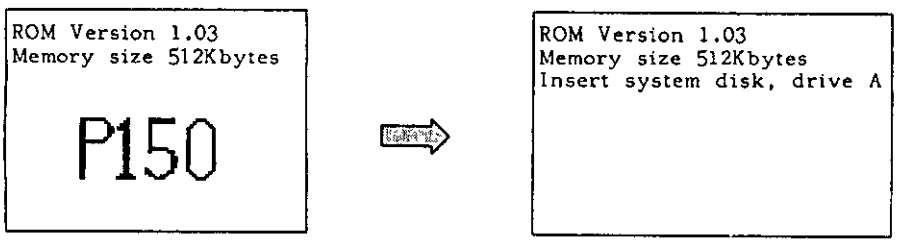
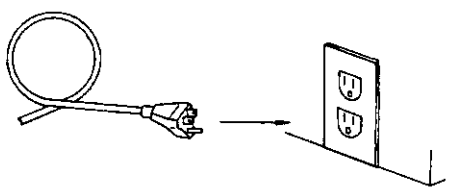


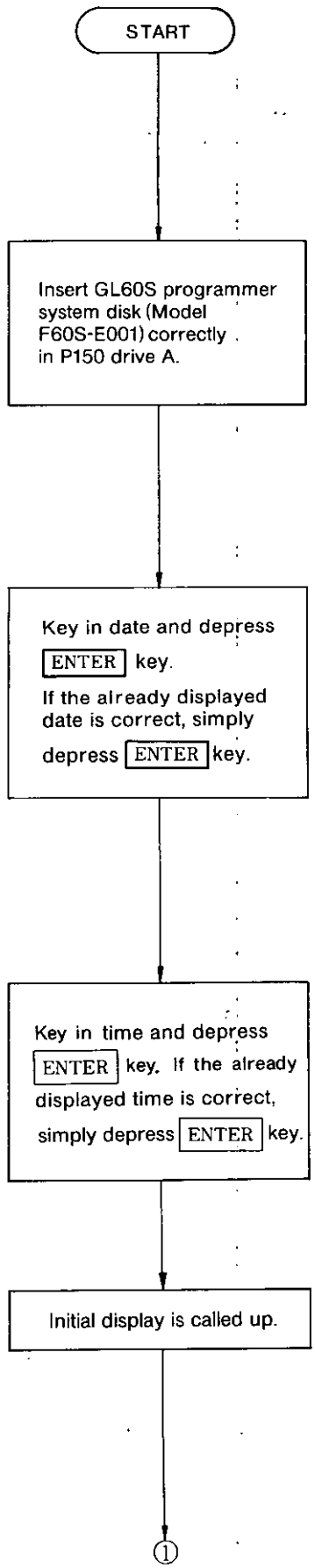
Fig. 4. 3 Display Screen

IMPORTANT

1. Be sure to plug in the power cable to a 100VAC outlet provided with a grounding terminal.
2. After prolonged storage, when P150 is turned on , the display remains blank for several minutes . This is normal with a plasma display.



4. 2. 4 System Disk READ-IN



POINT Insert the disk with nameplate side up.

POINT For the date for October 19, 1988, key in 10-19-1988, or 10-19-88, or 10/19/88, and depress ENTER key.

POINT Key in time using the 24-hour system. For example, for 3:30:00 p.m, key in 15:30:00 and depress ENTER key.

POINT The eight displayed labels correspond to the label keys F1 to F8 on the keyboard, indicating their functions.

NOTE

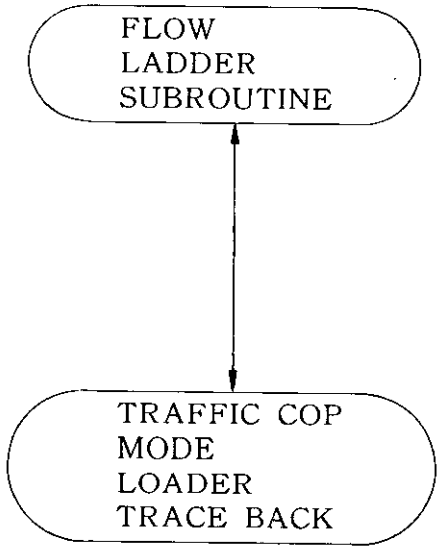
1. Before inserting a system disk, check that it is a GL60S programmer.
2. To restart the system, start from the power supply switching operation.
3. If the power OFF is required, first remove disk from P150, then turn the power off.

IMPORTANT

The GL60S programmer system is loaded in overlay mode. Do not remove the system disk from drive A while using the GL60S because the system disk will be accessed again when the P150 functions are to be altered.

(1) When the first attach operation is performed after the P150 is turned on, the "FLOW.LADDER.SUBROUTINE" system is loaded.

(2) When any of the functions listed below is altered, the system is loaded again.



*The system disk is accessed when any of the above-mentioned labeled keys is depressed, and the necessary system is loaded.

4. 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.

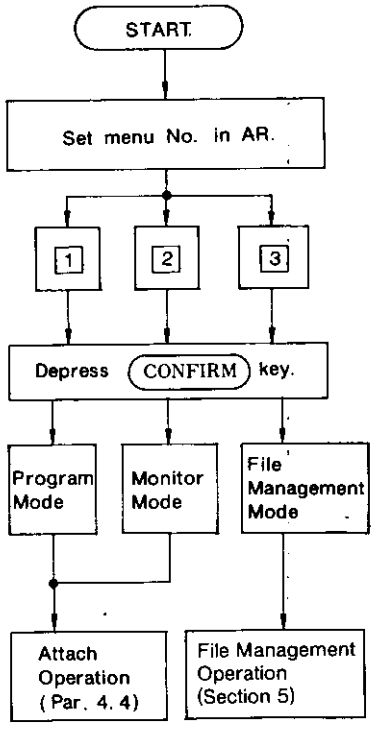
MONITOR MODE: This mode is selected to display the SFCs or networks and GL60S operation status. In this mode, GL60S memory contents cannot be altered. (Accidental or erroneous memory destruction is prevented.)

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 P150. Set the memory protect switch of GL60S according to the selected mode as shown in Table 4.2.

Table 4. 2 Setting of Memory Protect Switch of GL60S

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



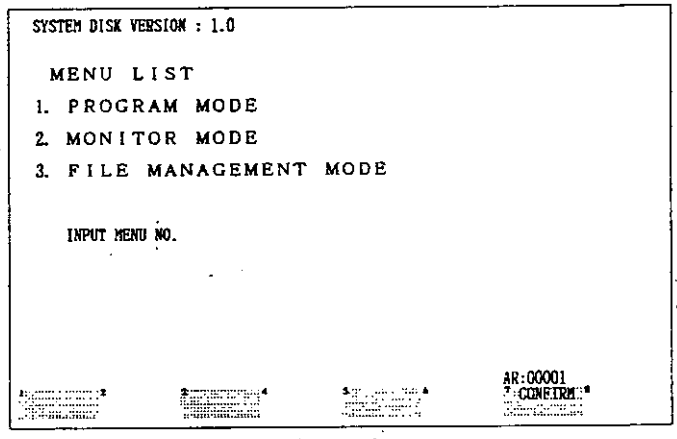


Fig. 4.4

NOTE

1. To clear AR, depress CLR AR / CLR ERR key while depressing SHIFT key.
2. To change modes after making ATTACH operations, first return to the initial display (Fig. 4.4) and select the menu again. To return the initial display, either depress SUPER VISORY key first and then, depress INITIAL DISPLAY key, or depress SUPER VISORY key while depressing SHIFT key.

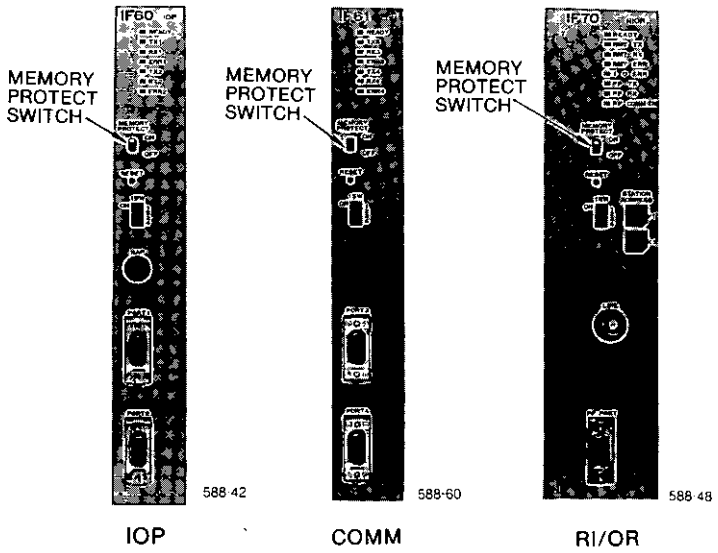


Fig. 4.5 GL60S Memory Protect Switches

IMPORTANT

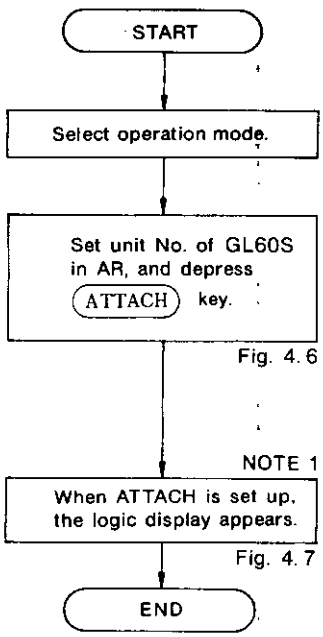
1. Six P150s can be connected to GL60S communication module. However, in this case, only one of them can be used in the program mode and others only in the monitor mode.
2. Even when the memory protect switch is on, the program mode can be selected. However, memory content altering operations such as storing and altering SFCs or networks, and GL60S status altering are not possible.
3. All the file management mode operations can be executed with the P150 alone (without connecting to the GL60S).

4.4 ATTACH OPERATION

"ATTACH" means as follows:

- After read-in a system disk in P150, connect P150 to GL60S by softwave. 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.



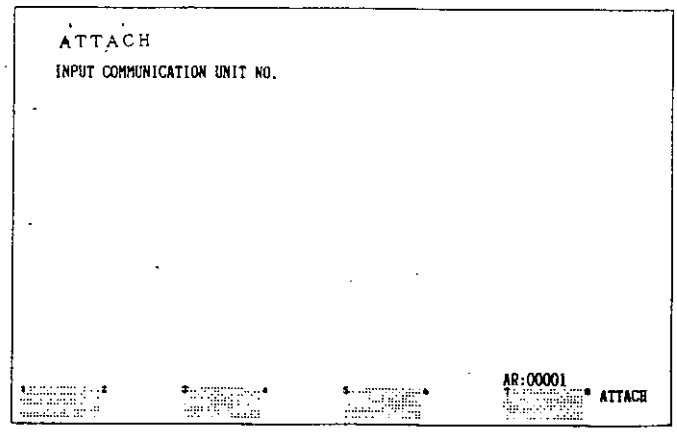


Fig. 4.6

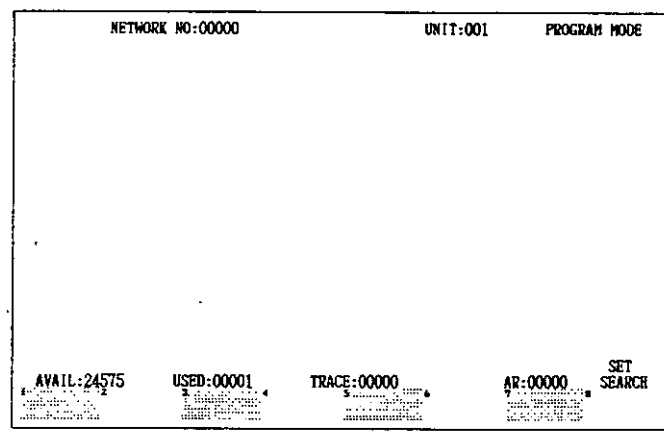


Fig. 4.7

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. 4.7, 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.

4. 5 SUPERVISORY OPERATION

Depressing [SUPER VISORY] key after ATTACH activation produces the display shown in Fig. 4. 8, enabling the SUPERVISORY operations indicated in the label area.

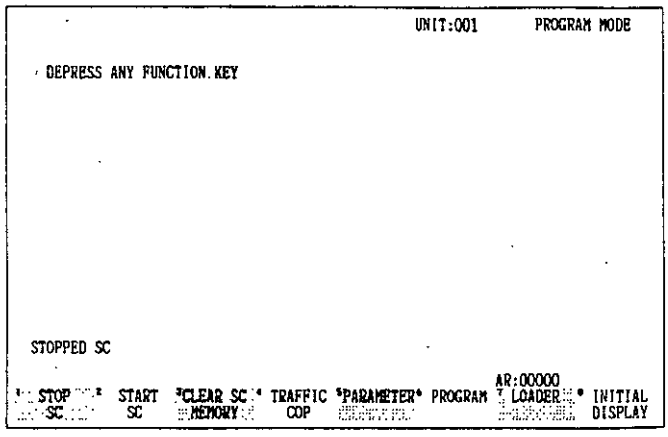


Fig. 4. 8

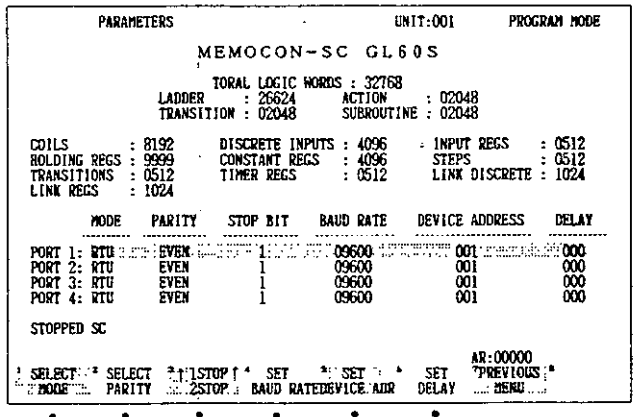
NOTE

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 VISORY] keys are depressed simultaneously, the initial display (Fig. 4. 4) appears.

4.5.1 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. 4.9 GL60S Parameter Display

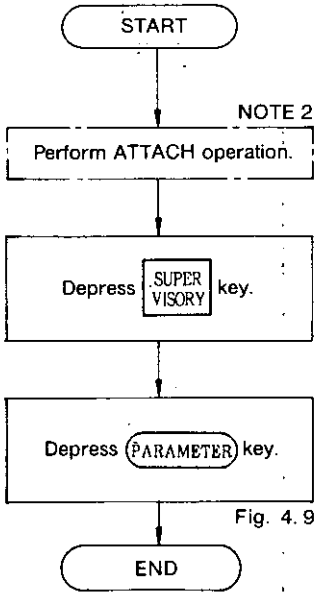


Fig. 4.9

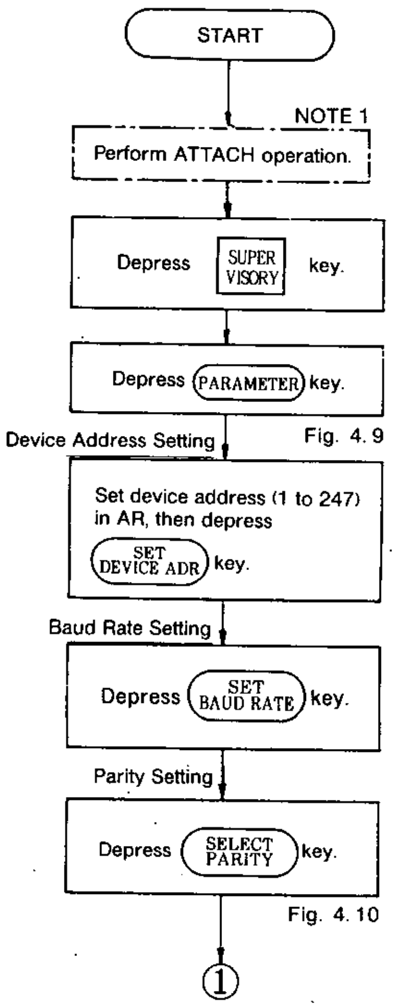
NOTE

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 DISPLAY key calls Fig. 4.8.

(2) GL60S PORT PARAMETER SETTING

The GL60S communicates with the host computer, P150, 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)


START
NOTE 1
Perform ATTACH operation.
Depress SUPER VISORY key.
Depress PARAMETER key.
Fig. 4.9
Device Address Setting
Set device address (1 to 247) in AR, then depress
SET DEVICE ADR key.
Baud Rate Setting
Depress SET BAUD RATE key.
Parity Setting
Depress SELECT PARITY key.
Fig. 4.10
①

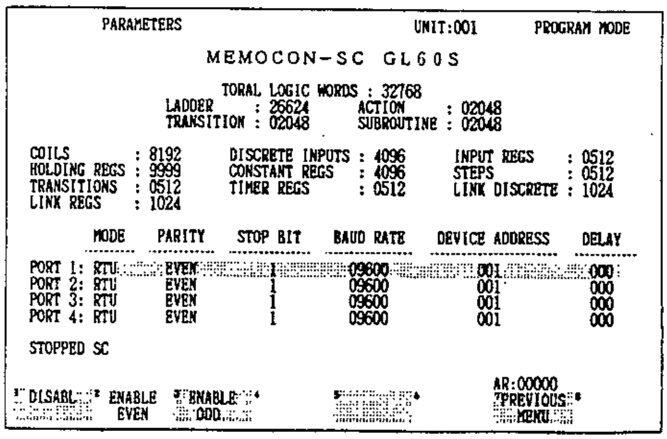
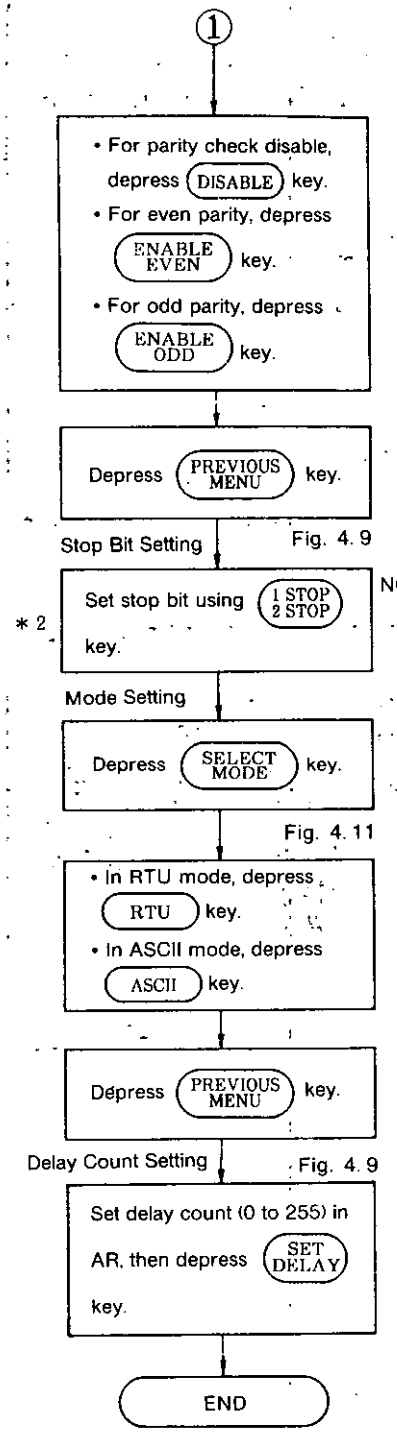

PARAMETERS
UNIT:001
PROGRAM MODE
MEMOCON-SC GL60S
TORAL LOGIC WORDS : 32768
LADDER : 26624
ACTION : 02048
TRANSITION : 02048
SUBROUTINE : 02048
COILS : 8192
HOLDING REGS : 9999
TRANSITIONS : 0512
LINK REGS : 1024
DISCRETE INPUTS : 4096
CONSTANT REGS : 4096
TIMER REGS : 0512
INPUT REGS : 0512
STEPS : 0512
LINK DISCRETE : 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
DISABL
ENABLE EVEN
ENABLE ODD
AR:00000
PREVIOUS MENU

Fig. 4.10



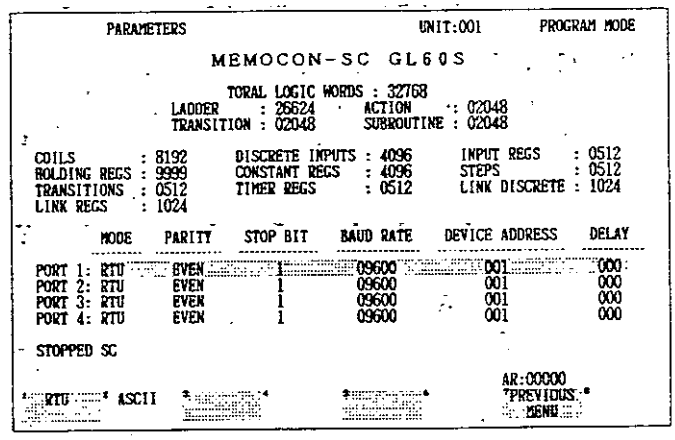


Fig. 4. 11

NOTE

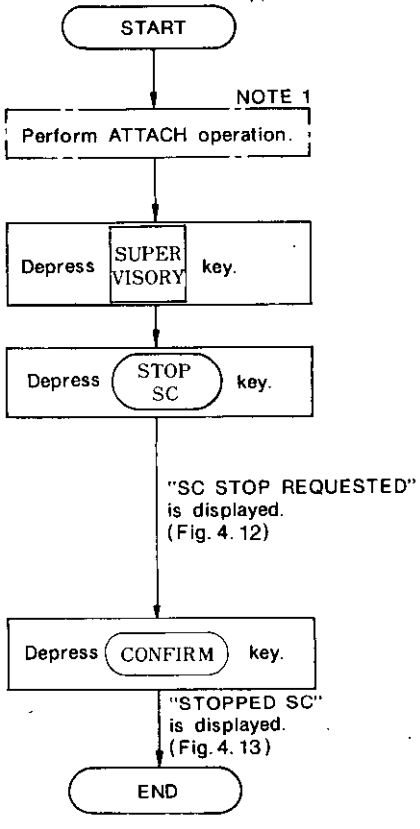
1. When ATTACH operation has already been completed, this step can be skipped.
2. Every time the labeled key (1 STOP 2 STOP) is depressed, arrows (↑↑, ↓↓) move up or down.
3. Depressing the (PREVIOUS MENU) key after completion of parameter setting returns the display to the supervisory display (see Fig. 4. 8).

4. 5. 2 GL60S Stop

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.



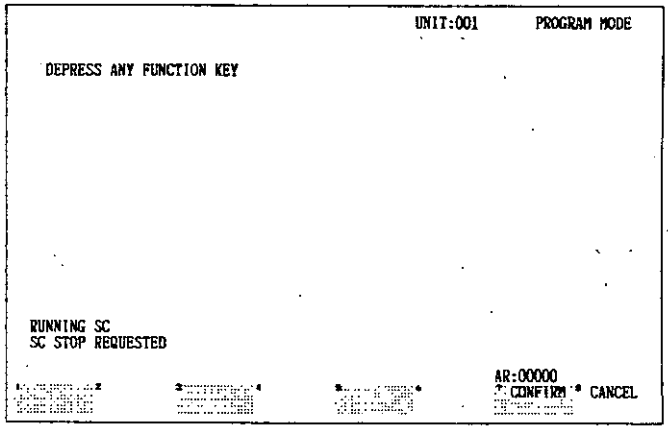


Fig. 4. 12

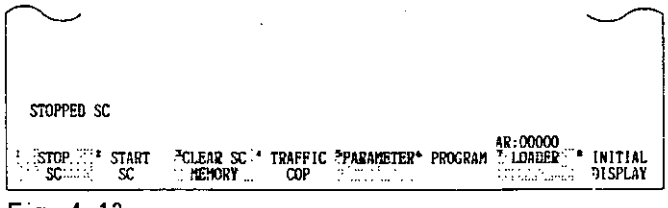


Fig. 4. 13

NOTE

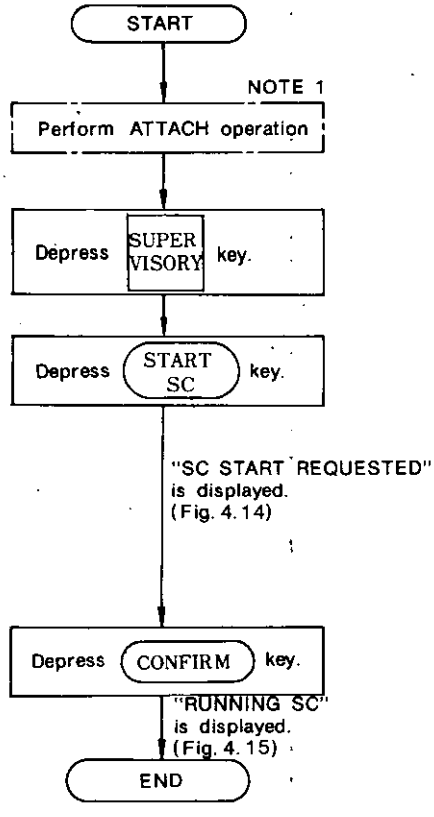
1. When ATTACH operation has already been completed, this step can be skipped.
2. When depressing (CANCEL) key instead of (CONFIRM) key, the display shown in Fig. 4. 8 appears with GL60S running.

4.5.3 GL60S Start

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.



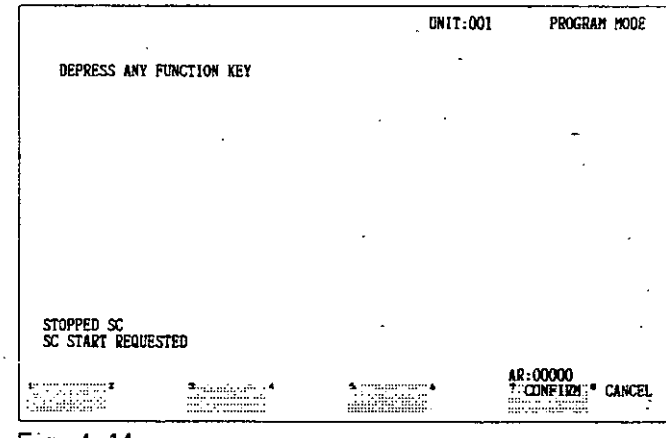


Fig. 4.14

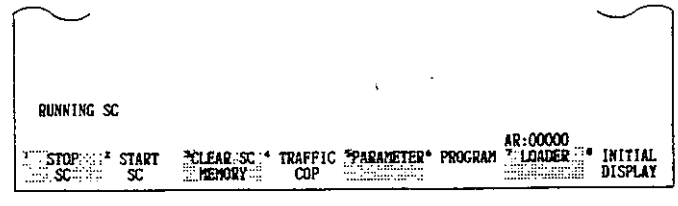


Fig. 4.15

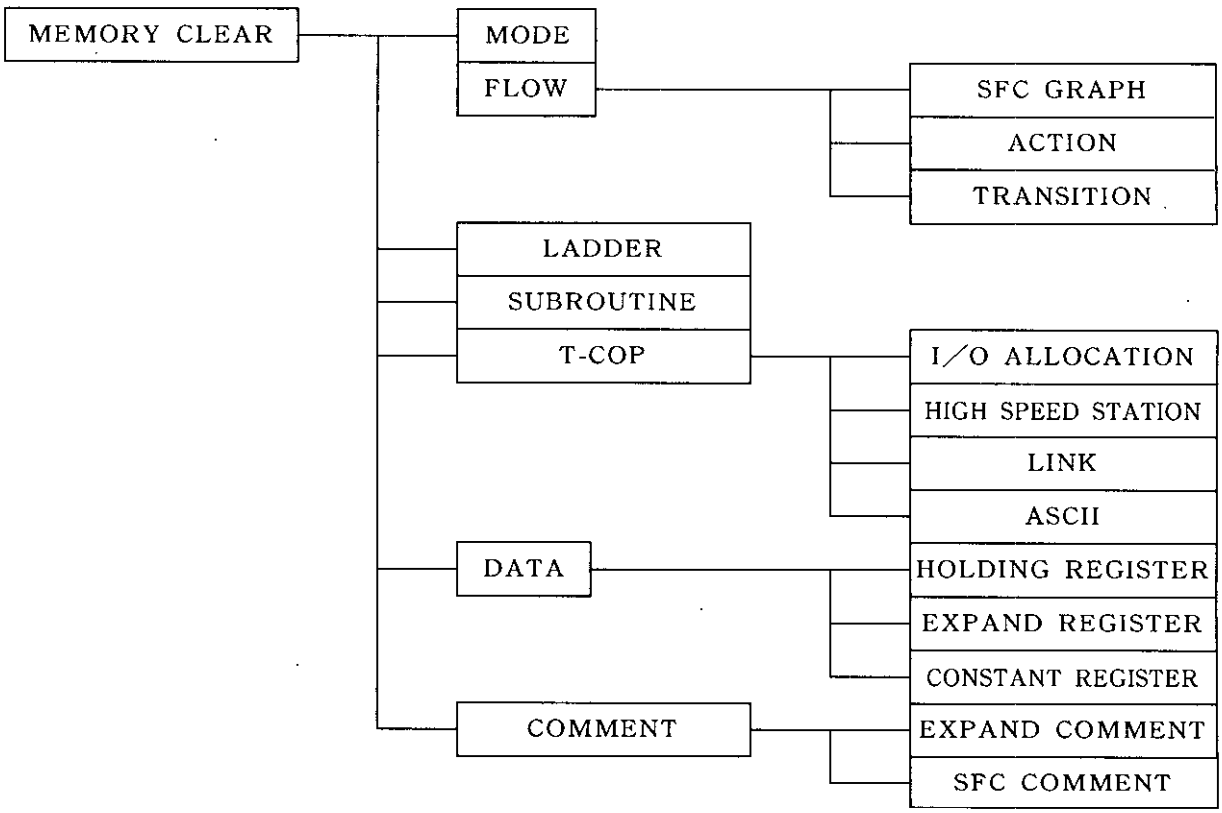
NOTE

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. 4.8 appears with GL60S not running.
3. It takes approximately 5 to 10 seconds to light RUN LED after depressing (CONFIRM) key.

4. 5. 4 Clearing 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.



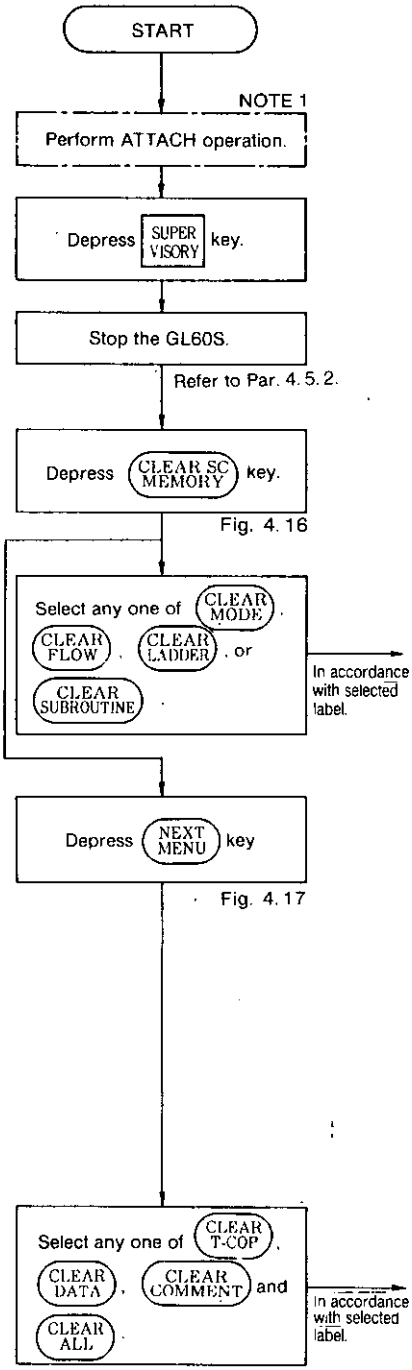
NOTE

Stop the GL60S before clearing the memory areas.

• 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 proprramming 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 SFC COM	Clears the area for the SFC comment.
CLERA ALL COMMENTS	Clears all of the comment areas.
CLEAR ALL	Clears all of the GL60S memory areas.

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



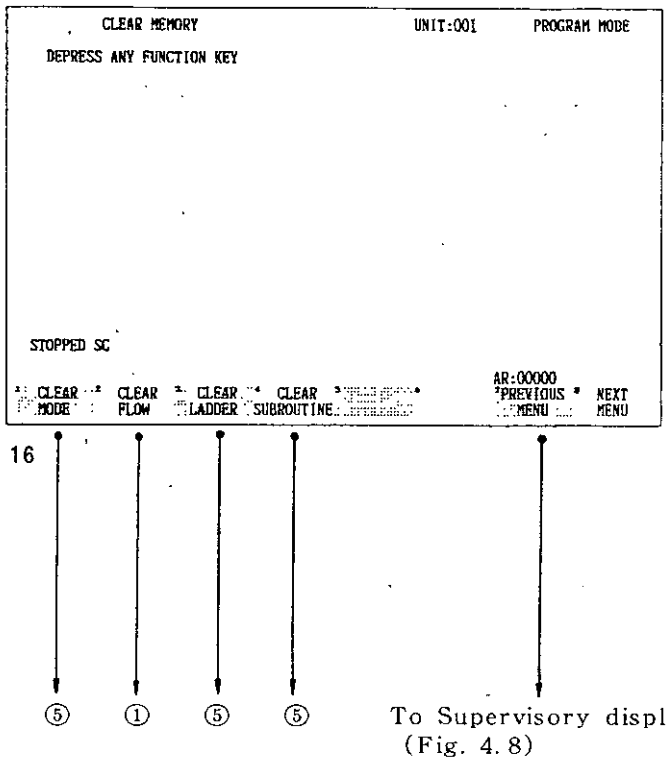


Fig. 4.16

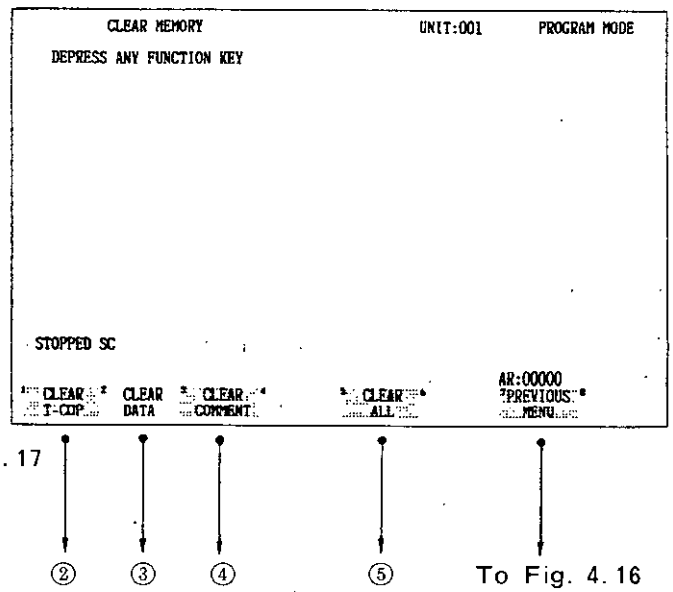
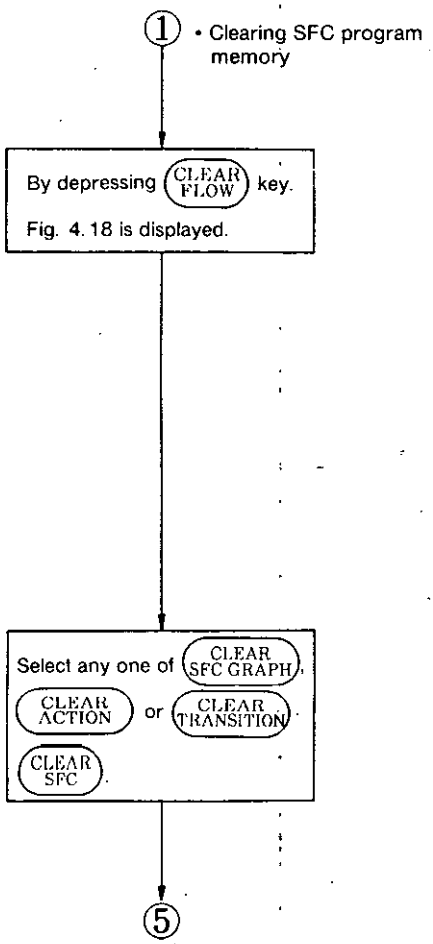


Fig. 4.17

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. 4.17.



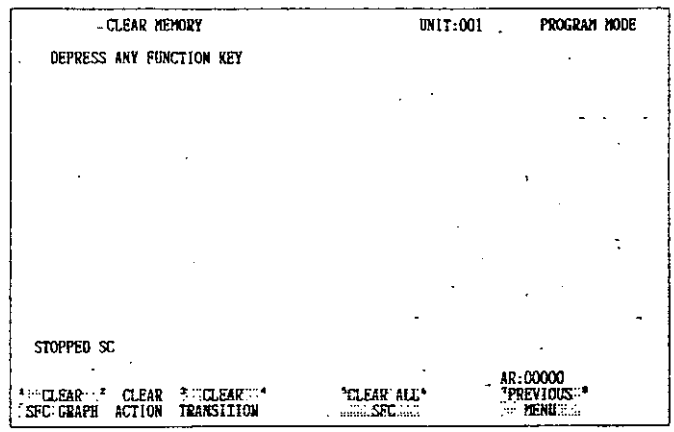
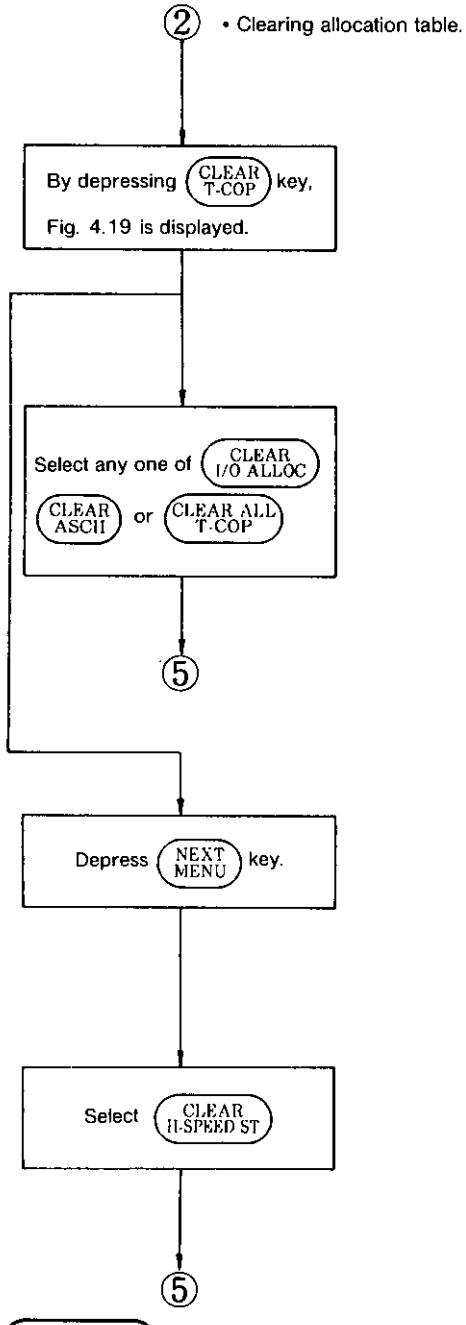


Fig. 4.18

NOTE

1. To clear all of the SFC GRAPH, ACTION and TRANSITION memory areas, depress CLEAR ALL SFC on the display shown in fig. 4.18.
2. Depressing PREVIOUS MENU on the display shown in Fig. 4.18 returns the display to the state shown in Fig. 4.16.



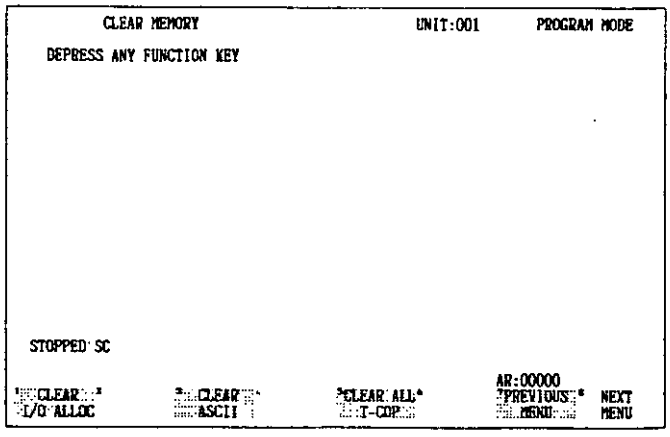


Fig. 4. 19

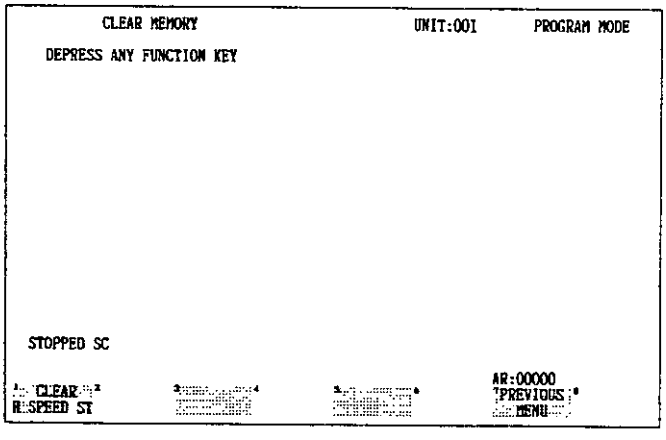
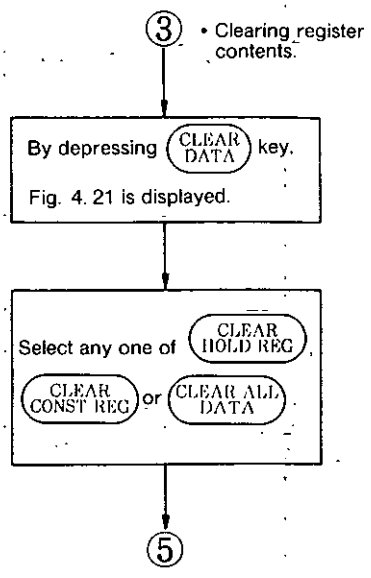


Fig. 4. 20

NOTE

1. PREVIOUS MENU selection in Fig. 4. 19 calls up the display shown in Fig. 4. 17.
2. PREVIOUS MENU selection in Fig. 4. 20 calls up the display shown in Fig. 4. 19.



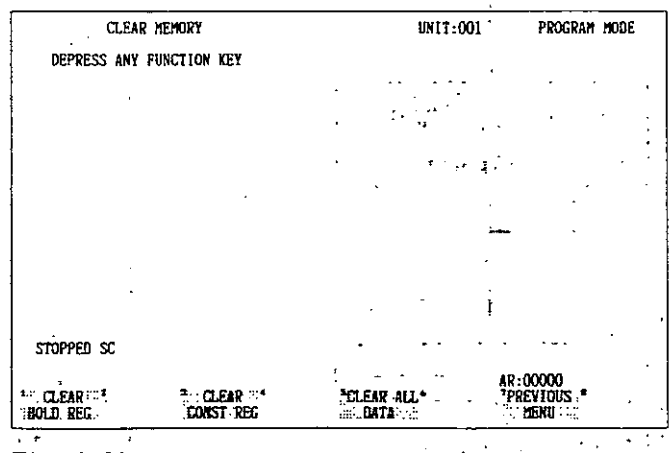
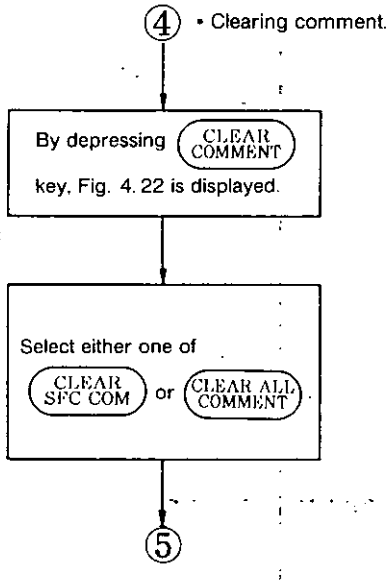


Fig. 4. 21

NOTE

PREVIOUS MENU selection in Fig. 4. 21 calls up the display shown in Fig. 4. 17.



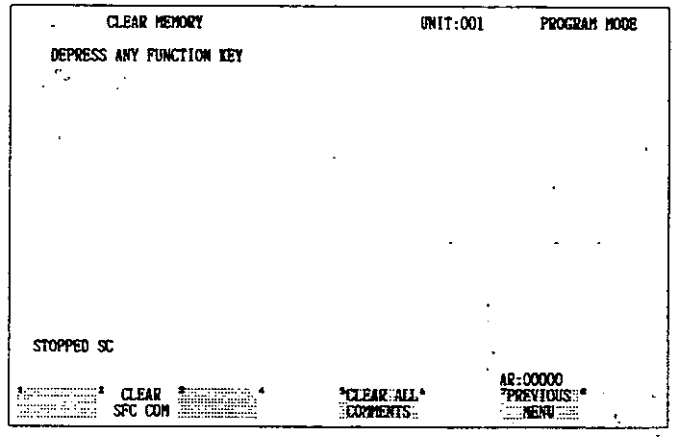
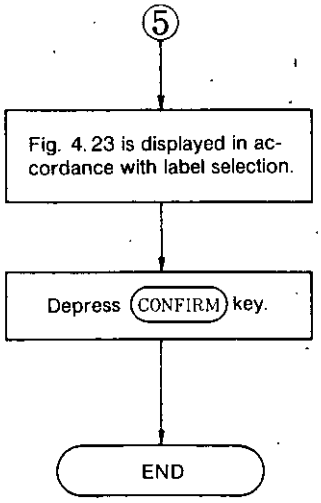


Fig. 4. 22

NOTE

PREVIOUS MENU selection in Fig. 4. 22 calls up the display shown in Fig. 4. 17.



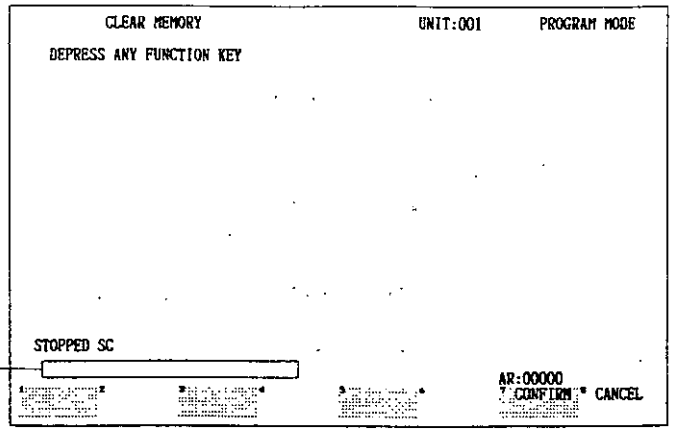


Fig. 4. 23

"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 SFC COMMENT MEMORY CLEAR REQUESTED"
"SC ALL COMMENT MEMORY CLEAR REQUESTED"
"SC ALL MEMORY CLEAR REQUESTED"

Any one of the above messages is displayed.

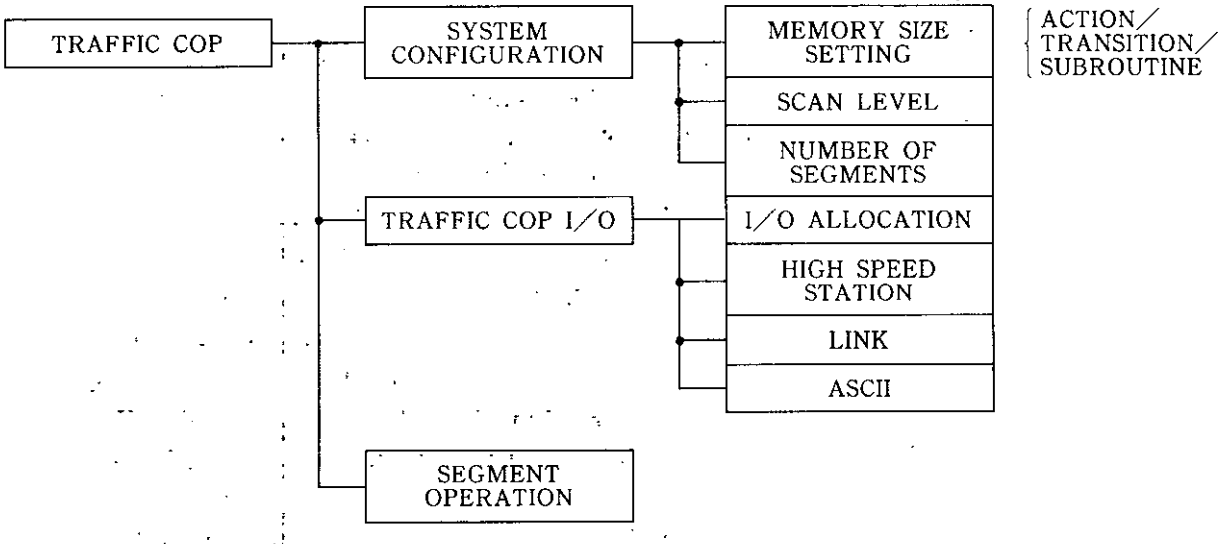
NOTE

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.

4.5.5 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.

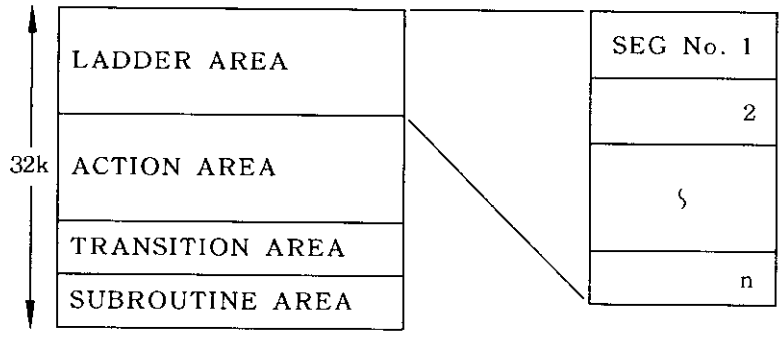
The following figure shows the structure of the traffic cop operation.



(1) 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. 4.25 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

6. Fig. 4. 26 is the display in the initial state (cleared state).

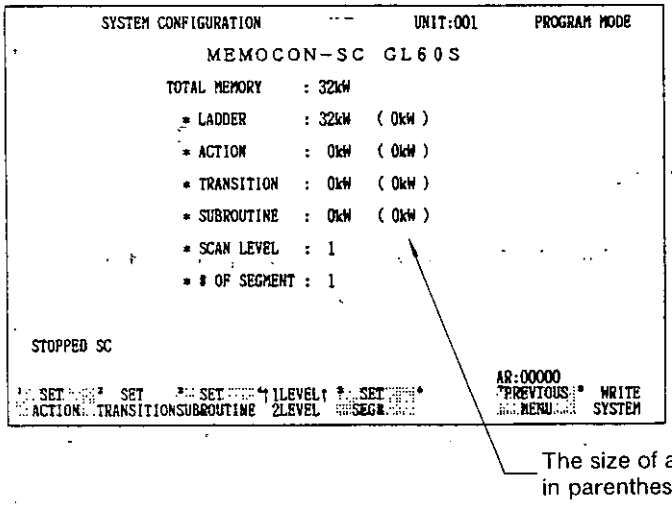
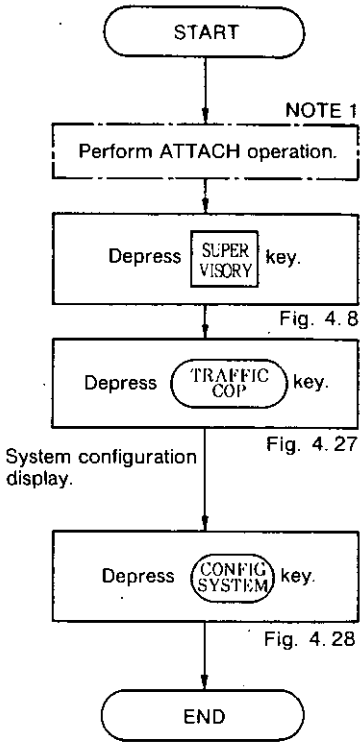


Fig. 4. 26 Display in the Initial State

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. 4. 26.

■ System Configuration Display



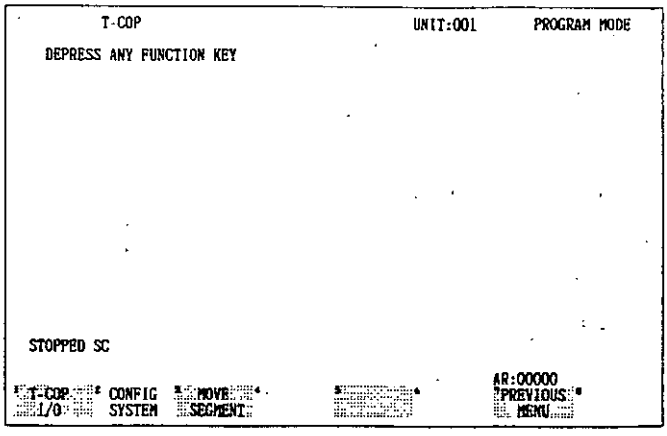


Fig. 4.27

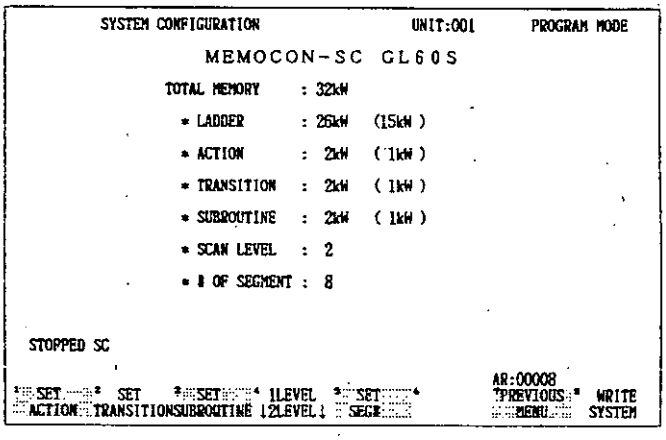
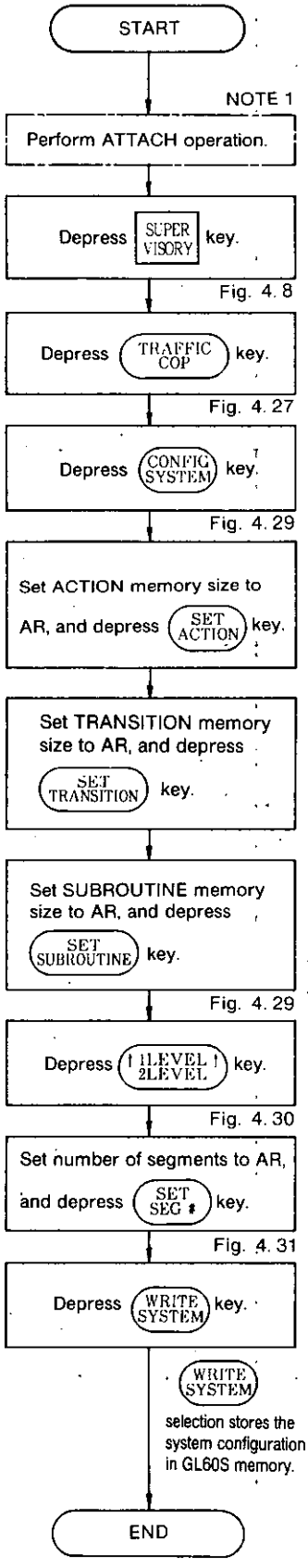


Fig. 4.28

NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. PREVIOUS MENU selection in Fig. 4.28 calls up the display in Fig. 4.27.
3. PREVIOUS MENU selection in Fig. 4.27 calls up the display in Fig. 4.8.

■ System Configuration Storing




```
SYSTEM CONFIGURATION                UNIT:001      PROGRAM MODE
                    MEMOCON-SC GL60S
          TOTAL MEMORY     : 32kW
            * LADDER       : 26kW  ( 0kW )
            * ACTION       :  2kW  ( 0kW )
            * TRANSITION   :  2kW  ( 0kW )
            * SUBROUTINE   :  2kW  ( 0kW )
            * SCAN LEVEL   :  1
            * # OF SEGMENT :  1

STOPPED SC
                                                    AR:00002
1 SET    2 SET    3 SET    4↑1LEVEL↑ 5 SET    6     7PREVIOUS 8 WRITE
  ACTION   TRANSITION SUBROUTINE 2LEVEL   SEG#       MENU     SYSTEM
```

Fig. 4.29

```
SYSTEM CONFIGURATION                UNIT:001      PROGRAM MODE
                    MEMOCON-SC GL60S
          TOTAL MEMORY     : 32kW
            * LADDER       : 26kW  ( 0kW )
            * ACTION       :  2kW  ( 0kW )
            * TRANSITION   :  2kW  ( 0kW )
            * SUBROUTINE   :  2kW  ( 0kW )
            * SCAN LEVEL   :  2
            * # OF SEGMENT :  1

STOPPED SC
                                                    AR:00002
1 SET    2 SET    3 SET    4 1LEVEL  5 SET    6     7PREVIOUS 8 WRITE
  ACTION   TRANSITION SUBROUTINE ↓2LEVEL↓ SEG#       MENU     SYSTEM
```

Fig. 4.30

```
SYSTEM CONFIGURATION                UNIT:001      PROGRAM MODE
                    MEMOCON-SC GL60S
          TOTAL MEMORY     : 32kW
            * LADDER       : 26kW  ( 0kW )
            * ACTION       :  2kW  ( 0kW )
            * TRANSITION   :  2kW  ( 0kW )
            * SUBROUTINE   :  2kW  ( 0kW )
            * SCAN LEVEL   :  2
            * # OF SEGMENT :  8

STOPPED SC
                                                    AR:00008
1 SET    2 SET    3 SET    4 1LEVEL  5 SET    6     7PREVIOUS 8 WRITE
  ACTION   TRANSITION SUBROUTINE ↓2LEVEL↓ SEG#       MENU     SYSTEM
```

Fig. 4.31

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. 4.27.
5. (PREVIOUS MENU) selection in the allocation menu calls up the display in Fig. 4.8.

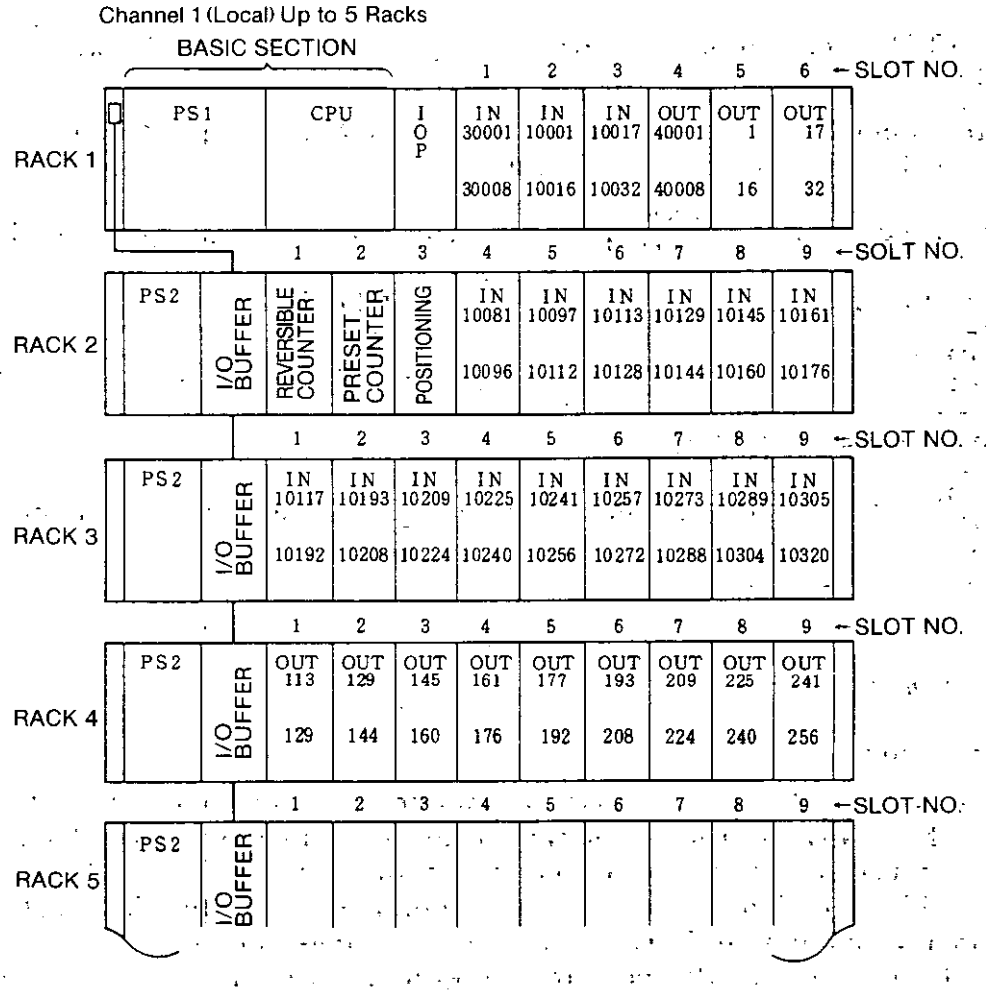
(2) Traffic Cop I/O

1. 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.



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. 4.32 Sample I/O Allocation

■ I/O Allocation Screens

I/O allocation display has up to 10 displays per channel as shown in Fig. 4.33, up to 5 racks for local I/Os and up to 4 racks for remote I/Os can be displayed.

Rack 1 Input Allocation

T-COP I/O ALLOCATION UNIT:001 PROGRAM MODE

• INPUT • CHANNEL:1 RACK:01

SLOT	DISCRETE REF #	DISCRETE POINTS	REGISTER REF #	REGISTER SIZE
1	------	------	30001	08
2	10001	016	------	---
3	10017	016	------	---
4	------	------	------	---
5	------	------	------	---
6	------	------	------	---

Rack 1 Output Allocation

T-COP I/O ALLOCATION UNIT:001 PROGRAM MODE

• OUTPUT • CHANNEL:1 RACK:01

SLOT	DISCRETE REF #	DISCRETE POINTS	REGISTER REF #	REGISTER SIZE
1	------	------	------	---
2	------	------	------	---
3	------	------	------	---
4	------	------	40001	08
5	00001	016	------	---
6	00017	016	------	---

Rack 2 Input Allocation

T-COP I/O ALLOCATION UNIT:001 PROGRAM MODE

• INPUT • CHANNEL:1 RACK:02

SLOT	DISCRETE REF #	DISCRETE POINTS	REGISTER REF #	REGISTER SIZE
1	10033	016	30009	04
2	10049	016	30013	02
3	10065	016	30015	04
4	10081	016	------	---
5	10097	016	------	---
6	10113	016	------	---
7	10129	016	------	---
8	10145	016	------	---
9	10161	016	------	---

Rack 2 Output Allocation

T-COP I/O ALLOCATION UNIT:001 PROGRAM MODE

• OUTPUT • CHANNEL:1 RACK:02

SLOT	DISCRETE REF #	DISCRETE POINTS	REGISTER REF #	REGISTER SIZE
1	00033	016	40009	04
2	00049	024	40013	08
3	00073	024	40021	04
4	------	------	------	---
5	------	------	------	---
6	------	------	------	---
7	------	------	------	---
8	------	------	------	---
9	------	------	------	---

Rack 3 Input Allocation

T-COP I/O ALLOCATION UNIT:001 PROGRAM MODE

• INPUT • CHANNEL:1 RACK:03

SLOT	DISCRETE REF #	DISCRETE POINTS	REGISTER REF #	REGISTER SIZE
1	10177	016	------	---
2	10193	016	------	---
3	10209	016	------	---
4	10225	016	------	---
5	10241	016	------	---
6	10257	016	------	---
7	10273	016	------	---
8	10289	016	------	---
9	10305	016	------	---

Rack 3 Output Allocation

T-COP I/O ALLOCATION UNIT:001 PROGRAM MODE

• OUTPUT • CHANNEL:1 RACK:03

SLOT	DISCRETE REF #	DISCRETE POINTS	REGISTER REF #	REGISTER SIZE
1	------	------	------	---
2	------	------	------	---
3	------	------	------	---
4	------	------	------	---
5	------	------	------	---
6	------	------	------	---
7	------	------	------	---
8	------	------	------	---
9	------	------	------	---

Rack 4 Input Allocation

T-COP I/O ALLOCATION UNIT:001 PROGRAM MODE

• INPUT • CHANNEL:1 RACK:04

SLOT	DISCRETE REF #	DISCRETE POINTS	REGISTER REF #	REGISTER SIZE
1	------	------	------	---
2	------	------	------	---
3	------	------	------	---
4	------	------	------	---
5	------	------	------	---
6	------	------	------	---
7	------	------	------	---
8	------	------	------	---
9	------	------	------	---

Rack 4 Output Allocation

T-COP I/O ALLOCATION UNIT:001 PROGRAM MODE

• OUTPUT • CHANNEL:1 RACK:04

SLOT	DISCRETE REF #	DISCRETE POINTS	REGISTER REF #	REGISTER SIZE
1	00113	016	------	---
2	00129	016	------	---
3	00145	016	------	---
4	00161	016	------	---
5	00177	016	------	---
6	00193	016	------	---
7	00209	016	------	---
8	00225	016	------	---
9	00241	016	------	---

Fig. 4.33 I/O Allocation Displays

■ 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 4.4. Number of racks and slots differs according to channel and station.

Table 4.3 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

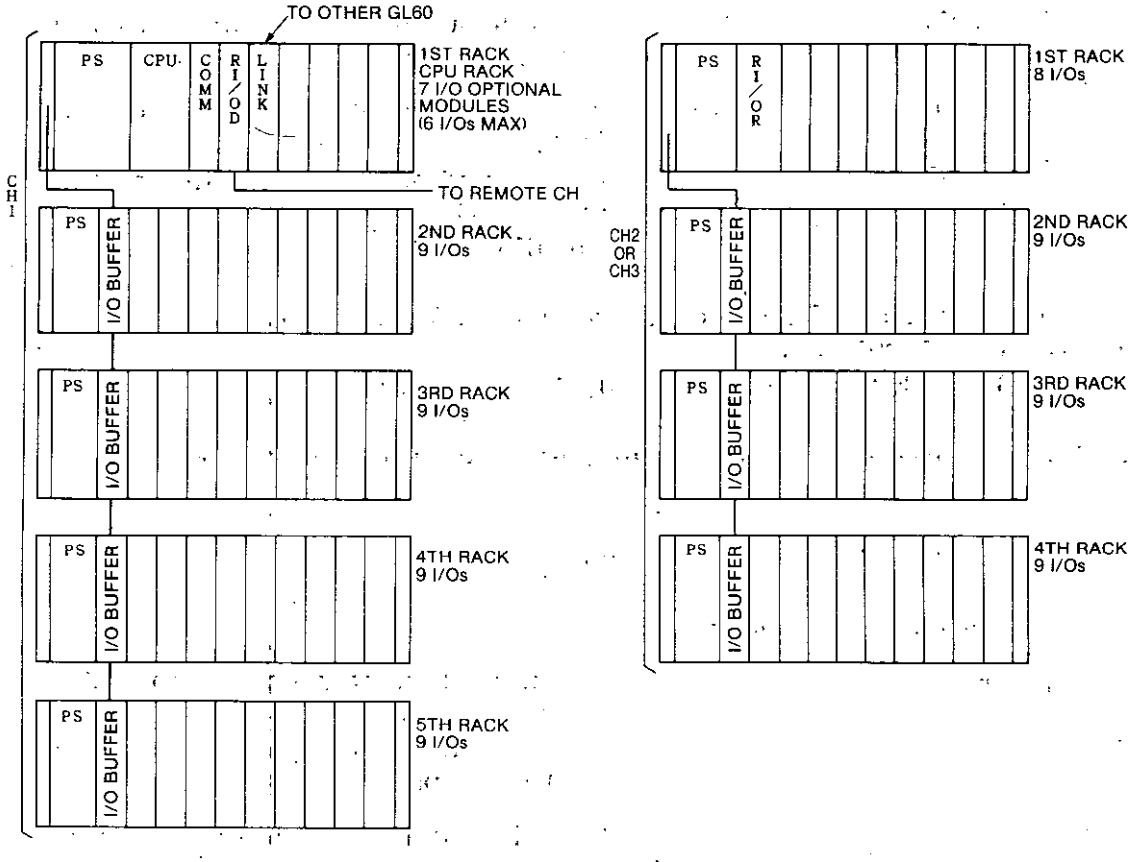
Restriction of number of registers in same slot:
Number of registers ≦ 0 to 8

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

■ Description of I/O Section (Cont'd)

LOCAL CHANNEL (CH1)

REMOTE CHANNEL (CH2, CH3)



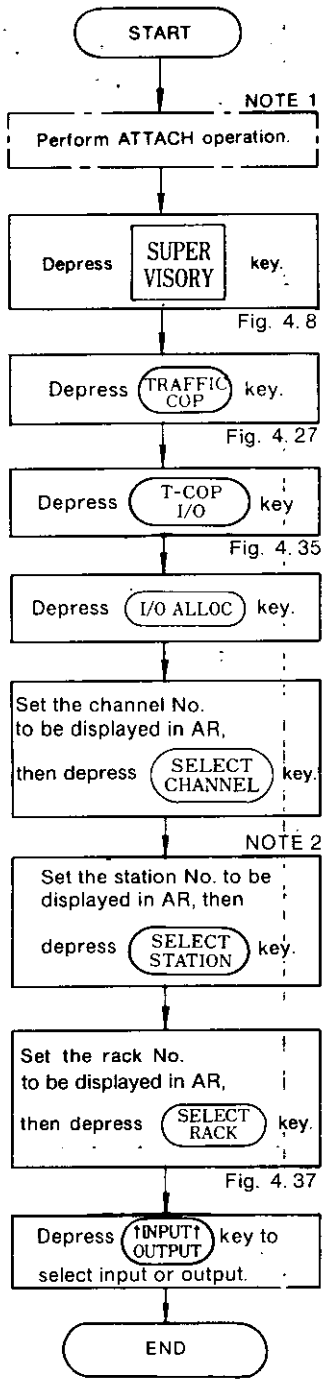
Note:
PS: Power Supply Module, CPU: CPU Module, Communication Module,
RIOD: Remote I/O Driver, LINK: PC Link Module,
RIOR: Remote I/O Receiver

Fig. 4.34 GL60S I/O Section Configuration

Table 4.4 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	16 or 24	2 or 4
Preset Counter	B2802	16	2	16 or 24	2 - 8
Positioning Module	B2803, B2813	16	4	24	4

■ I/O Allocation Display



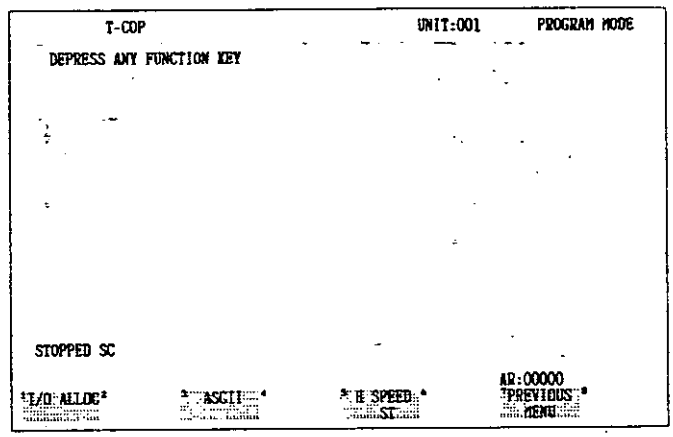


Fig. 4.35

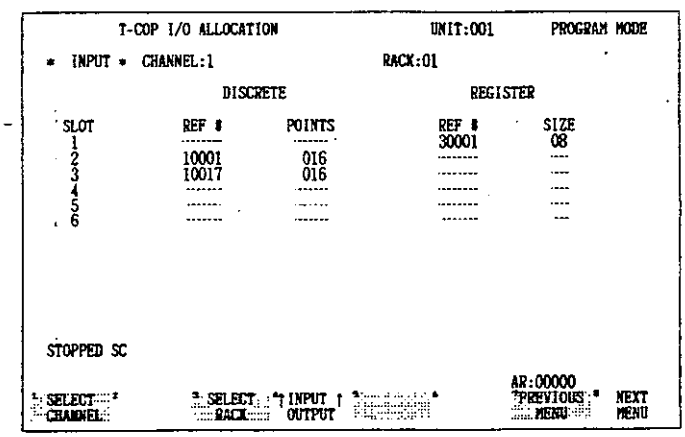


Fig. 4.36

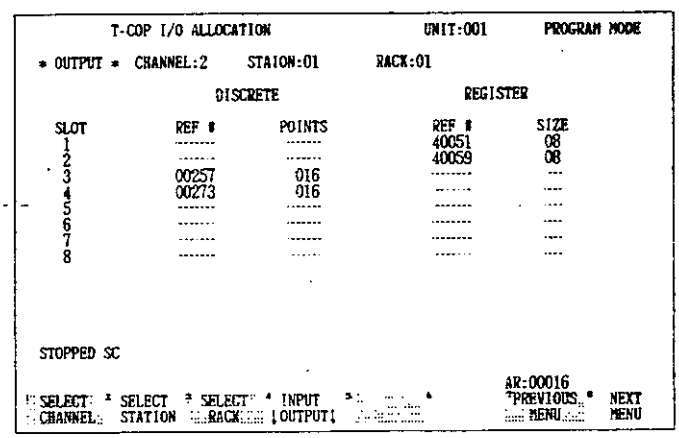
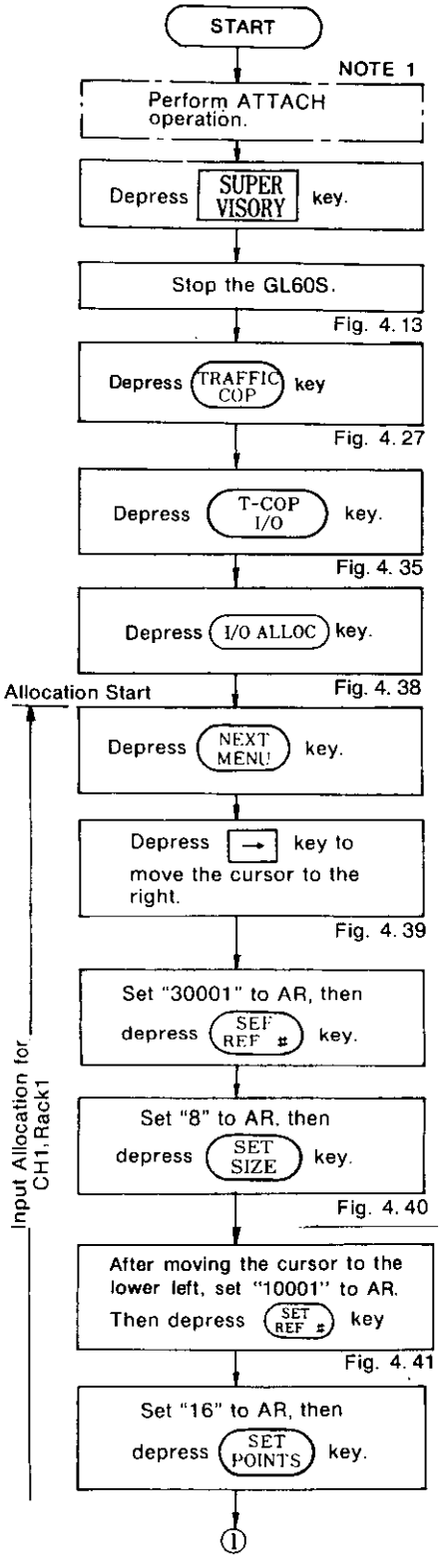


Fig. 4.37

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. 4.35 appears.

■ I/O Allocation Storing



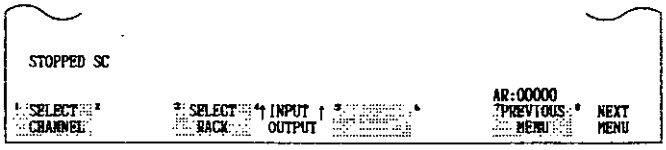


Fig. 4. 38

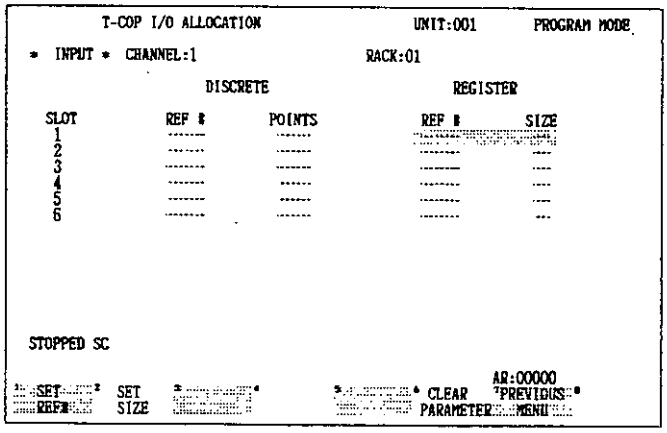


Fig. 4. 39

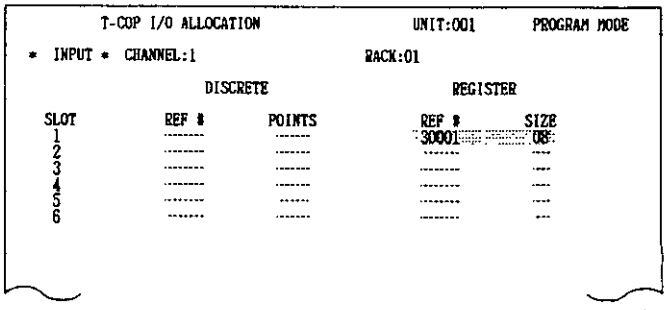


Fig. 4. 40

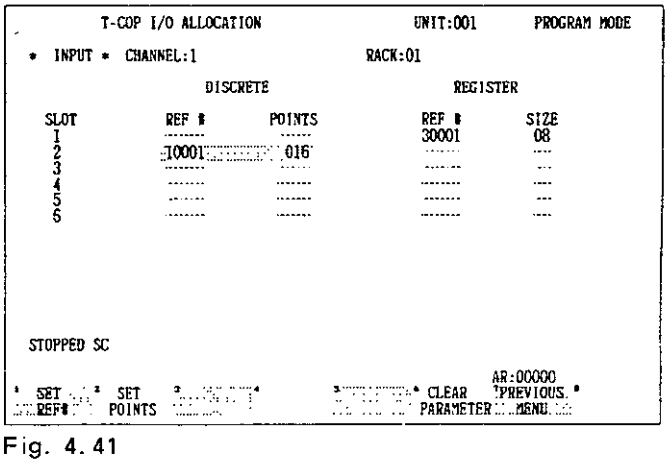
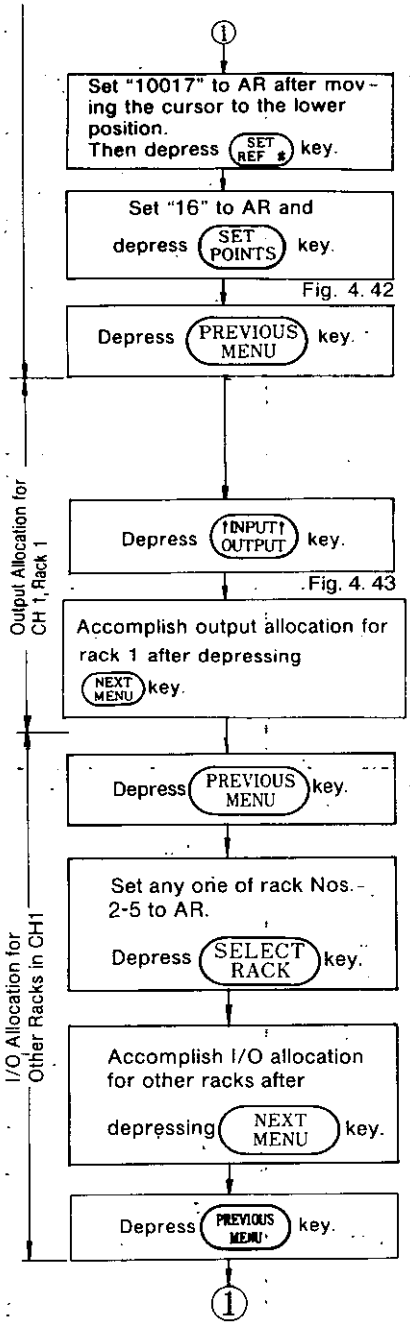


Fig. 4. 41

■ I/O Allocation Storing (Cont'd)



T-COP I/O ALLOCATION UNIT:001 PROGRAM MODE

* INPUT * CHANNEL:1 RACK:01

SLOT	DISCRETE REF #	DISCRETE POINTS	REGISTER REF #	REGISTER SIZE
1	-----	-----	30001	08
2	10001	016	-----	---
3	10017	016	-----	---
4	-----	-----	-----	---
5	-----	-----	-----	---
6	-----	-----	-----	---

Fig. 4. 42

T-COP I/O ALLOCATION UNIT:001 PROGRAM MODE

* OUTPUT * CHANNEL:1 RACK:01

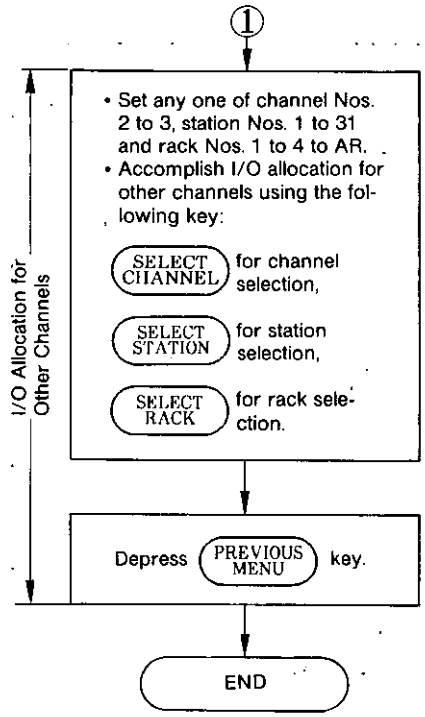
SLOT	DISCRETE REF #	DISCRETE POINTS	REGISTER REF #	REGISTER SIZE
1	-----	-----	-----	---
2	-----	-----	-----	---
3	-----	-----	-----	---
4	-----	-----	-----	---
5	-----	-----	-----	---
6	-----	-----	-----	---

STOPPED SC

AR:00000

SELECT CHANNEL | SELECT RACK | INPUT ↓OUTPUT↓ | PREVIOUS MENU | NEXT MENU

Fig. 4. 43



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.

2. 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.

NOTE

- 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

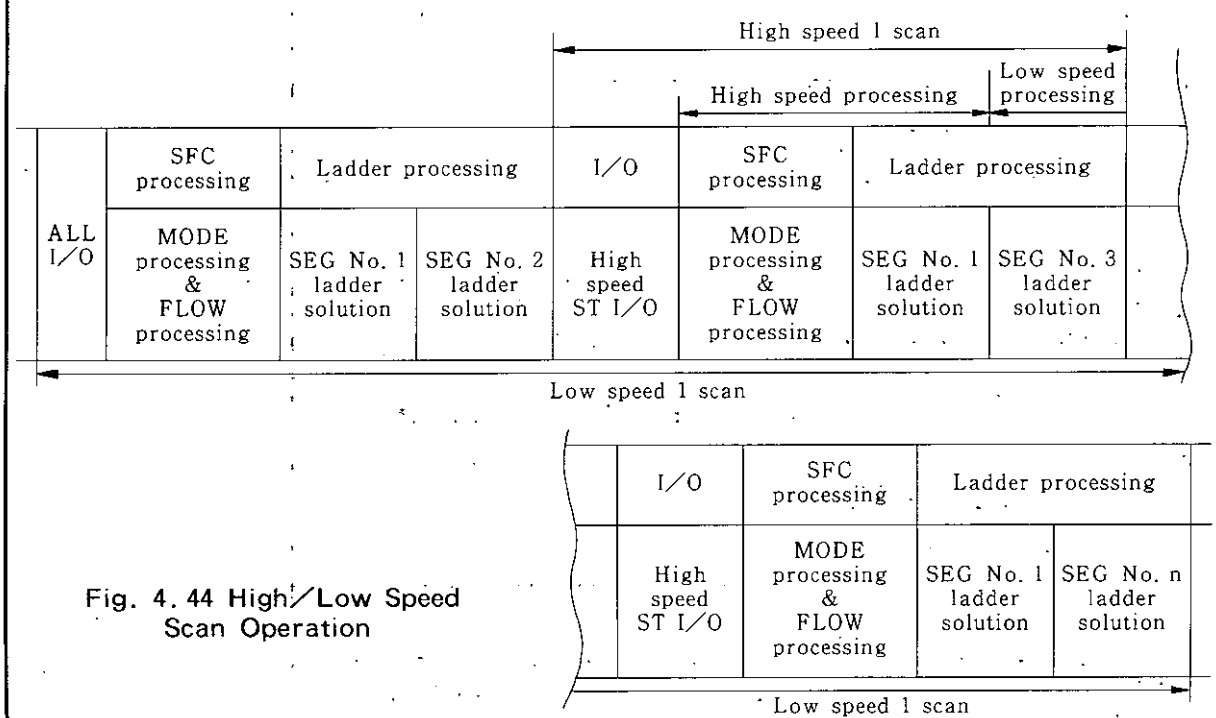
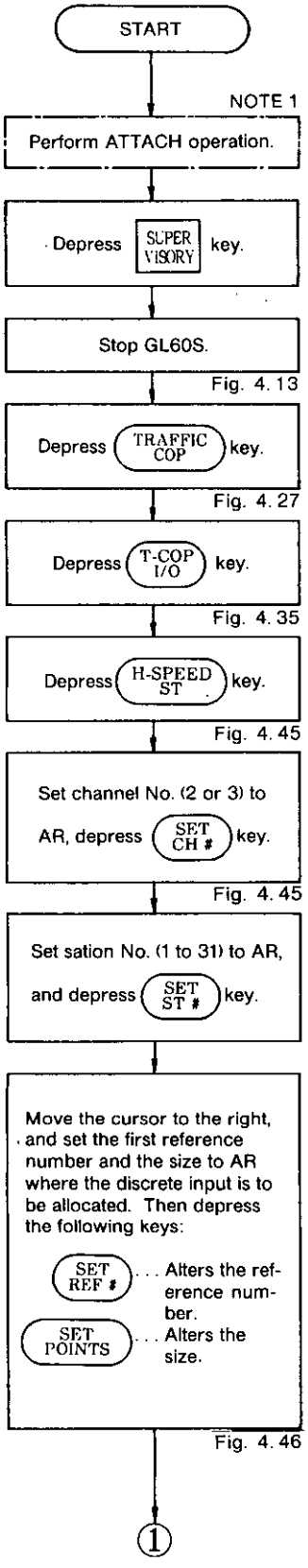


Fig. 4.44 High/Low Speed Scan Operation

■ Storing High Speed Station Allocation



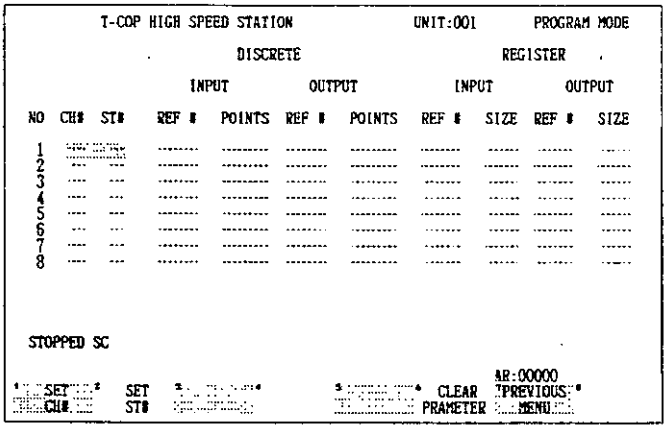


Fig. 4. 45

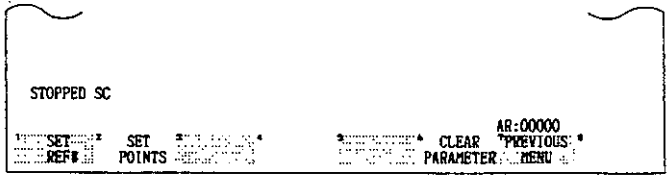


Fig. 4. 46

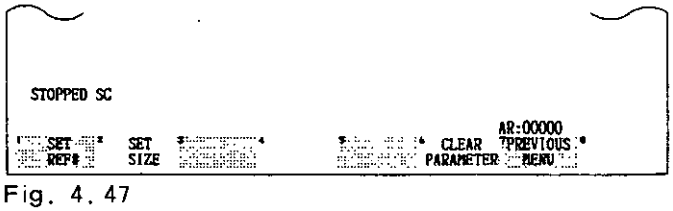


Fig. 4. 47

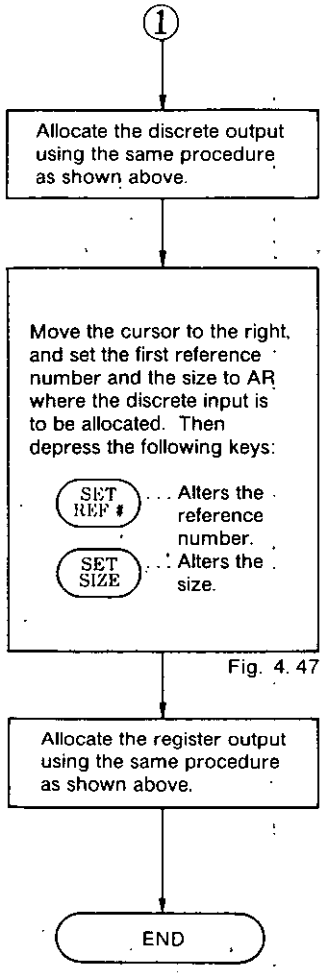


Fig. 4.47

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.

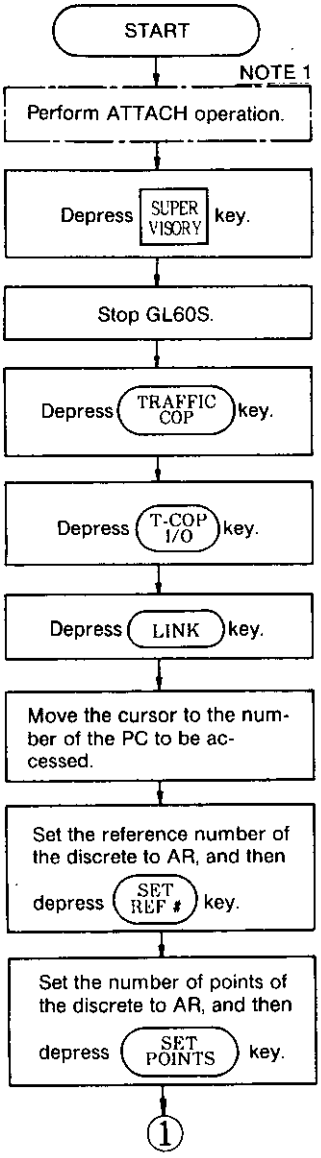
3 Link Allocation

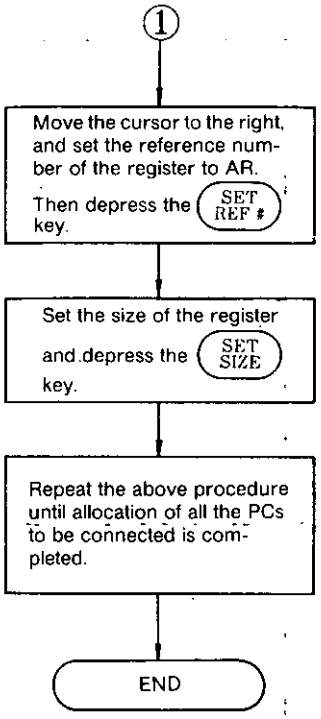
The inter-PC link function, which is one of the GL60S link functions, links up to 32 PCs by one line. Link allocation determines the reference numbers and the sizes for the link coil and the link register of another PC to be accessed in a program.

POINT

- 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.

■ Link Allocation Storing





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. 4. 35.
4. Depressing CLEAR PARAMETER key clears the link allocation shown at the cursor.

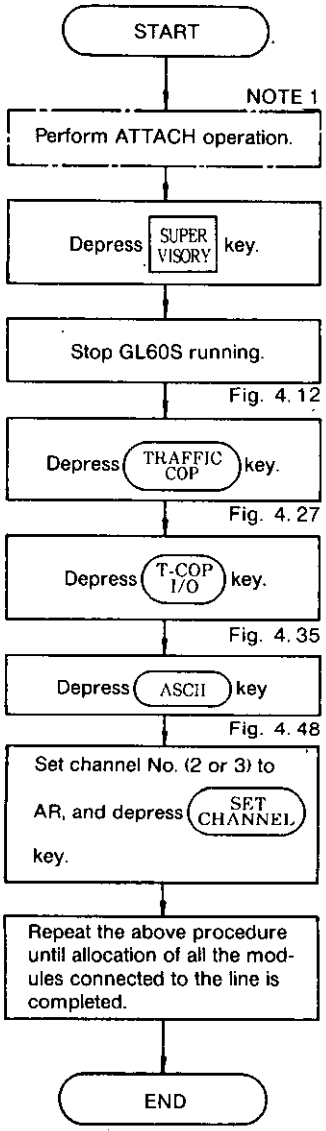
4 ASCII Allocation

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



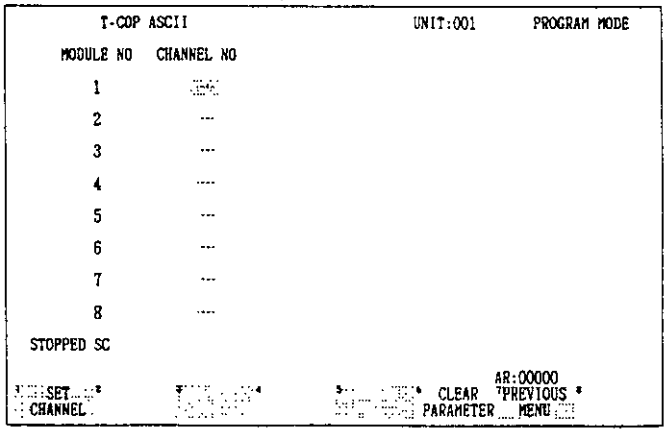


Fig. 4.48

NOTE

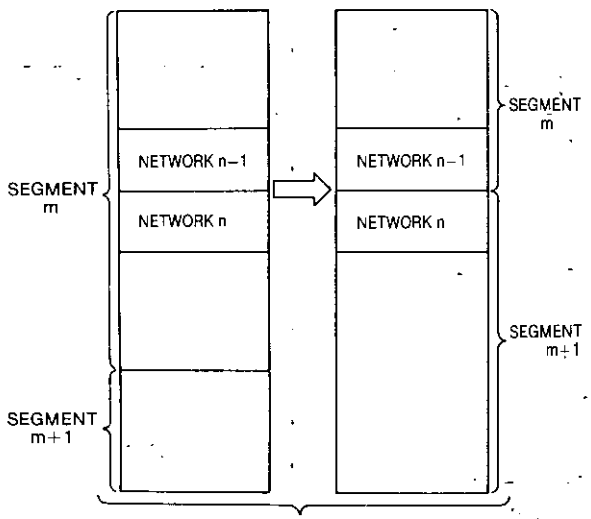
1. When ATTACH operation has already been completed, this step can be skipped.
2. The channel number is stored in the GL60S allocation table when it is specified in the CHANNEL # field on the screen.
3. Depressing PREVIOUS MENU key calls up the display in Fig. 4.35.
4. Depressing CLEAR PARAMETER key clears the link allocation shown at the cursor.

(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.

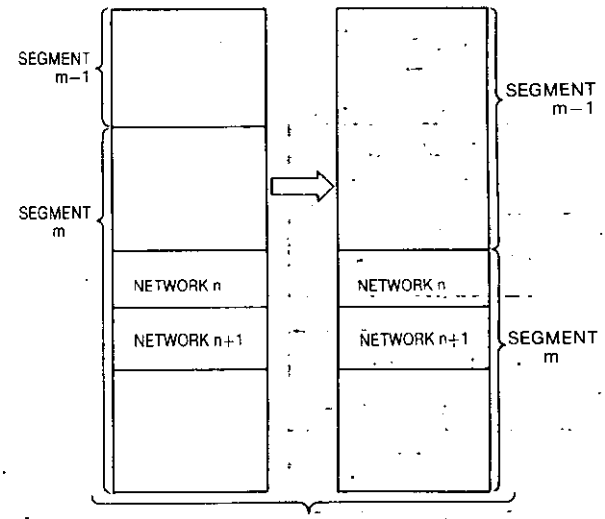
Moving networks can also be performed. The networks from n to the end within segment m can be moved into segment m+1 (MOVE NEXT), and the networks from n to the beginning within segment m can be moved into segment m-1 (MOVE PREVIOUS).

MOVE NEXT



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

MOVE PREVIOUS

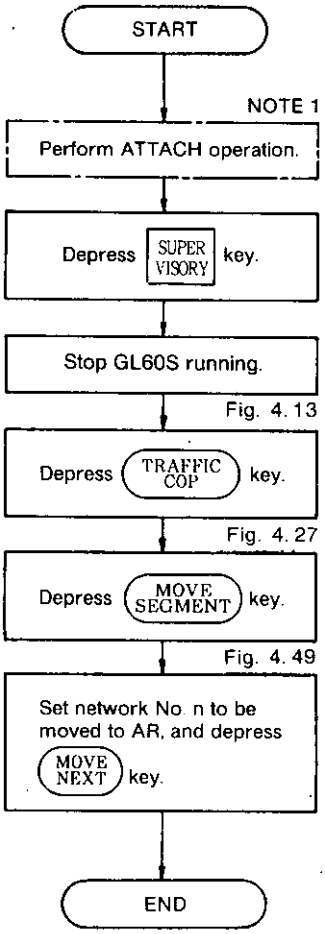


Set n+1 to AR, and depress (MOVE PREVIOUS) key.

NOTE

- Stop the GL60S running at segment operation.

① MOVE NEXT Operation



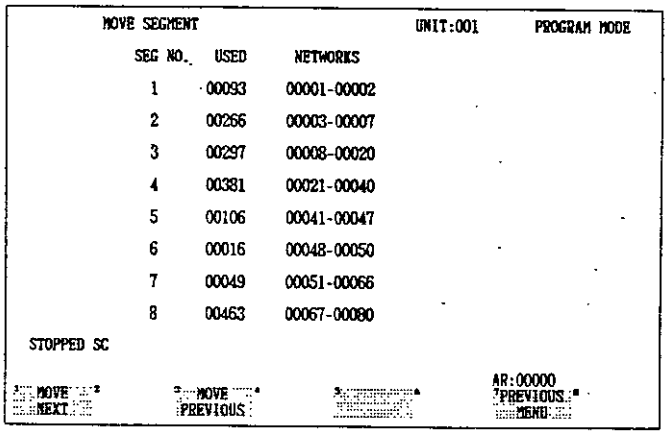
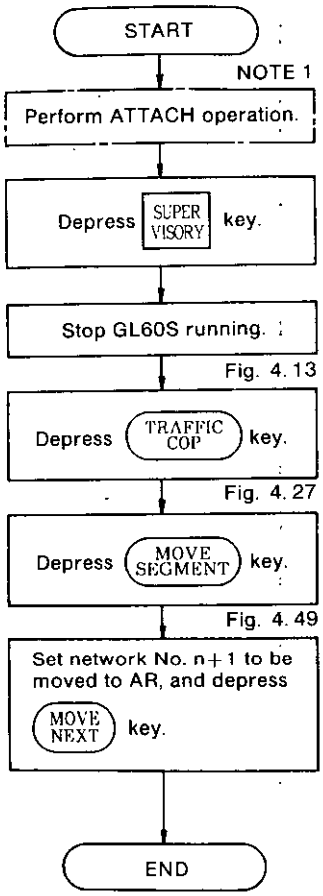


Fig. 4.49

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. 4.27.
3. For detailed information, refer to MEMOCON-SC GL60S User's Manual-No.1 (SIE-C815-14.1)

② MOVE PREVIOUS Operation



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. 4.27.

4. 5. 6 Loader Operation

This operation is for load, (write-in), save (read out) and verify programs with the GL60S unit. Prepare data disk.

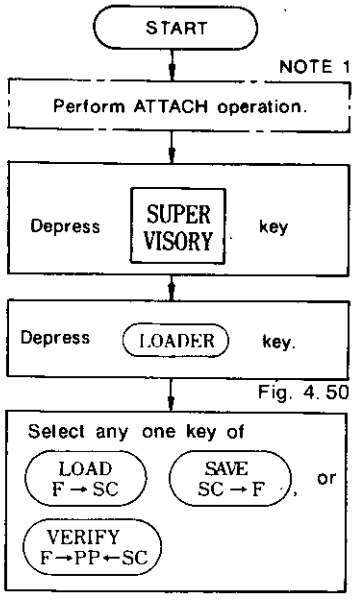


Fig. 4. 50

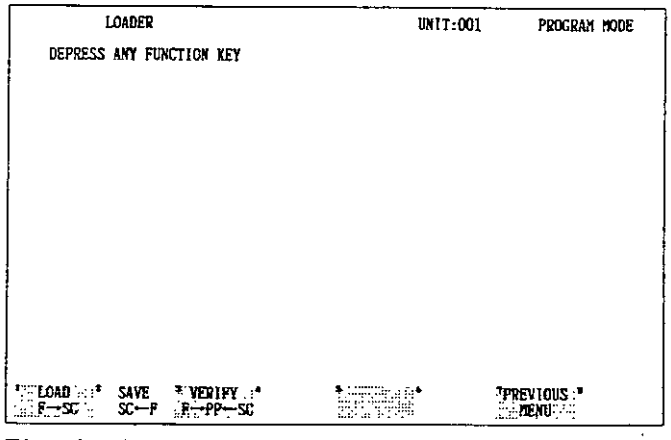


Fig. 4. 50

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. 4. 8.
4. For operation of disk files, refer to Section 5 "FILE MANAGEMENT OPERATION."

IMPORTANT

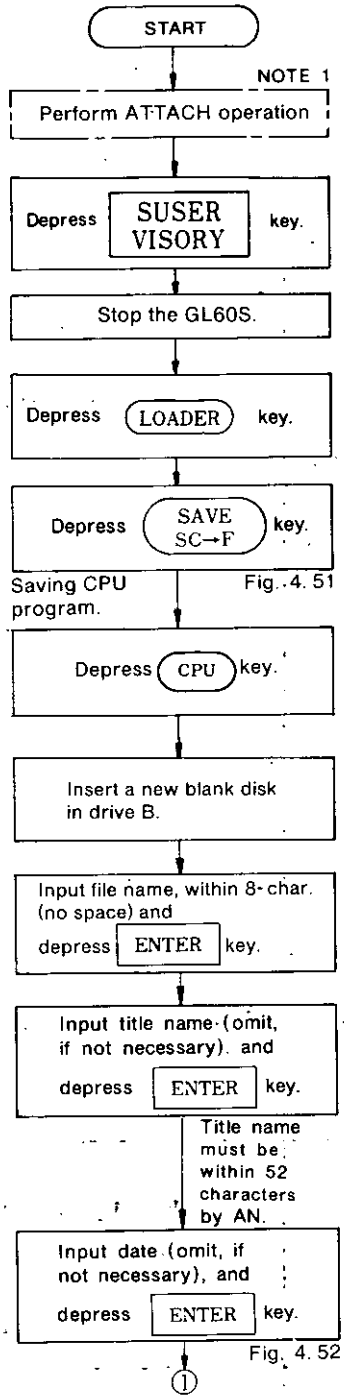
The data disk cannot be used unless formated (made usable with P150). For initialization, refer to the disk initialization under Par. 5. 2 "DISK OPERATION." Blank disks (Model: F150-000) are in the initialized state as delivered.

(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.



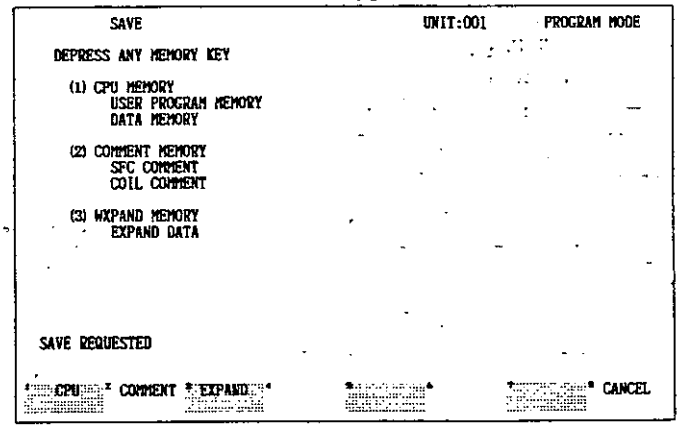


Fig. 4. 51

POINT

File name is within 8 characters by AN. Escape character is within 3 characters. Refer to Par. 5. 3.

TESTLDR1 • U84

FILE NAME ESCAPE CHARACTER

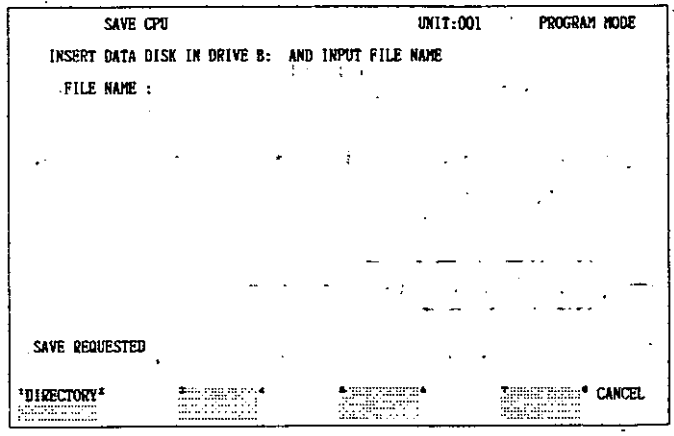
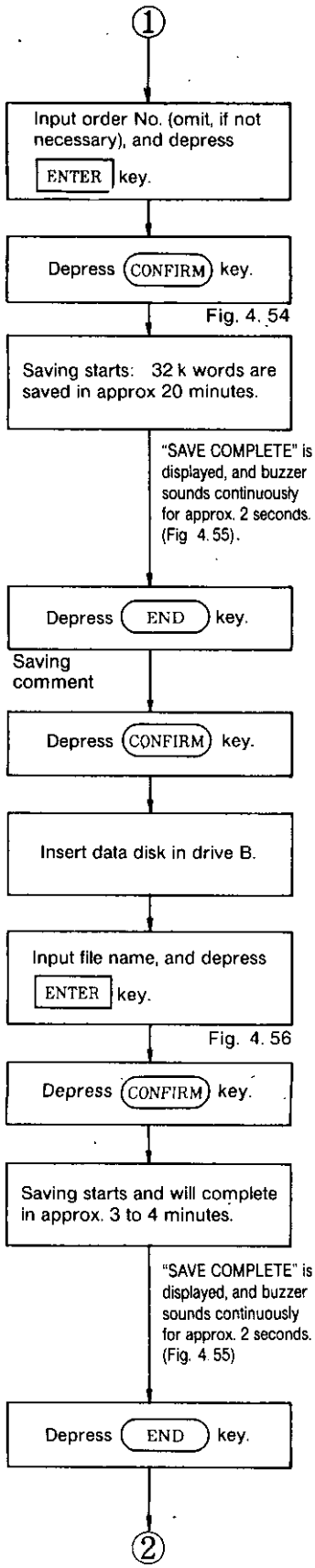


Fig. 4. 52



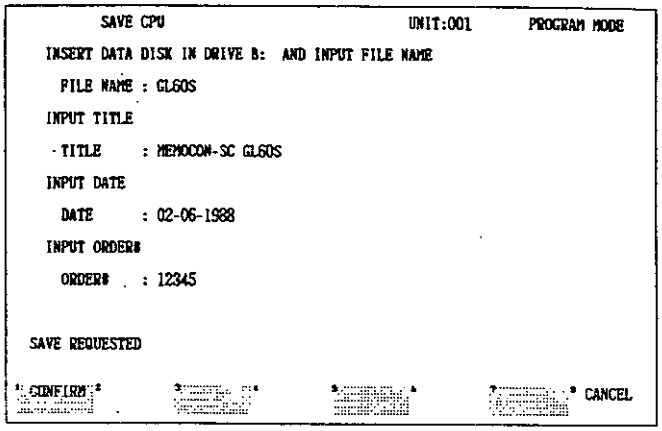


Fig. 4. 53

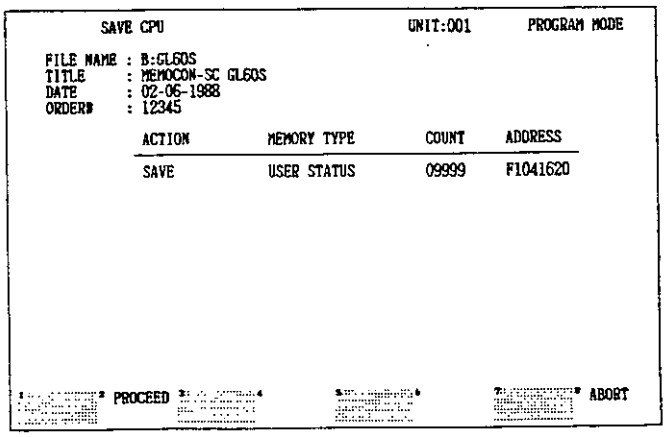


Fig. 4. 54

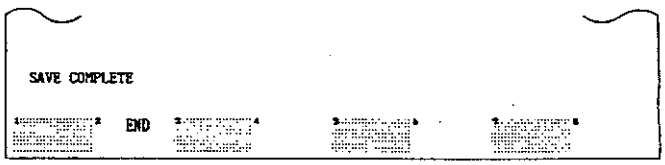


Fig. 4. 55

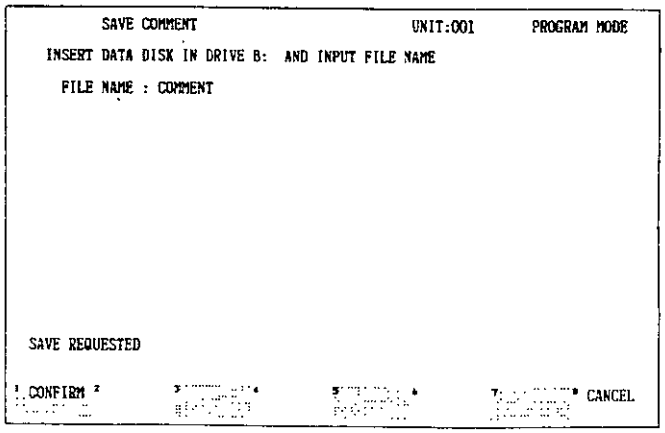
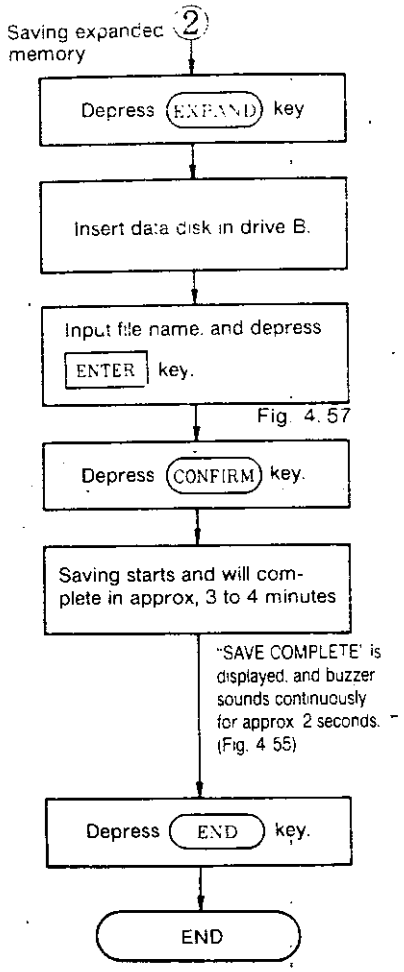


Fig. 4. 56



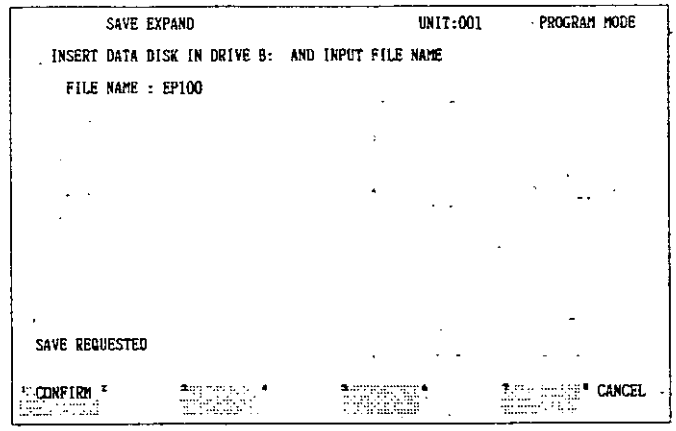


Fig. 4.57

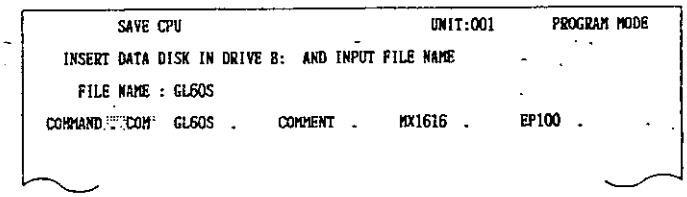


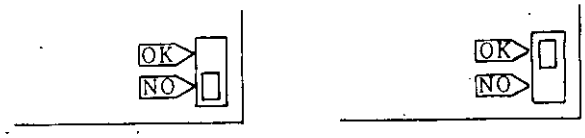
Fig. 4.58

NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. Depressing (DIRECTORY) key displays the file names. (Fig. 4.58)
3. Depressing (CANCEL) key restores the state shown in Fig. 4.50.
4. To stop the save process during save execution, depress (STOP) key. The labels shown in Fig. 4.54 are displayed. Depressing (PROCEED) key causes the saving process to resume, and depressing (ABORT) key returns to the display shown in Fig. 4.50.
5. Date can be input in the form "88-02-06" or "88/02/06" in addition to the example shown in Fig. 4.53.
6. Save operation can be executed also while GL60S is running. However, execution of verify operation causes a miscomparison.

IMPORTANT

Make the data disk write enable state beforehand.



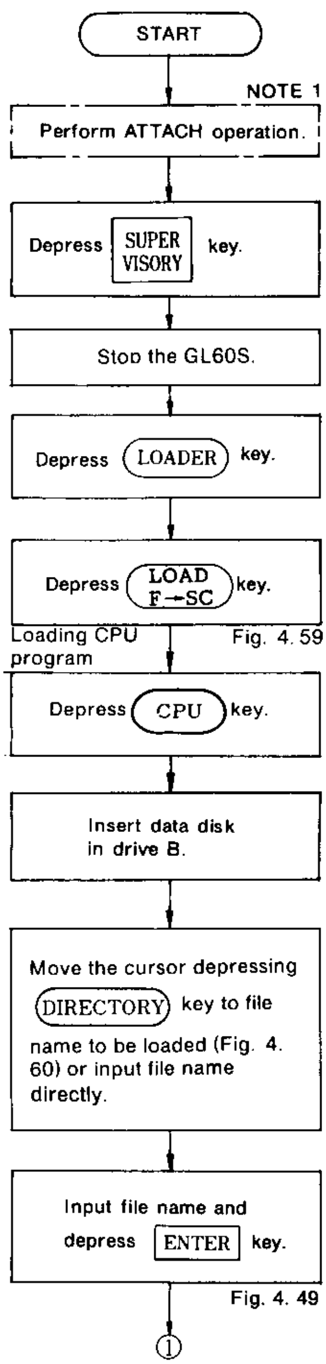
(a) Write Disable State (2) Write Enable State

(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

 LOAD REQUESTED
  CPU  COMMENT  EXPAND                                        CANCEL
```

Fig. 4. 59

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

 LOAD REQUESTED
                                                              CANCEL
```

Fig. 4. 60

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

Fig. 4. 61

①

- Depress (CONFIRM) key.
- Loading starts. 32 k words are loaded in approx 20 minutes.
  - "LOAD COMPLETE" is displayed, and buzzer sounds continuously for approx. 2 seconds (Fig. 4.63)
- Depress (END) key.

Loading comment

- Depress (CONFIRM) key.
- Insert data disk in drive B.
- Move the cursor depressing (DIRECTORY) key to file name to be loaded or input file name directly.
- Depress [ENTER] key.
  - Fig. 4.64
- Depress (CONFIRM) key.
- Loading starts and will complete in approx. 3 to 4 minutes.
  - "LOAD COMPLETE" is displayed, and buzzer sounds continuously for approx. 2 seconds. (Fig. 4.63)
- Depress (END) key.

②

```
        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     F1040000

          PROCEED                                               ABORT
```

Fig. 4. 62

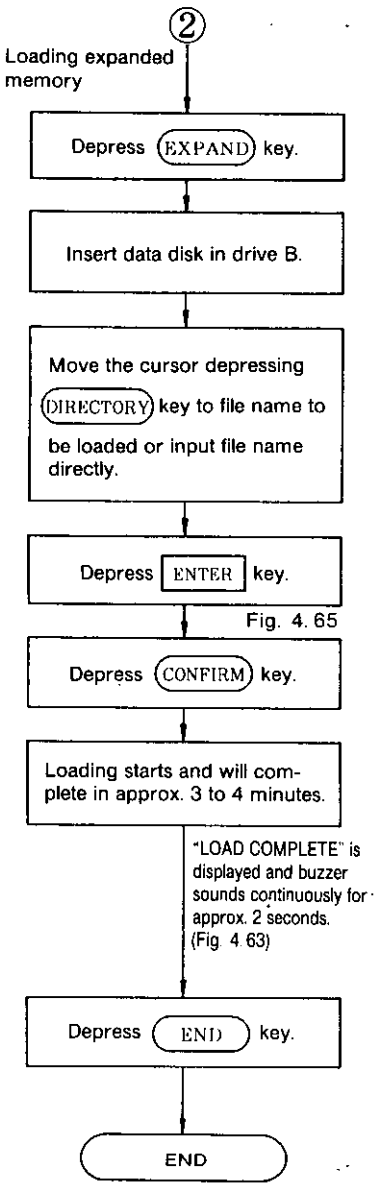
```
 LOAD COMPLETE

          END
```

Fig. 4. 63

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

Fig. 4. 64




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

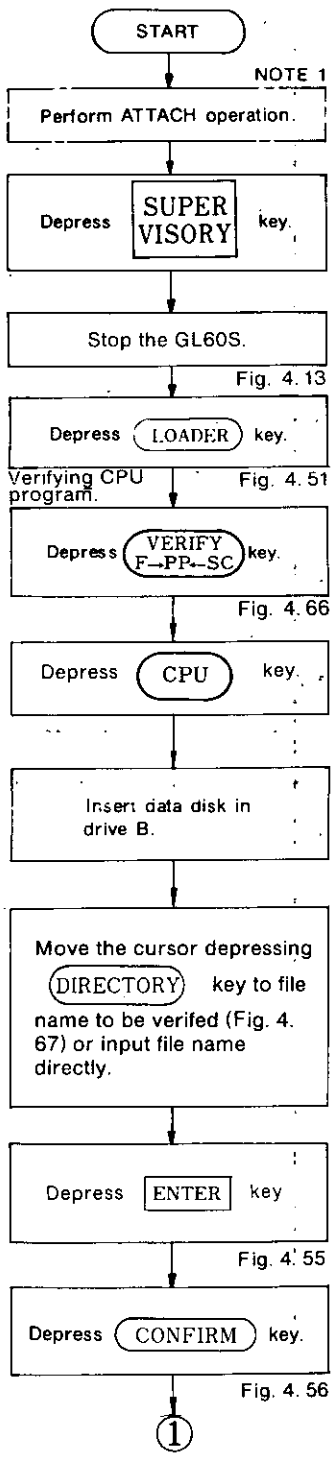
Fig. 4. 65

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. 4. 50.
3. To stop the loading during execution, depress STOP key. The labels shown in Fig. 4. 62 are displayed. Depressing PROCEED key causes the loading to resume, and depressing ABORT key calls up the display shown in Fig. 4. 50.

(3) GL60S ←→ FD VERIFY OPERATION

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




```
        VERIFY                               UNIT:001      PROGRAM MODE
  DEPRESS ANY MEMORY TYPE KEY
    (1) CPU MEMORY
          USER PROGRAM MEMORY
          DATA MEMORY
    (2) COMMENT MEMORY
          SFC COMMENT
          COIL COMMENT
    (3) WXPAND MEMORY
          EXPAND DATA

 VERIFY REQUESTED
 1 CPU  2 COMMENT  3 EXPAND  4              5            CANCEL
```

Fig. 4. 66

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

 VERIFY REQUESTED
 1          2          3          4          CANCEL
```

Fig. 4. 67

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

Fig. 4. 68

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 4 70)

Depress (END) key.

Verifying comment

Depress (CONFIRM) key.

Insert data disk in drive B.

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

Depress [ENTER] key.

Fig. 4.71

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. 4.70)

Depress (END) 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

   PROCEED   PAUSE  CONTINUE   SIZE  NO SIZE                 ABORT
```

Fig. 4. 69

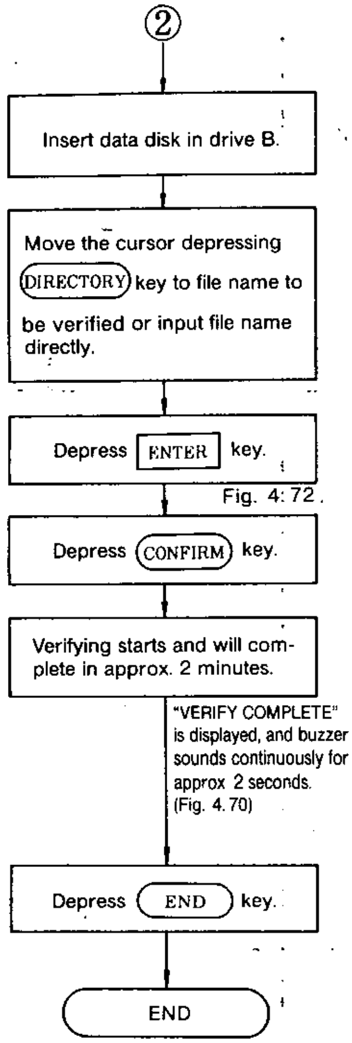
```
   VERIFY COMPLETE

              END
```

Fig. 4. 70

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

Fig. 4. 71




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

Fig. 4. 72

```
          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

              PROCEED    PAUSE   SIZE                          ABORT
                         CONTINUE  NO SIZE
```

Fig. 4. 73

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. 4. 50.
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. 4. 50.
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 4. 69 is displayed. Depressing (PROCEED) key causes the verifying process to continue and depressing (ABORT) key calls up the display shown in Fig. 4. 50.

   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

4. 6 PROGRAMMING MONITOR OPERATION

4. 6. 1 Mode Operation

4. 6. 2 Flow Operation

For two kinds of operations above, refer to "MEMOCON-SC GL60S USER'S MANUAL P150 PROGRAMMING PANEL SFC INFORMATION" (SIE-C815-14. 3).

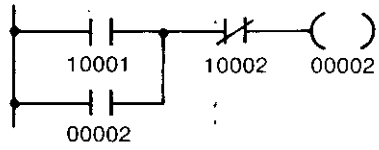
4. 6. 3 Ladder Operation

(1) LADDER

(a) NETWORK STORING

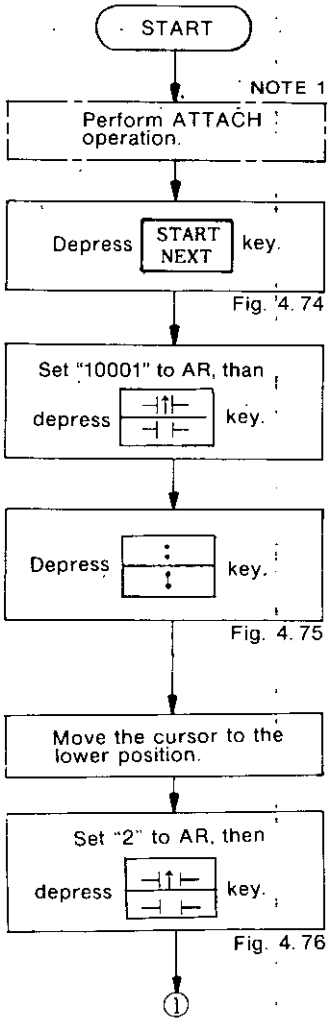
1. RELAY, COIL ①

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.



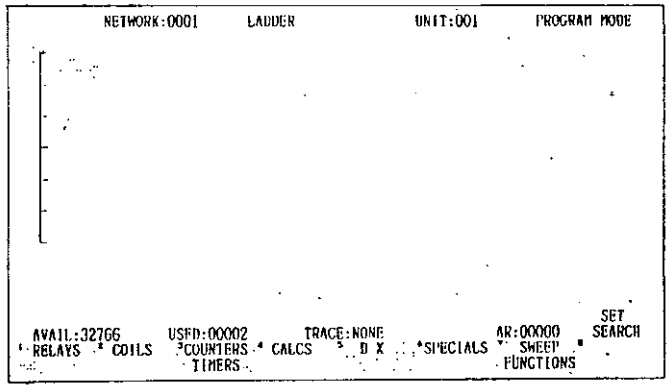


Fig. 4. 74

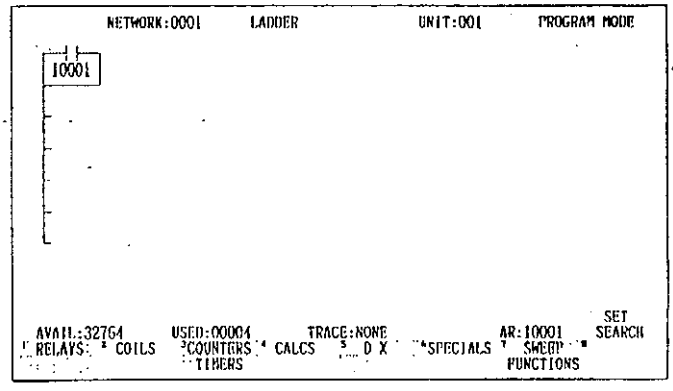


Fig. 4. 75

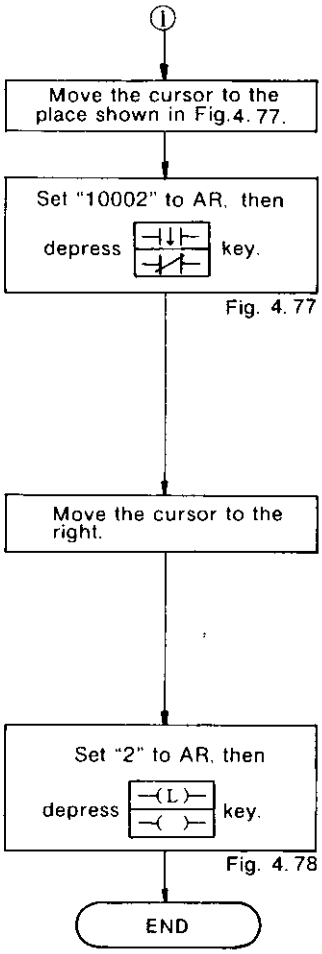


Fig. 4.77

Fig. 4.78

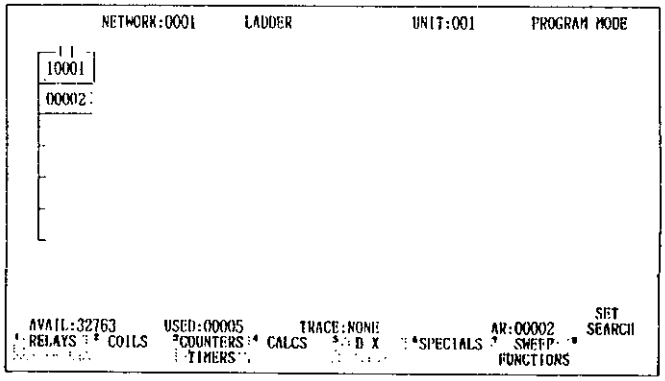


Fig. 4.76

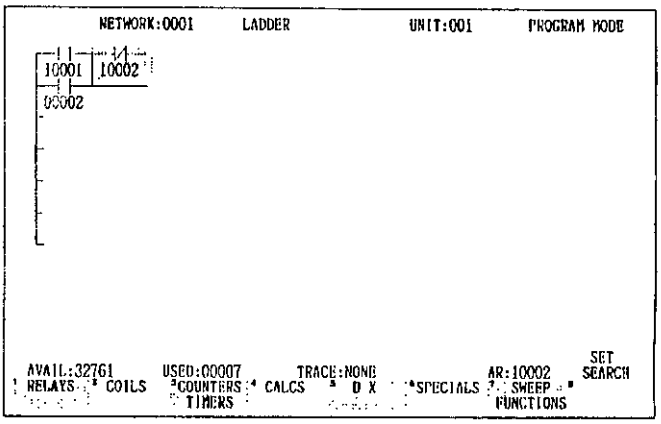


Fig. 4.77

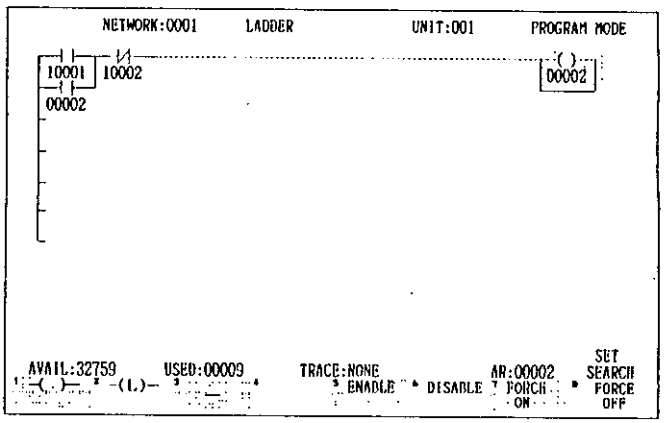


Fig. 4.78

NOTE

1. This step can be skipped if the system is ready to store the program.
2. The elements stored or altered via the P150 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.

1. RELAY, COIL ②

Storing operation is performed with label key.

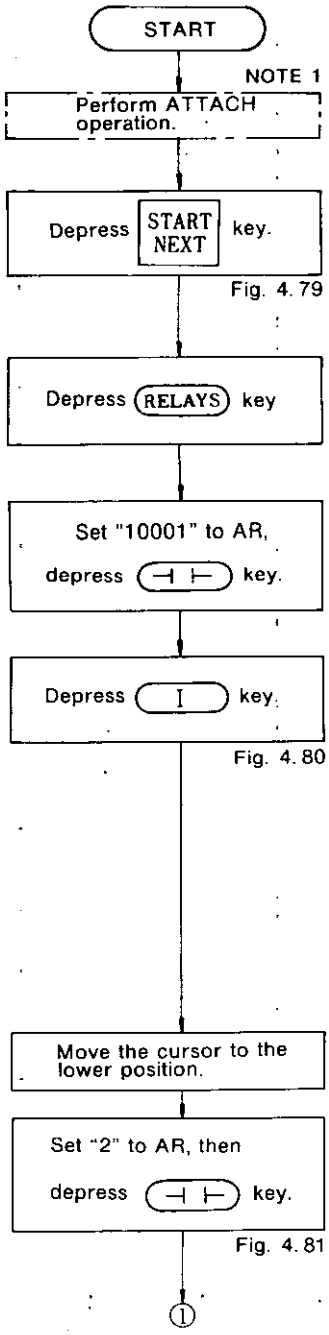


Fig. 4.79

Fig. 4.80

Fig. 4.81

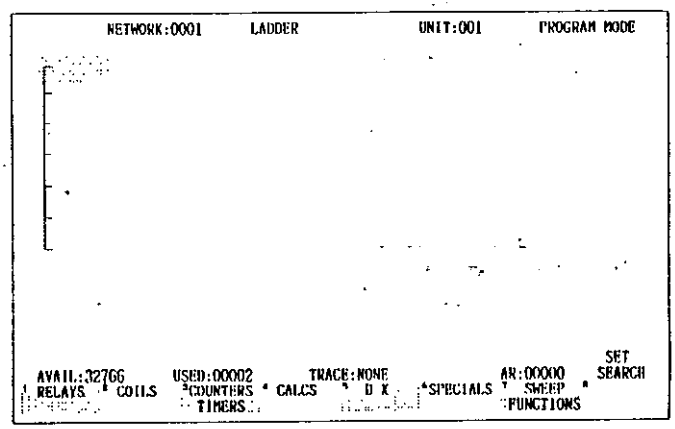


Fig. 4.79

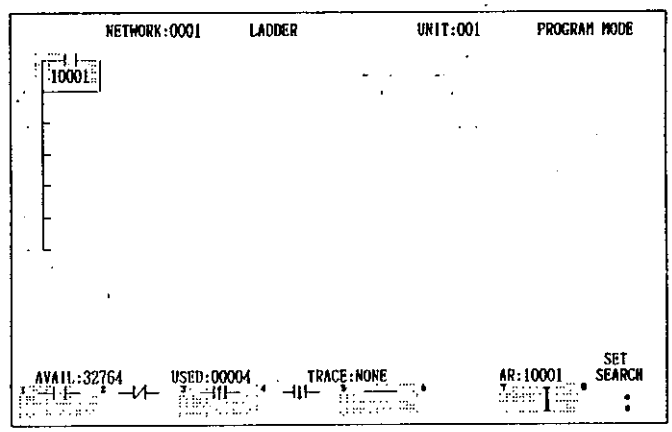


Fig. 4.80

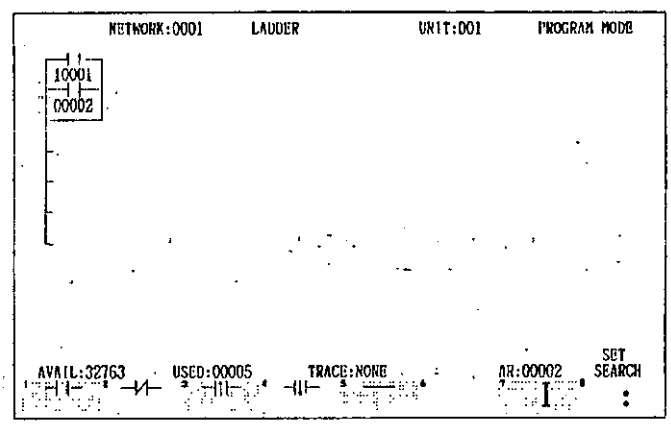
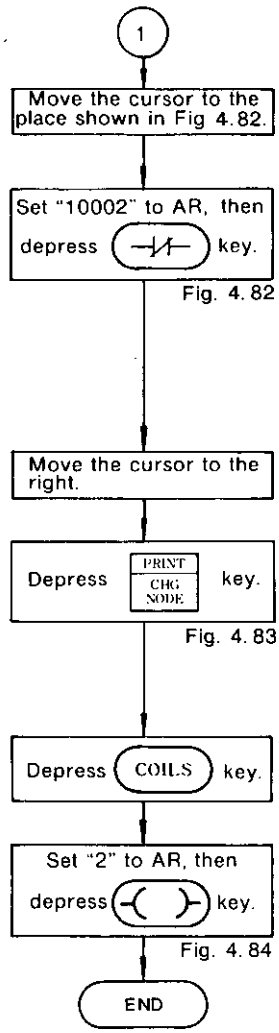


Fig. 4.81



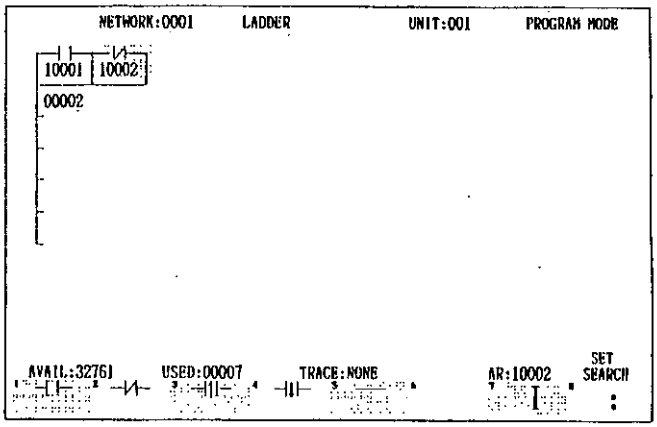


Fig. 4.82

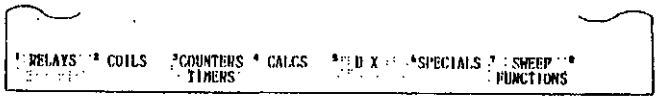


Fig. 4.83

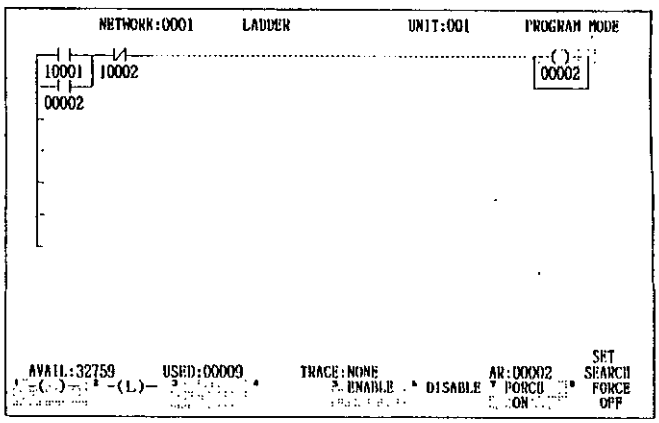


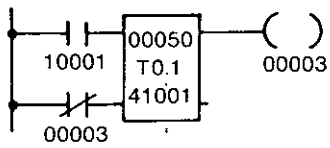
Fig. 4.84

NOTE

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

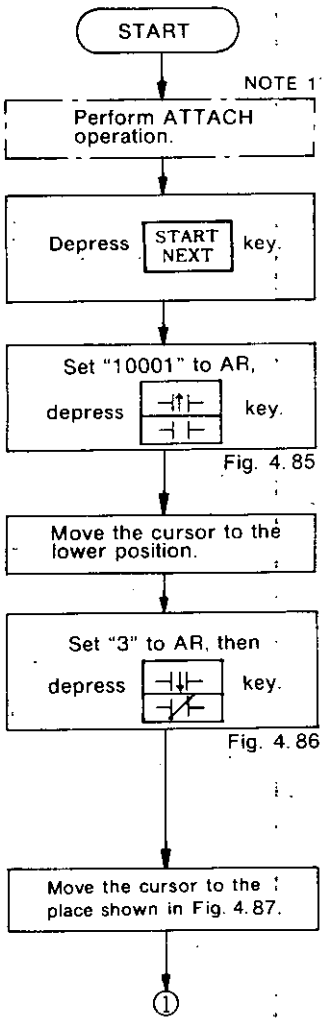
2. TIMER, COUNTER

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.



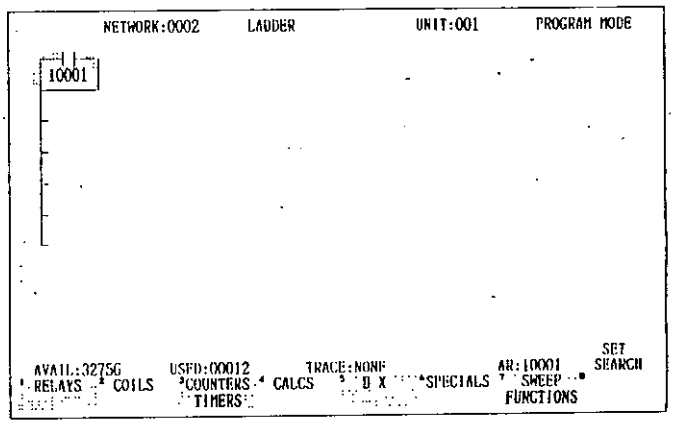


Fig. 4.85

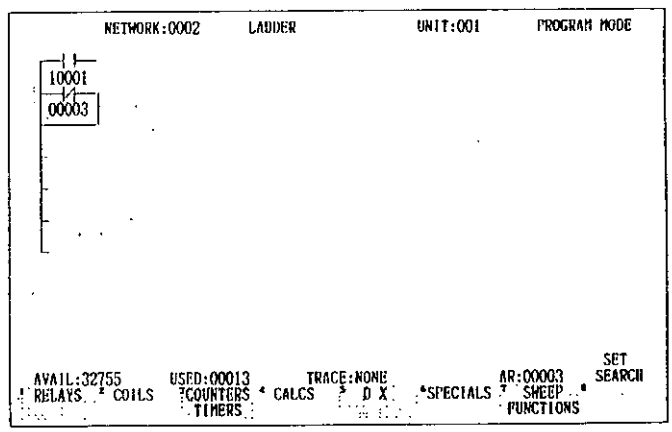
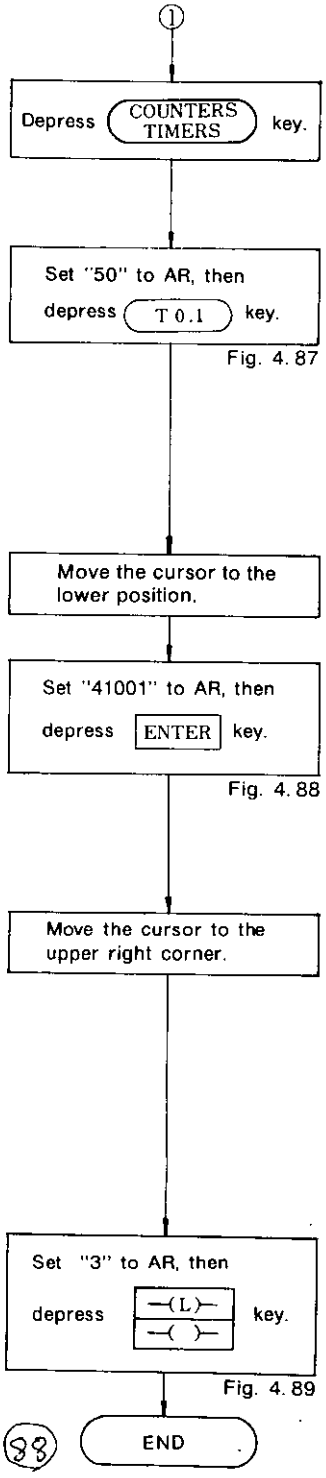


Fig. 4.86



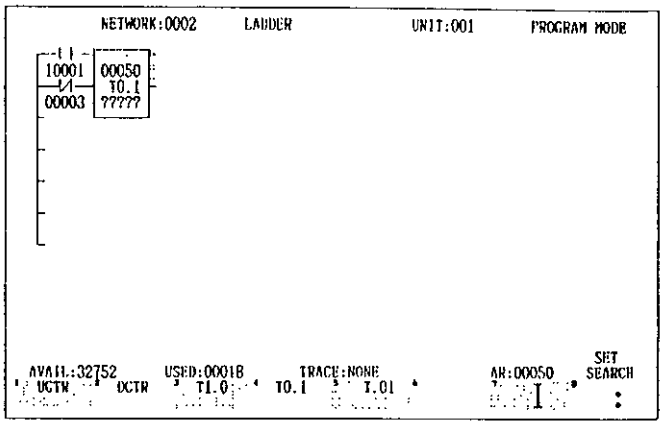


Fig. 4. 87

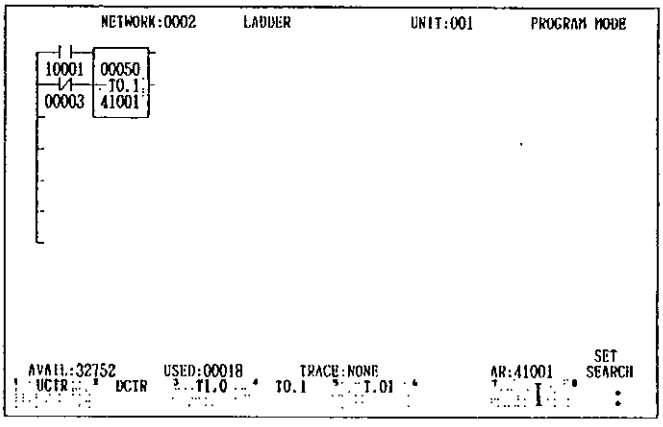


Fig. 4. 88

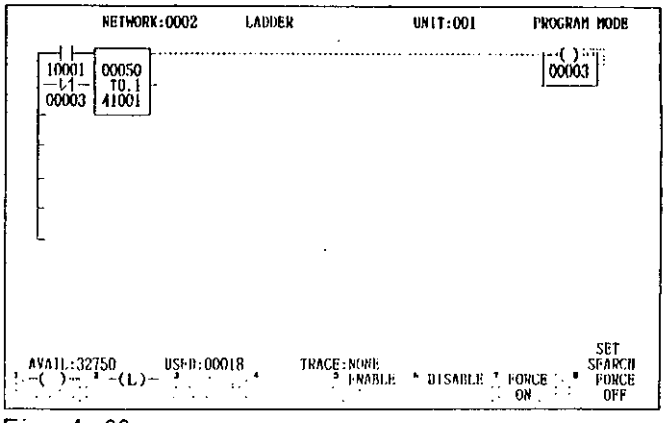


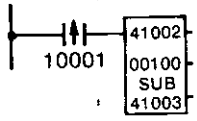
Fig. 4. 89

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.

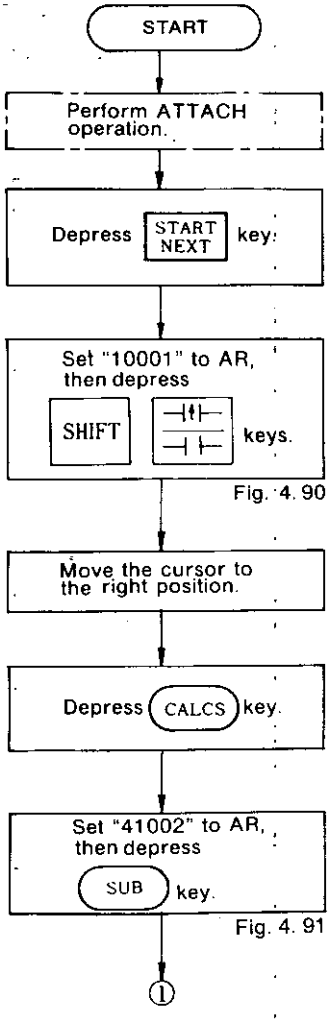
3. ARITHMETIC STORING ①

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.



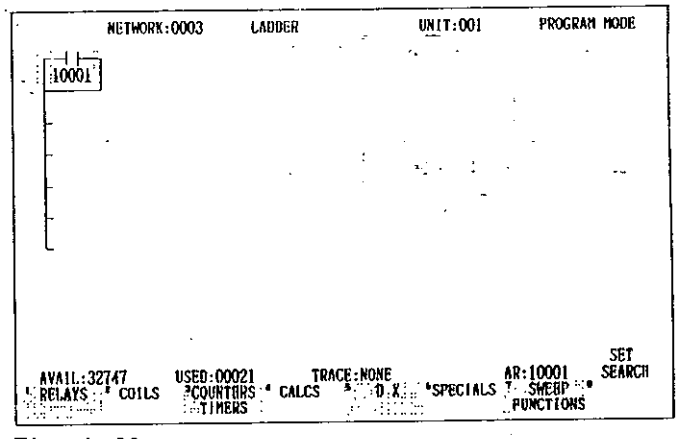


Fig. 4. 90

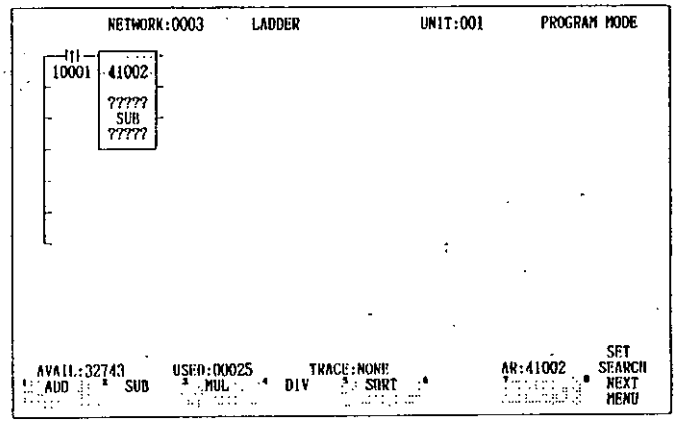
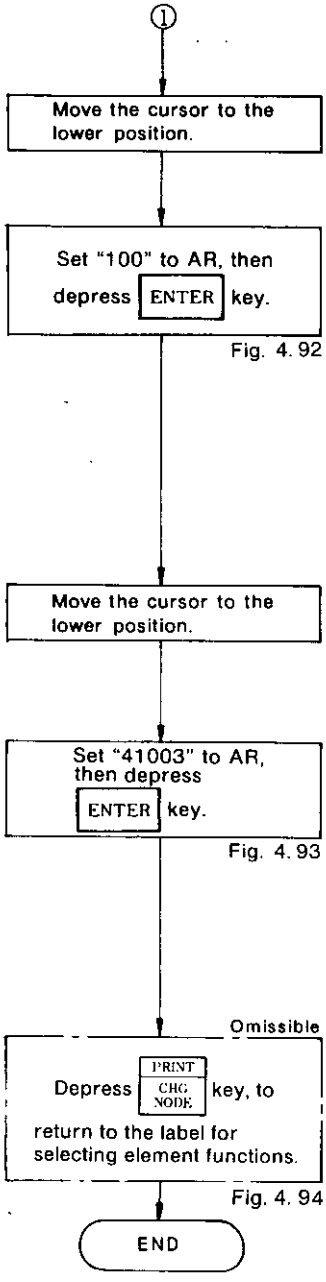


Fig. 4. 91



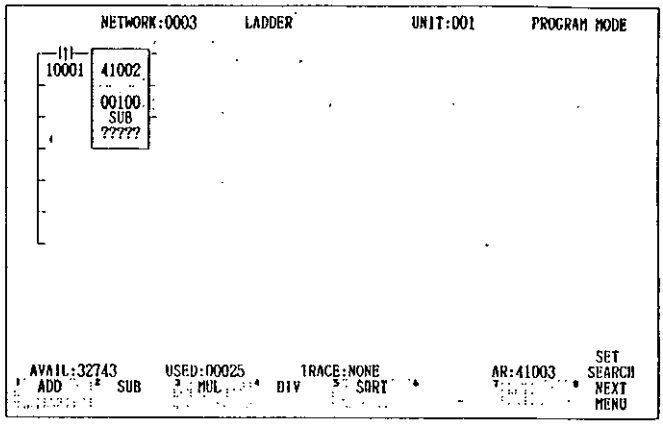


Fig. 4. 92

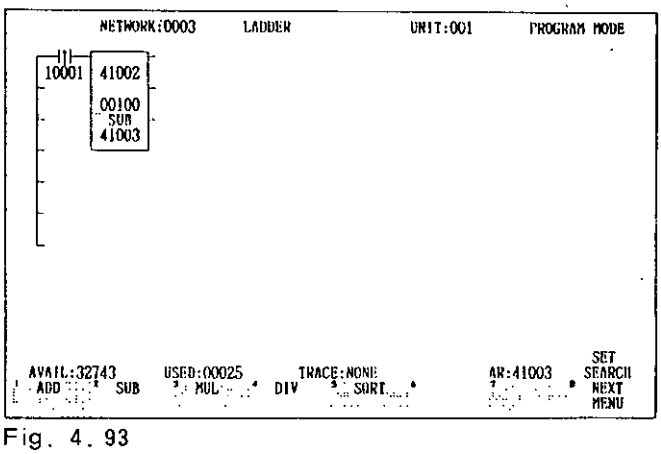


Fig. 4. 93

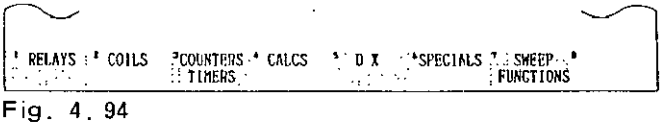


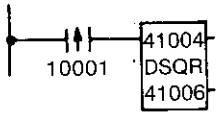
Fig. 4. 94

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. 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.

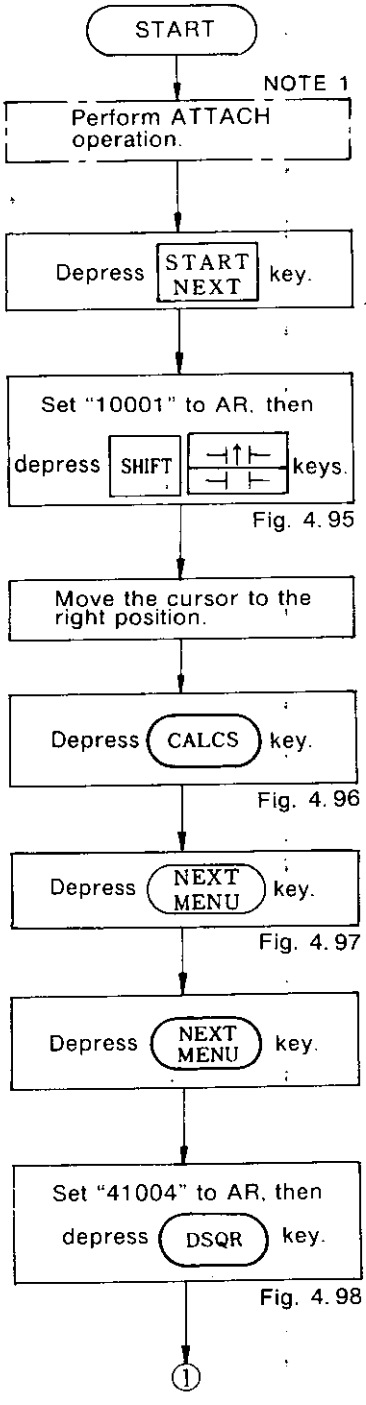


Fig. 4.95

Fig. 4.96

Fig. 4.97

Fig. 4.98

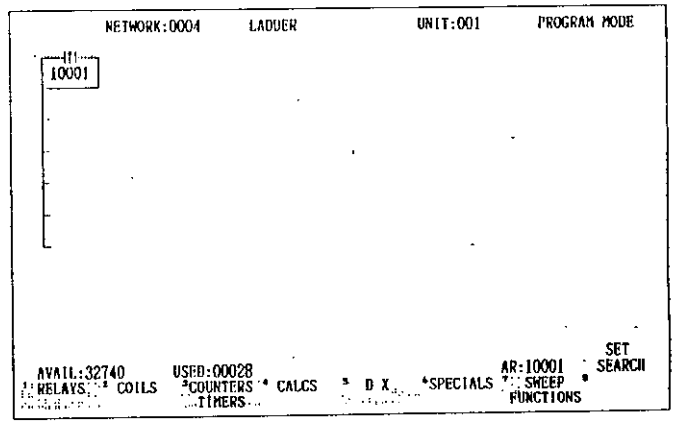


Fig. 4.95

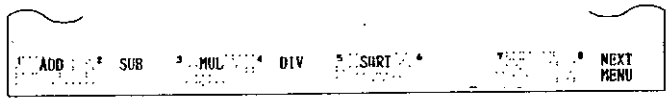


Fig. 4.96

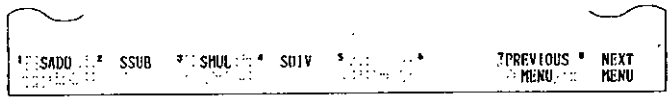


Fig. 4.97

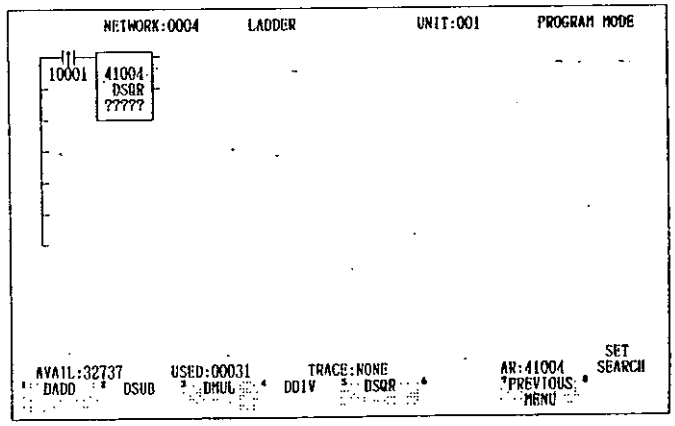


Fig. 4.98

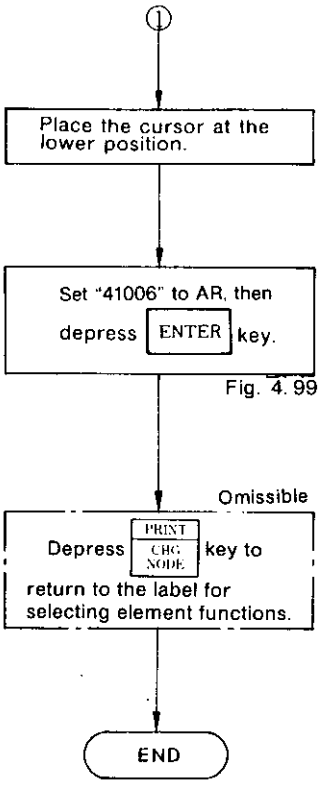


Fig. 4. 99

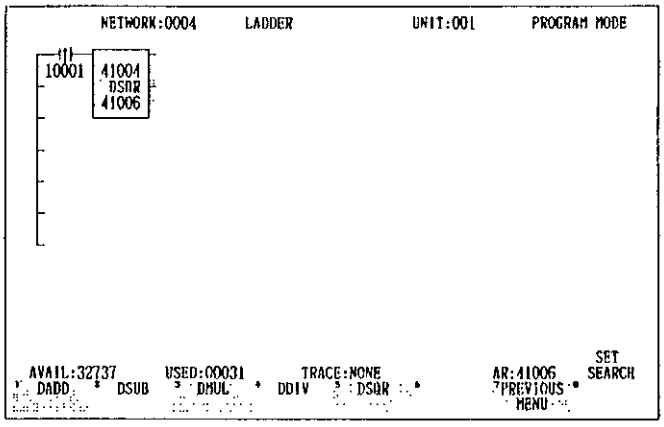


Fig. 4. 99

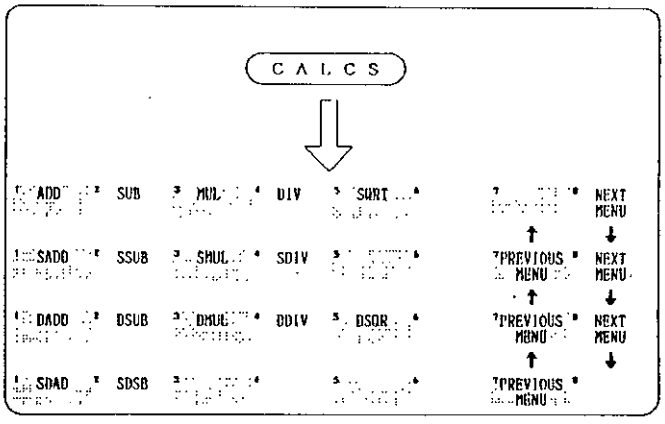


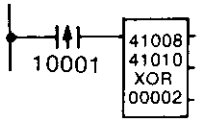
Fig. 4. 100

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.

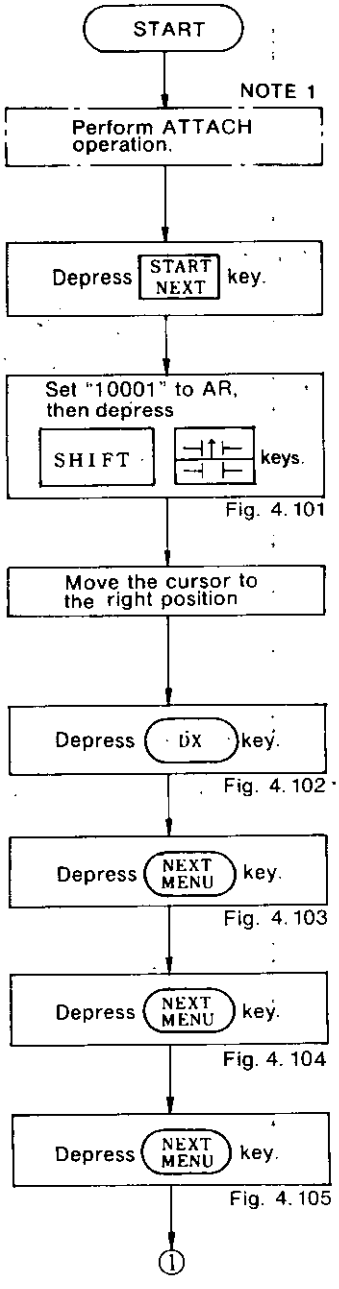
4. MOVE AND MATRIX STORING

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", "LOC", "SIN" and "COS" elements in a range of 1 to 6 rungs.



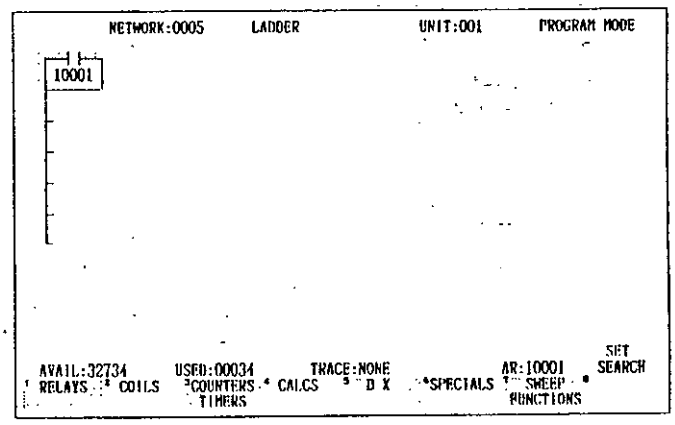


Fig. 4.101

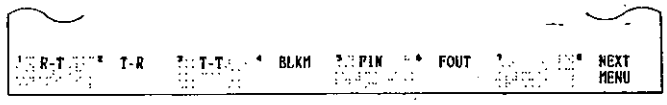


Fig. 4.102

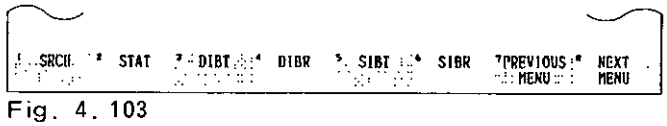


Fig. 4.103

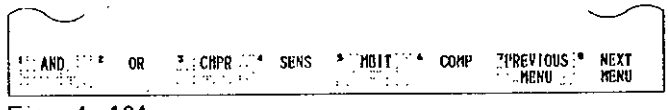


Fig. 4.104

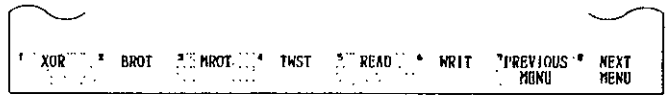
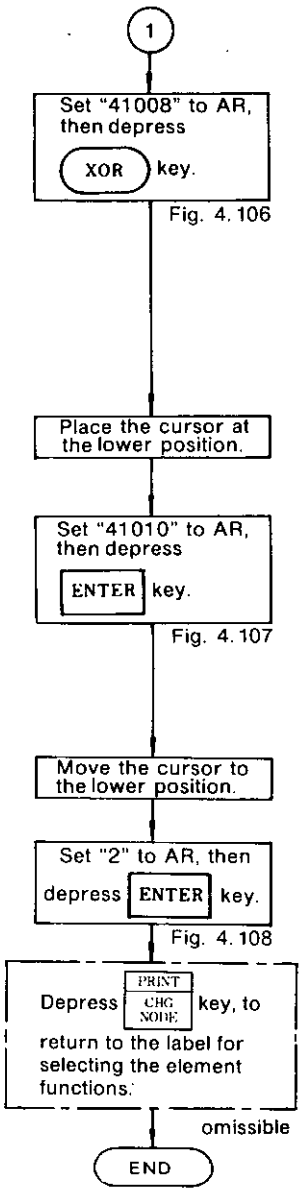


Fig. 4.105



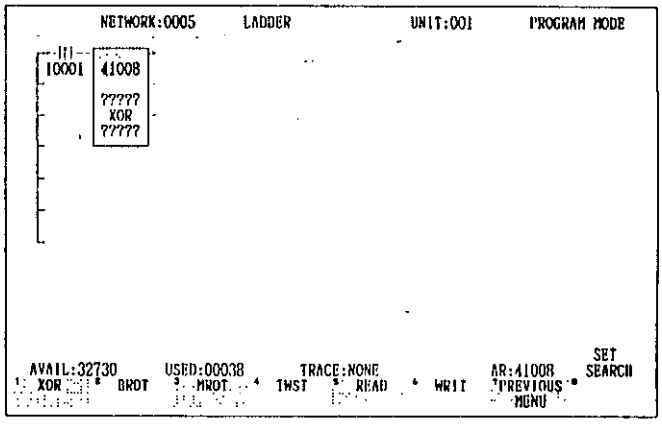


Fig. 4. 106

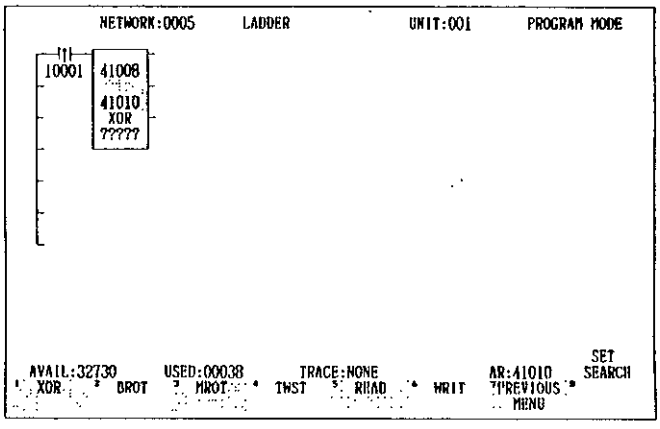


Fig. 4. 107

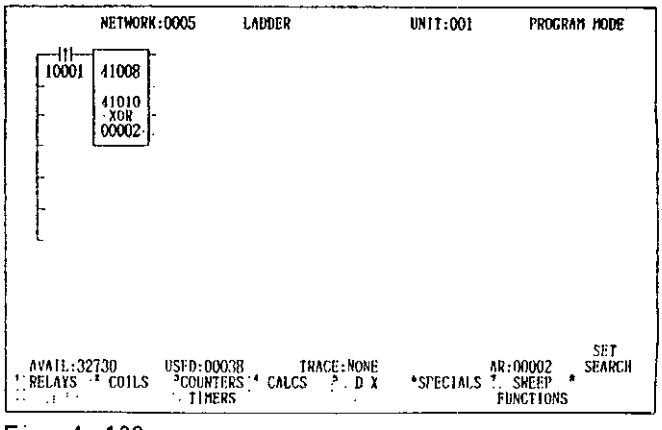


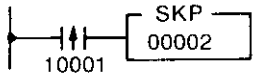
Fig. 4. 108

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.

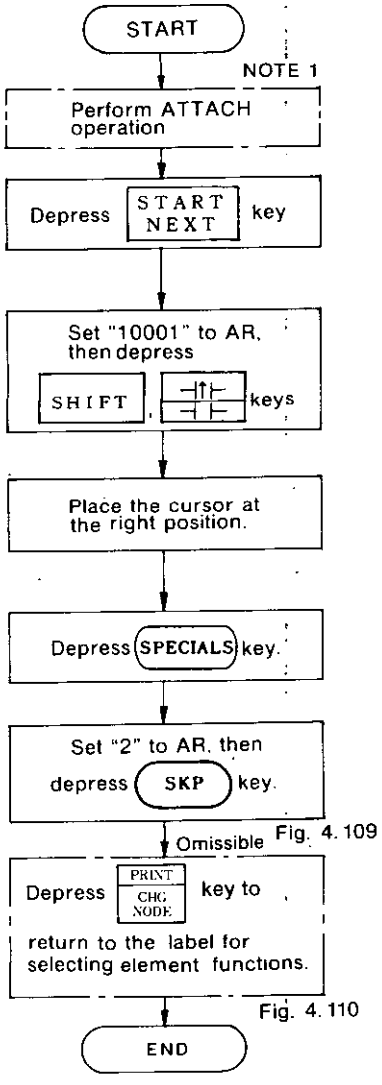
5. SKIP STORING

Sample Skip



POINT

- The cursor should be placed in the logic area.



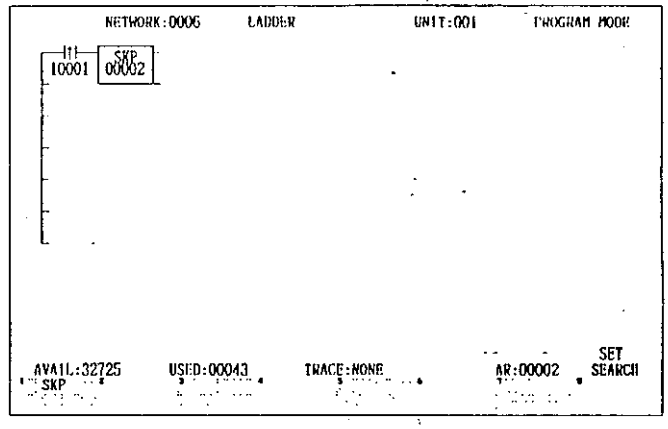


Fig. 4. 109

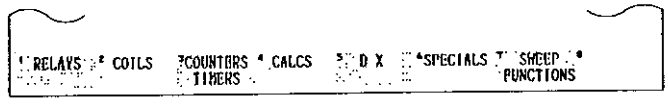


Fig. 4. 110

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.

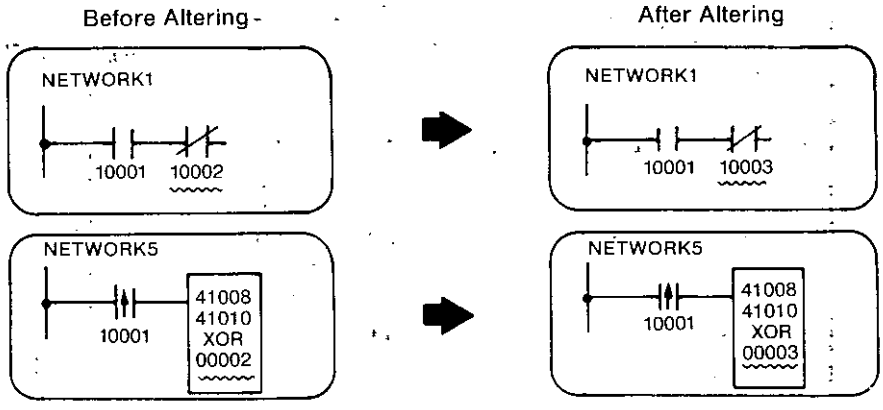
Table 4. Label Displays for Selecting Element Functions

Label Keys \ Label Displays	1	2	3	4	5	6	7	8
	RELAYS	COILS	COUNTERS TIMERS	CALCS	D X	SPECIALS	SWEEP FUNCTIONS	
RELAYS	⊣ ⊢	⊣/⊢	⊣↑⊢	⊣↓⊢	——		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	FIN	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	LOC		↑ PREVIOUS MENU	NEXT MENU ↓
	FRED	FWRT	SIN	COS	SWAP	SORT	↑ PREVIOUS MENU	NEXT MENU ↓
	BCNT	TSET	BYSL	BYCN	BADD		↑ PREVIOUS MENU	
SPECIALS	SKP		GOSUB					

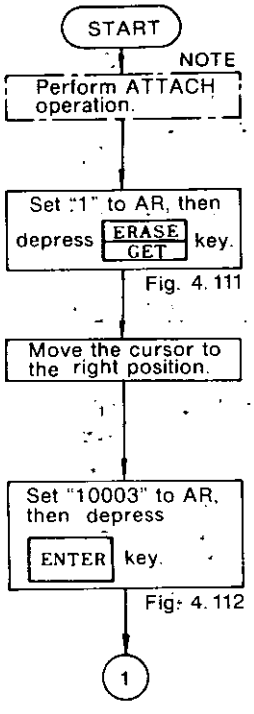
(b) NETWORK ALTERING

1. REFERENCE NUMBER ALTERING

Sample Reference Number and Constant Altering



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



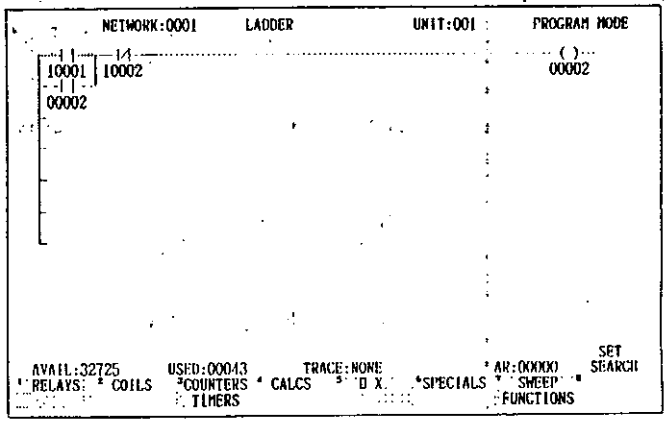


Fig. 4.111

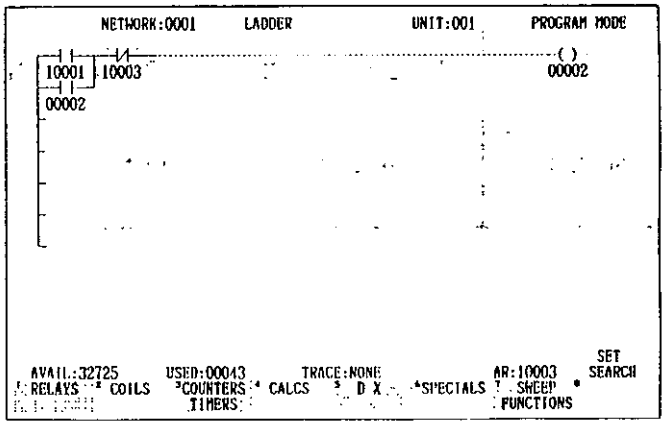
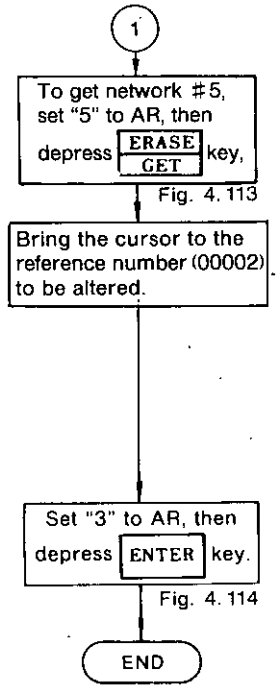


Fig. 4.112



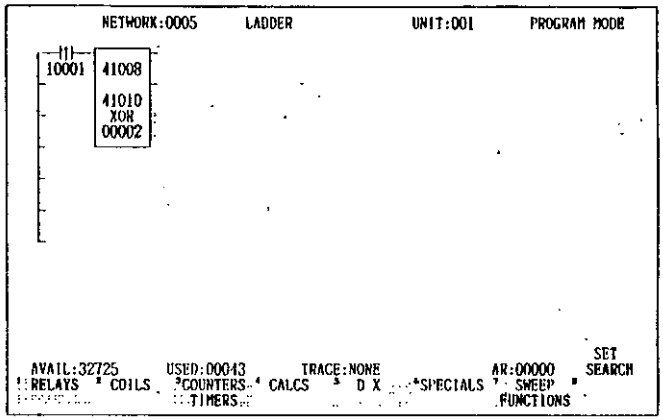


Fig. 4.113

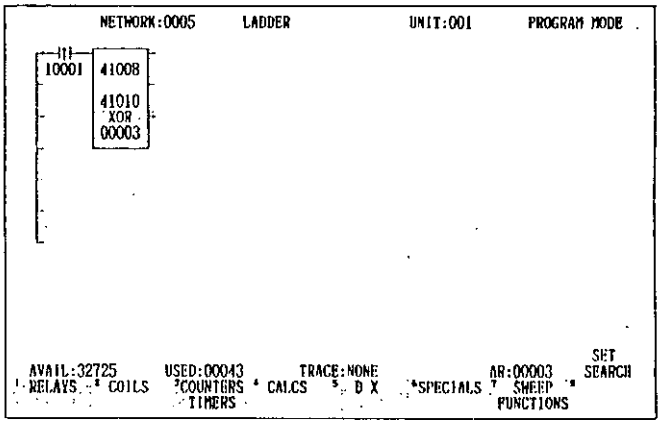
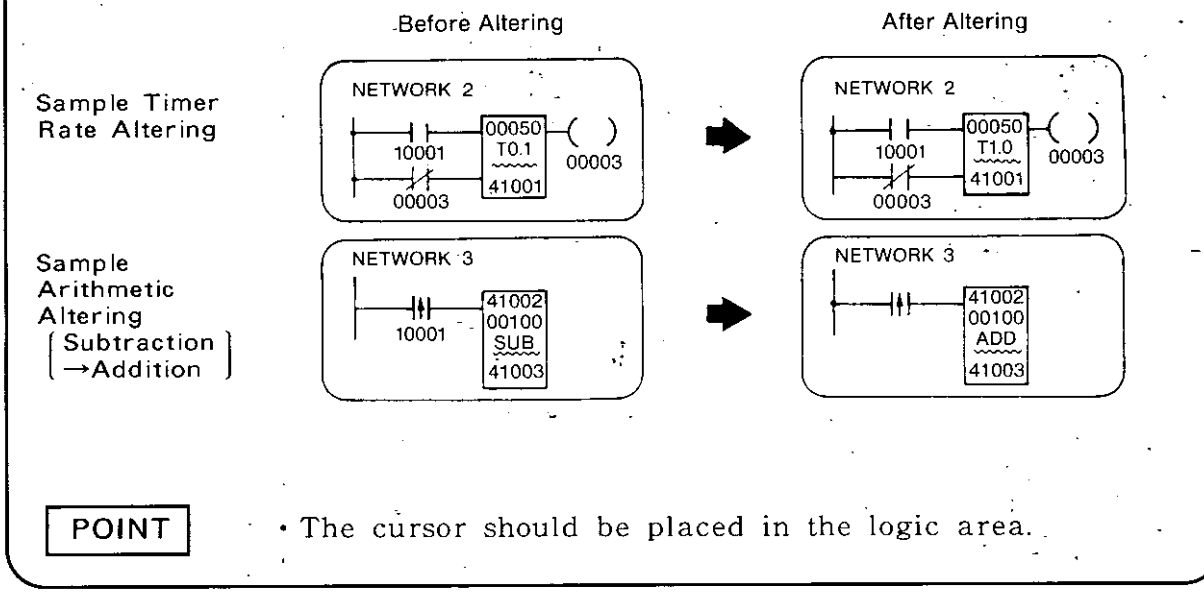


Fig. 4.114

NOTE

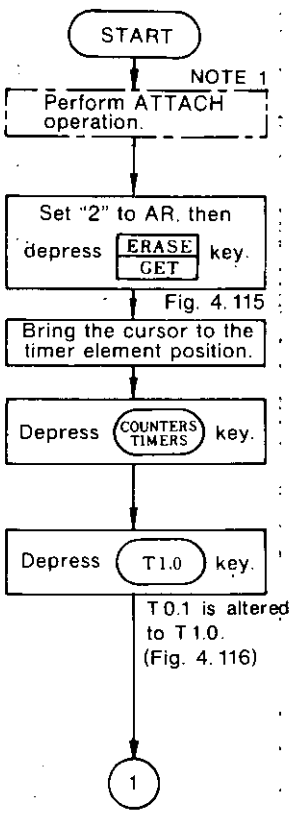
This step can be skipped if the system is ready to store the program.

2. ELEMENT ALTERING ①



POINT

• The cursor should be placed in the logic area.



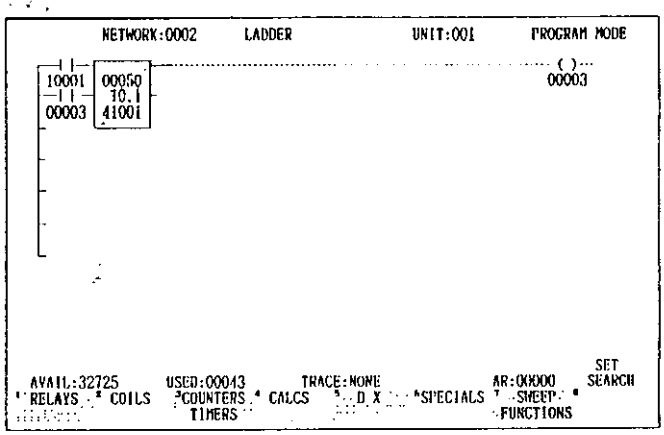


Fig. 4.115

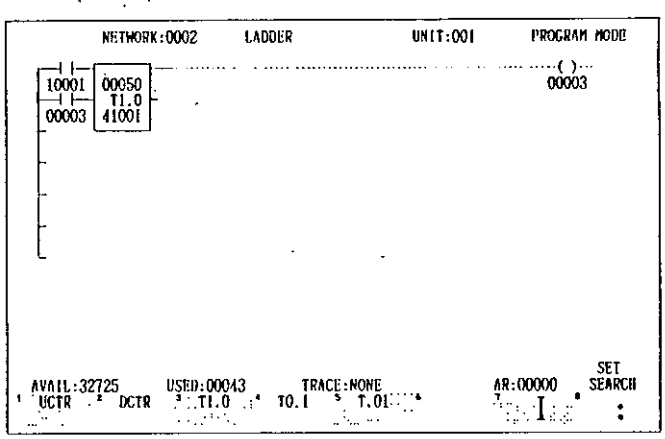
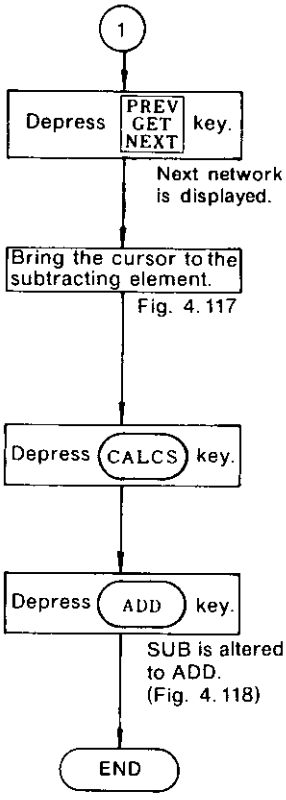


Fig. 4.116



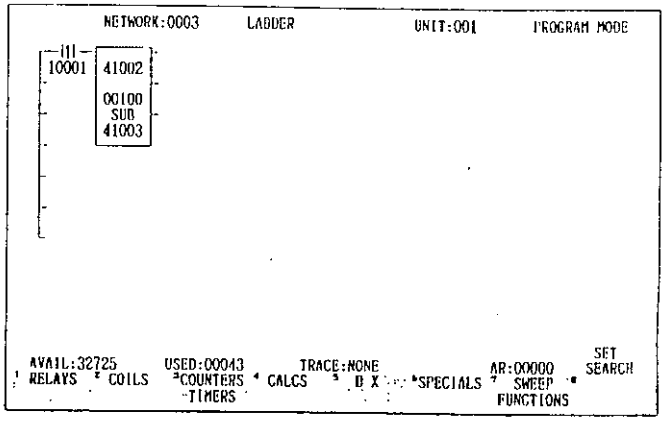


Fig. 4.117

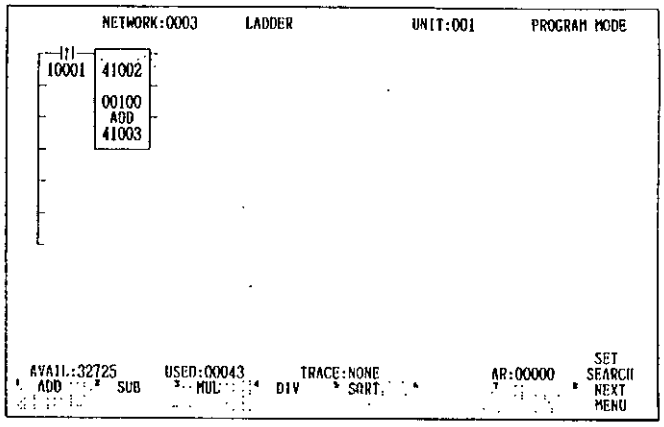


Fig. 4.118

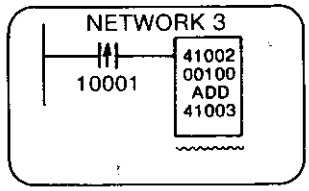
NOTE

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 DELETE NODE] key, and store new element in CPU.

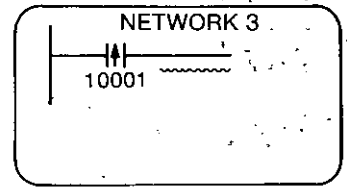
2. ELEMENT ALTERING ②

Sample Altering (Addition → Horizontal Short)

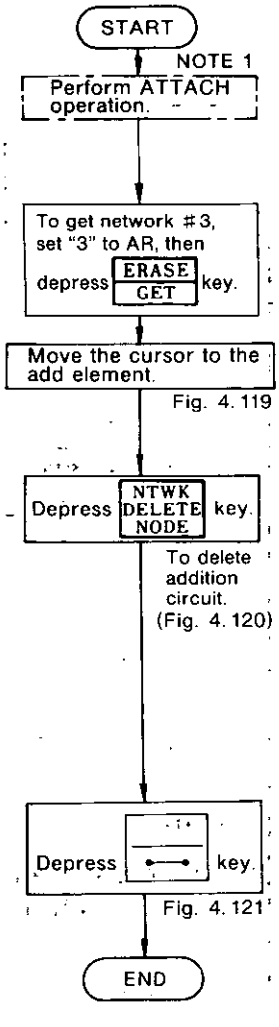
Before Altering



After Altering



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



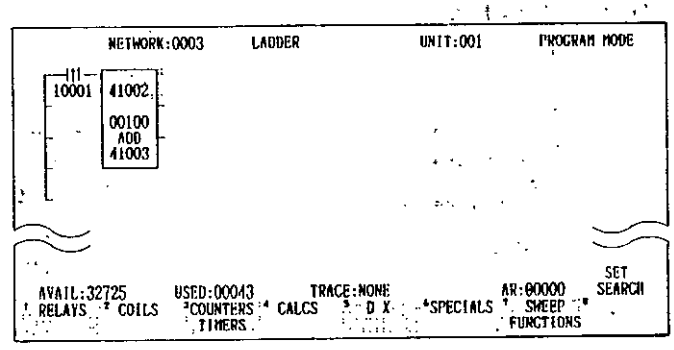


Fig. 4.119

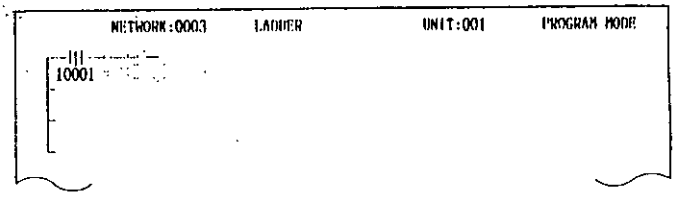


Fig. 4.120

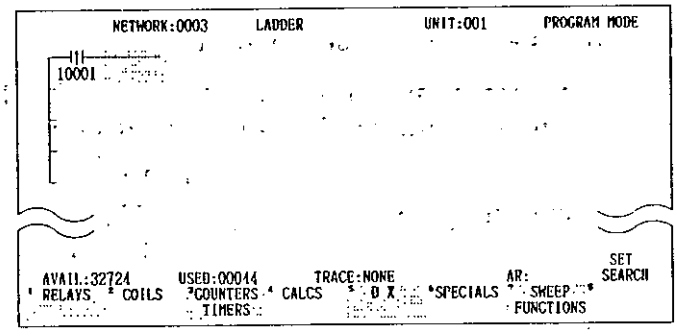


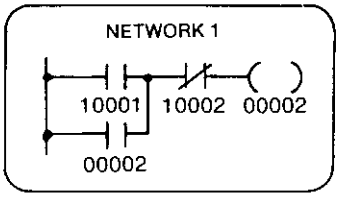
Fig. 4.121

NOTE

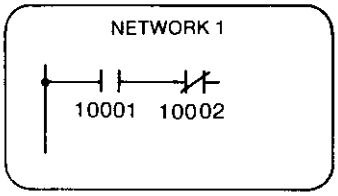
1. This step can be skipped if the system is ready to store the program.
2. The label keys are also available for storing of horizontal short.

3. ELEMENT DELETING

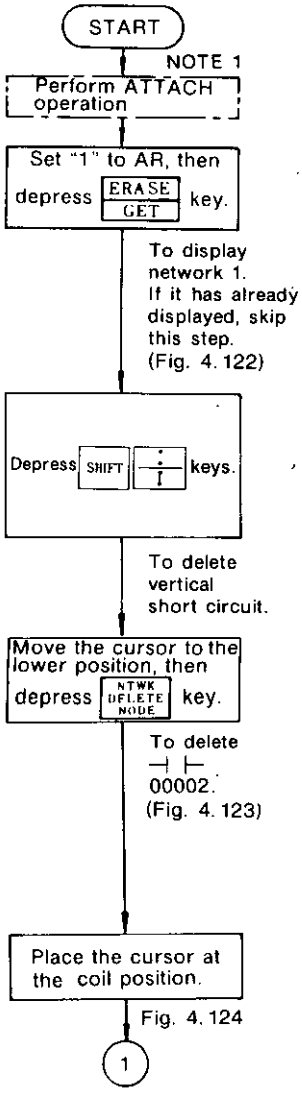
Before Deleting



After Deleting



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



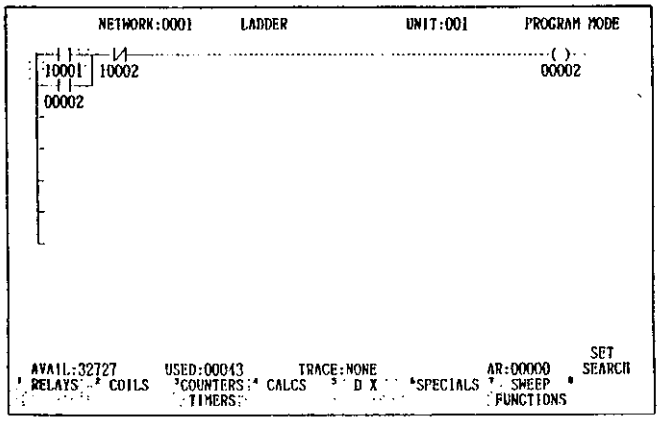


Fig. 4.122

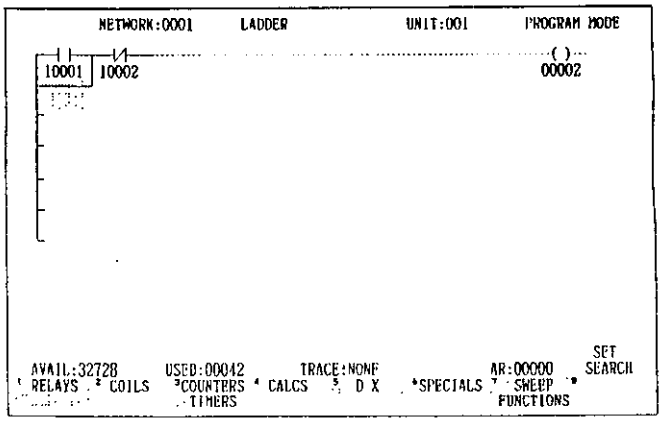


Fig. 4.123

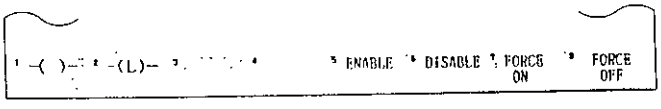
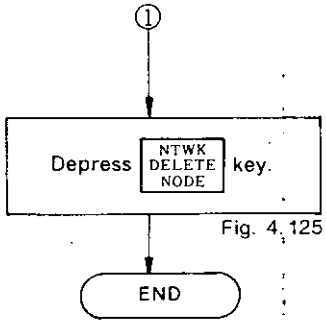


Fig. 4.124



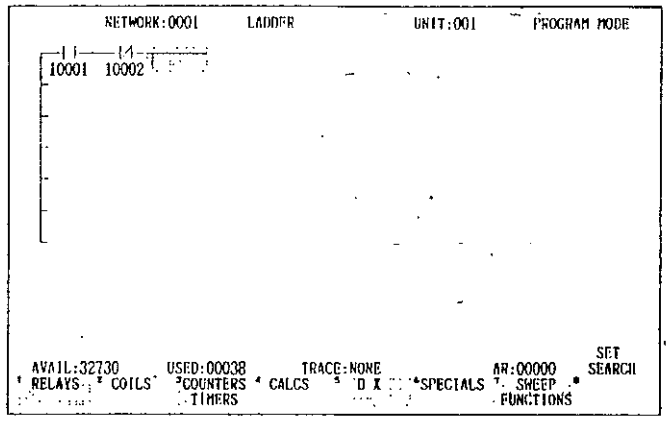


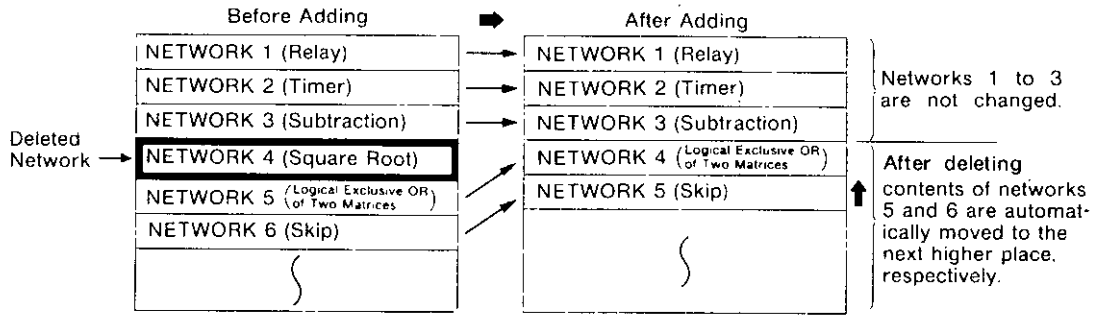
Fig. 4.125

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.

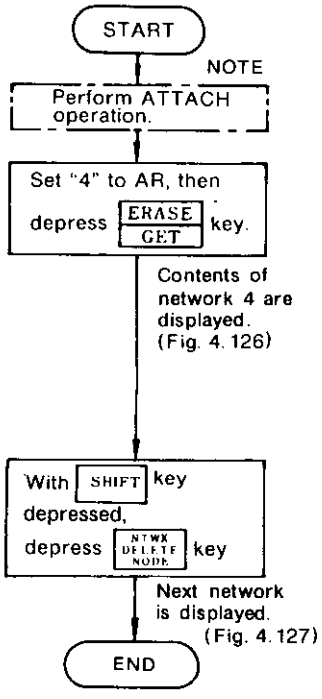
4. NETWORK DELETING

Sample Network 4 (Square Root) Deleting



POINT

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



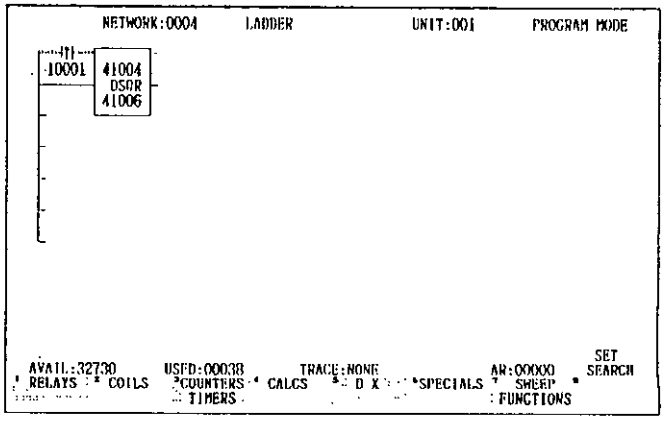


Fig. 4.126

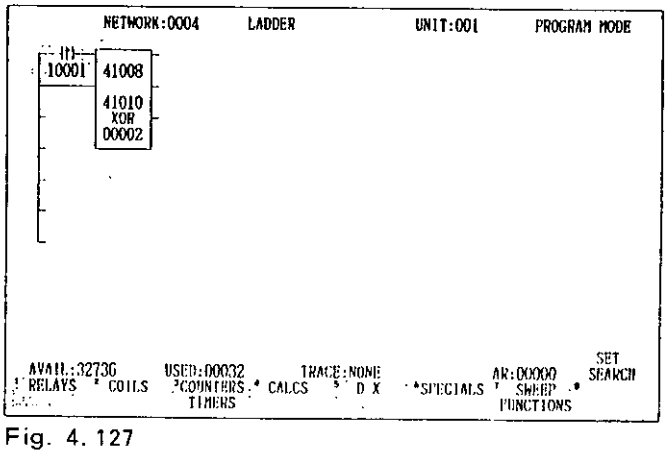


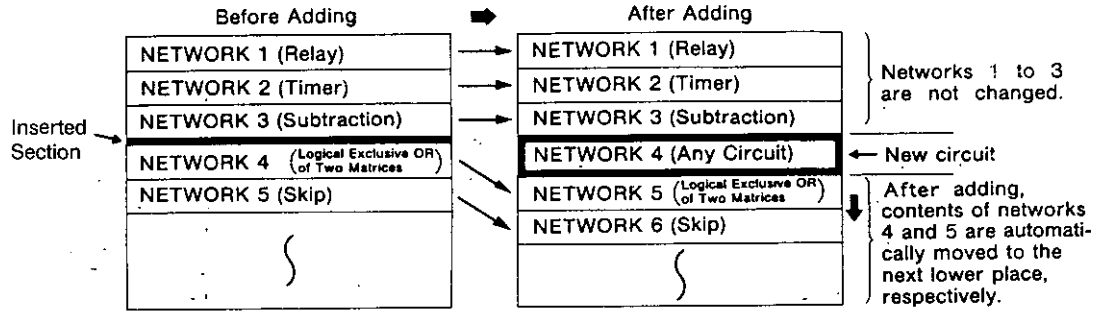
Fig. 4.127

NOTE

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

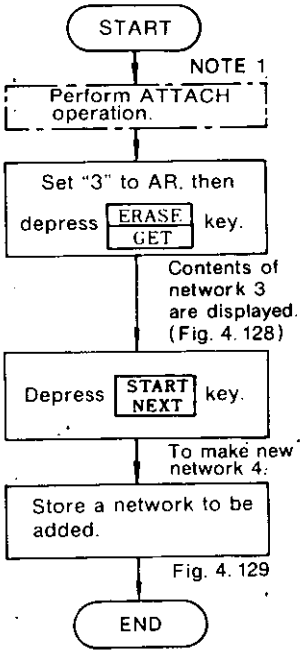
5. NETWORK ADDING

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.



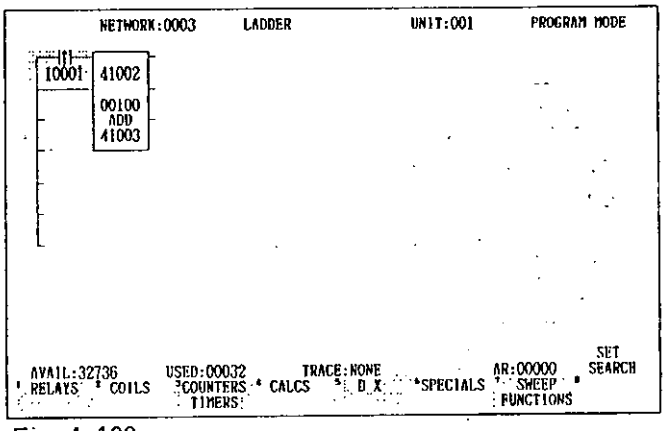


Fig. 4.128

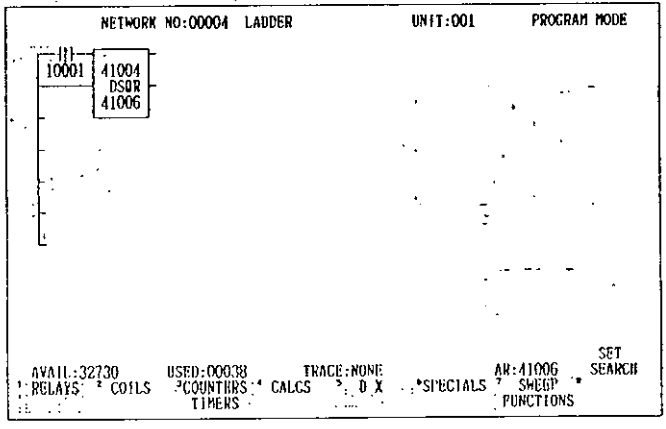


Fig. 4.129

NOTE

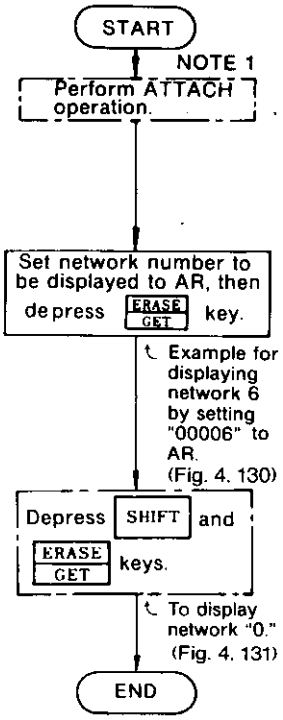
1. This step can be skipped if the system is ready to store the program.
2. When adding a new network to network 1, display network "0" by depressing SHIFT and ERASE GET keys, then depress START NEXT key to make the new network 1.

(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.



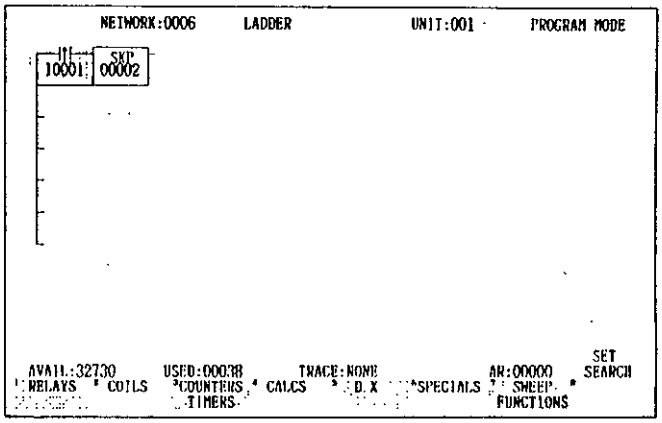


Fig. 4. 130

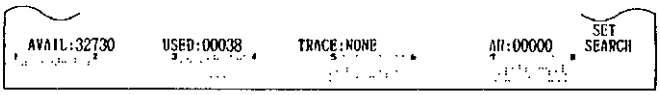


Fig. 4. 131

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

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: [PREV GET NEXT] key
- For the previous network display: [SHIFT] and [PREV GET NEXT] keys

POINT

- The cursor should be placed in the logic area.

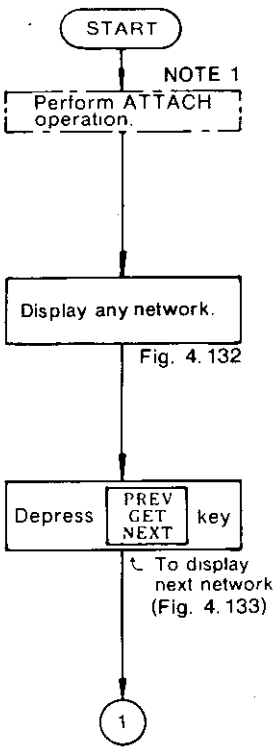


Fig. 4.132

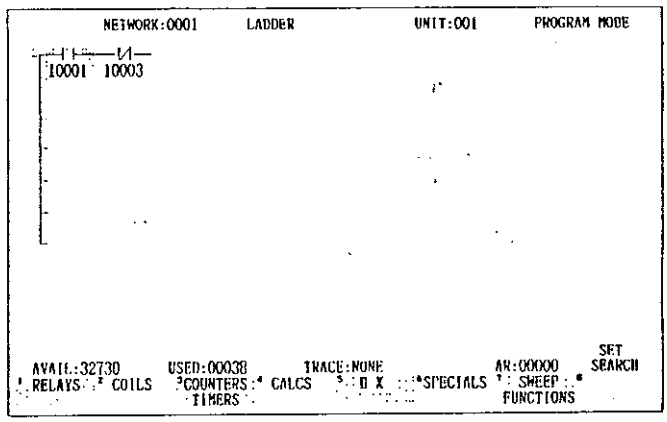


Fig. 4.132

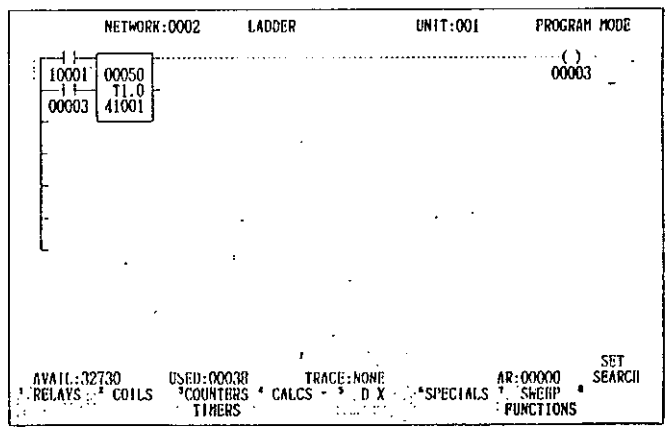
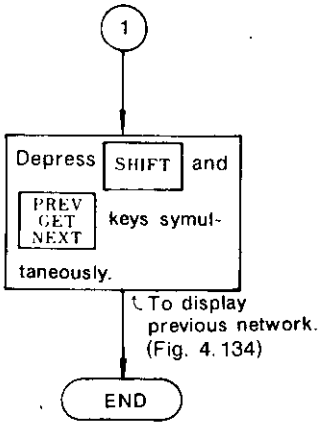


Fig. 4.133



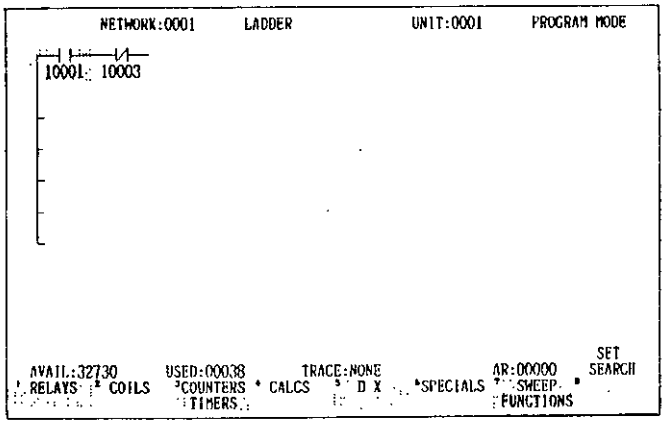


Fig. 4.134

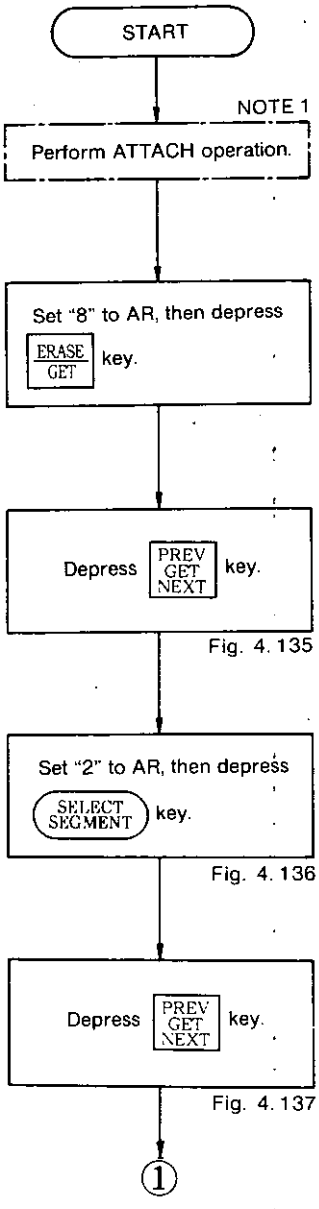
NOTE

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 3. The segment boundaries must be displayed at the beginning.

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



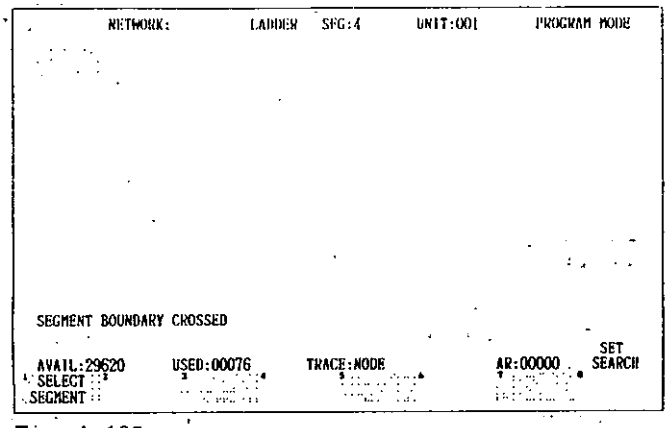


Fig. 4.135

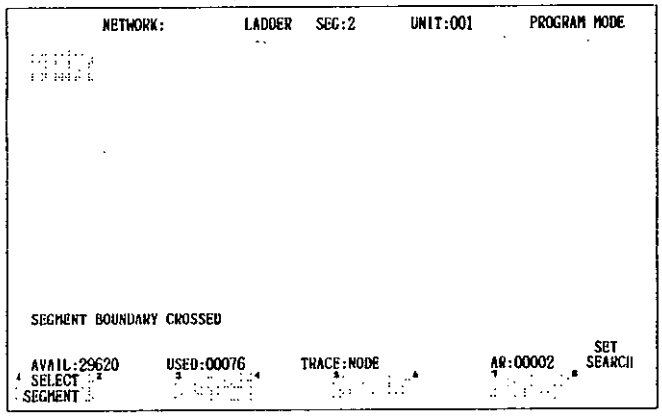


Fig. 4.136

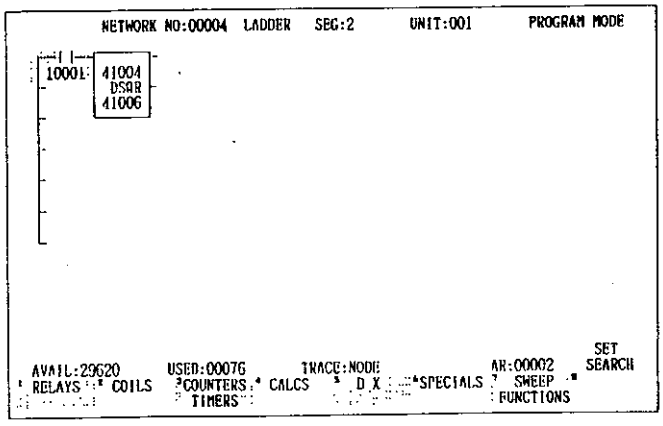


Fig. 4.137

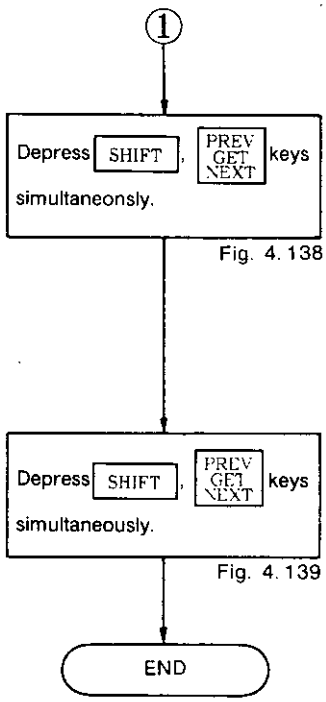


Fig. 4.138

Fig. 4.139

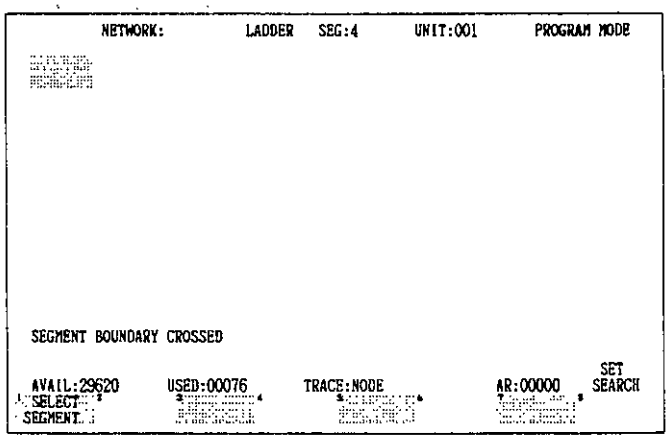


Fig. 4.138

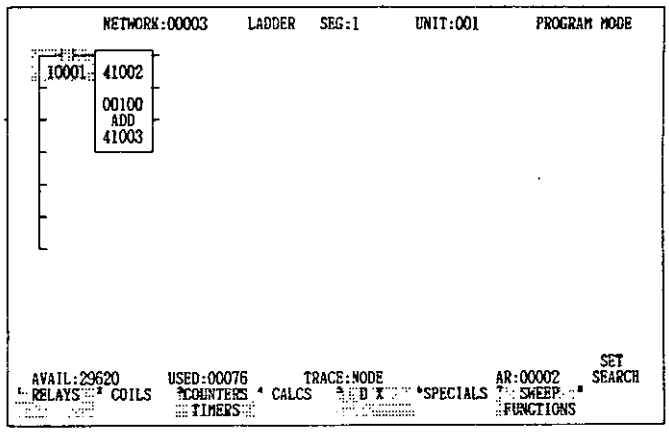


Fig. 4.139

NOTE

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

4. POWER FLOW/SPOT DISPAY

This function displays to which element power flow is enabled.

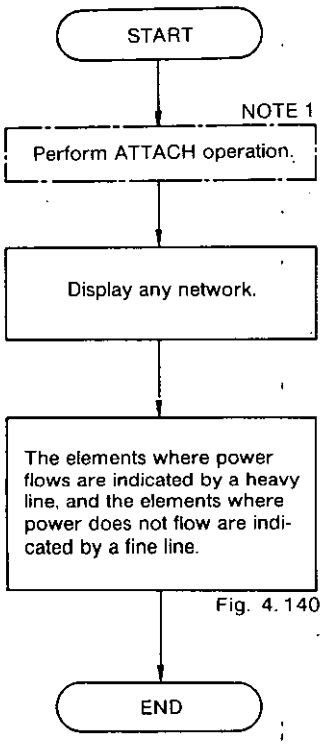


Fig. 4.140

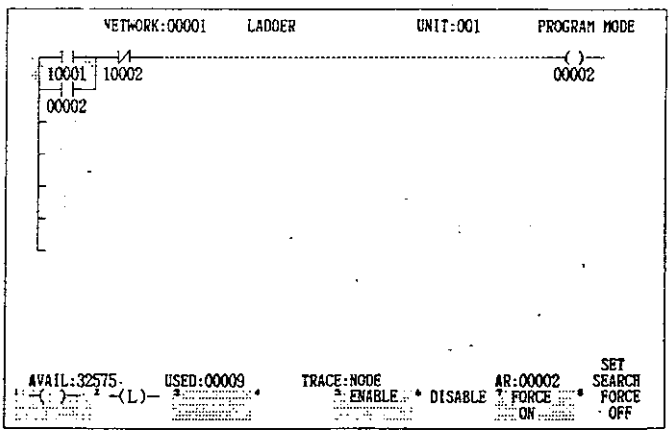


Fig. 4.140

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.

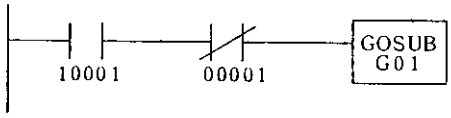
(2) SUBROUTINE

(a) SUBROUTINE DISPLAY

1. ZOOM FUNCTION 1

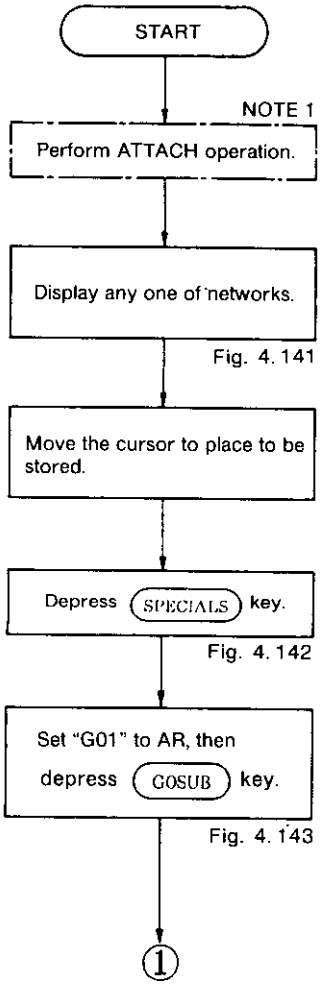
When the subroutine to be displayed exists :

Sample GOSUB



POINT

- The cursor should be placed in the logic area.



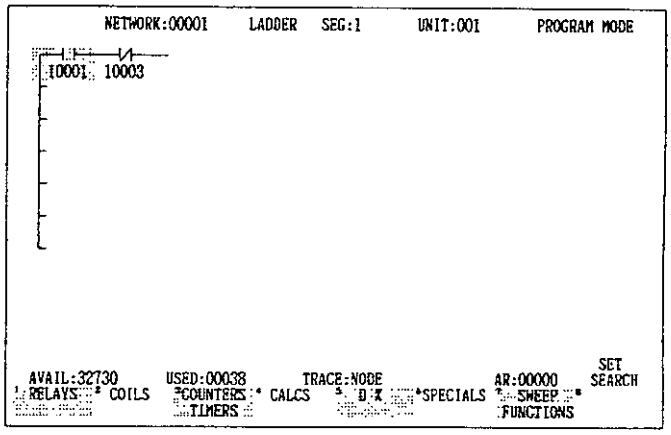


Fig. 4.141

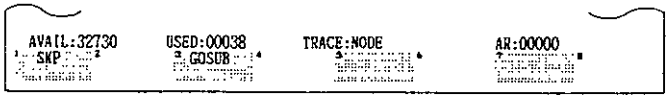


Fig. 4.142

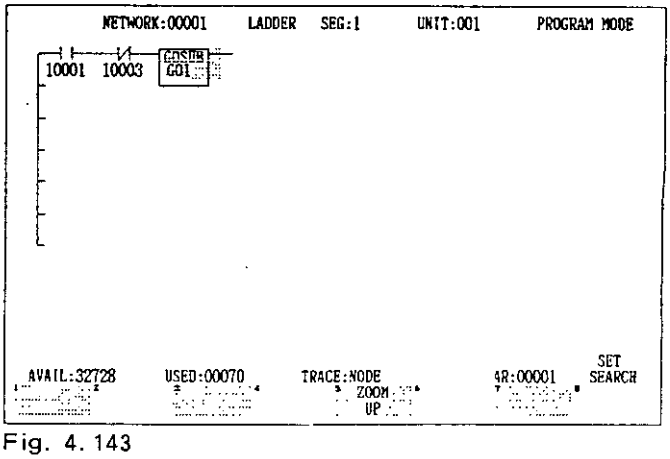


Fig. 4.143

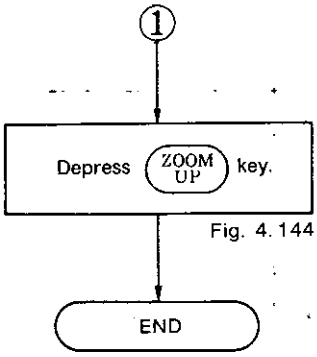


Fig. 4.144

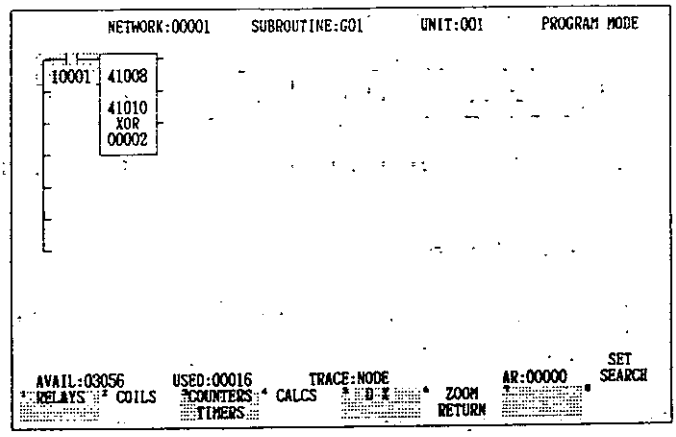
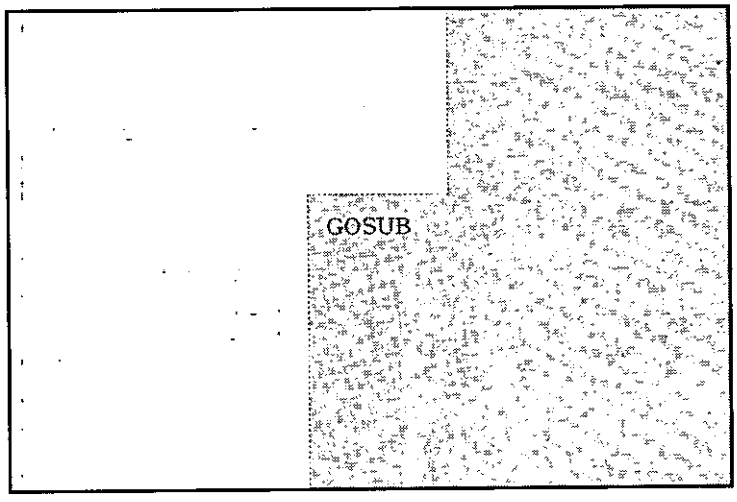


Fig. 4.144

NOTE

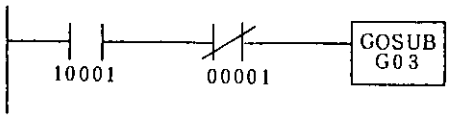
1. This step can be skipped if the system is ready to store the program.
2. If "GOSUB" is stored in the area shown below, no elements can be stored in the shaded portion.



1. ZOOM FUNCTION 2

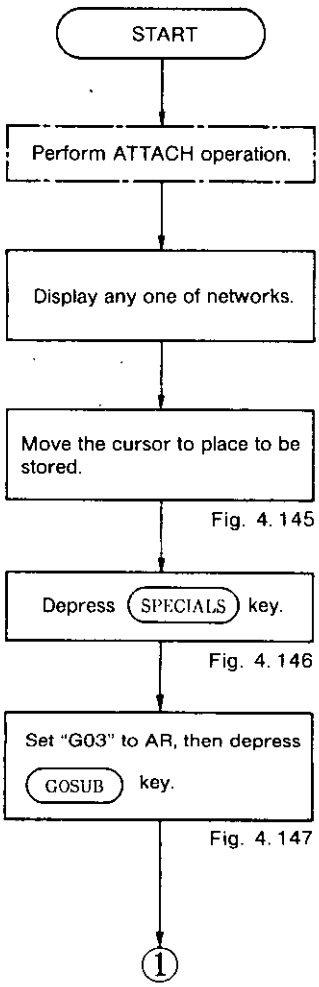
When the subroutine to be displayed exists :

Sample GOSUB



POINT

- The cursor should be placed in the logic area.



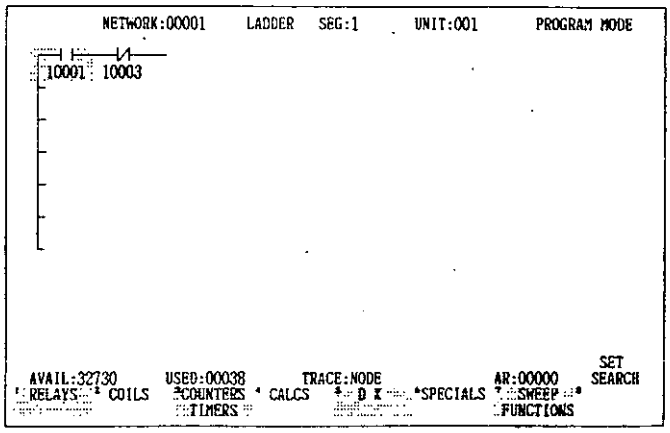


Fig. 4. 145

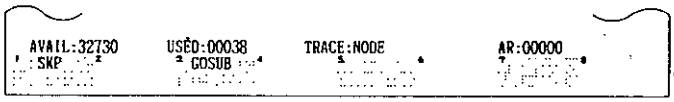


Fig. 4. 146

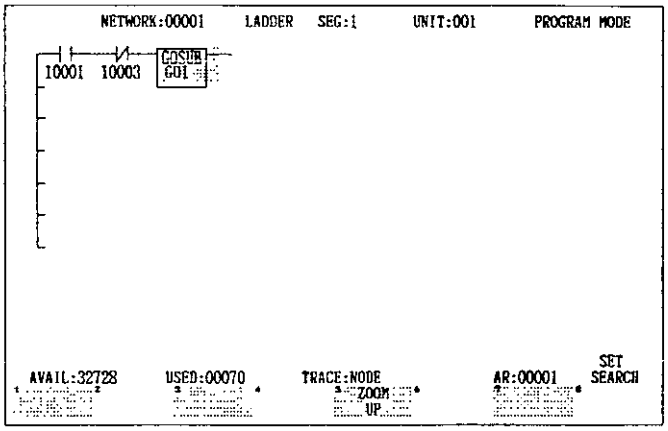
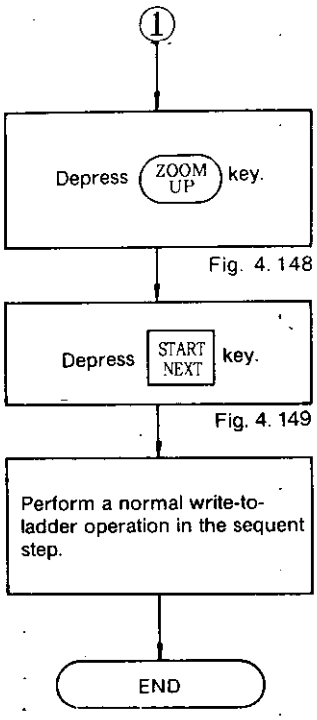


Fig. 4. 147



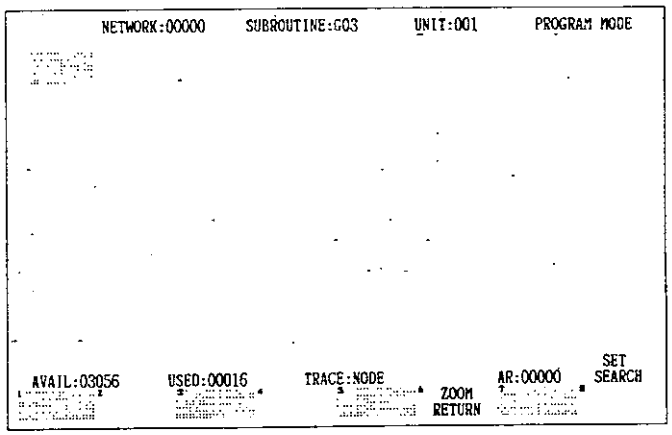


Fig. 4.148

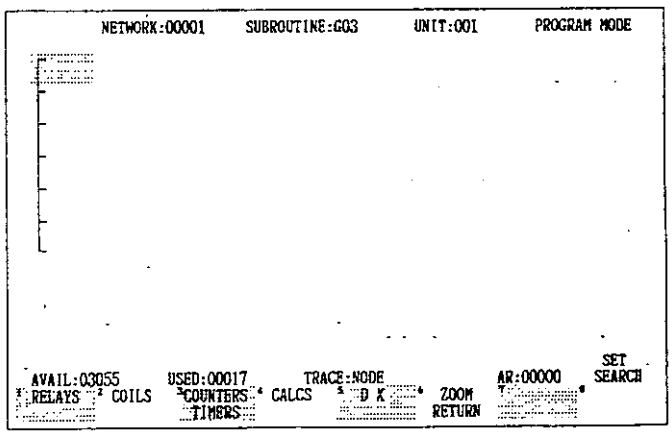
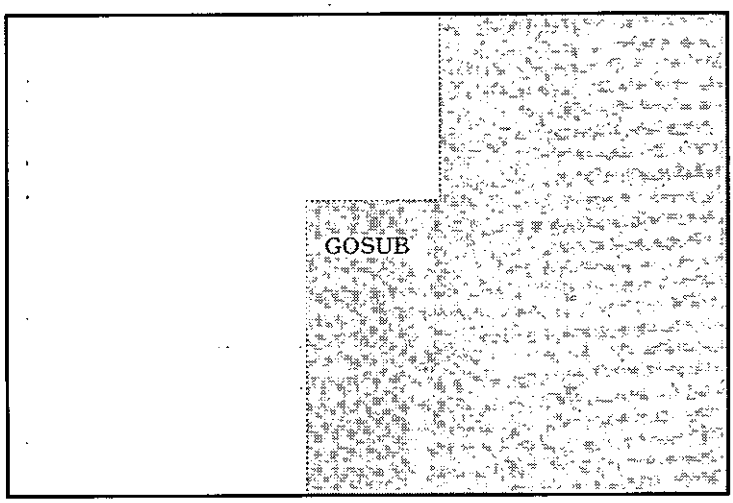


Fig. 4.149

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.

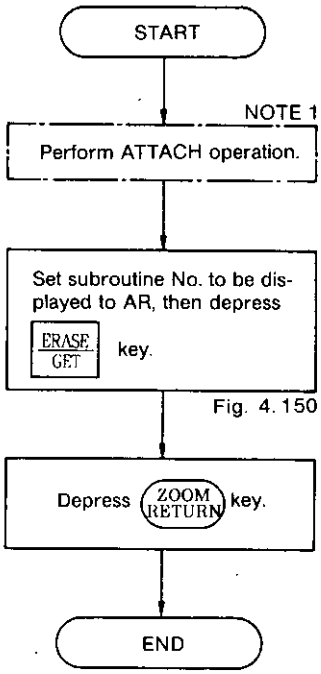


Fig. 4.150

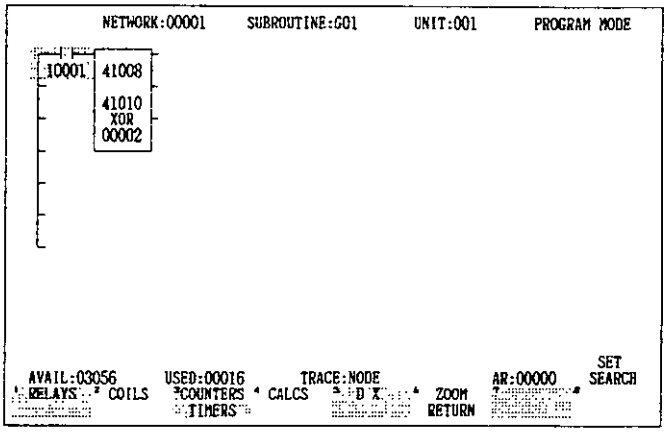


Fig. 4.150

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.

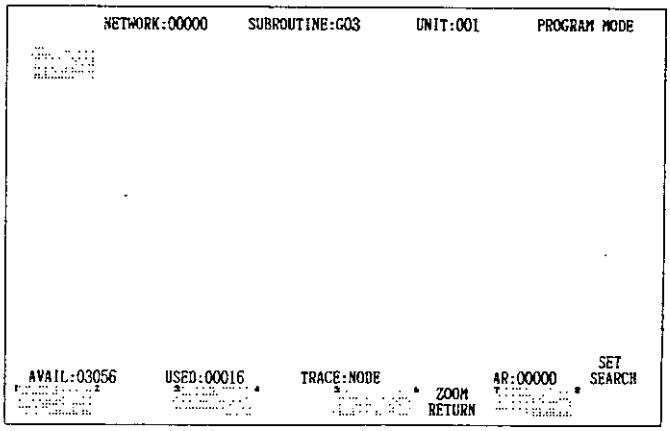


Fig. 4 .151

(2) SUBROUTINE (Cont'd)

(b) NETWORK STORING

Same as the procedure in Par. 4.6.3 (1) ① (a).

(c) NETWORK ALTERING

Same as the procedure in Par. 4.6.3 (1) (b).

(d) NETWORK DISPLAY

Same as the procedure in Par. 4.6.3 (1) (c).

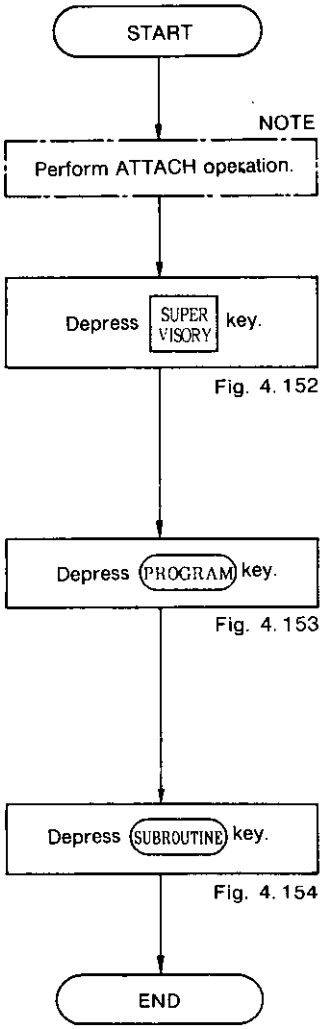
Note that the display functions described in Par. (1) ANY NETWORK DISPLAY and (3) DISPLAY OF THE FIRST AND THE LAST NETWORKS IN SEGMENTS are not available.

4. 6. 4 Subroutine Operation

(1) SUBROUTINE DISPLAY

ⓐ READ OPERATION

Procedure to read a subroutine by depressing [SUPER VISORY] key.



NOTE

1. When ATTACH operation has already been completed, this step can be skipped.

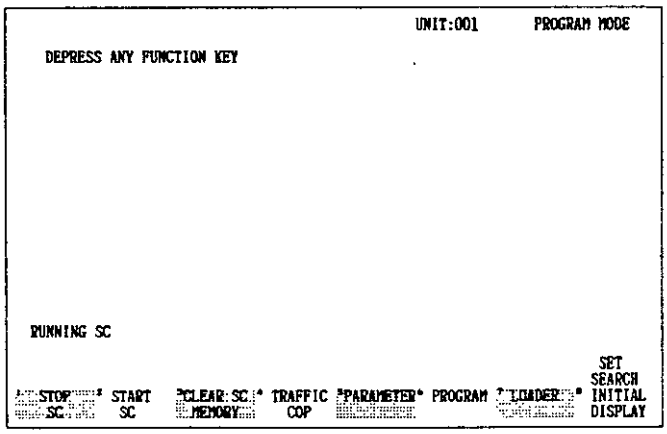


Fig. 4.152

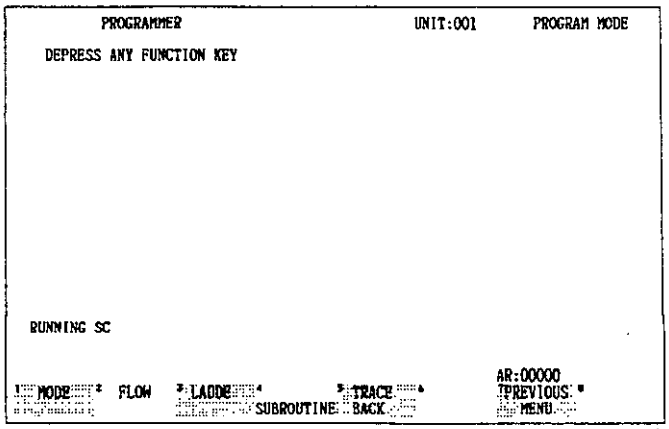


Fig. 4.153

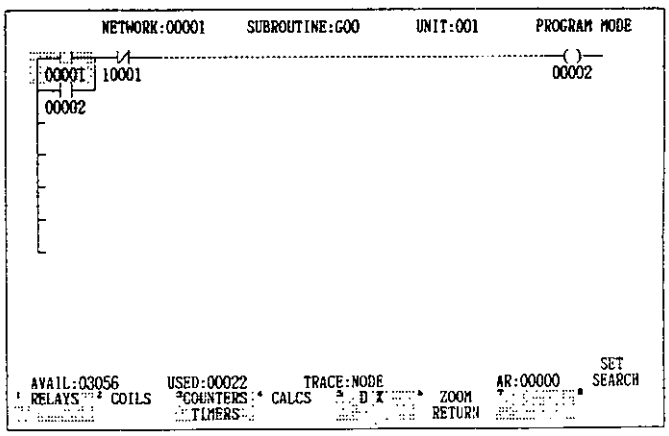


Fig. 4.154

ⓑ NETWORK STORING

Same as the procedure in Par. 4.6.3 (1) ⓐ.

ⓒ NETWORK ALTERING

Same as the procedure in Par. 4.6.3 (1) ⓑ.

ⓓ NETWORK ALTERING

Same as the procedure in Par. 4.6.3 (1) ⓒ.

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.

4. 6. 5 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)

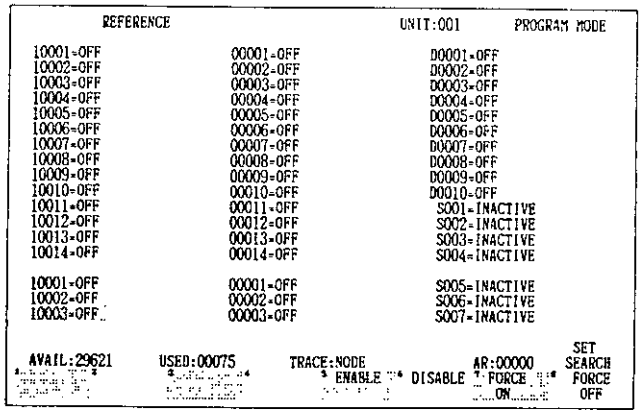
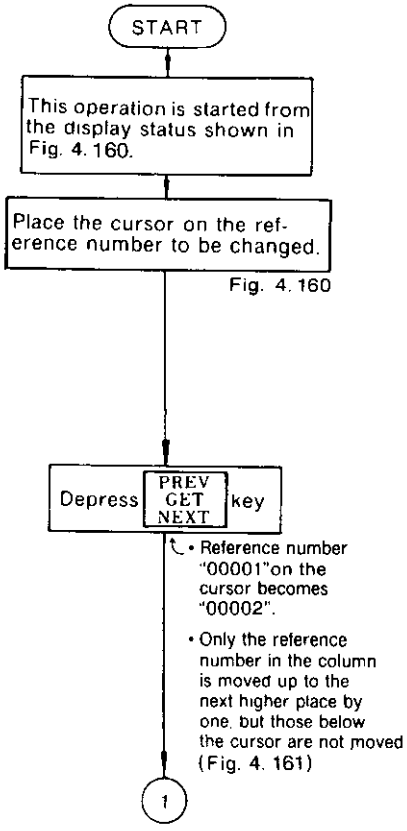


Fig. 4. 155

POINT

- The cursor should be placed in the expanding reference area.
- The cursor moves from logic area to reference area at SRCH ⇨ / TAB ⇩ ⇧ Key depression.
- For step and link coil inputs, be sure to use 3-digit and 4-digit data.



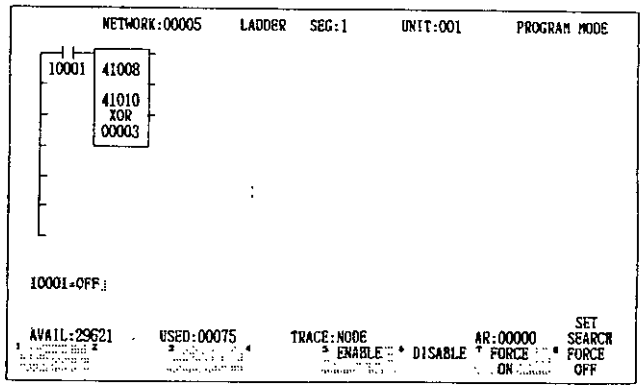


Fig. 4. 156

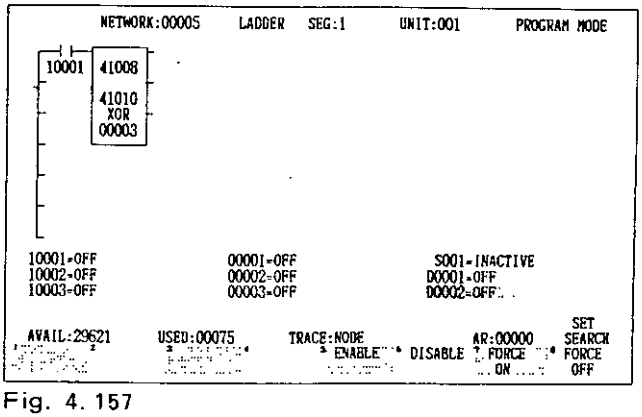
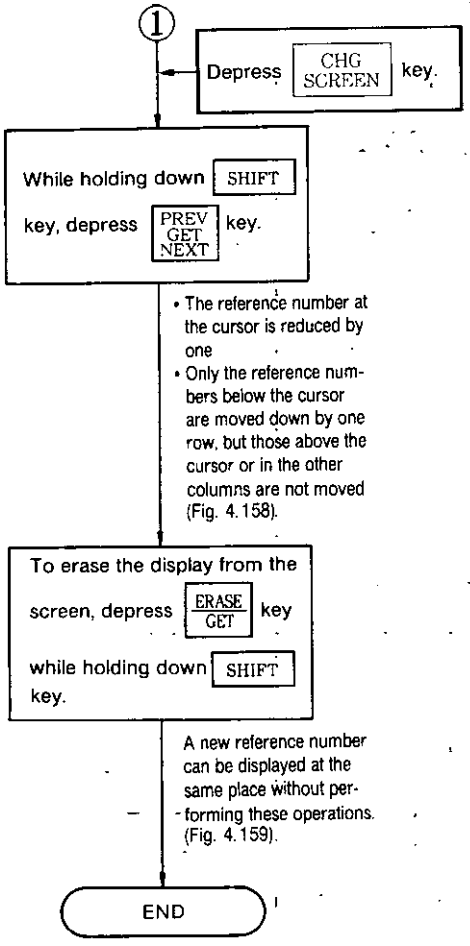


Fig. 4. 157



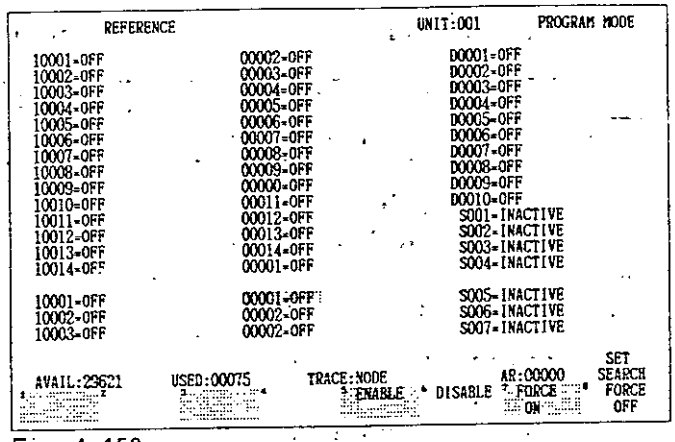


Fig. 4.158

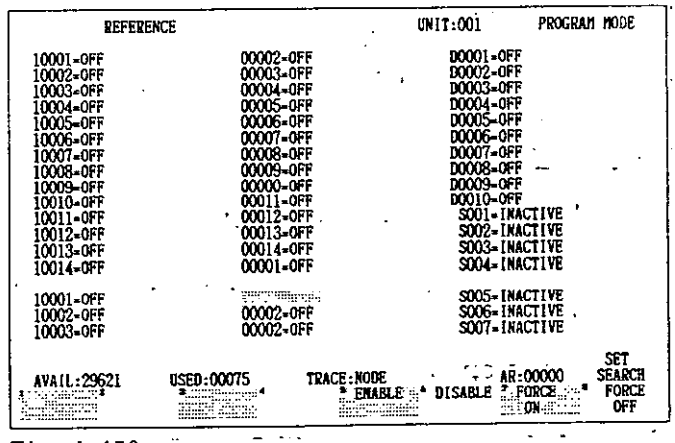


Fig. 4.159

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 PREV GET NEXT 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 PREV GET NEXT key 16 times.

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

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

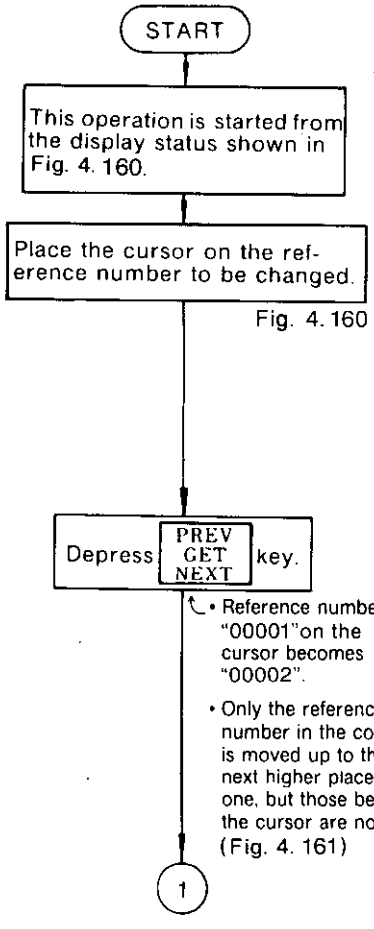
(a) STATUS DISPLAY OF COIL, INPUT RELAY, STEP, LINK COIL ②

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: PREV GET NEXT key
- For the previous reference number display: SHIFT and PREV GET NEXT keys

POINT

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



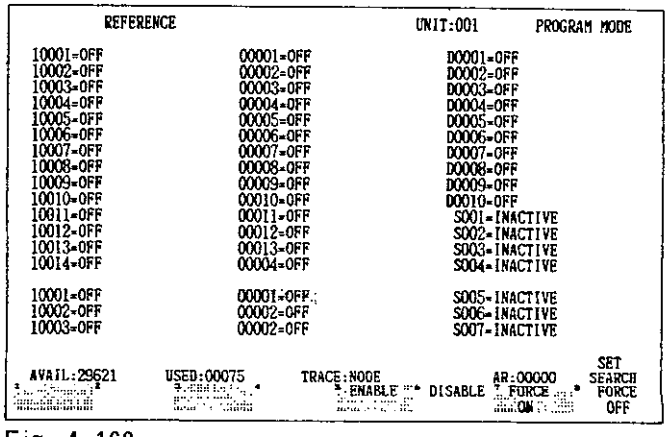


Fig. 4. 160

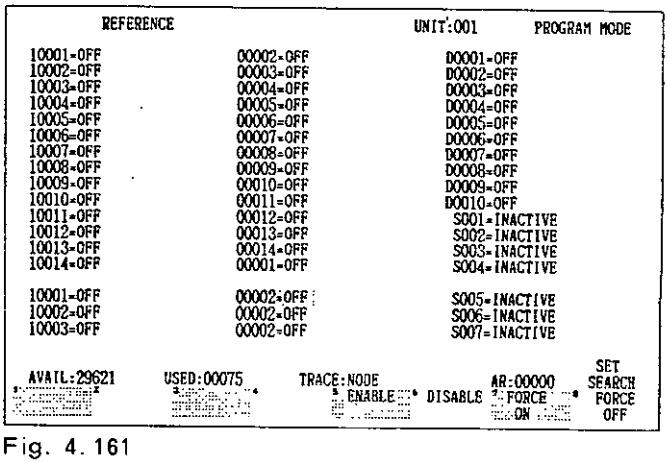
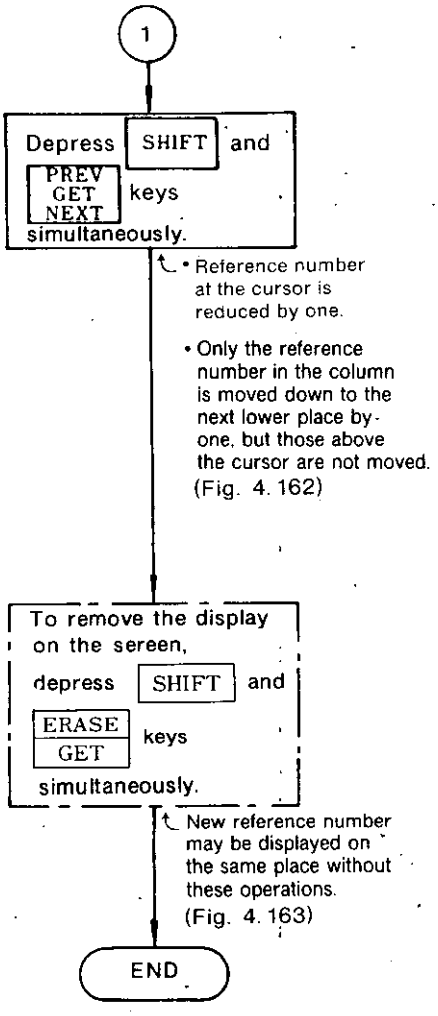


Fig. 4. 161



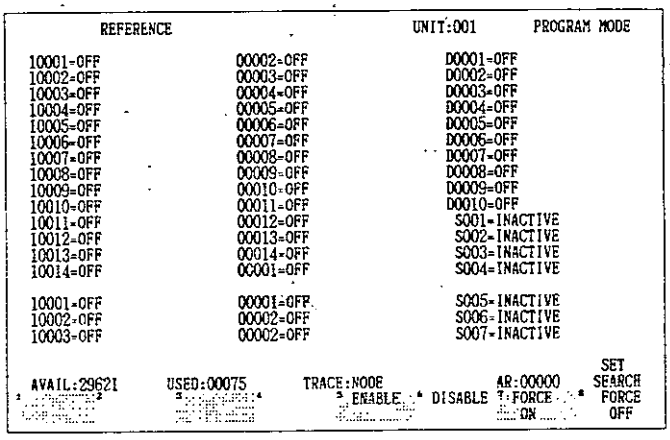


Fig. 4.162

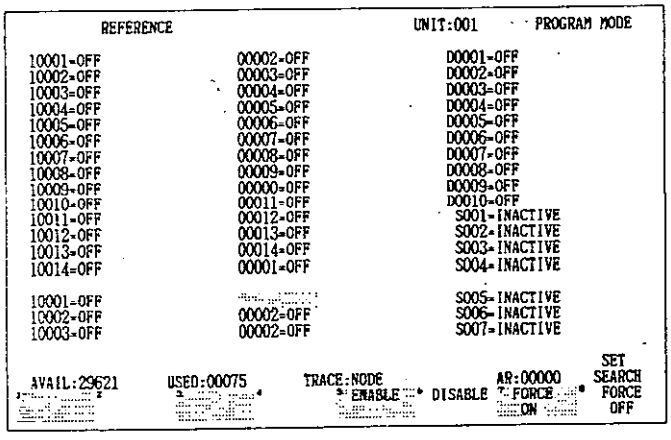


Fig. 4.163

IMPORTANT

If ON/OFF cycle is changed over at high speed, a correct content may not be displayed on P150 screen, but in RAP section of GL60S.

NOTE

1. Effective PREV GET NEXT 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 PREV GET NEXT key 16 times.
   - Display coil "17" on the top line in the expanding reference area, then depress PREV GET NEXT key 16 times, with SHIFT key depressed.

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

(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.

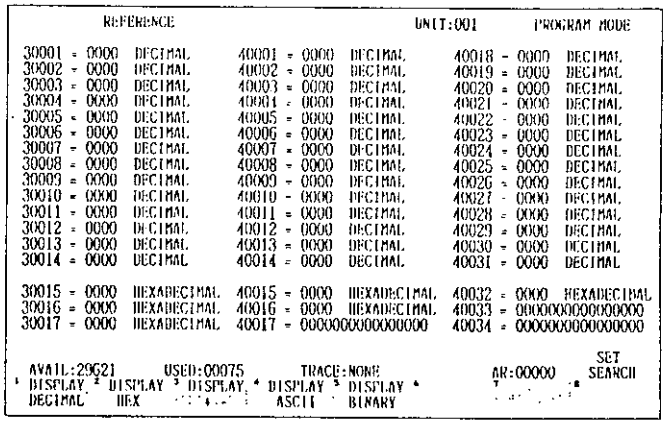
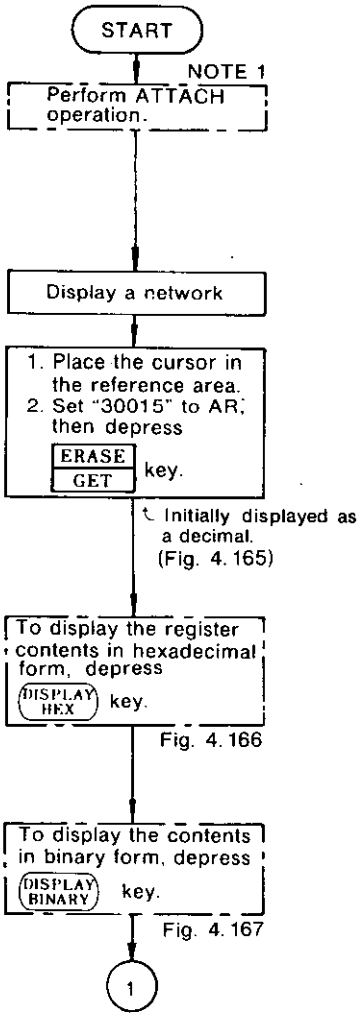


Fig. 4. 164

POINT

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



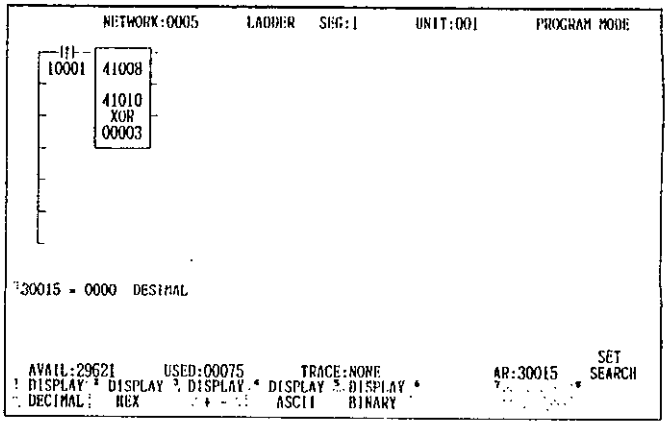


Fig. 4. 165

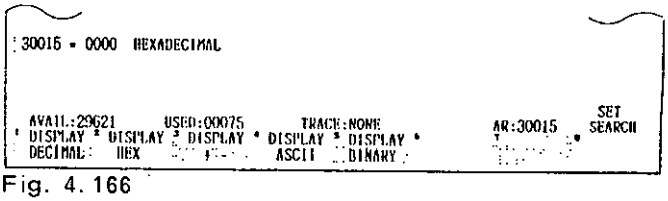


Fig. 4. 166

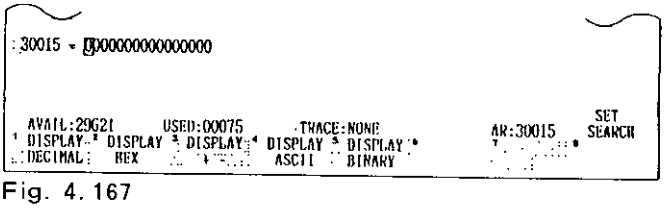
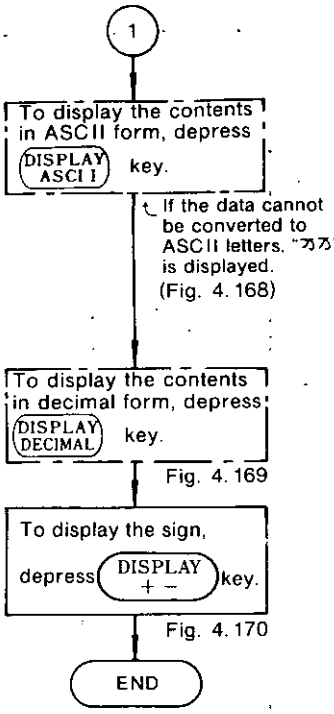


Fig. 4. 167



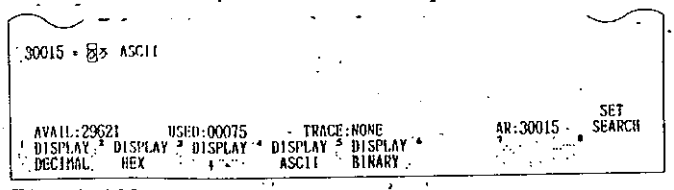


Fig. 4.168

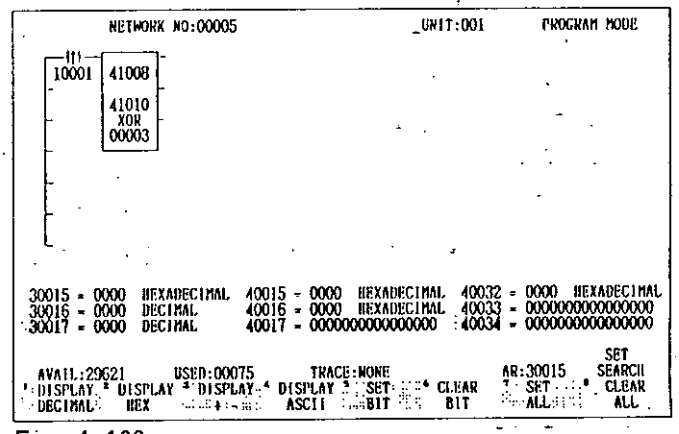


Fig. 4.169

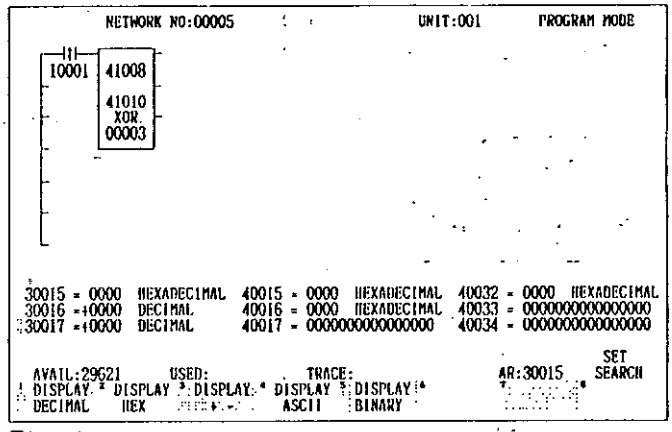


Fig. 4.170

NOTE

1. When ATTACH operation has already been completed, this step can be skipped.
2. CHG SCREEN 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 0000000000000000

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

   Example, 40100 = > 9999 OVERFLOW

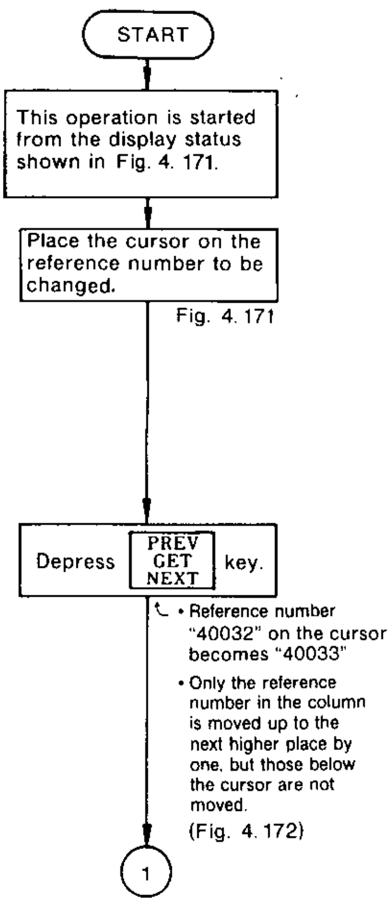
(b) REGISTER CONTENTS DISPLAY ②

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: PREV GET NEXT key
- For the previous reference number display: SHIFT and PREV GET NEXT keys

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.



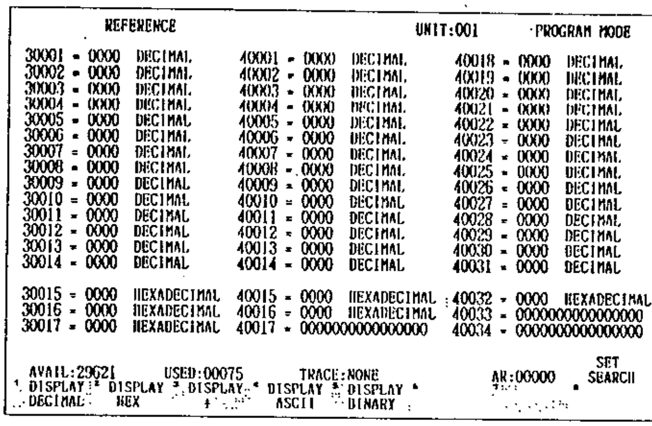


Fig. 4. 171

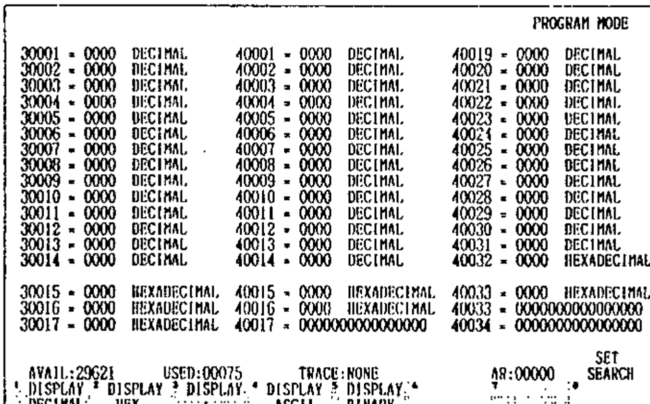


Fig. 4. 172

(1)

Depress [SHIFT] and [PREV GET NEXT] keys simultaneously.

- Reference number "40033" on the cursor becomes "40032."
- Only the reference number in the column is moved down to the next lower place by one, but those above the cursor are not moved.

(Fig. 4 173)

To remove the display on the P150 screen, depress [SHIFT] and [ERASE GET] keys simultaneously.

New reference number may be displayed on the same place without these operations (Fig. 4.174)

END

```
        REFERENCE                                          UNIT:001       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  40032 = 0000  HEXADECIMAL
30016 = 0000  HEXADECIMAL  40016 = 0000  HEXADECIMAL  40033 = 0000  HEXADECIMAL
30017 = 0000  HEXADECIMAL  40017 = 0000000000000000   40033 = 0000000000000000

                                                                          SET
 AVAIL:              USED:00075        TRACE:NONE               AR:00000  SEARCH
1 DISPLAY  2 DISPLAY  3 DISPLAY  4 DISPLAY  5 DISPLAY  6        7         8
  DECIMAL    HEX        + -        ASCII      BINARY
```

Fig. 4. 173

```
        REFERENCE                                          UNIT:001       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  40032 = 0000  HEXADECIMAL
30016 = 0000  HEXADECIMAL  40016 = 0000  HEXADECIMAL  40033 = 0000  HEXADECIMAL
                           40017 = 0000000000000000   40033 = 0000000000000000

                                                                          SET
 AVAIL:29621         USED:00075        TRACE:NONE               AR:00000  SEARCH
1          2         3          4         5          6          7         8
```

Fig. 4. 174

NOTE

1. Effective [PREV GET NEXT] Key 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 [PREV GET NEXT] key 16 times.
- Display register "40017" on the top line in the expanding reference area, then depress [PREV GET NEXT] key 16 times, with [SHIFT] key depressed.

(c) DATA STORING IN HOLDING REGISTER

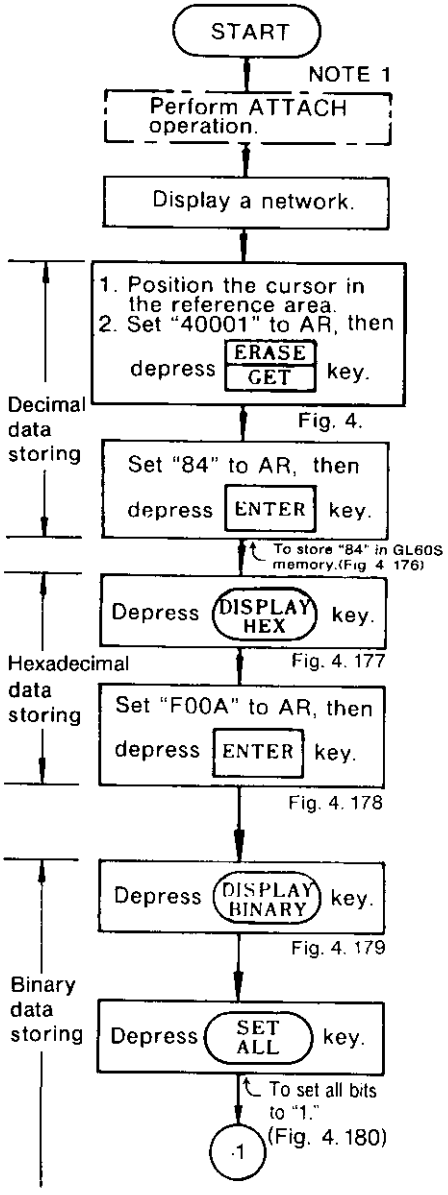
This function is used to store any numerical value (pattern) in any holding register, and it is displayed in the reference area or the expanding reference area.

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 P150 cannot store the numerical value in the input register.



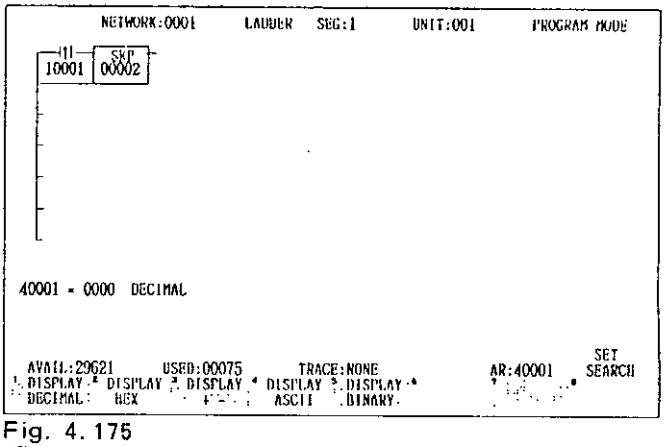


Fig. 4. 175

Fig. 4. 176

Fig. 4. 177

Fig. 4. 178

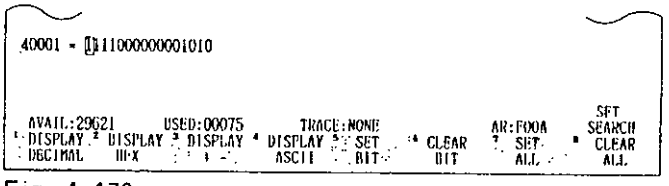
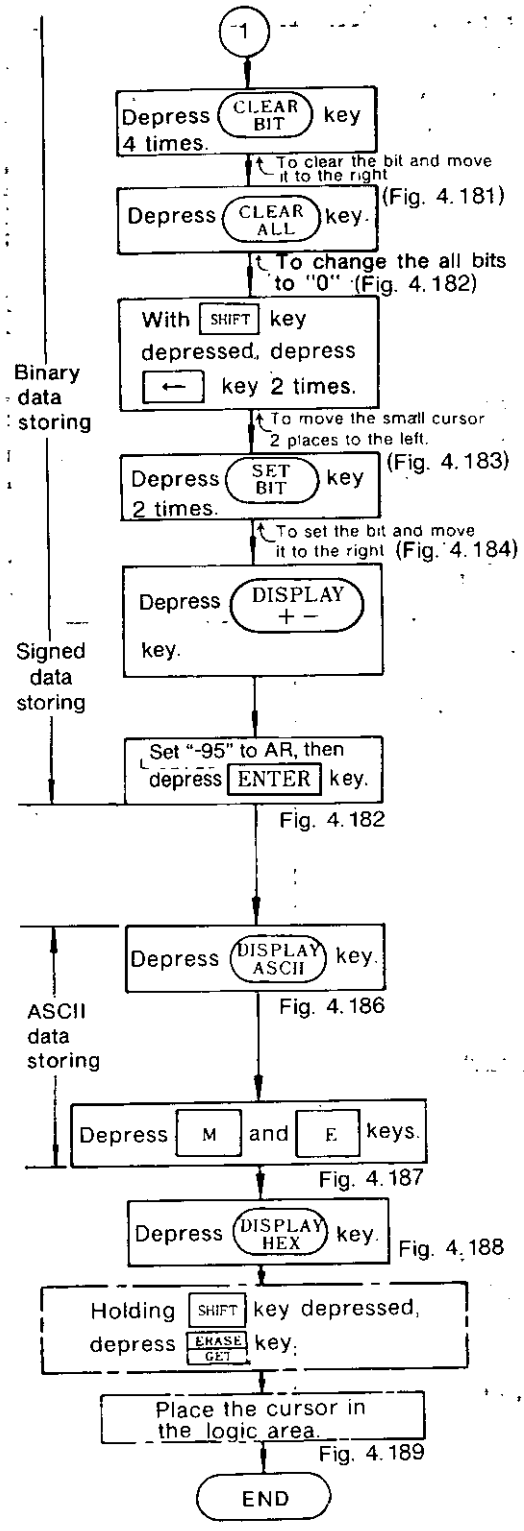


Fig. 4. 179

Fig. 4. 180


1
Depress CLEAR BIT key 4 times.
To clear the bit and move it to the right
Depress CLEAR ALL key.
(Fig. 4.181)
To change the all bits to "0" (Fig. 4.182)
With SHIFT key depressed, depress ← key 2 times.
To move the small cursor 2 places to the left.
Depress SET BIT key 2 times.
(Fig. 4.183)
To set the bit and move it to the right (Fig. 4.184)
Depress DISPLAY +− key.
Set "-95" to AR, then depress ENTER key.
Fig. 4.182
Binary data storing
Signed data storing
Depress DISPLAY ASCII key.
Fig. 4.186
ASCII data storing
Depress M and E keys.
Fig. 4.187
Depress DISPLAY HEX key.
Fig. 4.188
Holding SHIFT key depressed, depress ERASE GET key.
Place the cursor in the logic area.
Fig. 4.189
END

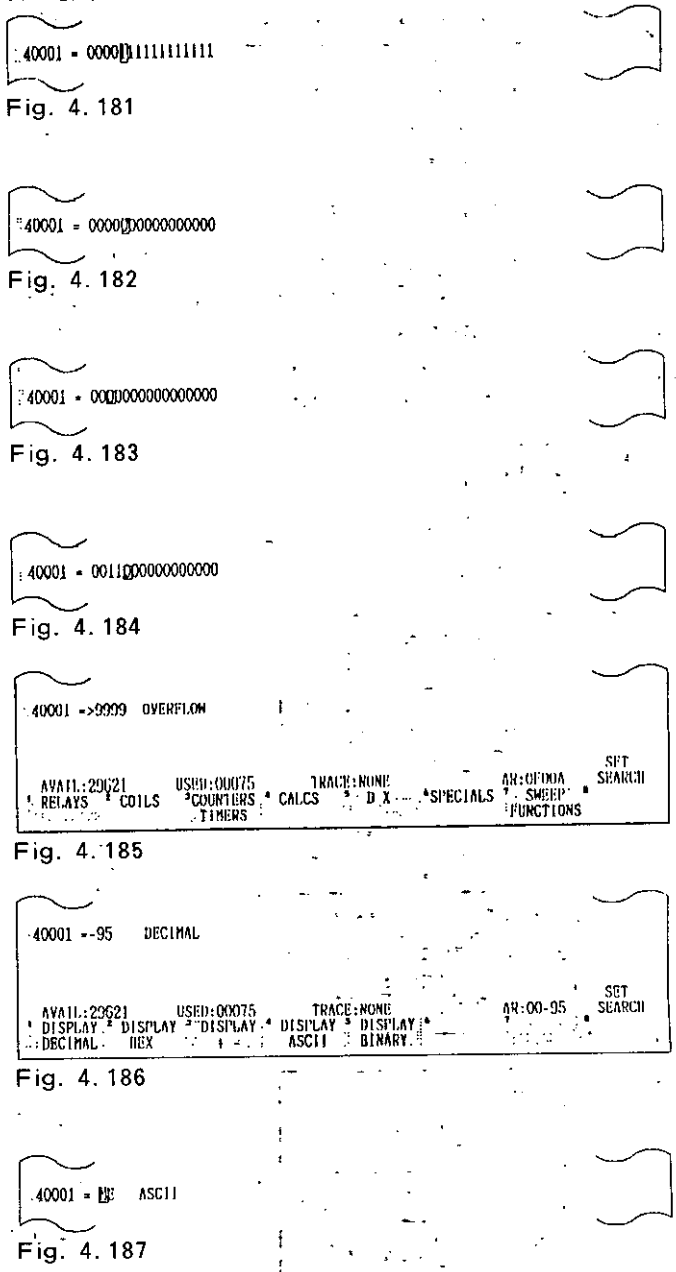

40001 = 0000 1111111111
Fig. 4.181
40001 = 0000 0000000000
Fig. 4.182
40001 = 000 0000000000000
Fig. 4.183
40001 = 001 0000000000000
Fig. 4.184
40001 =>9999 OVERFLOW
AVAIL:29621 USED:00075 TRACE:NONE AR:0F00A SET
1 RELAYS 2 COILS 3 COUNTERS TIMERS 4 CALCS 5 D X 6 SPECIALS 7 SWEEP FUNCTIONS 8 SEARCH
Fig. 4.185
40001 =-95 DECIMAL
AVAIL:29621 USED:00075 TRACE:NONE AR:00-95 SET
1 DISPLAY DECIMAL 2 DISPLAY HEX 3 DISPLAY + - 4 DISPLAY ASCII 5 DISPLAY BINARY 8 SEARCH
Fig. 4.186
40001 = ASCII
Fig. 4.187

Fig. 4. 188

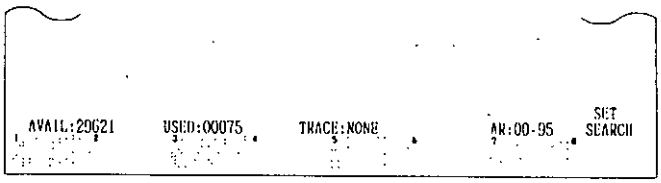


Fig. 4. 189

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

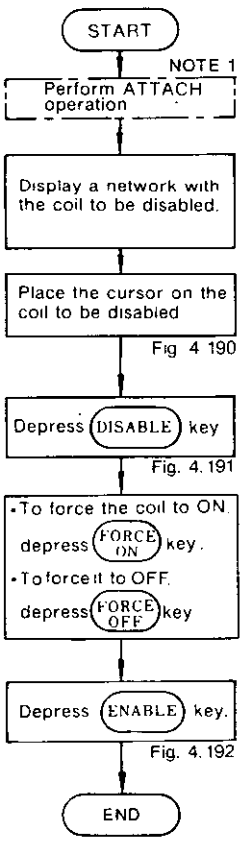
(2) Disable Operation

(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.



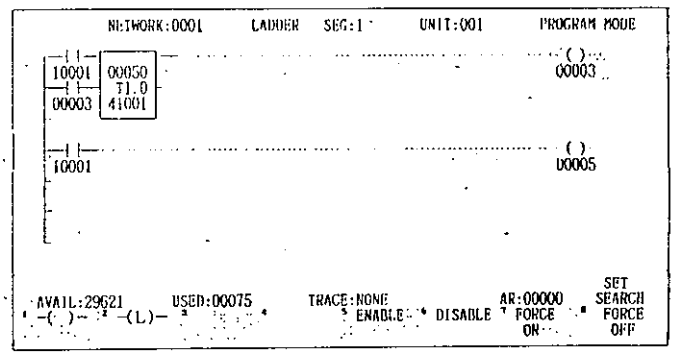


Fig. 4. 190

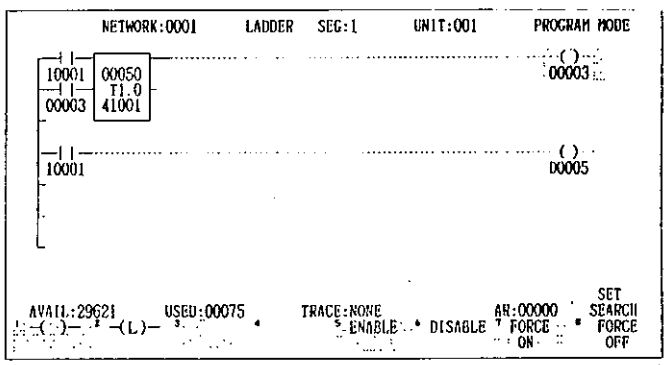


Fig. 4. 191

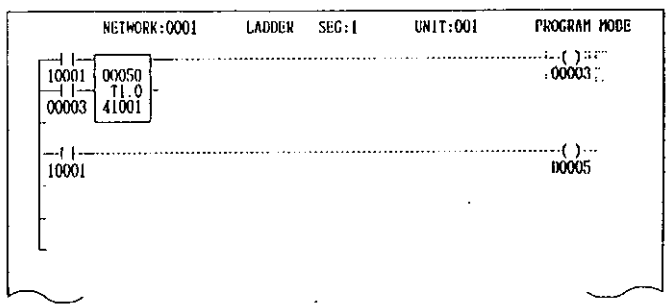


Fig. 4. 192

NOTE

1. This step can be skipped if the system is ready to store the program.
2. Unnecessary disabled coils should be enabled.

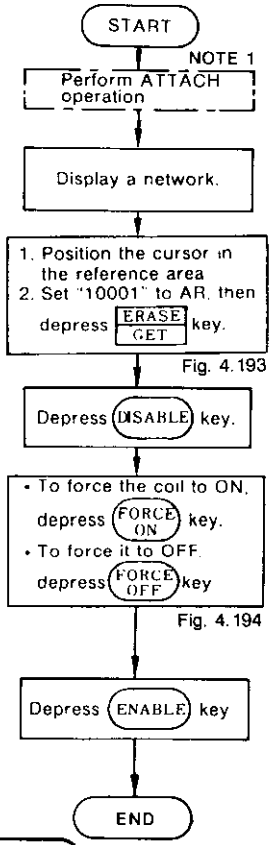
(b) DISABLE COIL, INPUT RELAY, LINK COIL (REFERENCE AREA)

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.



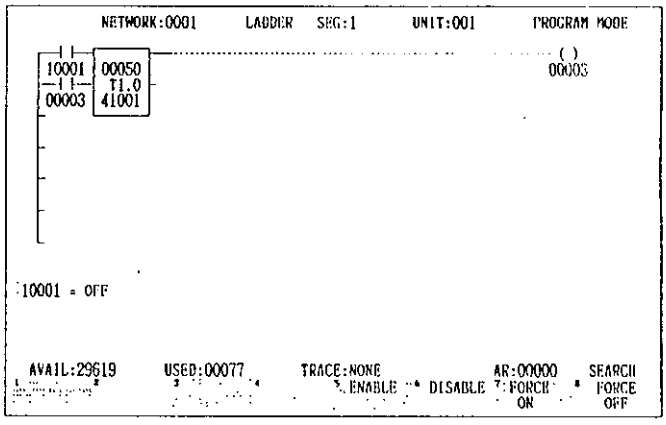


Fig. 4.193

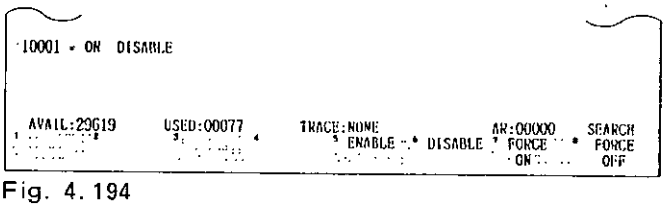


Fig. 4.194

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. Comment display: Additional functions will be provided for comment display.

4. 6. 6 Network Checking

(1) SEARCH ①

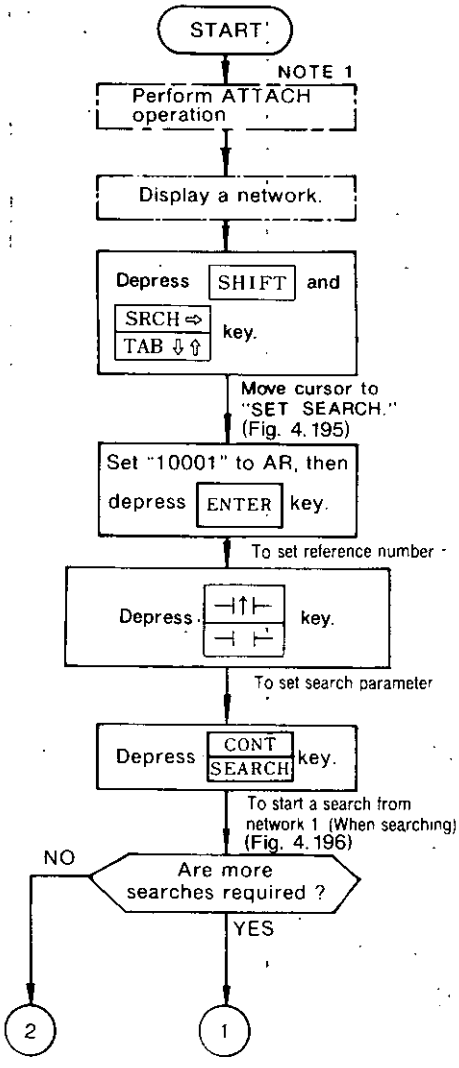
The logic in the GL60S can be searched for specific elements. Networks containing the desired elements will be placed on the P150 screen, one at a time. The cursor is placed on the specified element. (Example of search for ⊣ ⊢ 10001.)

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.



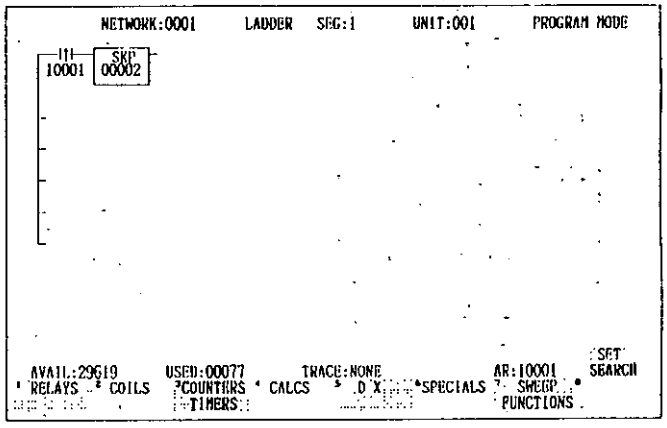


Fig. 4. 195

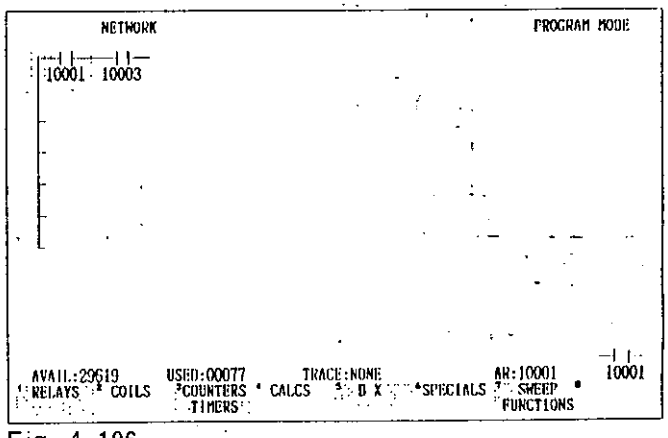
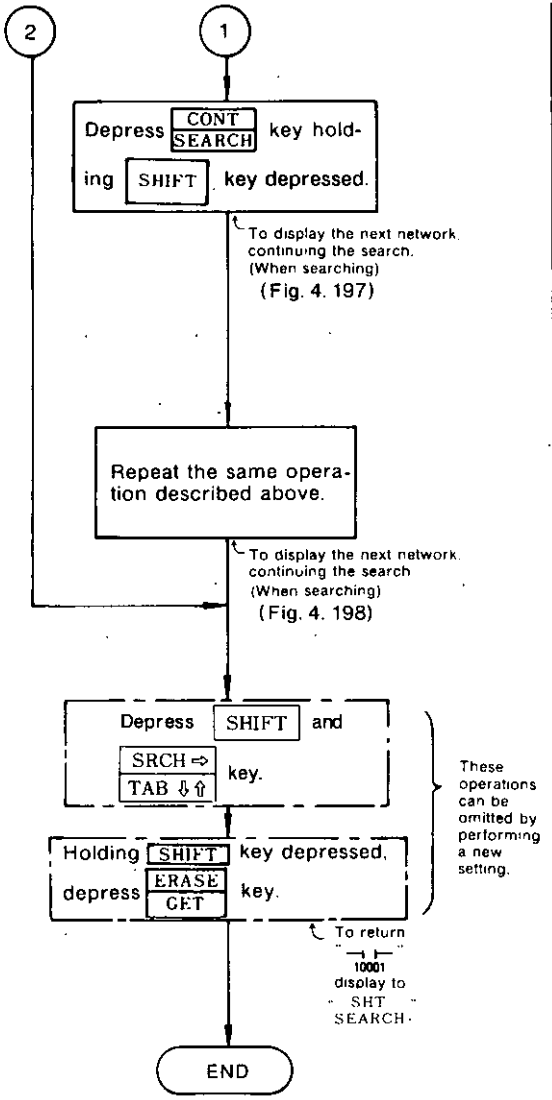


Fig. 4. 196



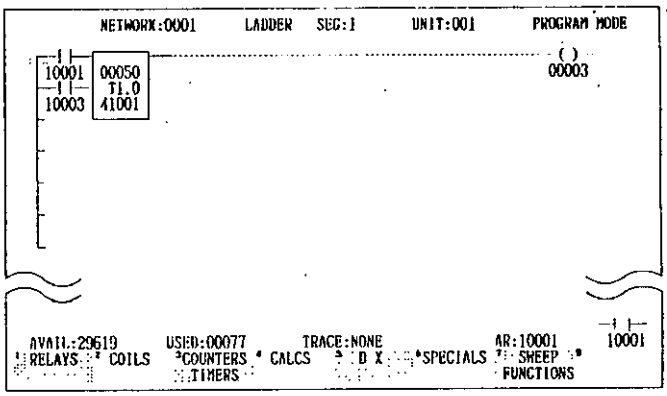


Fig. 4. 197

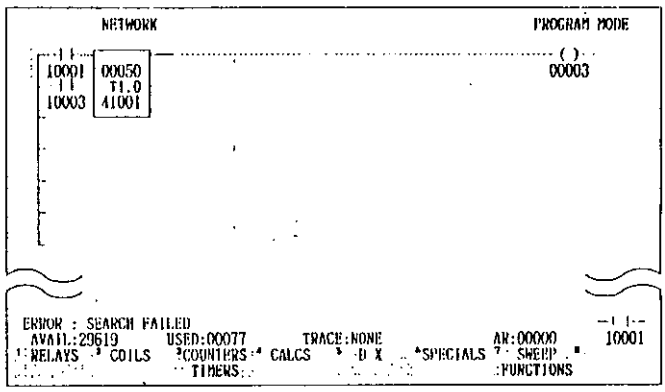


Fig. 4. 198

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).

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 [PRINT / 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 [SRCH ⇨ / TAB ⇩⇧] key.

(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.

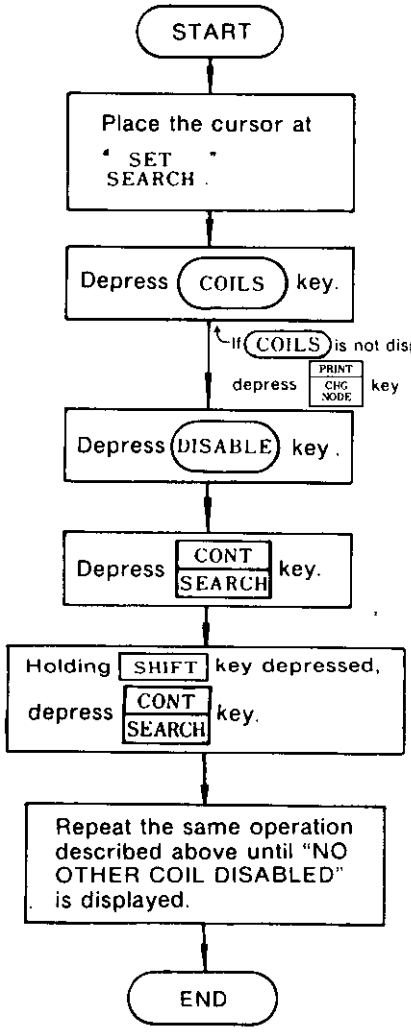


Table 4.7

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 Disable 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.
NO OTHER COIL DISABLED	It appears during search procedures when all disabled coils and input relays have been found.

NOTE

Displays in the logic area, the reference area and the expanding reference area remain on the screen.

Table 4.8 Label Displays for Selecting the Search Element Functions

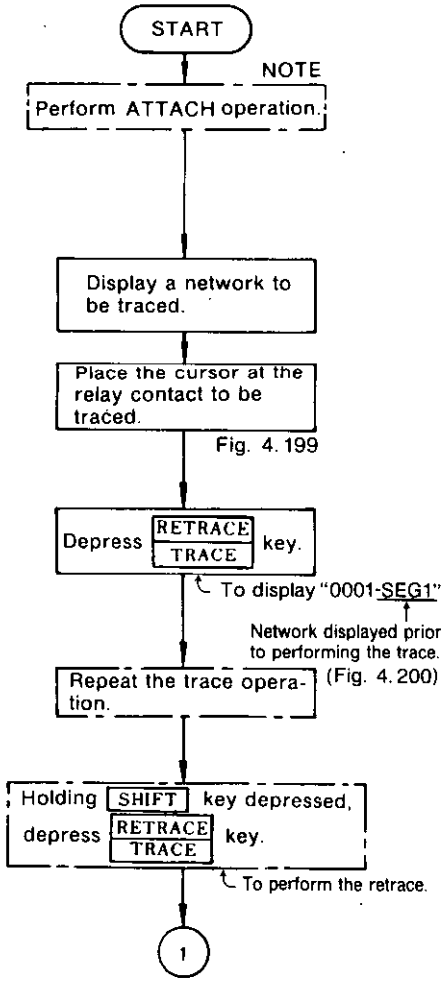
Label Keys \ Label Displays	1	2	3	4	5	6	7	8
RELAYS	1 ⊣ ⊢	2 ⊣/⊢	3 ⊣↑⊢	4 ⊣↓⊢	5 ⊣ ⊢	6	7	8 :
COILS	1 -( )-	2 -(L)-	3	4	5 ENABLE	6 DISABLE	7 FORCE ON	8 FORCE OFF
COUNTER TIMERS	1 UCTR	2 DCTR	3 T1.0	4 T0.1	5 T.01	6	7	8 :
CALCS	1 ADD	2 SUB	3 MUL	4 DIV	5 SQRT	6	7	8 NEXT MENU
	1 SADD	2 SSUB	3 SMUL	4 SDIV	5	6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

(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.



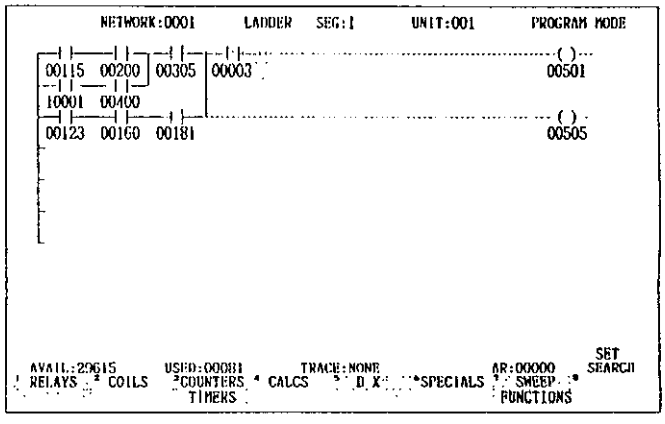


Fig. 4.199

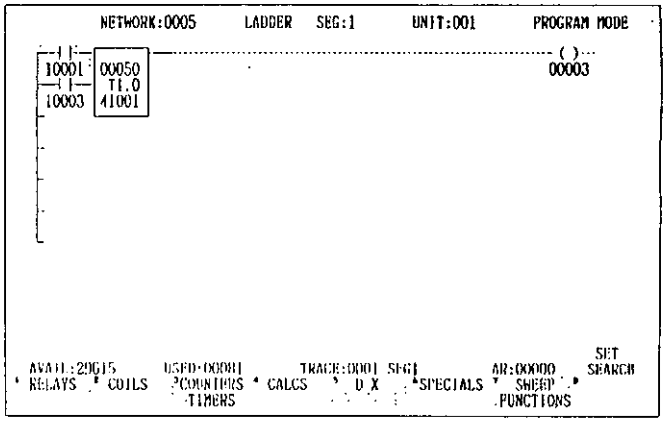
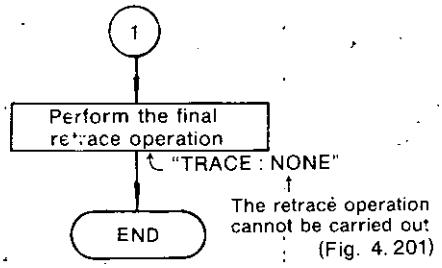


Fig. 4.200



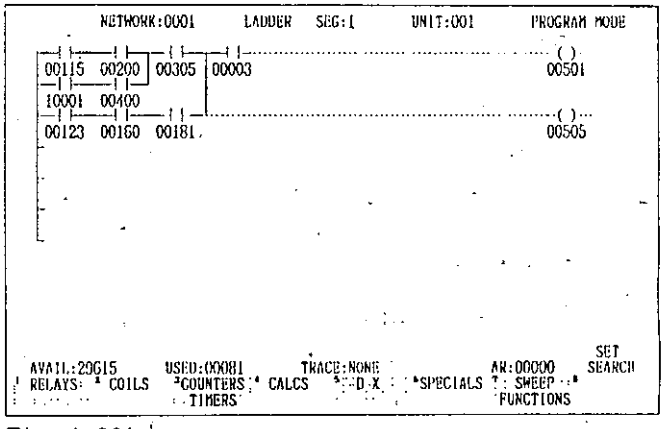


Fig. 4. 201

NOTE

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

4. 6. 7 Scan Control

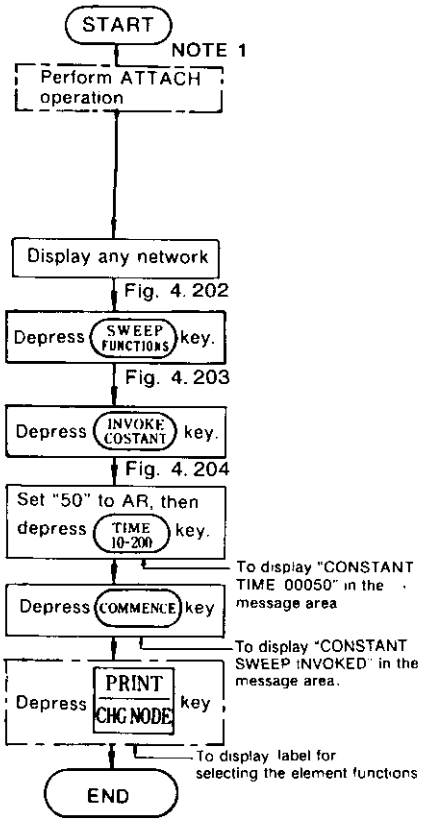
(1) CONSTANT SWEEP

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.



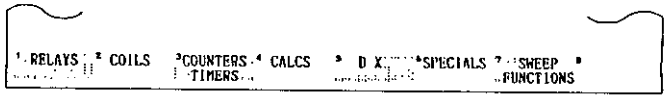


Fig. 4. 202

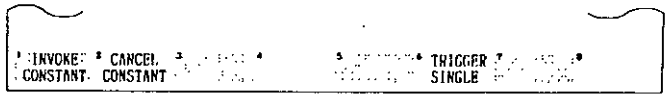


Fig. 4. 203

Fig. 4. 204

NOTE

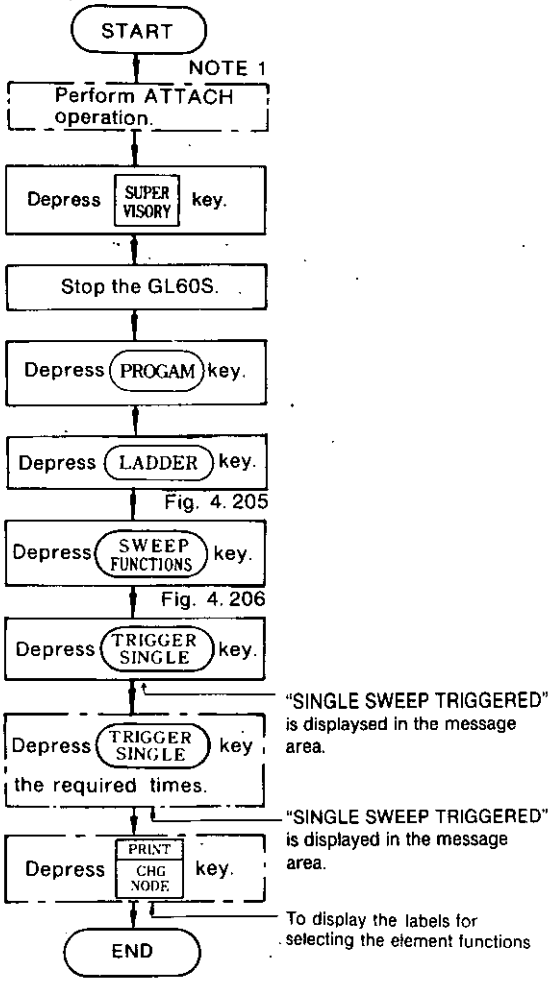
1. This step can be skipped if the system is ready to store the program.
2. If the labels for selecting the element functions are not displayed on the screen. Depress PRINT / CHG NODE key.
3. The holding registers 49998 and 49999 should not be used for other applications except when the constant sweep 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.



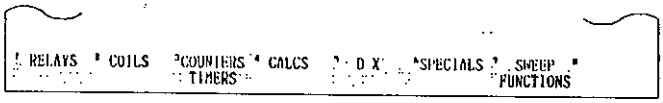


Fig. 4.205

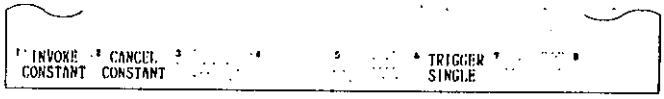


Fig. 4.206

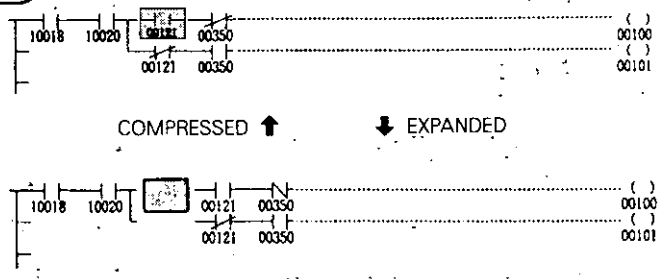
NOTE

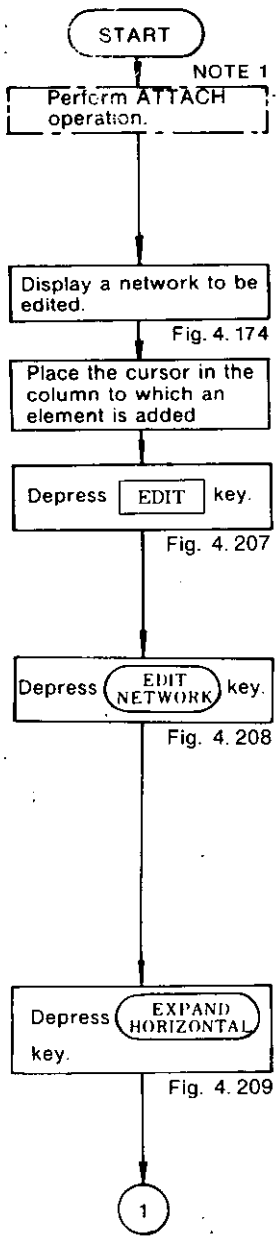
1. This step can be skipped if the system is ready to store the program.
2. If the labels for selecting the element functions are not displayed on the screen, depress PRINT / CHG NODE key.

4. 6. 8 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.





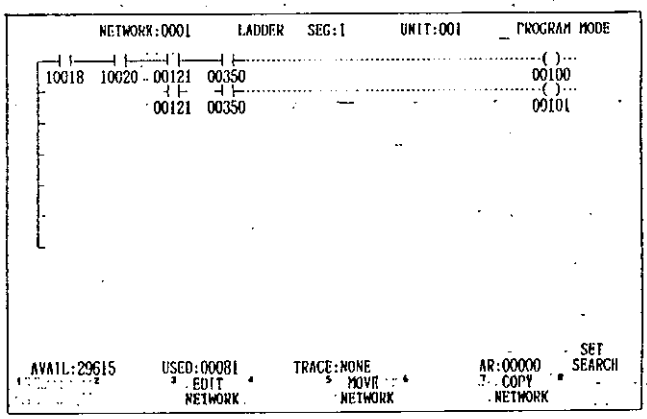


Fig. 4. 207

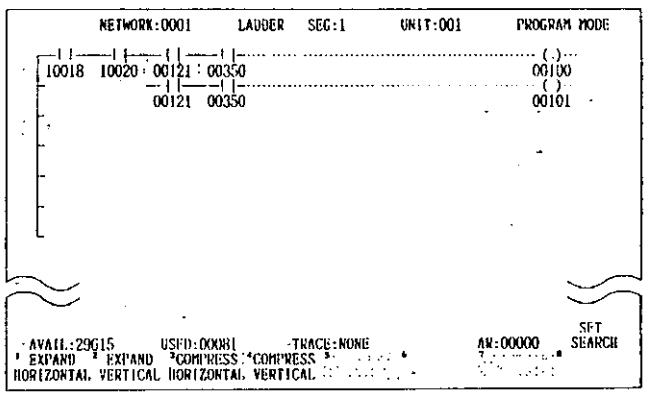


Fig. 4. 208

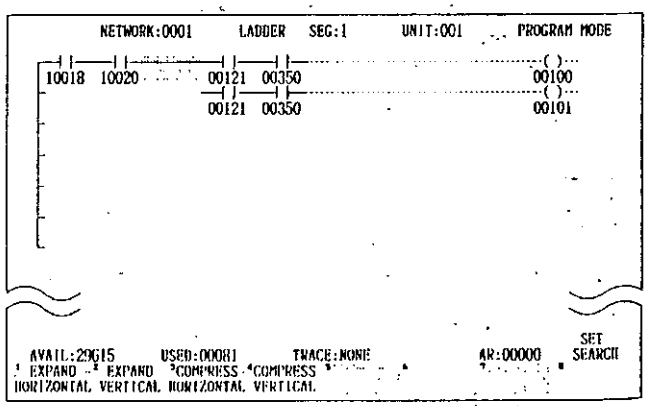
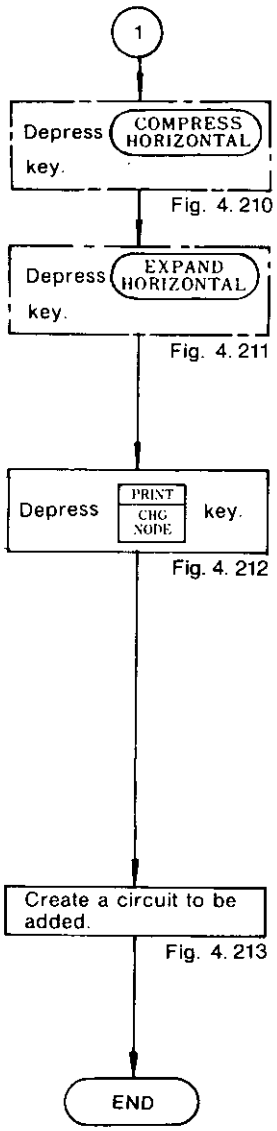


Fig. 4. 209



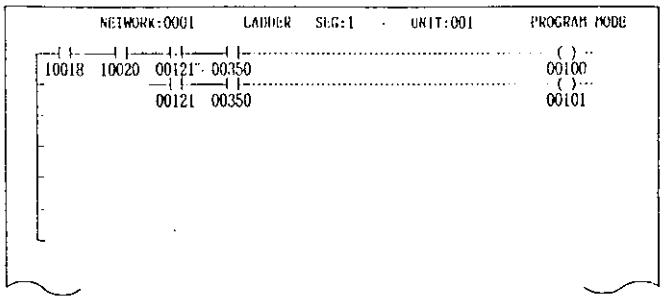


Fig. 4. 210

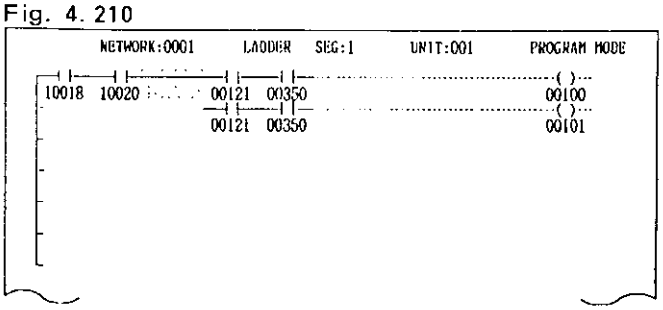


Fig. 4. 211

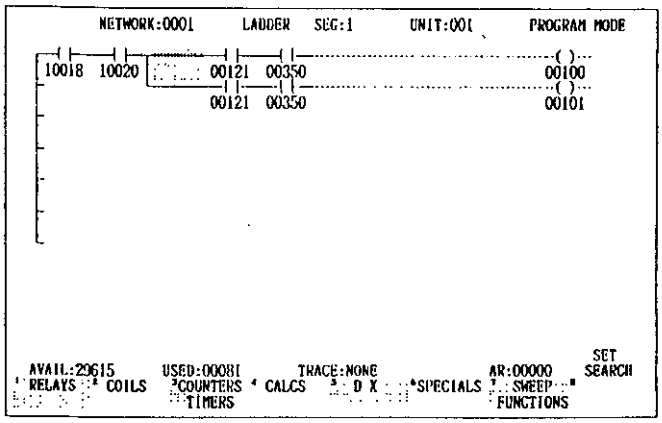


Fig. 4. 212

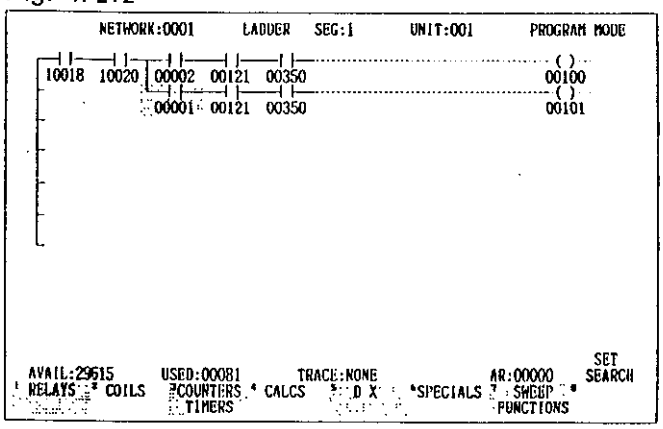


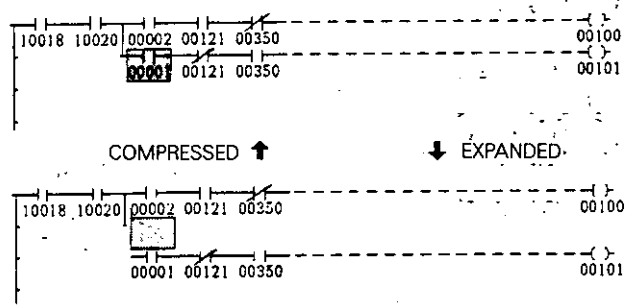
Fig. 4. 213

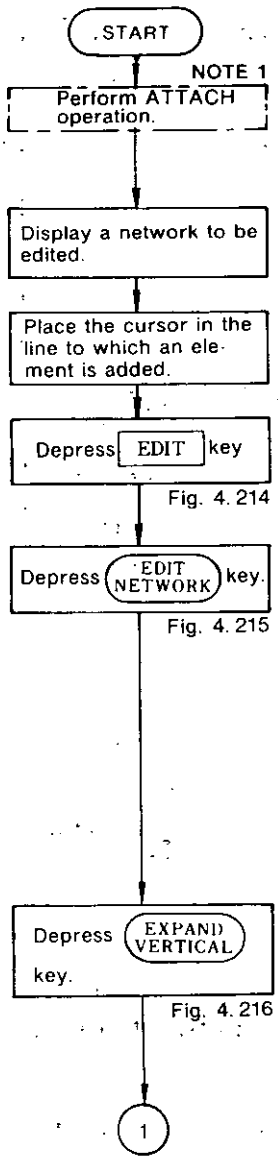
NOTE

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 PRINT / 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.





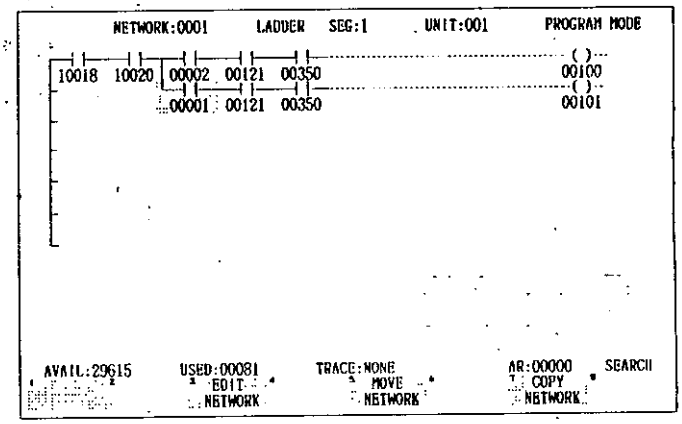


Fig. 4. 214

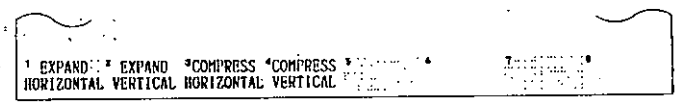


Fig. 4. 215

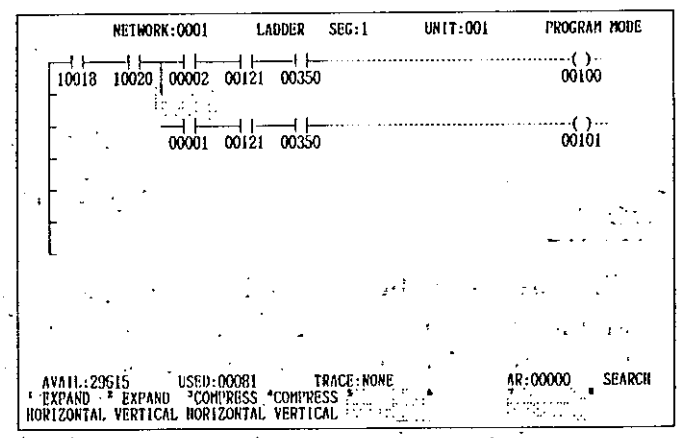
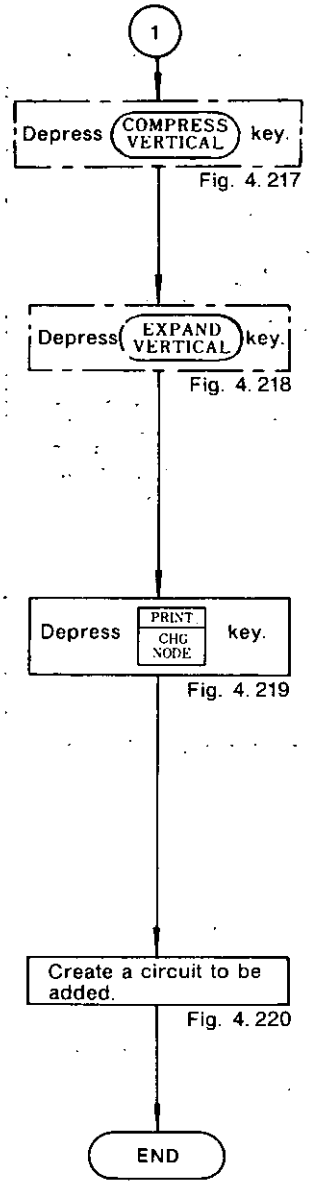


Fig. 4. 216



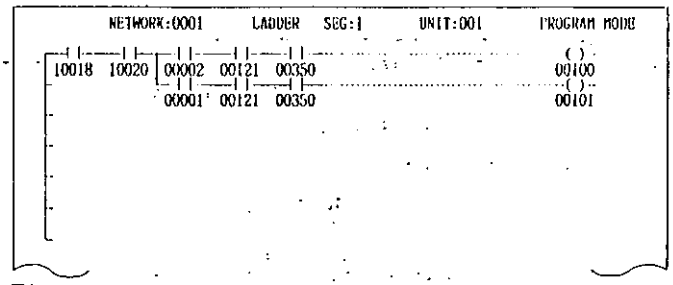


Fig. 4. 217

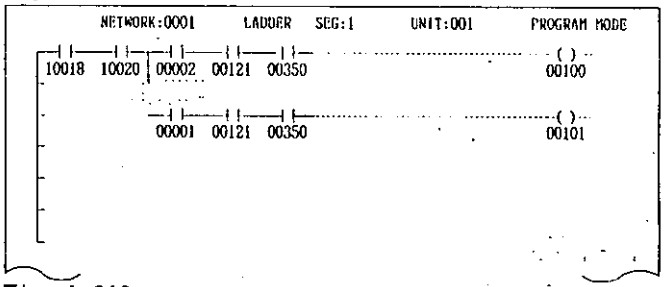


Fig. 4. 218

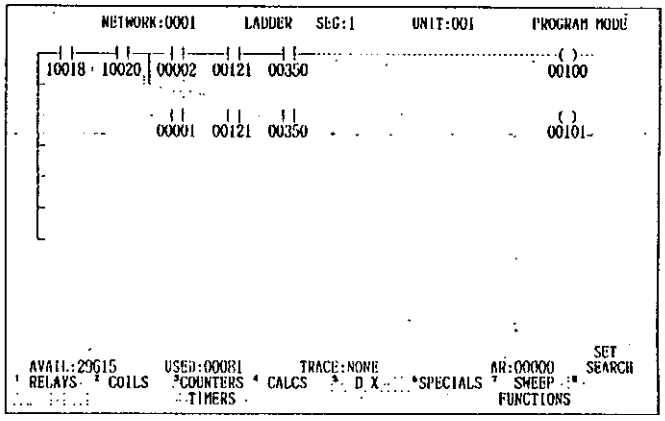


Fig. 4. 219

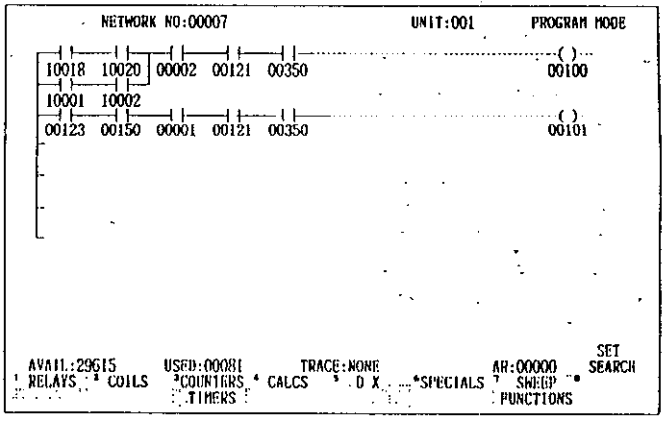


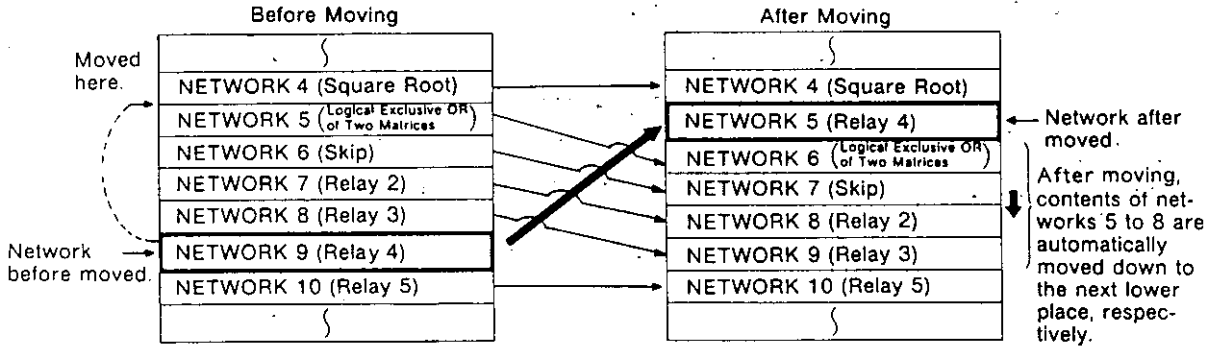
Fig. 4. 220

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 PRINT / CHG NODE key returns the current label display to the label display for selecting the element functions.

(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.

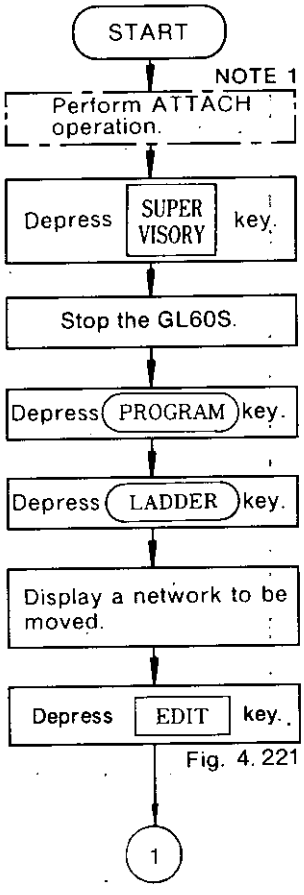


Fig. 4.221

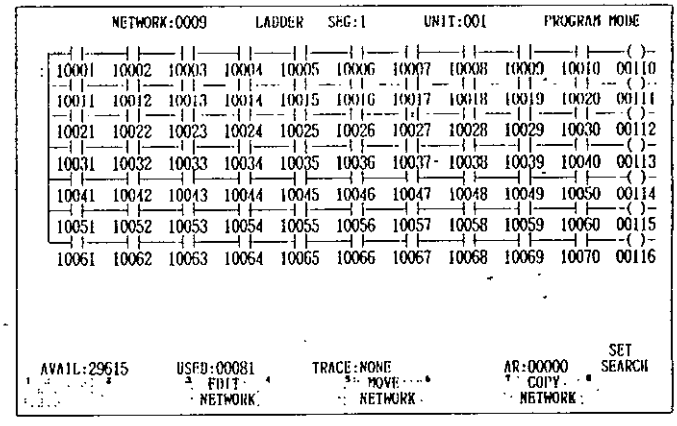
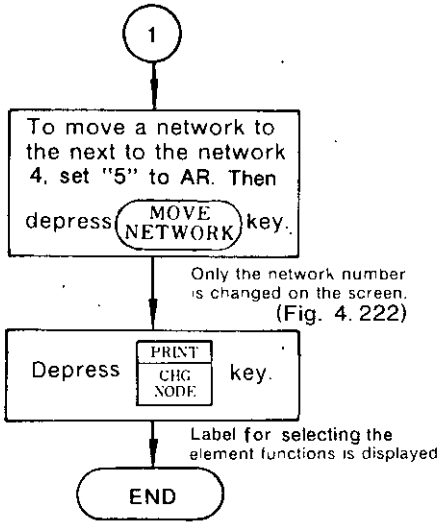


Fig. 4.221



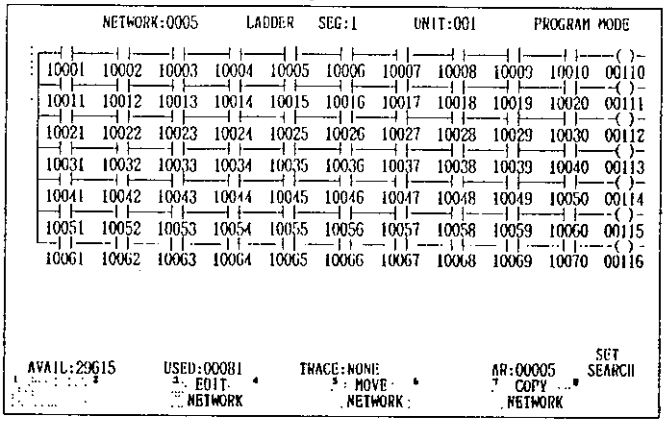


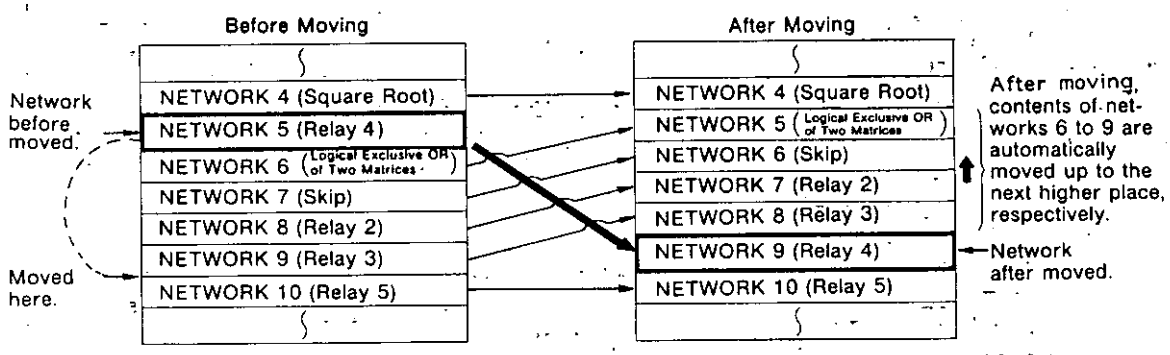
Fig. 4. 222

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 PRINT / CHG NODE key without use of MOVE NETWORK key.

(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.

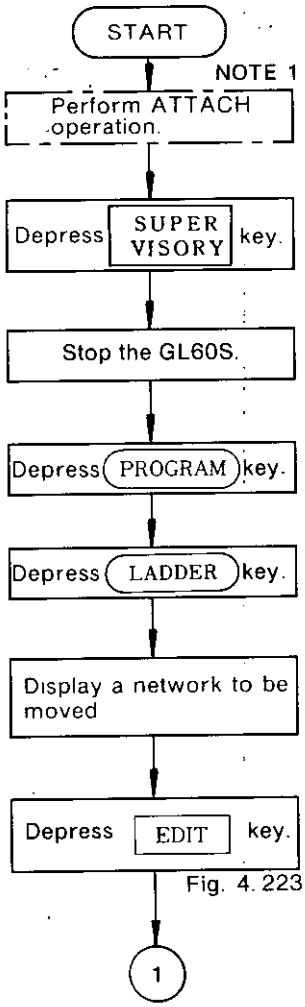


Fig. 4. 223

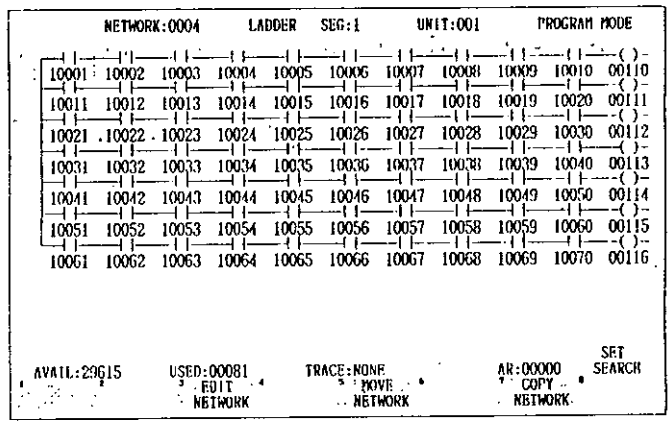
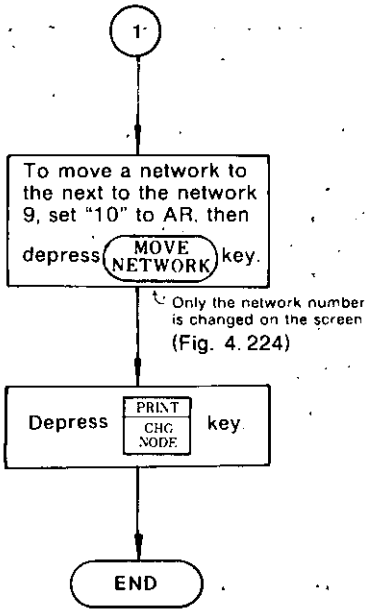


Fig. 4. 223



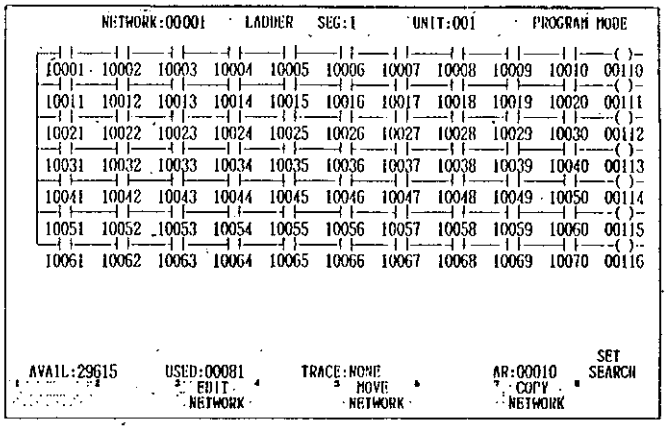


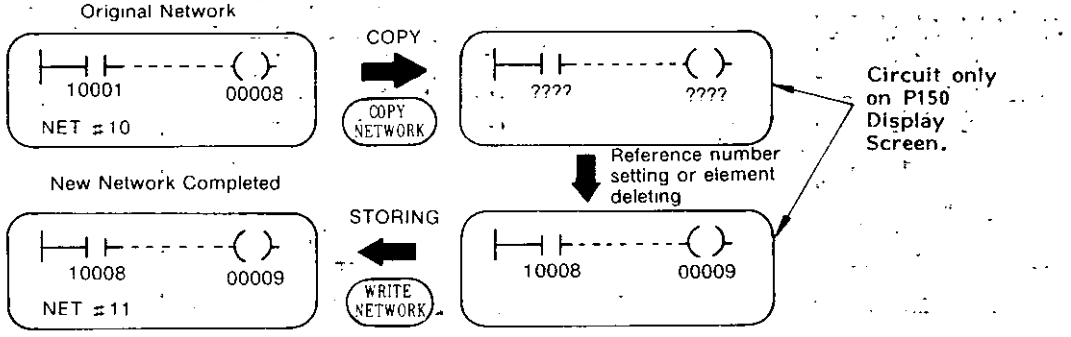
Fig.4. 224

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 PRINT CHG NODE key without use of MOVE NETWORK key.

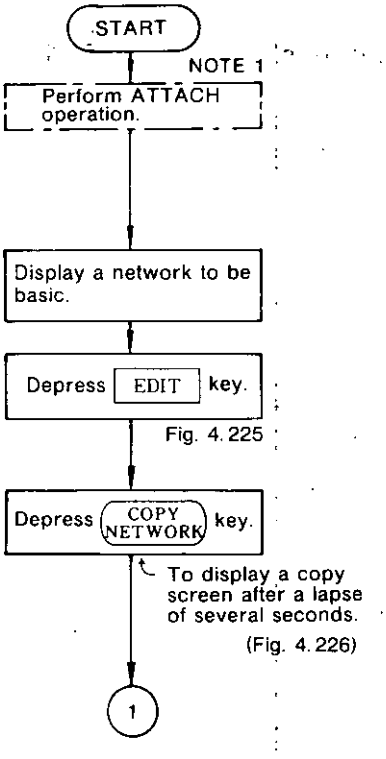
(3) NETWORK COPY

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 P150 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.



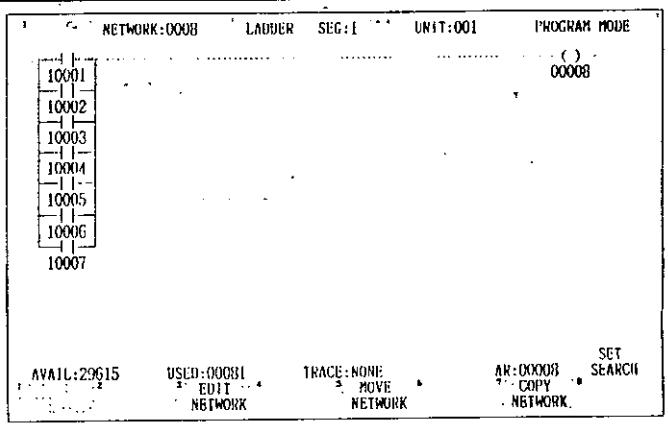


Fig.4. 225

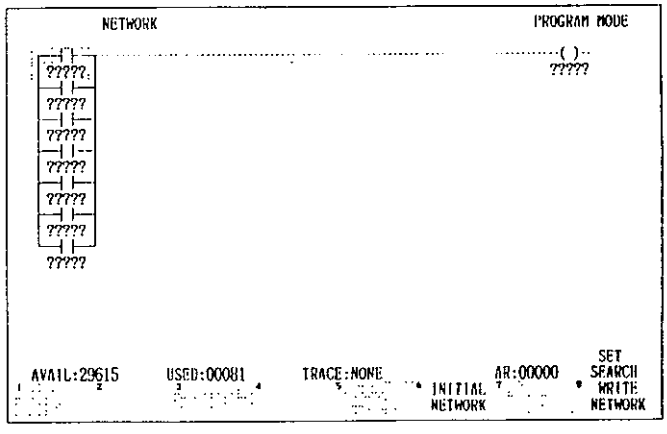
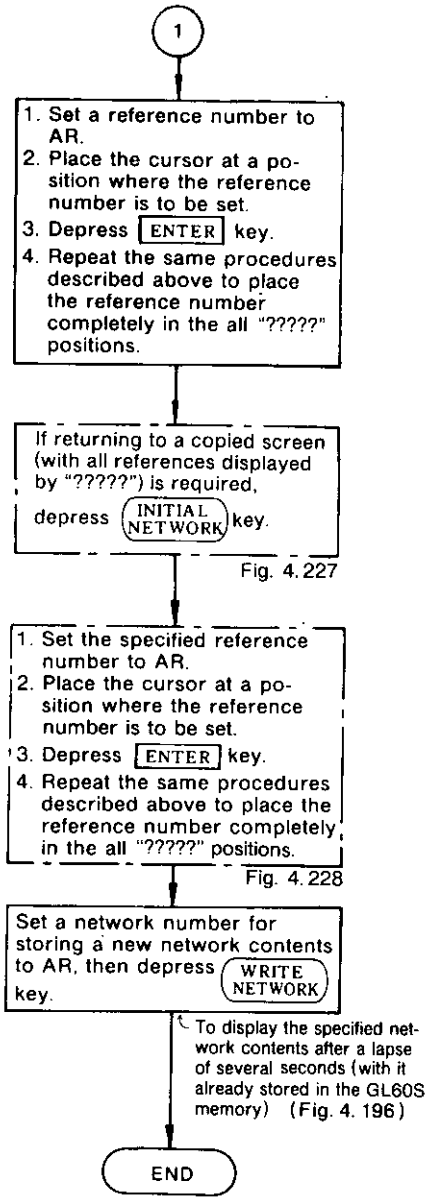


Fig.4. 226



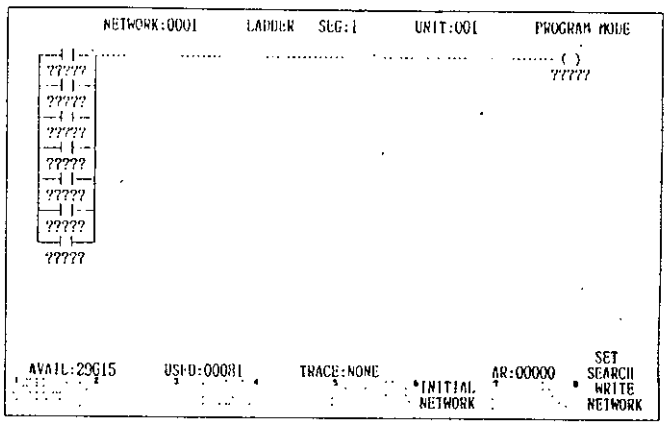


Fig.4. 227

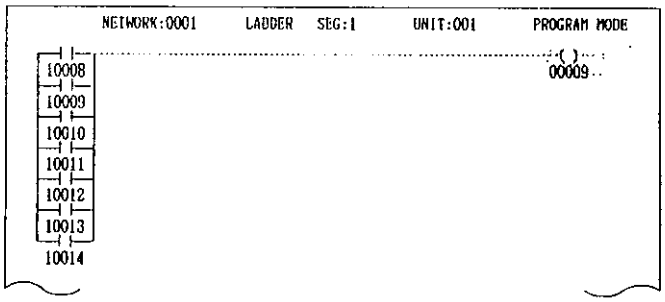


Fig.4. 228

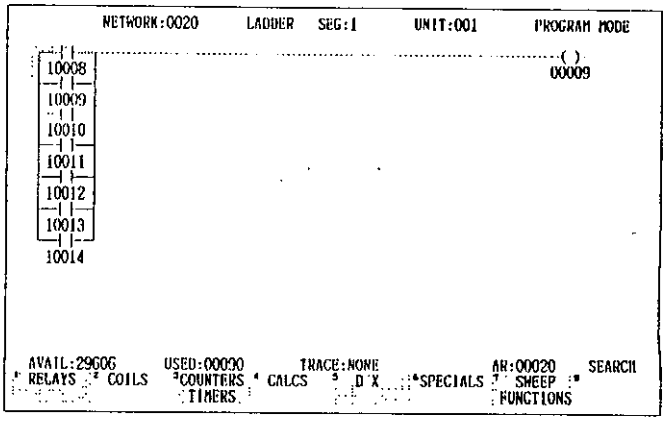


Fig.4. 229

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 PRINT / 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.

4. 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

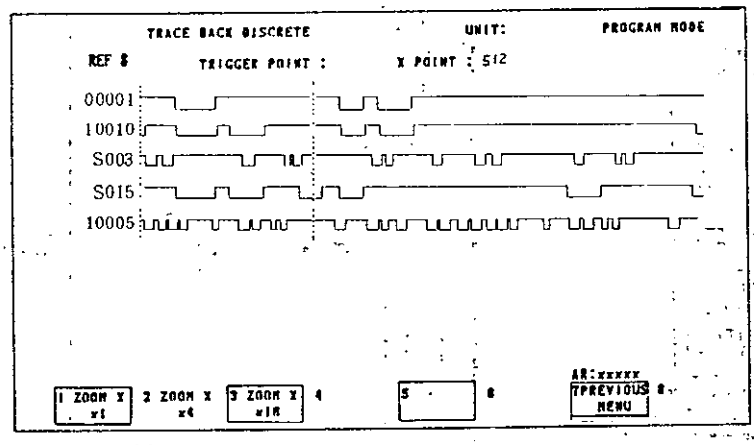


Fig. 4. 230

- Register

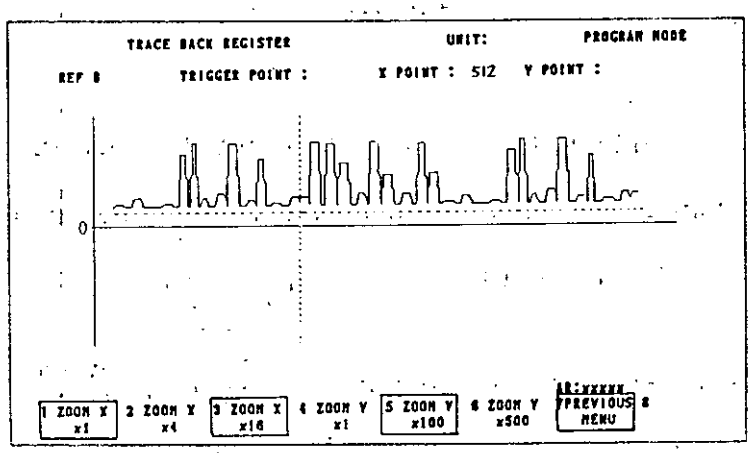


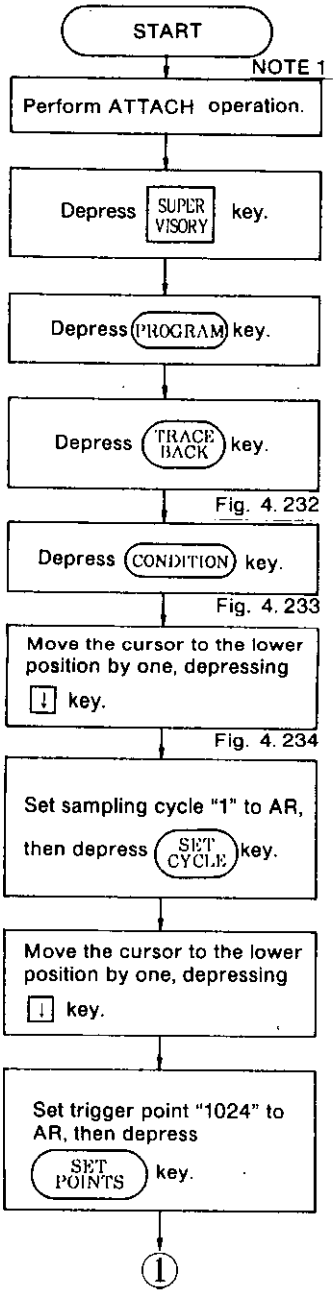
Fig. 4. 231

4. 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



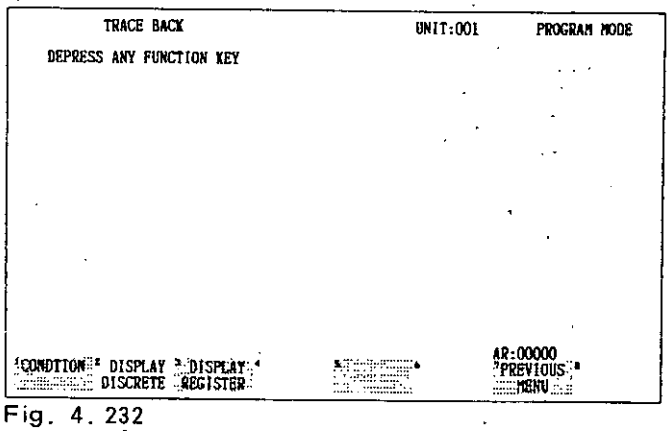


Fig. 4. 232

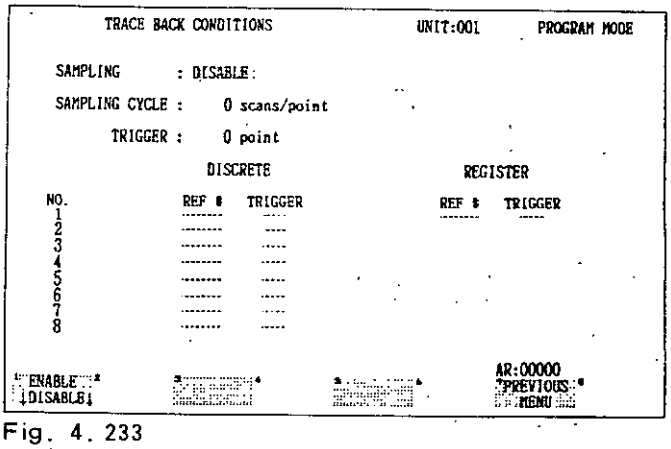


Fig. 4. 233

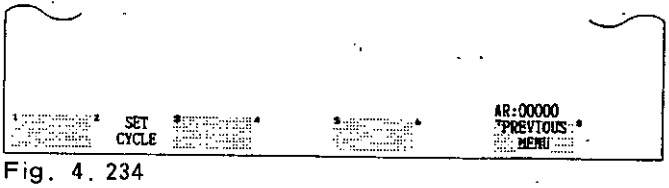


Fig. 4. 234

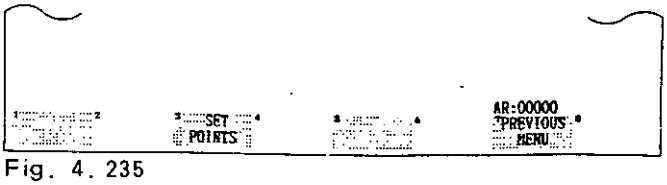


Fig. 4. 235

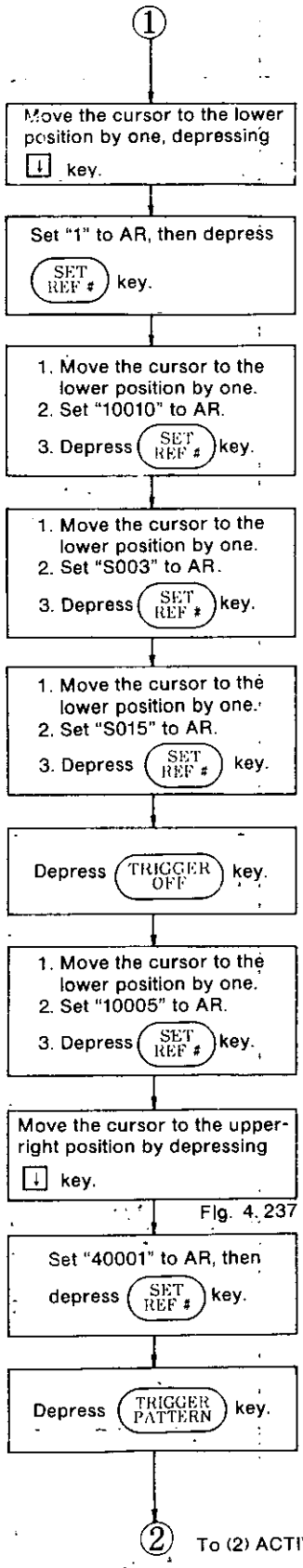


Fig. 4.237

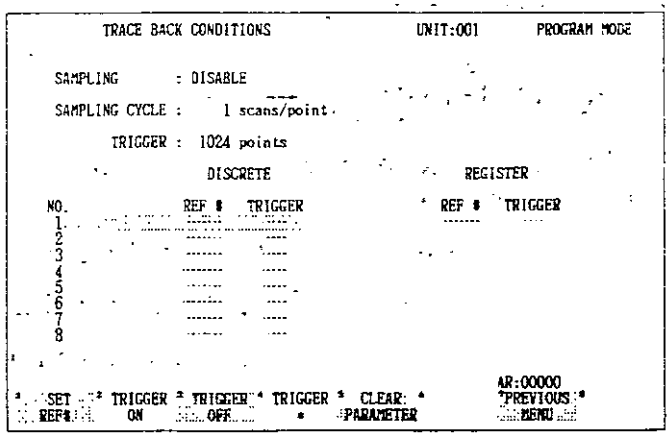


Fig. 4.236

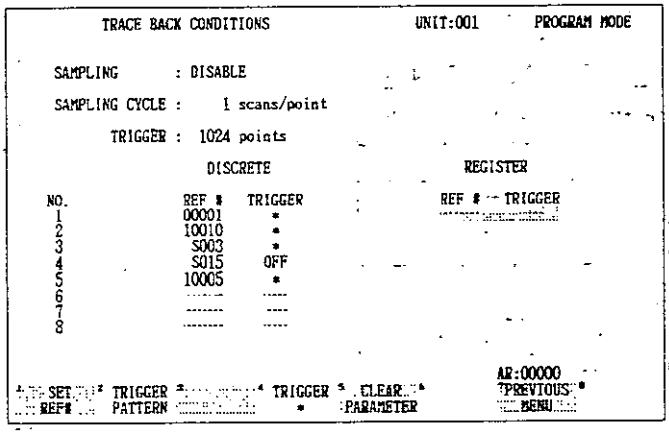


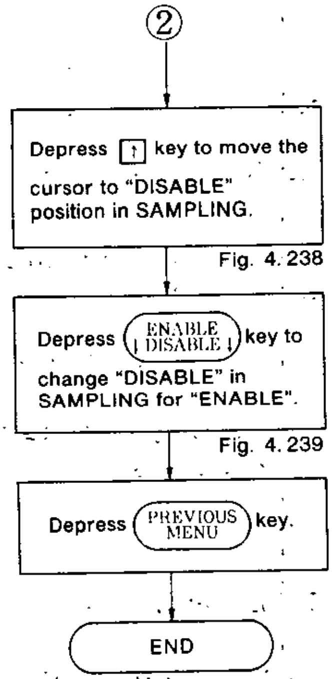
Fig. 4.237

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 1 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. 4. 232.

(2) ACTIVATION

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



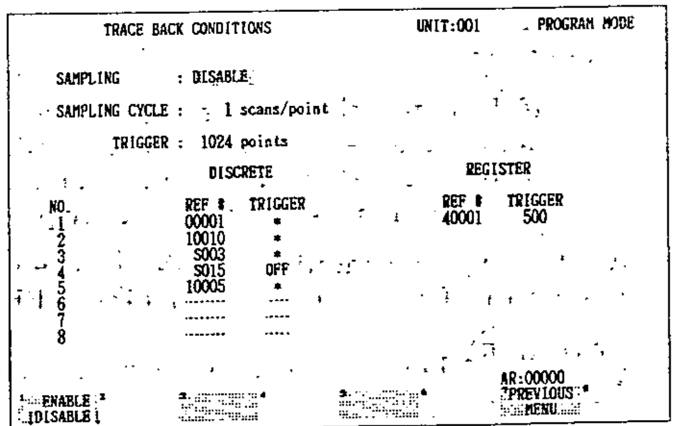


Fig. 4.238

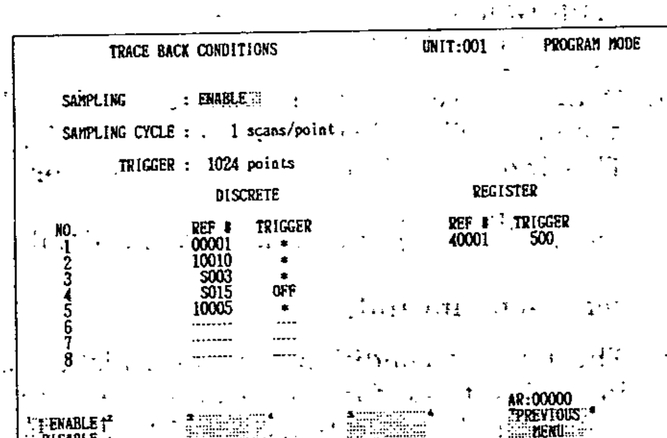


Fig. 4.239

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.

4. 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

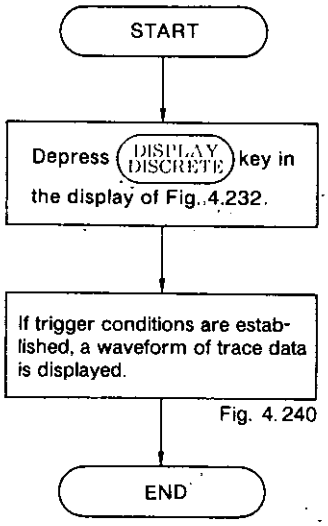


Fig. 4.240

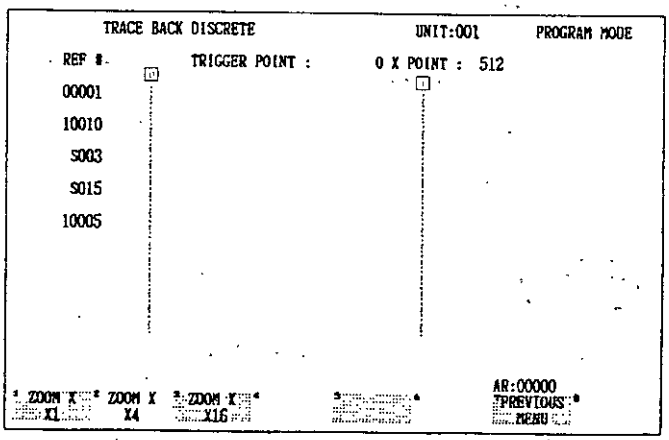
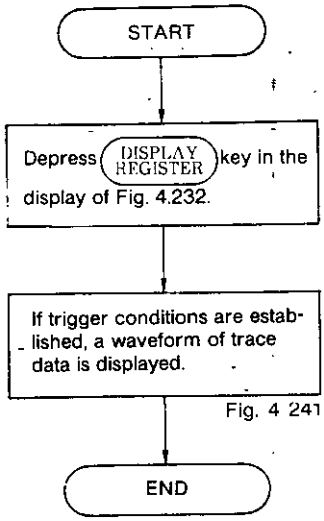


Fig. 4. 240

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 (ZOOME X ×4) key elongates the waveform 4 times, while depressing (ZOOM X ×16) key elongates 16 times. To display the entire waveform again, depress (ZOOM X ×1) key.
4. Depressing (PREVIOUS MENU) key calls up the display in Fig. 4. 232.
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.



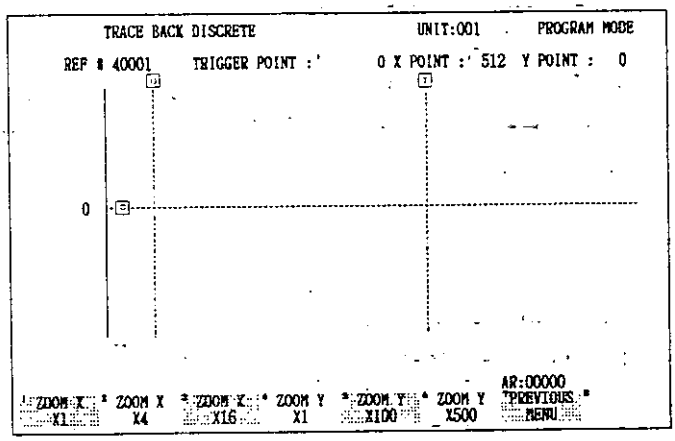


Fig. 4. 241

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.
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 X ×4) key elongates the waveform 4 times in the horizontal direction, and depressing (ZOOM X ×16) key elongates it 16 times in the same direction. To display the entire waveform again, depress (ZOOM X ×1) key. Depressing (ZOOM Y ×100) key elongates the waveform 100 times in the vertical direction, depressing the (ZOOM Y ×500) key elongates it 500 times in the same direction. To display the entire waveform again, depress (ZOOM Y ×1) key.
4. Depressing (PREVIOUS MENO) key calls up the display in Fig. 4. 232.
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.
6. Depressing (CHG SCREEN) key displays the contents of the register by value, not by waveform.

5. FILE MANAGEMENT OPERATION

The file control is used for operation of data disk files (user files), disk formating and P150 communication parameter settings, as listed below:

FILE CONTROL

- Directory: File names are displayed.
- File deleting: Unnecessary files are deleted.
- File renaming: File names are altered.
- File formatting: New disks are formatted (initialized).
- Disk checking: From the disk inserted in drive B, specified files or all the files are copied onto the disk inserted in drive A.
- Port parameter setting: The communication parameters for PORT 1 and PORT 2 of P150 are set.

These operations can be executed with P150 alone (off-line).

POINT

Before starting operation, insert the correct disks as instructed by the display in drives A and B.

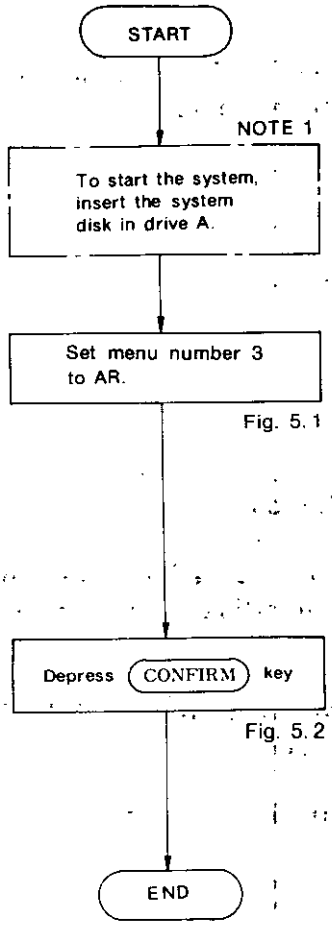


Fig. 5.1

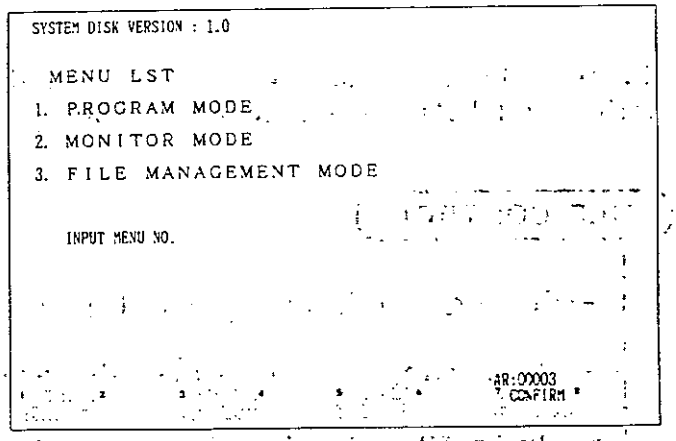


Fig. 5.1

Fig. 5.2

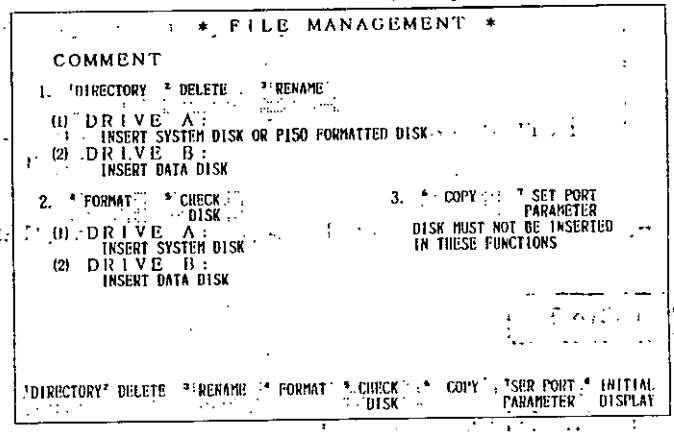


Fig. 5.2

NOTE

1. When ATTACH operation has already been completed, depress SUPER VISORY key and then depress (INITIAL DISPLAY) key, or depress SHIFT and SUPER VISORY keys simultaneously to return the operation menu display.
2. Depressing (INITIAL DISPLAY) key shown in Fig. 5.2 also calls up the operation menu display.

5. 1 P150 PORT PARAMETERS

(1) PORT PARAMETER SETTING

When the P150 serial port (RS-232C) is used, port parameters must be set in the port (1 or 2) to connect GL60S by the following steps.

1. Select port (1 or 2) to connect GL60S.
2. Set port parameters to the selected port.
3. Connect the GL60S to the port.

When the printer (PC-PR101F or PC-PR201F) is used, it is connected to parallel port (CENTRONICS) by only setting printer.

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.
- Parallel port has already been set before shipping to connect printer.

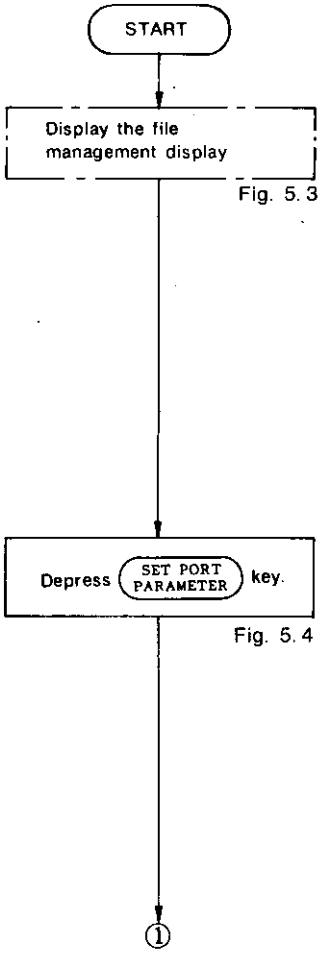


Fig. 5. 3

Fig. 5. 4

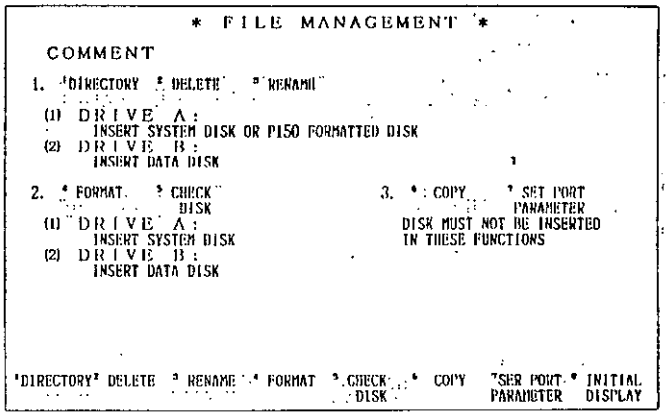


Fig. 5. 3

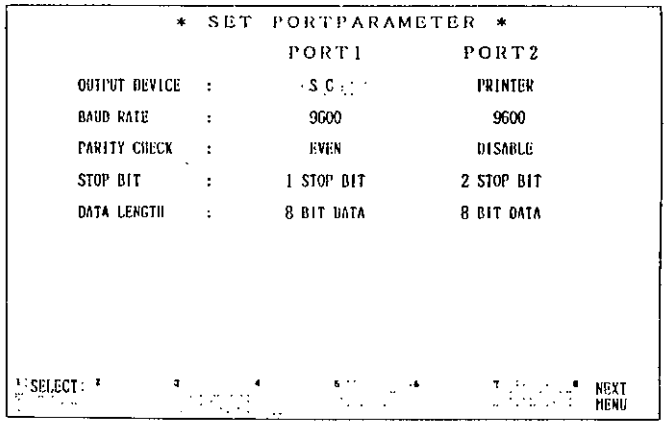
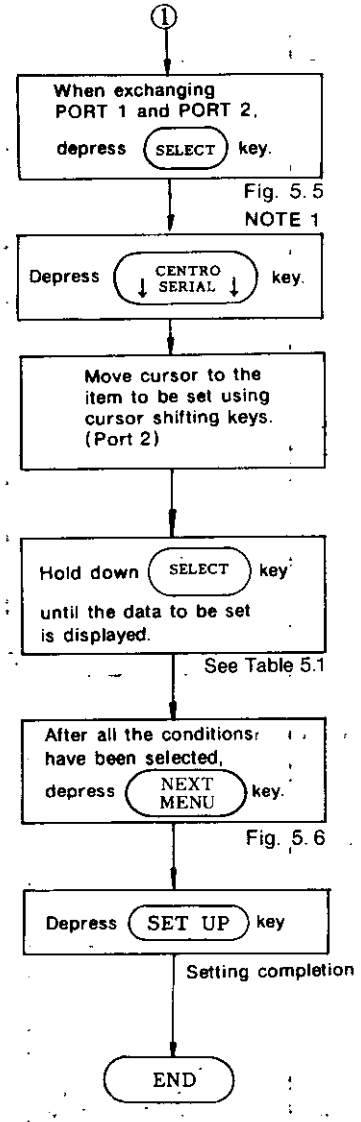


Fig. 5. 4


①
When exchanging PORT 1 and PORT 2,
depress SELECT key.
Fig. 5.5
NOTE 1
Depress CENTRO SERIAL key.
Move cursor to the item to be set using cursor shifting keys. (Port 2)
Hold down SELECT key until the data to be set is displayed.
See Table 5.1
After all the conditions have been selected,
depress NEXT MENU key.
Fig. 5.6
Depress SET UP key
Setting completion
END

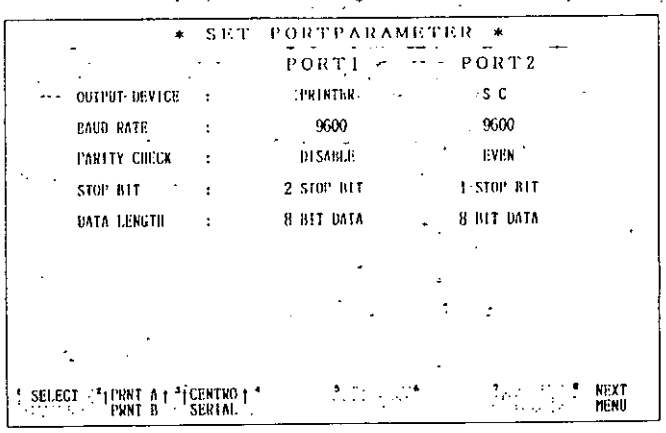

* SET PORTPARAMETER *
PORT1
PORT2
OUTPUT DEVICE : PRINTER S C
BAUD RATE : 9600 9600
PARITY CHECK : DISABLE EVEN
STOP BIT : 2 STOP BIT 1 STOP BIT
DATA LENGTH : 8 BIT DATA 8 BIT DATA
SELECT
PRNT A
PRNT B
CENTRO
SERIAL
NEXT MENU

Fig. 5.5

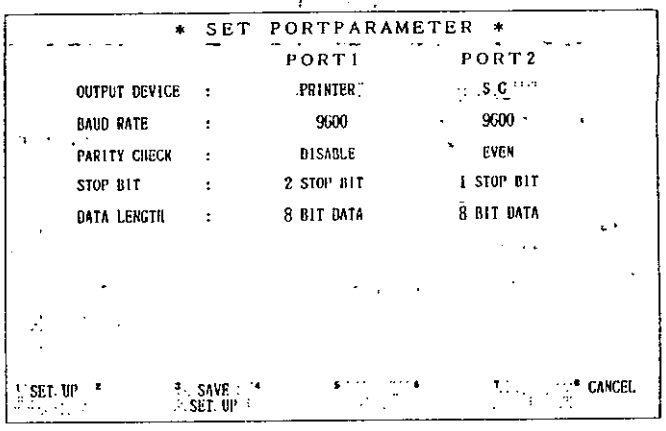

* SET PORTPARAMETER *
PORT1
PORT2
OUTPUT DEVICE : PRINTER S C
BAUD RATE : 9600 9600
PARITY CHECK : DISABLE EVEN
STOP BIT : 2 STOP BIT 1 STOP BIT
DATA LENGTH : 8 BIT DATA 8 BIT DATA
SET UP
SAVE SET UP
CANCEL

Fig. 5.6

NOTE

1. When [↑CENTRO↑ SERIAL] label has already been displayed, [↑CENTRO↑ SERIAL] key should not be depressed.

2. P150 has a communication parameter file in the system disk, the default values (initial values) shown in Fig. 5. 4. By copying all modifications of these initial values on the system disk, the need to alter the communication parameters at system starting is eliminated. Depress [SAVE SET UP] key instead of [SET UP] key (Fig. 5. 6) . After the display shown in Fig. 5. 7 appears, insert the system disk with writable state in drive A, and depress [CONFIRM] key.

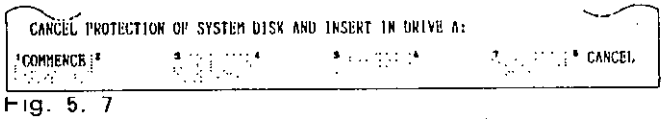


Fig. 5. 7

INPORTANT

Be sure to make the system disk to the write disable state after executing [SAVE SET UP] key.

Table 5. 1 Change of Setting Value at [SELECT] key Depression

Item	Setting Value
OUTPUT DEVICE	→SC→PRINTER→
BAUD RATE	→75→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→

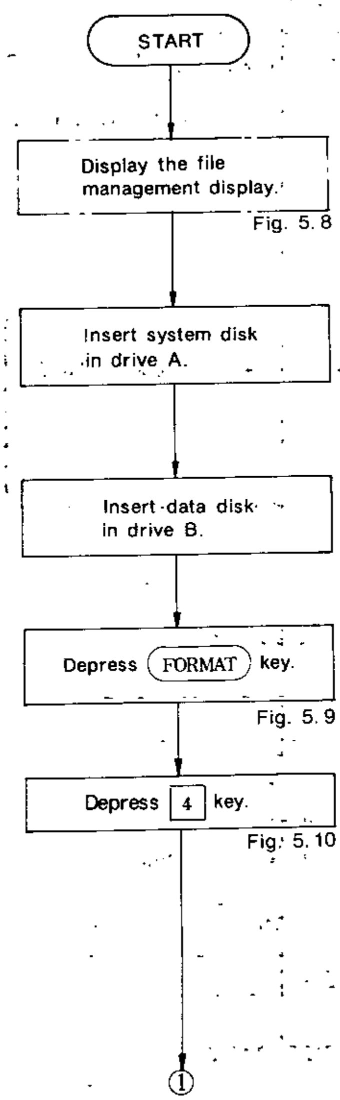
5.2 DISK OPERATION

(1) DISK FORMATTING

The disks are formatted by this procedure. Through this operation disks become usable with P150.

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.




```
* FILE MANAGEMENT *
COMMENT
1. *DIRECTORY * DELETE * RENAME
  (1) DRIVE A:
      INSERT SYSTEM DISK OR P150 FORMATTED DISK
  (2) DRIVE B:
      INSERT DATA DISK
2. * FORMAT  * CHECK            3. * COPY   * SET PORT
               DISK                          PARAMETER
  (1) DRIVE A:                     DISK MUST NOT BE INSERTED
      INSERT SYSTEM DISK           IN THESE FUNCTIONS
  (2) DRIVE B:
      INSERT DATA DISK

*DIRECTORY* DELETE * RENAME * FORMAT * CHECK * COPY *SET PORT * INITIAL
                                       DISK         PARAMETER   DISPLAY
```

Fig. 5.8

```
* FORMAT *
Select media type
 320kb type ····· 1
 360kb type ····· 2
 640kb type ····· 3
 720kb type ····· 4
```

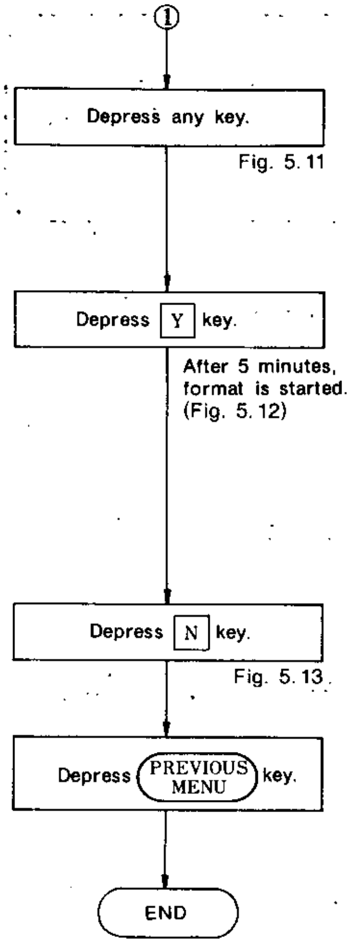
Fig. 5.9

POINT

- For media type, four types (320 to 720 k bytes) can be selected. Usually, select 720 k bytes type.

```
* FORMAT *
Select media type ?
 320kb type ····· 1
 360kb type ····· 2
 640kb type ····· 3
 720kb type ····· 4
4
Insert new diskette for drive B:
and strike any key when ready
```

Fig. 5.10




```
                         * FORMAT *
Select media type ?
 320kb type ····> 1
 360kb type ····> 2
 640kb type ····> 3
 720kb type ····> 4
4
Insert new diskette for drive B:
and strike any key when ready

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

Fig. 5.11

```
                         * FORMAT *
Select media type ?
 320kb type ····> 1
 360kb type ····> 2
 640kb type ····> 3
 720kb type ····> 4
4
Insert new diskette for drive B:
and strike any key when ready

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

Formatting · · ·
```

Fig. 5.12

```
                         * FORMAT *
Select media type ?
 320kb type ····> 1
 360kb type ····> 2
 640kb type ····> 3
 720kb type ····> 4
4
Insert new diskette for drive B:
and strike any key when ready

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

Formatting · · · System transferred

 730112 bytes total disk space
  61440 bytes used by system
 668672 bytes available on disk

Format another <Y/N>? n

                                                 PREVIOUS
                                                  MENU
```

Fig. 5.13

NOTE

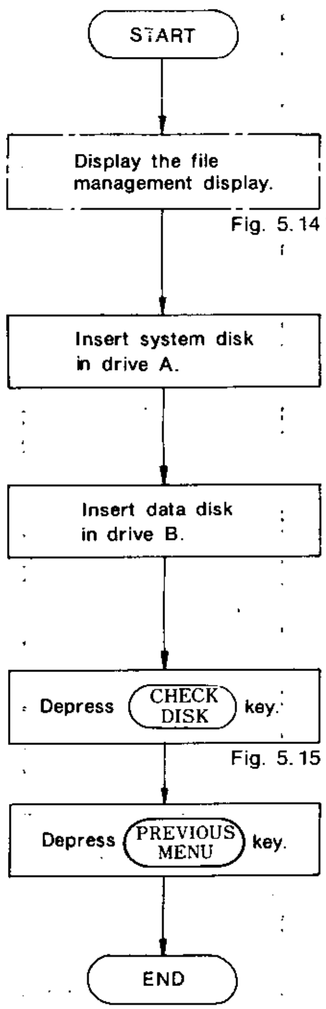
1. Depressing N key in the display of Fig. 5.11 displays PREVIOUS MENU label.
   Depressing END key calls up the display in Fig. 5.8.
2. The disk formatted by P150 contains a file "COMMAND · COM."
   This disk can be used in place of the system disk in the file operation.

IMPORTANT

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

(2) DISK CHECKING

This function is for checking inconsistant or incorrect disk usage and records. The use of this function is recommended to check the directory and the disk residual capacity.



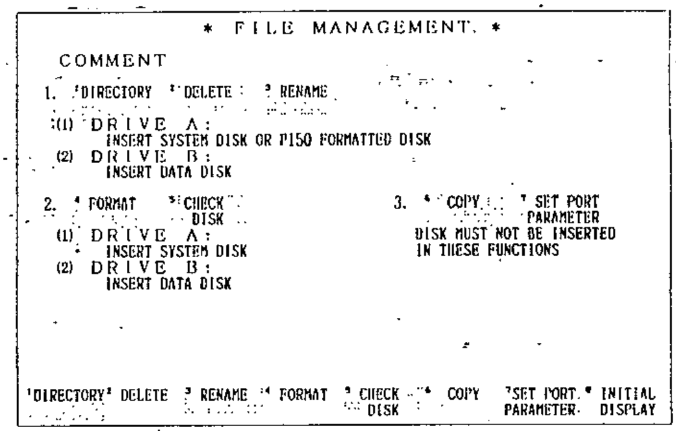


Fig. 5.14

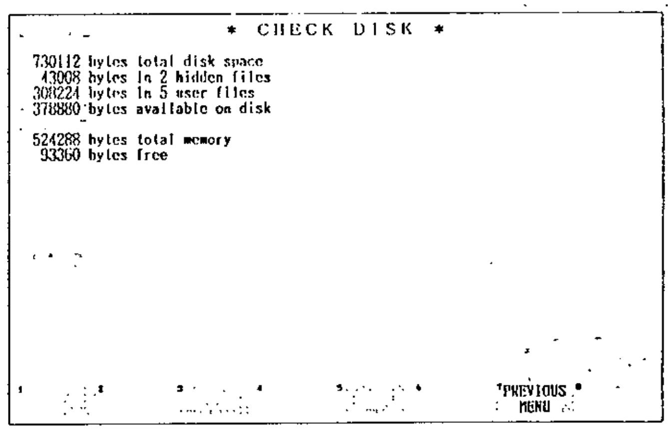
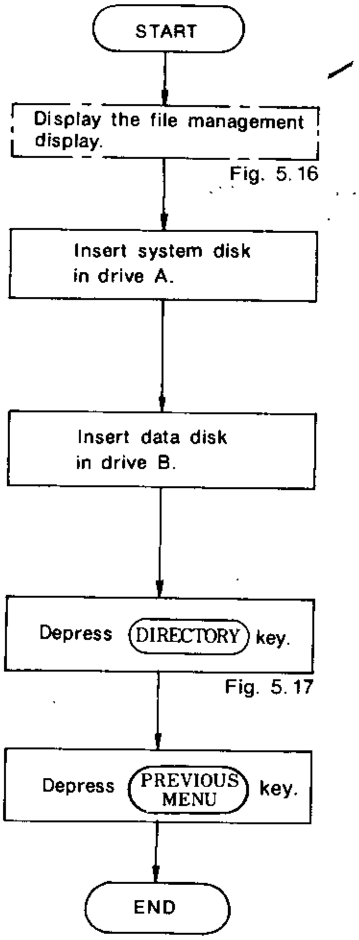


Fig. 5.15

5. 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.



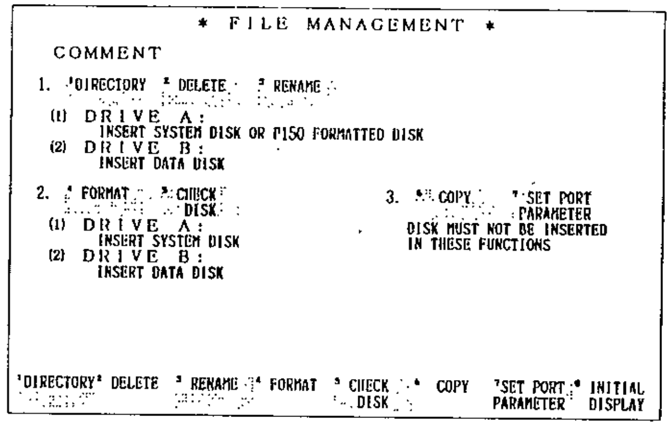


Fig. 5. 16

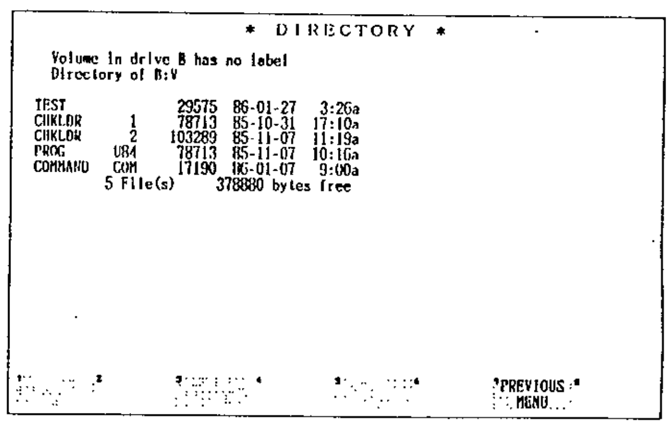


Fig. 5. 17

NOTE

1. In place of a system disk, a disk formatted by P 1 5 0 (containing "COMMAND. COM" file) can be used.
2. 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, P150 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

(2) FILE RENAMING

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.

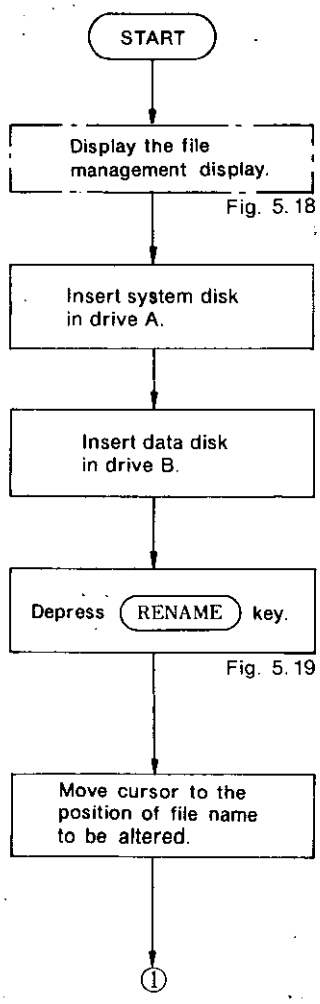


Fig. 5.18

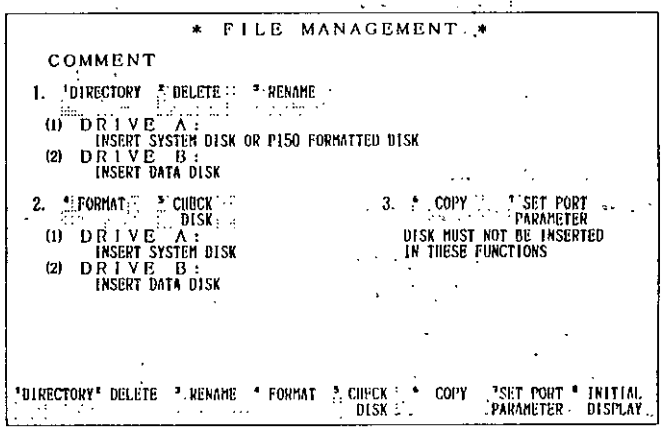


Fig. 5.18

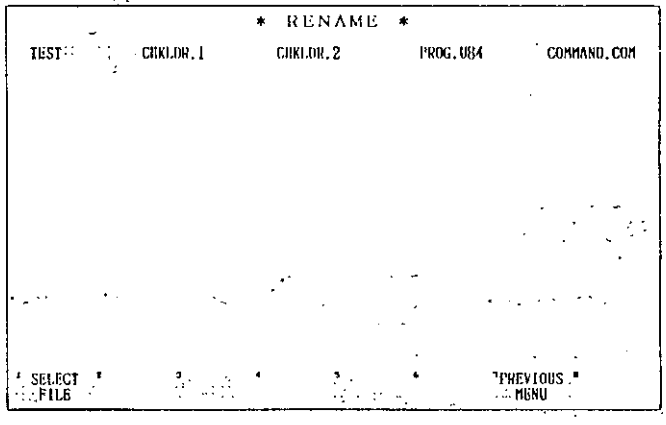
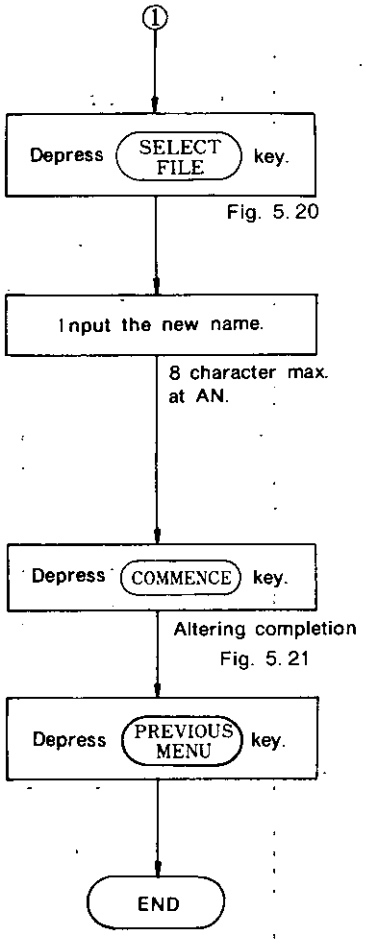


Fig. 5.19



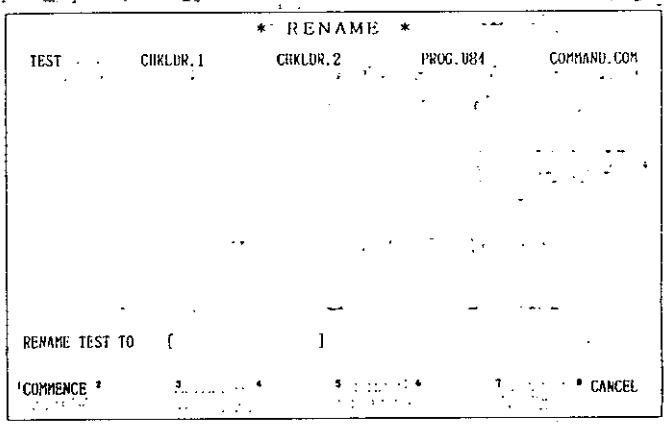


Fig. 5.20

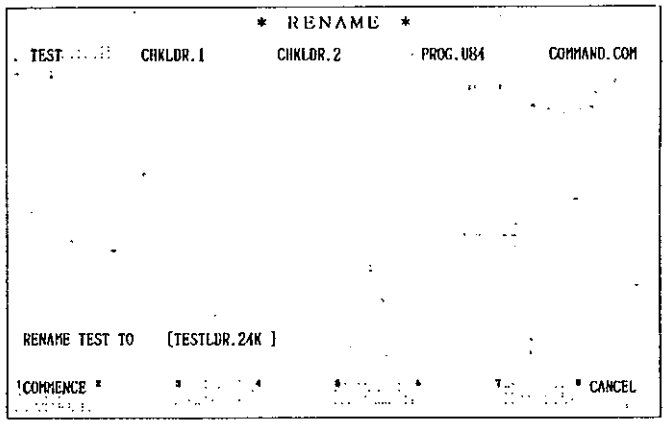


Fig. 5.21

NOTE

1. Depressing (CANCEL) key (in the display of Fig. 5.21) calls up the display in Fig. 5.19.
2. In place of the system disk, a disk formatted by P150 (containing "COMMAND. COM" file) can be used.

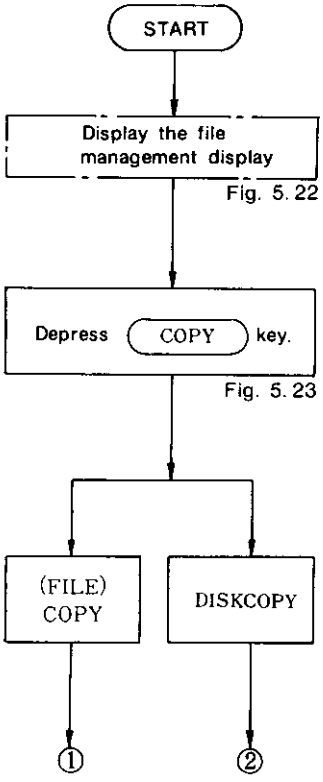
(3) FILE COPYING

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

Drive A ... Destination disk (accepting copy)
Drive B ... Source disk (original files)

POINT

Make the destination disk writable in advance.



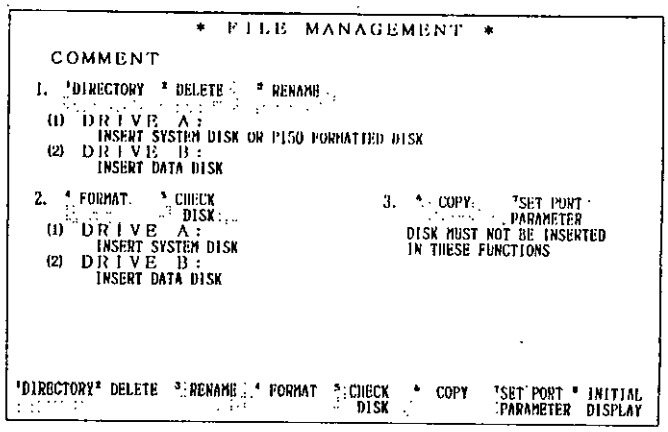


Fig. 5.22

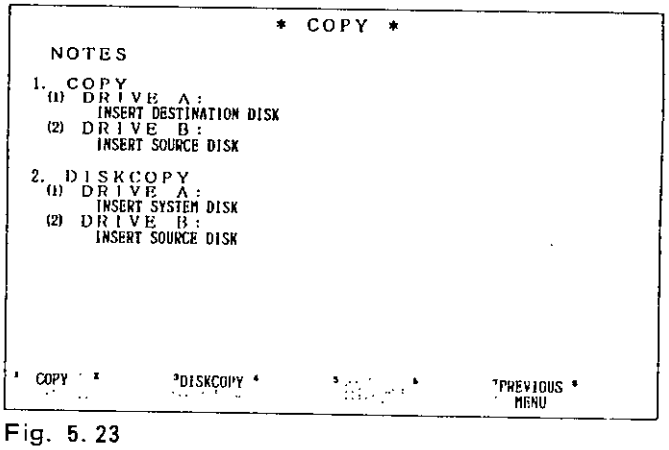


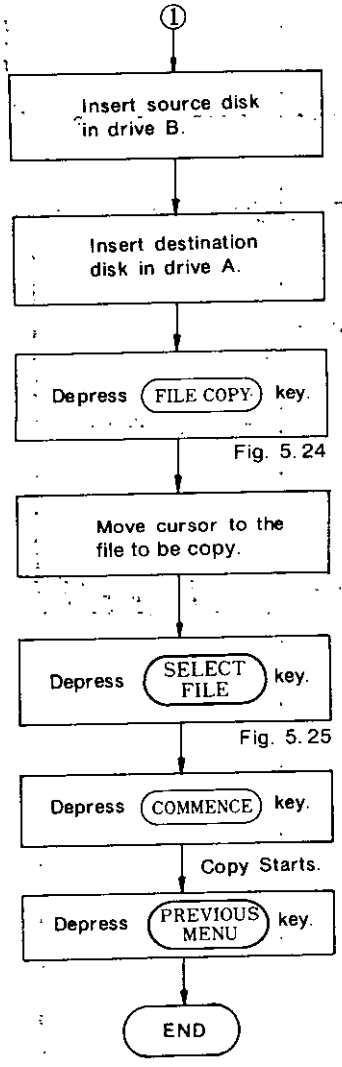
Fig. 5.23

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.

• FILE COPY

Copying the specified file contents from the disk in drive B to the disk in drive A.



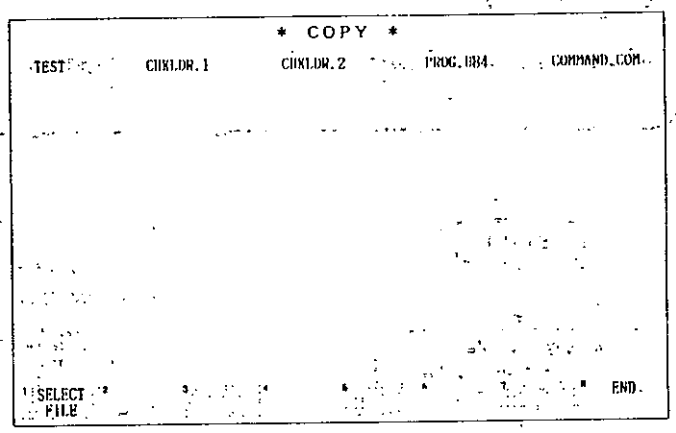


Fig. 5.24

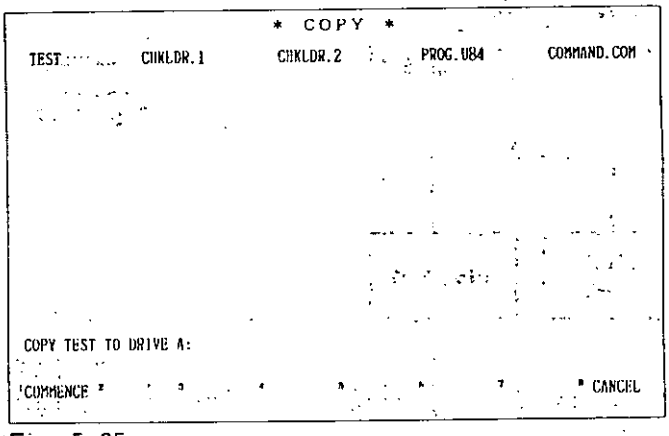


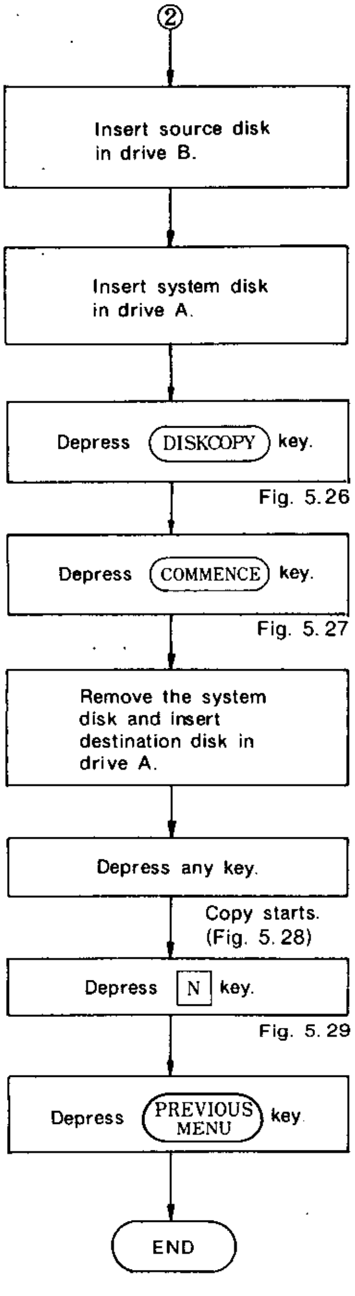
Fig. 5.25

NOTE

1. Make the destination disk writable in advance.
2. Depressing CANCEL key (Fig. 5.25) calls up the display in Fig. 5.23.

• DISK COPY

Copying the entire contents of the disk in drive B onto the disk in drive A.



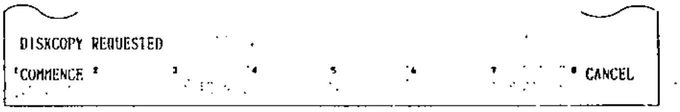


Fig. 5. 26

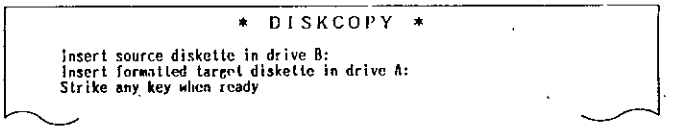


Fig. 5. 27

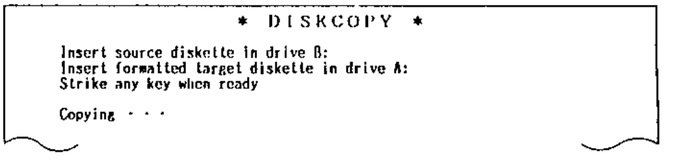


Fig. 5. 28

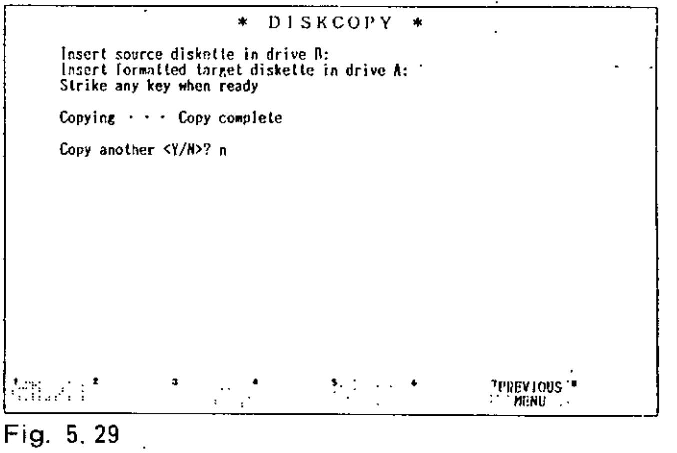


Fig. 5. 29

NOTE

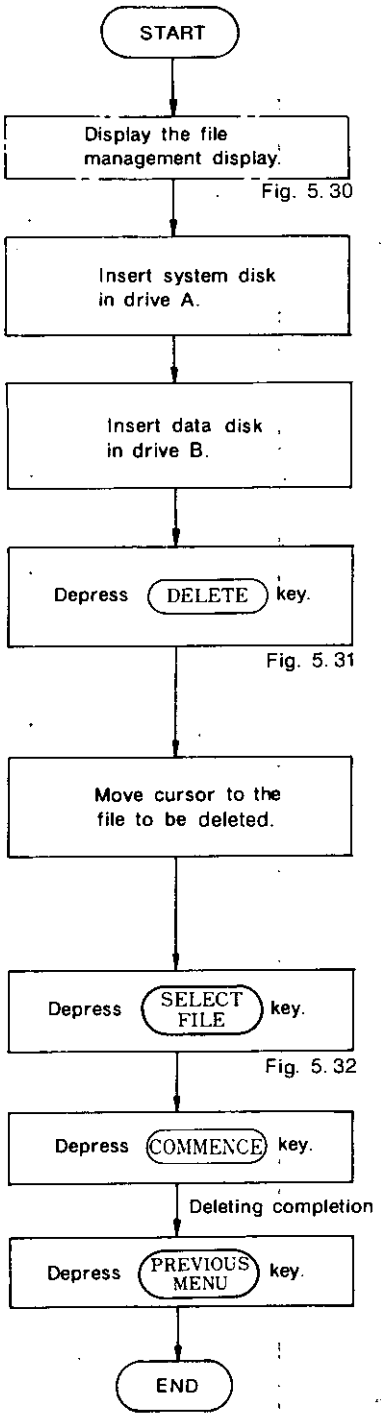
1. Make the destination disk writable in advance.
2. Depressing (CANCEL) key (Fig. 5. 26) calls up the display in Fig. 5. 23.
3. To copy other disks in Fig. 5. 29, first depress [Y] key, and then make the same operations as shown above.

(4) FILE DELETING

Deleting unnecessary files in the data disk.

POINT

Make the data disk writable in advance.



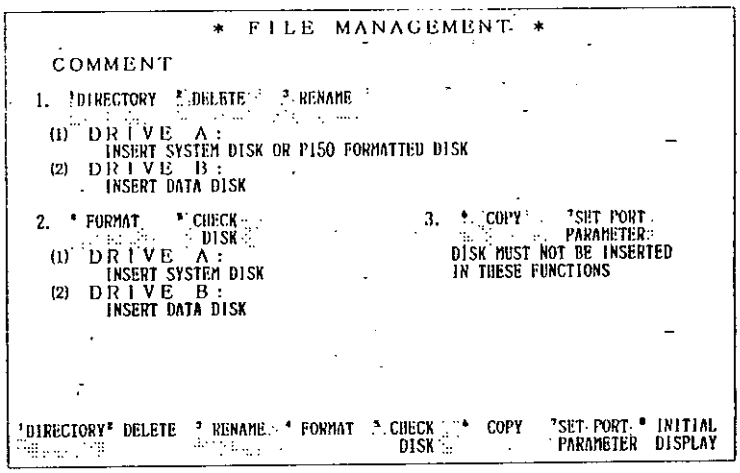


Fig. 5.30

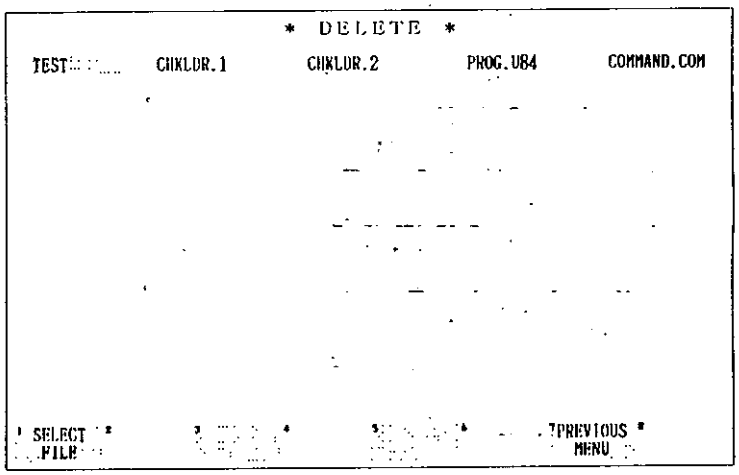


Fig. 5.31

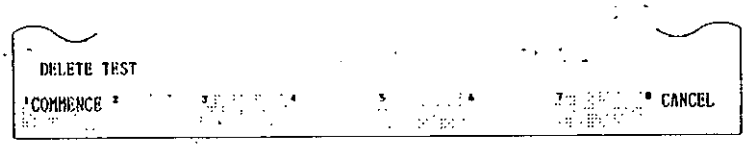


Fig. 5.32

NOTE

1. Depressing (CANCEL) key (Fig. 5.32) calls up the display in Fig. 5.31.
2. A disk formatted by P150 (containing "COMMAND. COM" file) can be used in place of the system disk.

IMPORTANT

Be sure to make disks important to write disable state.
Do not delete the file "COMMAND. COM" because this disk will lose the function for data disk.

5.4 DISPLAY PRINTING

Using a printer available on the market, connected to the parallel port* of P150, then depressing [SHIFT] and [PRINT / CHG NODE] keys simultaneously produces a hard copy of the display.

(a) Applicable printer

- PC-PR201 F (made by NEC Co., Ltd.)
- PC-PR101 F (made by NEC Co., Ltd.)

(b) Necessary equipment

The following items are required in addition to GL60S, P150, and the cable (JZMSZ-W1006) connecting them:

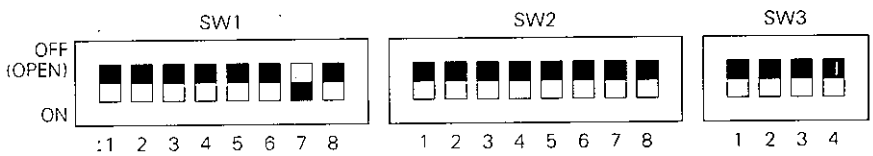
Name	Type	Q'ty	Remarks
Cable between P150 and printer	PC-8894	1	Delivered with printer
Printer	PC-PR201F PC-PR101F	1	Purchased from maker or agents.
Print Paper	10 × 11 inches	1 set	

Note: Cable and Printer above are made by NEC Co., Ltd.

(c) Transmission conditions setting

With DIP switches of PC-PR201F, or PC-PR101F, observe the following.

- Set SW 1-7 of print command on CR, LF, VT, FF, US, ESCa, ESCb.
- Set SW 3-2 of NHS pica/SHS pica on SHS pica made.



For using PC-PR201G, set memory switches as follows.
Other switches would be at the default values.

SW1-7 : ON SW3-2 : OFF

POINT

- Make this setting with P150 power ON/OFF switch turned off.

(d) Printer connection cable

The cable delivered with the printer should be used.

*Made by Centronics Data Computer Corp.

6. MESSAGES

6.1 OPERATION ERROR MESSAGES

Table 6.1 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 [CLR AR / CLR ERR] key.
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 [CLR AR / CLR ERR] key.
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 [CLR AR / CLR ERR] key.
COIL NOT ALLOWED HERE	A coil cannot be placed on the left side of another element.	Place the coil in the correct position.

Table 6.1 Error Messages for Operation (Cont'd)

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 NOT IN A NETWORK	The requested coil has not yet been used.	Depress [CLR AR / CLR ERR] key.
COIL USED	The requested coil has already been programmed.	Change the reference number of the coil.
COMPRESS NOT ALLOWED DUE TO LINE #8	Line compression was attempted when the cursor was on line 8 (line 8S or 8T) of the SFC screen.	Depress [CLR AR / CLR ERR] key.
COMPRESS NOT ALLOWED DUE TO COLUMN #8	Column compression was attempted when the cursor was in column 8 of the SFC screen.	Depress [CLR AR / CLRERR] key.
COMPRESS NOT ALLOWED DUE TO ROW #7	Horizontal compression was attempted when the cursor was on line 7 of the network screen.	Depress [CLR AR / CLR ERR] key.
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 [CLR AR / CLR ERR] key.
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 [CLR AR / CLR ERR] key.
END OF LOGIC MEMORY	[PREV GET NEXT] key was depressed when the last network was displayed on the screen.	Depress [CLR AR / CLR ERR] key.
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	Column expansion was attempted when the cursor was in column 8 on the SFC screen.	Depress [CLR AR / CLR ERR] key.
EXPAND NOT ALLOWED DUE TO LINE # 8	Line expansion was attempted when the cursor was on line 8 (line 8S or 8T) of the SFC screen.	Depress [CLR AR / CLR ERR] key.

Table 6.1 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 [CLR AR / CLR ERR] key.
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 [CLR AR / CLR ERR] key.
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 [CLR AR / CLR ERR] key.
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 [CLR AR / CLR ERR] key.

Table 6.1 Error Messages for Operation (Cont'd)

Error Message	Description	Action
INITIAL STEP USED	The initial step is already in use.	Depress CLR AR / CLR ERR key.
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 CLR AR / CLR ERR key.
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 CLR AR / CLR ERR key.
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 CLR AR / CLR ERR key.
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 CLR AR / CLR ERR key.
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 CLR AR / CLR ERR key.

Table 6.1 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 [CLR AR / CLR ERR] key.
MOVE NOT ALLOWED DUE TO COLUMN # 8	Branches or loops cannot be moved to column 8 on the SFC screen.	Depress [CLR AR / CLR ERR] key.
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 [CLR AR / CLR ERR] key.
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 [CLR AR / CLR ERR] key.
NO ELEMENT AT CURSOR LINE	Copying a line is not allowed when no element is on the line where the cursor is positioned.	Depress [CLR AR / CLR ERR] key.
NO ELEMENT AT CURSOR	An operation such as deletion cannot be performed when there is no element at the cursor position.	Depress [CLR AR / CLR ERR] key.
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 [CLR AR / CLR ERR] key.
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 [CLR AR / CLR ERR] key.
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 [CLR AR / CLR ERR] key.
NO NETWORK IN THE CONTROLLER	[ERASE GET] or [PREV GET NEXT] key was depressed when no network was stored in ladder area of the GL60S.	Depress [CLR AR / CLR ERR] key.
NO NETWORK ON SCREEN	Deleting a network cannot be performed when no network is displayed.	Depress [CLR AR / CLR ERR] key.
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 [CLR AR / CLR ERR] key.
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.

Table 6.1 Error Messages for Operation (Cont'd)

Error Message	Description	Action
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 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 (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 CLR AR / CLR ERR key.
NOT ENOUGH ROOM TO COPY	There is not enough space for copying data.	Depress CLR AR / CLR ERR key.

Table 6.1 Error Messages for Operation (Cont'd)

Error Message	Description	Action
NOT ENOUGH ROOM TO EXPAND	There is not enough space for an expansion operation.	Depress [CLR AR / CLR ERR] key.
NOT ENOUGH ROOM TO MOVE	There is not enough space for moving an SFC.	Depress [CLR AR / CLR ERR] key.
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 performed in the monitor mode.	Select the program mode.
NOT SAVED FILE	The specified file was not saved by the loader.	Depress [CLR AR / CLR ERR] key.
ONLY DECIMAL OR HEXADEDIMAL CHARACTERS ALLOWED IN AR	A character other than 0 to 9, A to F, S, T or R was set to AR.	Depress [CLR AR / CLR ERR] key.
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 parameters, 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 attemoted 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 [CLR AR / CLR ERR] key.
SEARCH FAILED	The searched parameter is not found.	Depress [CLR AR / CLR ERR] key.
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 [CLR AR / CLR ERR] key.
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.
SPECIFY POINTS OR SIZE PARAMETER	In allocation, (PREVIOVS MENU) was depressed 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.

Table 6.1 Error Messages for Operation (Cont'd)

Error Message	Description	Action
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	[SHIFT] and [PREV GET NEXT] keys were depressed when the first network was displayed.	Depress [CLR AR / CLR ERR] key.
STEP ACTIVE	On the SFC screen, attempt to delete or move an active step was made.	Depress [CLR AR / CLR ERR] key.
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 [CLR AR / CLR ERR] key.
STEP USED	The specified step number is already in use.	Specify another step number.
TIMEOUT ERROR-PRINTER	Communication time ran out when date was being output to a printer.	Depress [CLR AR / CLR ERR] key.
TRACE STACK EMPTY	Retracing was performed when the status display for TRACE was "NONE".	Depress [CLR AR / CLR ERR] key.
TRANSITION NOT USED	When the transition condition had not been stored, a zoom return from the transition circuit was attempted.	Depress [CLR AR / CLR ERR] key.
TRANSITION USED	The specified transition condition number is alerady in use.	Change the transition condition number.
VERTICAL NOT ALLOWED IN THIS ROW	A vertical shunt cannot be stored on line 7.	Depress [CLR AR / CLR ERR] key.

6. 2 MESSAGE ERROR

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	
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	

6.3 SYSTEM ERROR MESSAGE

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 P150. (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 P150 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 P150 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 P150 does not receive a response after transmitting a signal to the GL60S.	Check the parameters (P150 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 P150 received a response from the GL60S that an error was found in the received data.	Retry the operation from the first step.

P150 PROGRAMMING PANEL
DESCRIPTIVE INFORMATION

TOKYO OFFICE
New Pier Takeshiba South Tower, 1-16-1, Kaigan, Minatoku, Tokyo 105-6891 Japan
Phone 81-3-5402-4511 Fax 81-3-5402-4580

YASKAWA ELECTRIC AMERICA, INC.
2121 Norman Drive South, Waukegan, IL 60085, U.S A.
Phone 1-847-887-7000 Fax 1-847-887-7370

MOTOMAN INC. HEADQUARTERS
805 Liberty Lane West Carrollton, OH 45449, U.S.A.
Phone 1-937-847-6200 Fax 1-937-847-6277

YASKAWA ELÉTRICO DO BRASIL COMÉRCIO LTDA.
Avenida Fagundes Filho, 620 Bairro Saude-Sao Päulo-SP, Brazil CEP: 04304-000
Phone 55-11-5071-2552 Fax 55-11-5581-8795

YASKAWA ELECTRIC EUROPE GmbH
Am Kronberger Hang 2, 65824 Schwalbach, Germany
Phone 49-6196-569-300 Fax 49-6196-888-301

Motoman Robotics AB
Box 504 S38525 Torsås, Sweden
Phone 46-486-48800 Fax 46-486-41410

Motoman Robotec GmbH
Kammerfeldstraße 1, 85391 Allershausen, Germany
Phone 49-8166-900 Fax 49-8166-9039

YASKAWA ELECTRIC UK LTD.
1 Hunt Hill Orchardton Woods Cumbernauld, G68 9LF, United Kingdom
Phone 44-1236-735000 Fax 44-1236-458182

YASKAWA ELECTRIC KOREA CORPORATION
Kfpa Bldg #1201, 35-4 Youido-dong, Yeongdungpo-Ku, Seoul 150-010, Korea
Phone 82-2-784-7844 Fax 82-2-784-8495

YASKAWA ELECTRIC (SINGAPORE) PTE. LTD.
151 Lorong Chuan, #04-01, New Tech Park Singapore 556741, Singapore
Phone 65-282-3003 Fax 65-289-3003

YATEC ENGINEERING CORPORATION
Shen Hsiang Tang Sung Chiang Building 10F 146 Sung Chiang Road, Taipei, Taiwan
Phone 886-2-2563-0010 Fax 886-2-2567-4677

BEIJING OFFICE
Room No. 301 Office Building of Beijing International Club, 21
Jianguomenwai Avenue, Beijing 100020, China
Phone 86-10-6532-1850 Fax 86-10-6532-1851

SHANGHAI OFFICE
27 Hui He Road Shanghai 200437 China
Phone 86-21-6553-6600 Fax 86-21-6531-4242

YASKAWA JASON (HK) COMPANY LIMITED
Rm. 2909-10, Hong Kong Plaza, 186-191 Connaught Road West, Hong Kong
Phone 852-2803-2385 Fax 852-2547-5773

TAIPEI OFFICE
Shen Hsiang Tang Sung Chiang Building 10F 146 Sung Chiang Road, Taipei, Taiwan
Phone 886-2-2563-0010 Fax 886-2-2567-4677

SHANGHAI YASKAWA-TONGJI M & E CO., LTD.
27 Hui He Road Shanghai China 200437
Phone 86-21-6531-4242 Fax 86-21-6553-6060

BEIJING YASKAWA BEIKE AUTOMATION ENGINEERING CO., LTD.
30 Xue Yuan Road, Haidian, Beijing P.R. China Post Code: 100083
Phone 86-10-6233-2782 Fax 86-10-6232-1536

SHOUGANG MOTOMAN ROBOT CO., LTD.
7, Yongchang-North Street, Beijing Economic Technological Investment & Development Area,
Beijing 100076, P.R. China
Phone 86-10-6788-0551 Fax 86-10-6788-2878

YASKAWA ELECTRIC CORPORATION

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