YASKAWA ELECTRIC

SIE-C815-12.5C
DESCRIPTIVE INFORMATION

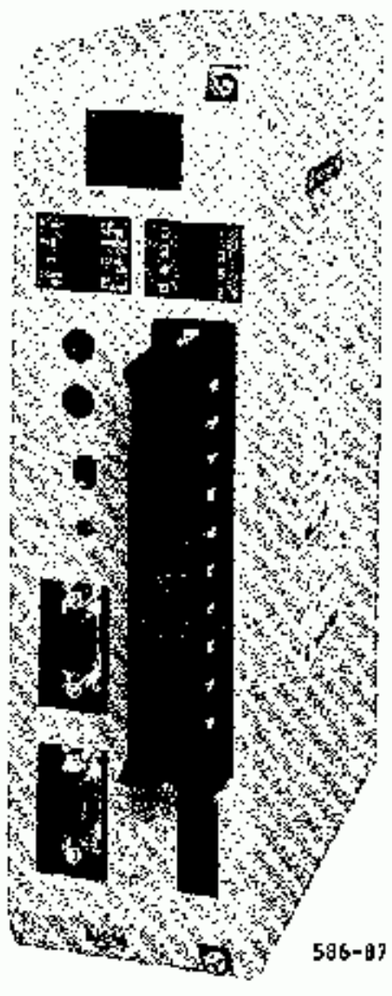
I/O COMMUNICATION SYSTEM FOR *Memocon*™-SC

MEMOLINK™

MASTER MODULE TYPE JAMSC-B1084
SLAVE MODULE TYPE JAMSC-B1085
I/O SLAVE MODULE TYPE DISCT-J2040

USER'S MANUAL

This manual describes MEMOLINK specifications, programming, and external wiring needed to design MEMOLINK (I/O communication) system among Programmable Controller Memocon-SCs (PCs).



Master Module
Type JAMSC-B1084

Slave Module
Type JAMSC-B1085

I/O Slave Module
Type DISCT-J2040

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1. INTRODUCTION

The MEMOLINK system provides I/O data communications among Programmable Controller Memocon-SCs (PCs). As a result, it reduces wiring and simplifies building of a distributed control system.

The system requires a master module (JAMSC-B1084), slave modules (JAMSC-B1085) and an I/O slave module (DISCT-J2040). Mutual connection among PCs* is possible by using B1084 and B1085 via optical fiber cables.

The PC mounted with the master module is called the master PC and the PC mounted with the slave module is called the slave PC. The master PC and master module together are called the master station, and the slave PC and slave module together are called the slave station.

Both the master and slave modules are I/O modules, and several MEMOLINK networks can be built to the extent that the I/O space permits.

Remote I/O is possible by using B1084 and J2040. J2040 is a slave of the MEMOLINK and can be used in any station of the 31 slave stations. The 2000 Series I/O† is used as an I/O module.

* Memocon-SC R84 not included.
† Only discrete, register and analog modules available.

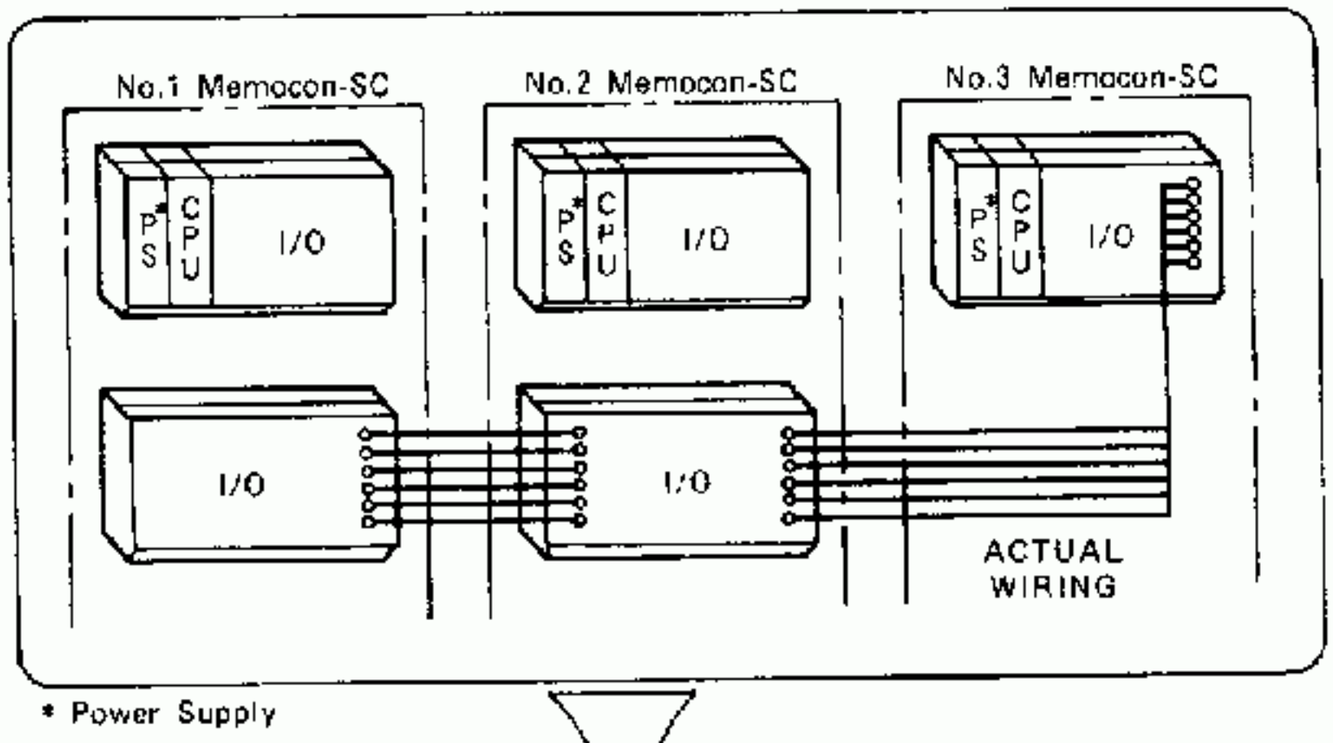


Fig. 1.1 Convensional Mutual Connection among Memocon-SCs (PCs)

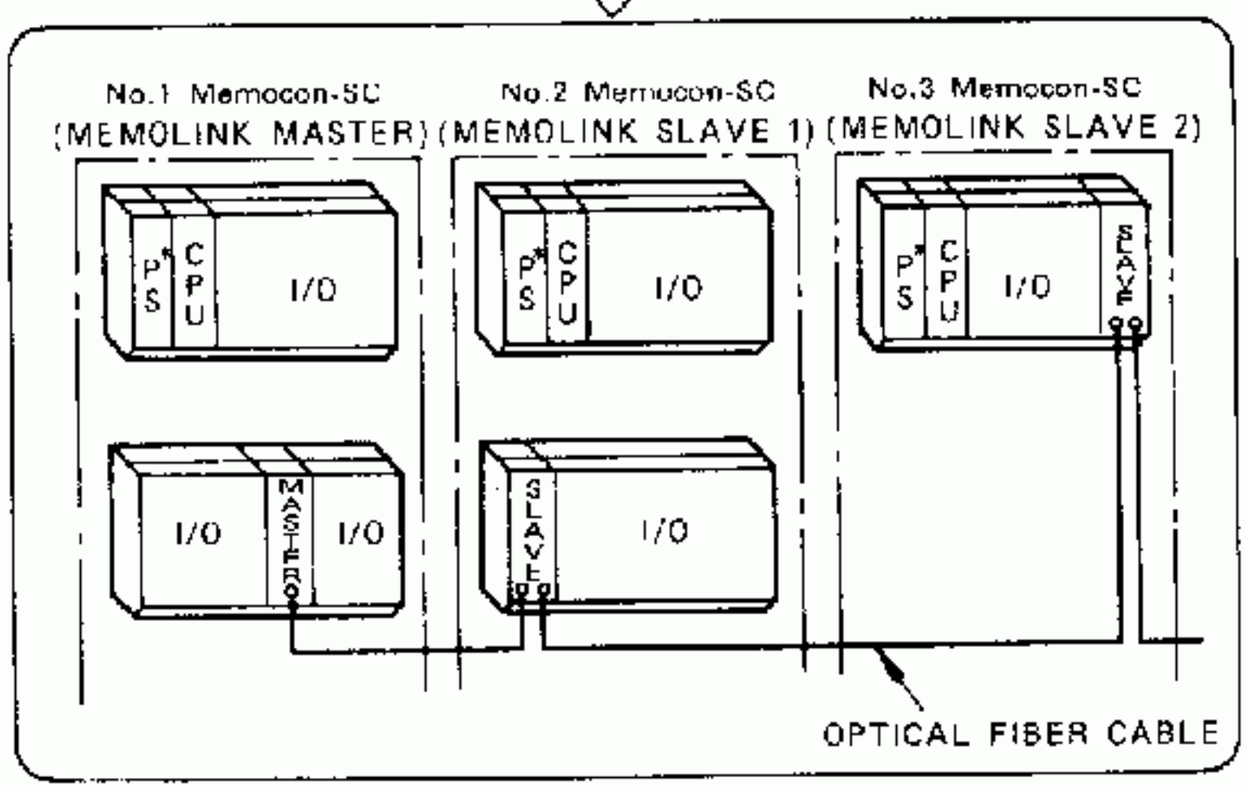


Fig. 1.2 MEMOLINK System

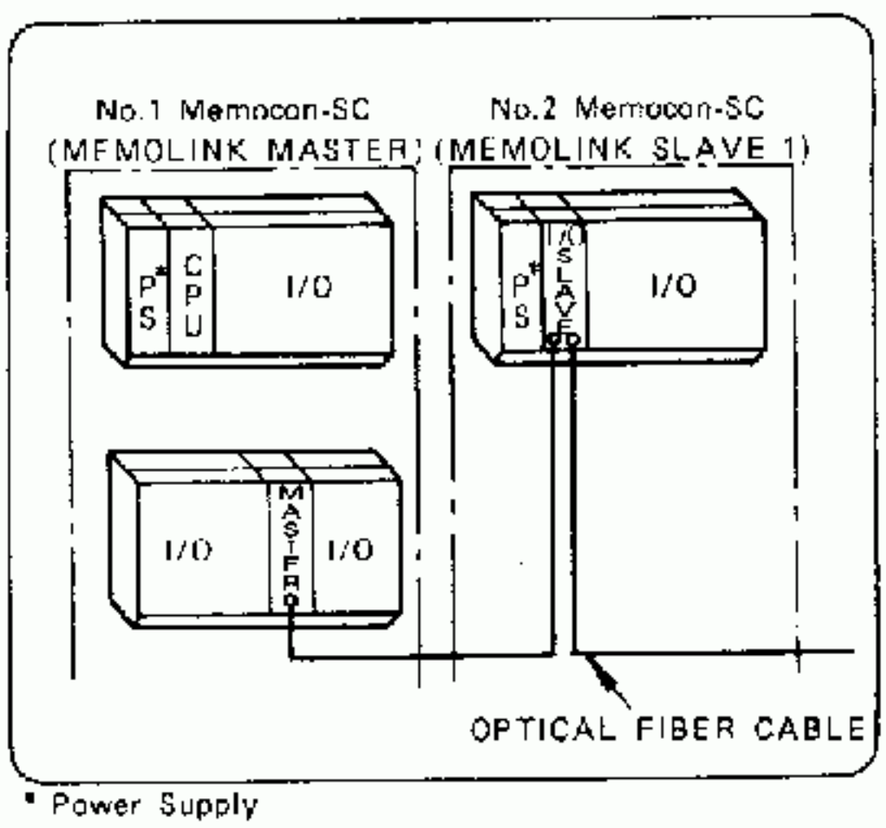


Fig. 1.3 Remote I/O

2. SPECIFICATIONS

2.1 PEFORMANCE SPECIFICATIONS

Table 2.1 Performance Specifications

Item	Specifications
Data Rate	1 Mbps
Communication Mode	Half duplex, bit serial
Synchronization	Bit synchronization
Transmission Control	Multi-point polling method
Cable Length	1 km max between stations
No. of Stations	32 max (1 master station, 31 slave stations)
Code	CMI
Frame Format	Complying with HDLC
Error Detection	CCITT-CRC (generator polynominal $X^6 + X^{12} + X^5 + 1$) Time-out
Fail-safe Function	Self-detaching on self-diagnostic error
Optical Fiber Connector	DC9007 (HITACHI, Ltd.), bi-directional
Optical Fiber	CA9003 Type SI compound glass, two-core Core diameter: 200 μm Clad diameter: 250 μm (See Table 8.1)
Transmission Loss of Optical Fiber Cable	24 dB/km max (λ = 0.85 μm) (See Table 8.1.)
Transmitted Level	−17 dB m to −11 dB m (peak value)
Received Level	−32 dB m to 11 dB m (peak value)
Operating Temperature	0 to 55℃
Storage Temperature	−20 to +75 ℃
Humidity	5 to 95% RH (no-condensing)
Vibration	Complying with JIS C0911
Shock Resistance	Complying with JIS C0912 (10 G applied 3 times in each direction of X, Y, Z)
Ambient Condition	No inflammable or corrosive gases or no excessive dust

2.2 NUMBER OF LINKS

2.2.1 Data Exchange with PCs

MEMOLINK modules are PC I/O modules. PCs exchange discrete and register data in accordance with I/O allocation of the PCs. I/O allocations to the module equipment positions are allocations of link data to the PC side. By allocating I/O points for links, the number of I/O points is reduced correspondingly.

Table 2.2 No. of Data to be Exchanged with PC

Master Module	Discrete Input (DI)	256 points max (allocated in increments of 8 points)
	Discrete Output (DO)	256 points max (allocated in increments of 8 points)
	Register Input (RI)	16 sets max (allocated in increments of 1 reg)
	Register Output (RO)	16 sets max (allocated in increments of 1 reg)
Slave Module	Discrete Input (DI)	128 points max (allocated in increments of 8 points)
	Discrete Output (DO)	128 points max (allocated in increments of 8 points)
	Register Input (RI)	8 sets max (allocated in increments of 1 reg)
	Register Output (RO)	8 sets max (allocated in increments of 1 reg)

Note: When viewed from the PC, input and output data terminate/originate at the PC. One set of registers has 16 bits.

2.2.2 Link Data

The maximum number of I/O data occurs when I/O data allocated to the different modules (mentioned earlier) are distributed to all stations as link data.

(1) Discrete data
256 + 128 × 31 = 4224 points
(2) Register data
16 + 8 × 31 = 264 registers

Note: Allocation of maximum I/O points and maximum link data as mentioned above is possible.

3. HARDWARE CONFIGURATION AND OPERATION

Tables 3.1, 3.2 and 3.3 list the components comprising the MEMOLINK system. Select the necessary components in accordance with your PC system.

3.1 LIST OF COMPONENTS

Where buiding a standard MEMOLINK system with B1084 and B1085, refer to Table 3.1. For a remote I/O system using J2040, refer to Table 3.2.

Table 3.1 List of PC System Components

Type	Application
JAMSC-B1084	MEMOLINK master module
JAMSC-B1085	MEMOLINK slave module
JAMSI-B1036	I/O mounting base for U84S CPU
JARMSI-B1037	I/O mounting base for U84S CPU (ASCII applicable)
JRMSI-B1033	Local I/O mounting base for U84S
JRMSI-B1027	Expansion mounting base
JRMSI-B1028	Expansion mounting base (for auxiliary power)
JRMSI-B1034	Remote I/O mounting base
JRMSI-B1026	I/O mounting base for R84H CPU
JRMSP-P8101	Main power supply module for U84
JRMSP-P8052	Auxiliary power supply module
JRMSP-P8051	Main power supply module for R84H (power supply module for remote I/O)
JRMSP-P8054	Auxiliary power supply module
JRMSP-P8601	Main power supply module for U84S

Table 3.2 List of Remote I/O Components

Type	Application
DISCT-J2040	MEMOLINK I/O slave moduic
JRMSI-MB20	I/O mounting base
JRMSP-PS21	Power supply module
JAMSC-B2×××	2000 Series I/O module (discrete, register, analog)

Table 3.3 List of Peripheral Units

Type	Application
DISCT-P190	Programming panel
DISCT-P150	Programming panel
T190-S002	MEMOLINK programmer tape for P190
T190-000	Blank tape for P190
F150-002	MEMOLINK programmer floppy for P150
F150-000	Blank disc for P150
JZMSZ-W1015	Communication cable for programming panel (for P190)
JZMSZ-W1015-T1	Communication cable for programming panel (for P150)

3.2 SYSTEM CONFIGURATION

Fig. 3.1 shows an example of the MEMOLINK system configuration.

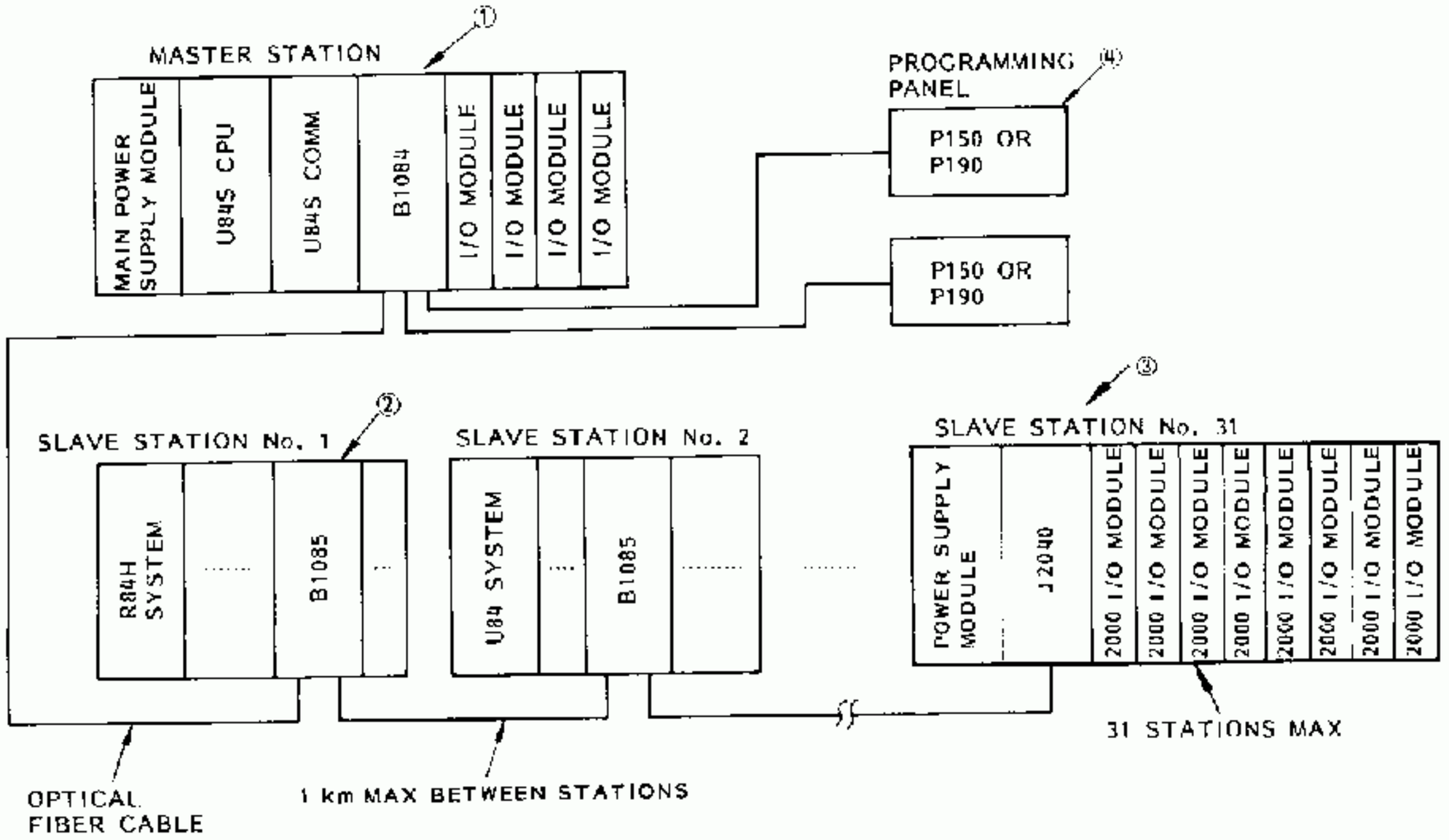


Fig. 3.1 An Example of System Configuration

① B1084 is mounted on the mounting base of 1000 Series I/O.
② B1085 is mounted on the mounting base of 1000 Series I/O.
③ J2040 is mounted on the mounting base (MB20) of 2000 Series I/O.
④ The Programming Panel P150 or P190 offers monitoring, disable and I/O allocation of the data in any station. The panel is connected to the B1084 MEMOBUS communication port using specified cable.

3.3 MASTER MODULE (JAMSC-B1084)

This module is used as a master module of the MEMOLINK. The PC with a master module is called a master PC. A combination of a master PC and master module is called a master station.

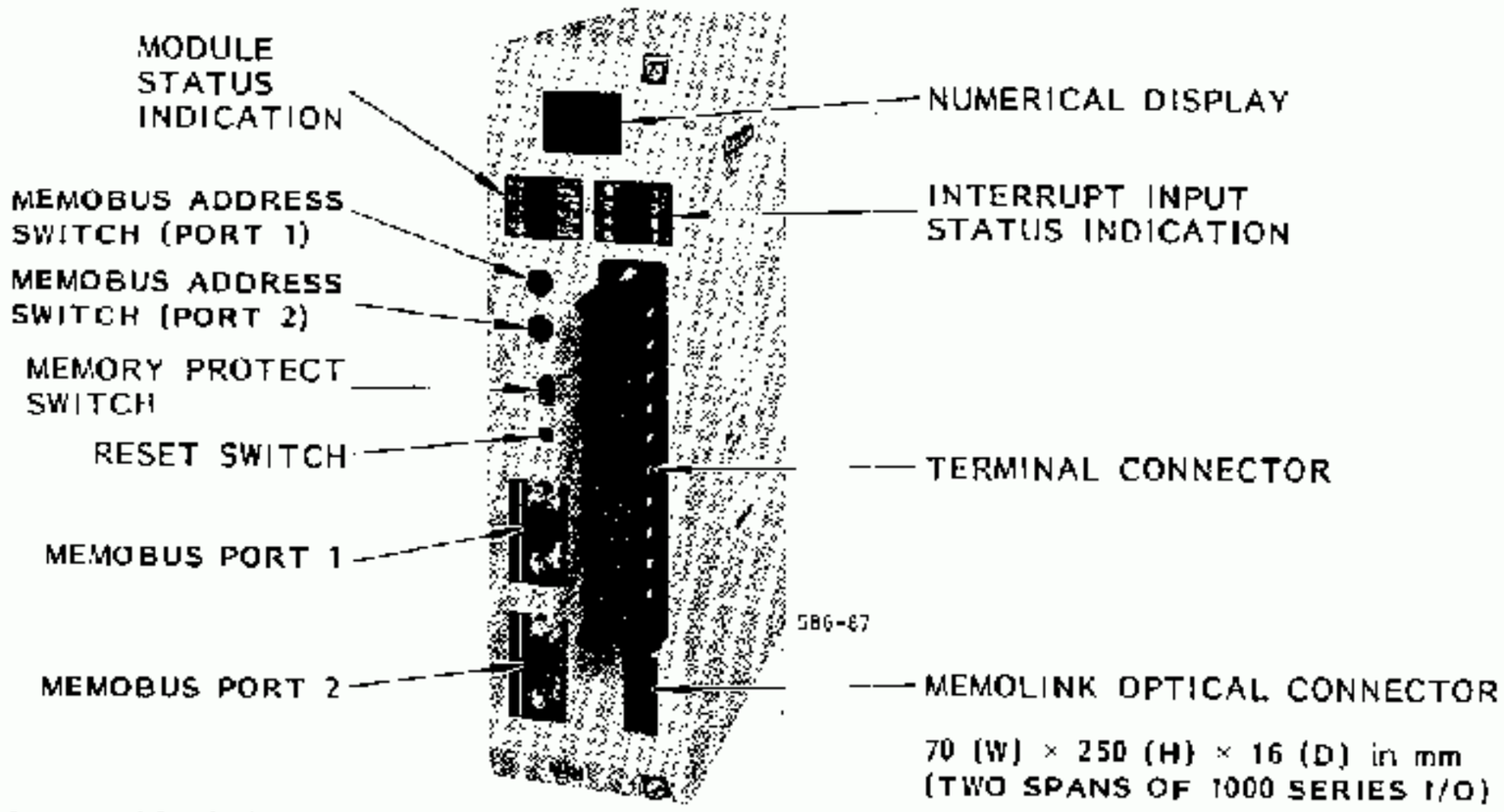


Fig. 3.2 Master Module
Type JAMSC-B1084

3.3.1 Numerical Display

Two-digit numerical display is offered.

Fig. 3.3 Two-digit Numerical Display

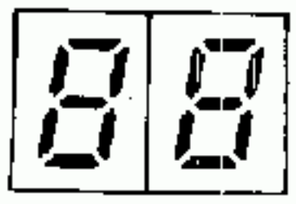


Table 3.4 lists the meaning of numerical displays. The module status indication LED blinks simultaneously with the code indication.

Table 3.4 Numerical Display

Display	Meaning
00 (00)	Normal
01 (01) to 31 (31)	Indicates the slave station address in communication error. The smallest number is shown if multiple communication errors.
E1 (E1)	System ROM error
E2 (E2) to E4 (E4)	System RAM error
E5 (E5)	MEMOBUS port parameter error
E6 (E6)	MEMOLINK allocation data and/or disable data error
E7 (E7)	WDT (Watchdog timer) error
E8 (E8)	MEMOLINK communication ROM error
E9 (E9)	MEMOLINK communication RAM error

Note: MEMOBUS port parameter error display is shown alternately with the previous display every 0.5 second.
(E5 ⟷ [illegible])

3.3.2 Module Status Display

The LED blinks to indicate the module operation status.

Fig. 3.4 Module Status Display

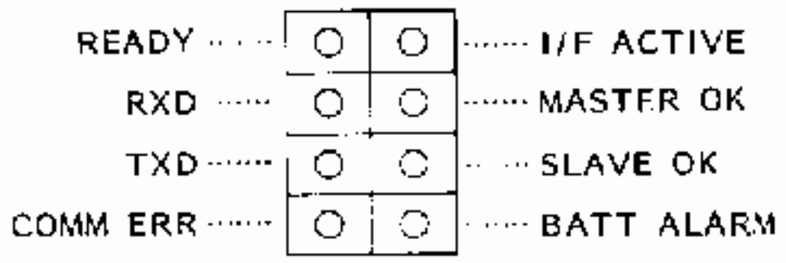


Table 3.5 Module Status Display

Status	Indication	Color
READY	Normal in self diagnosis	Green
RXD	Master module receives MEMOLINK data.	Green
TXD	Master module transmits MEMOLINK data.	Green
COMM ERR	Error in MEMOLINK communication. Turned off when MEMOLINK communication is stopped by programming panel.	Red
I/F ACTIVE	Data exchanged with PC	Green
MASTER OK	Almost the same with I/F ACTIVE	Green
SLAVE OK	Normal communication with allocated slaves.	Green
BATT ALARM	Battery voltage reduced	Red

3.3.3 Interrupt Input

The status of input signals at eight points which are input directly from the external devices are shown.

If the interrupt inputs changes, the master module preferentially transmits this information to all the slaves at the same time. Therefore, these interrupt inputs will be useful if there is a common interlock signal that requires urgent action.

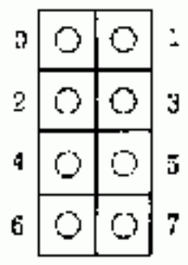


Fig. 3.5 Interrupt Input Status Display

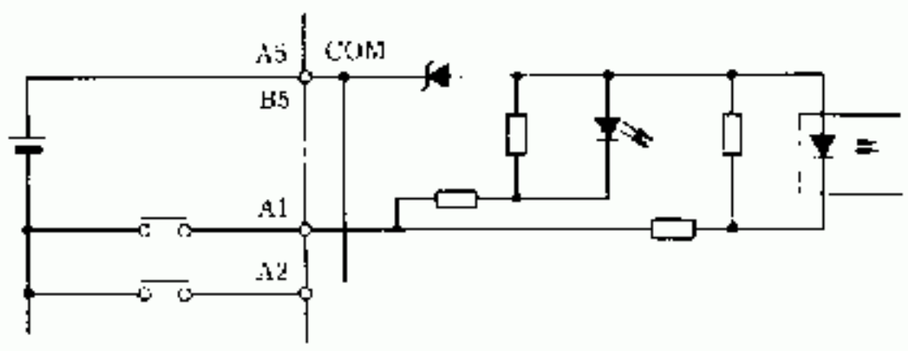


Fig. 3.6 Input Circuit

Table 3.6 Electrical Specifications of Interrupt Input

Item	Specifications
No. of Circuits	8
Rated Voltage	24 V DC (19 to 29 V)
Input Current	Approx. 10 mA (at 24 V)
Operating Voltage	ON level: 11 V or more (across common and input terminals) OFF level: 8 V or less (across common and input terminals)
Response Time	OFF→ON: 10 ms max ON→OFF: 10 ms max
Input Indication	LED (red) ON at Input ON
Isolation	Optical coupler
Dielectric Strength	1500 VAC for a minute
Supply Current at 24 V (Bias Current)	All input points OFF: 1 mA max All input points ON: 100 mA max

3.3.4 Terminal Connector

Fig. 3.7 shows terminal connections of the master module. Refer to Pars. 3.3.3 and 3.3.5 for input and output, respectively.

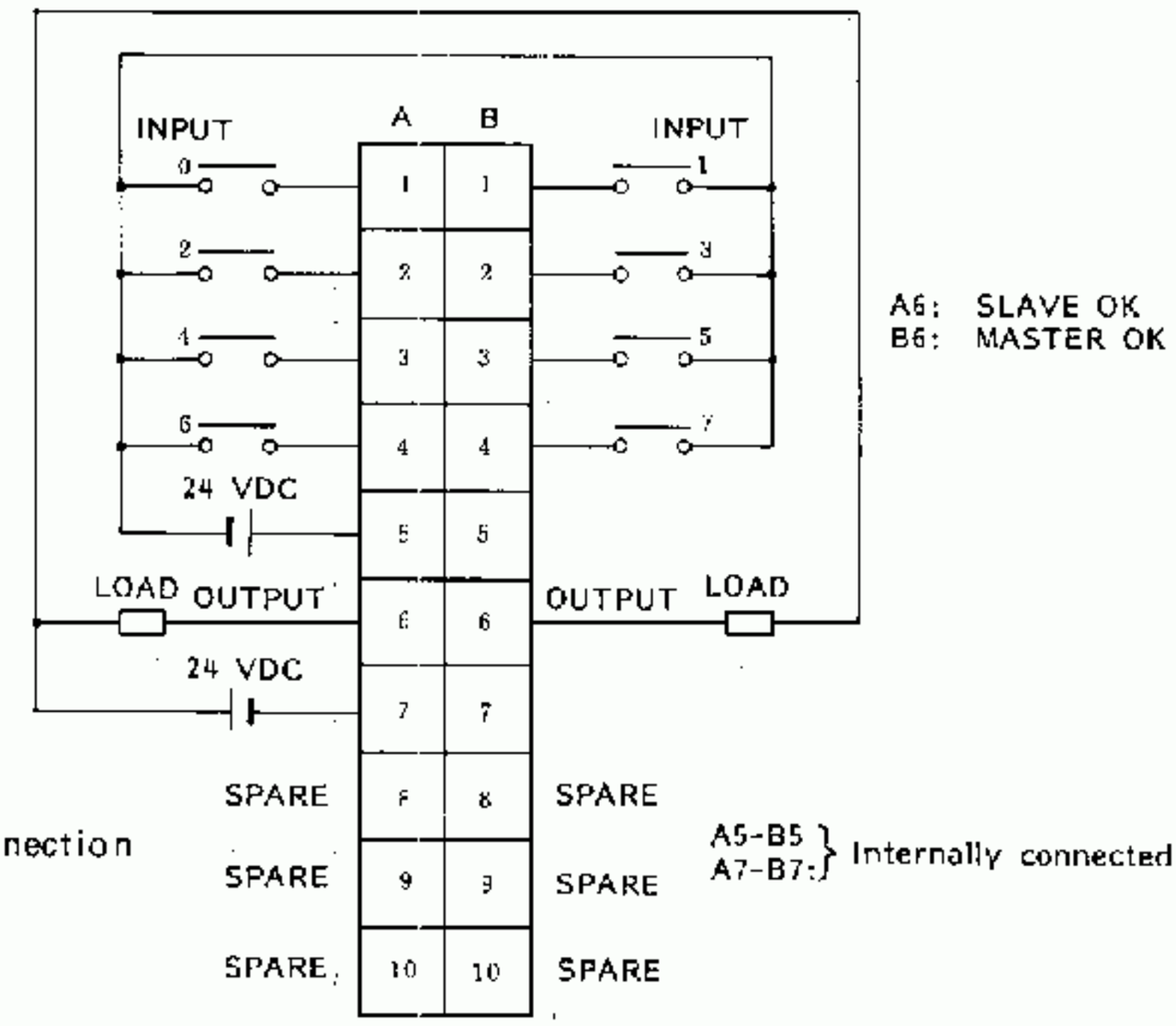


Fig. 3.7 Terminal Connector Connection

3.3.5 Status Output

"MASTER OK" and "SLAVE OK" are interlocked to the module status display LEDs of the same names (Refer to Par. 3.2.2).

Table 3.7 ON Condition

Output	ON Condition	Terminal
MASTER OK	Data exchanged with PC	A6
SLAVE OK	Normal communication with allocated slaves	B6

Table 3.8 Electrical Specifications of Status Output

Item	Specifications
No. of Circuits	2
Rated Voltage	24 VDC (19 to 29 V)
Max Output Current	300 mA/point, 600 mA/two points (continued)
Leakage Current at OFF	1 mA max
ON Voltage	1 V max (at 300 mA)
Response Time	OFF →ON: 1 ms max ON →OFF: 1 ms max
Transient Voltage	35 V (peak value)
Peak Surge Current	1 A (10 ms)
Output Form	Transistor output (open collector)
Isolation	Optical coupler
Dielectric Strength	1500 VAC for a minute
Fuse	None
Output Indication	LED (green) ON at output ON

3.3.5 Status Output (Cont'd)

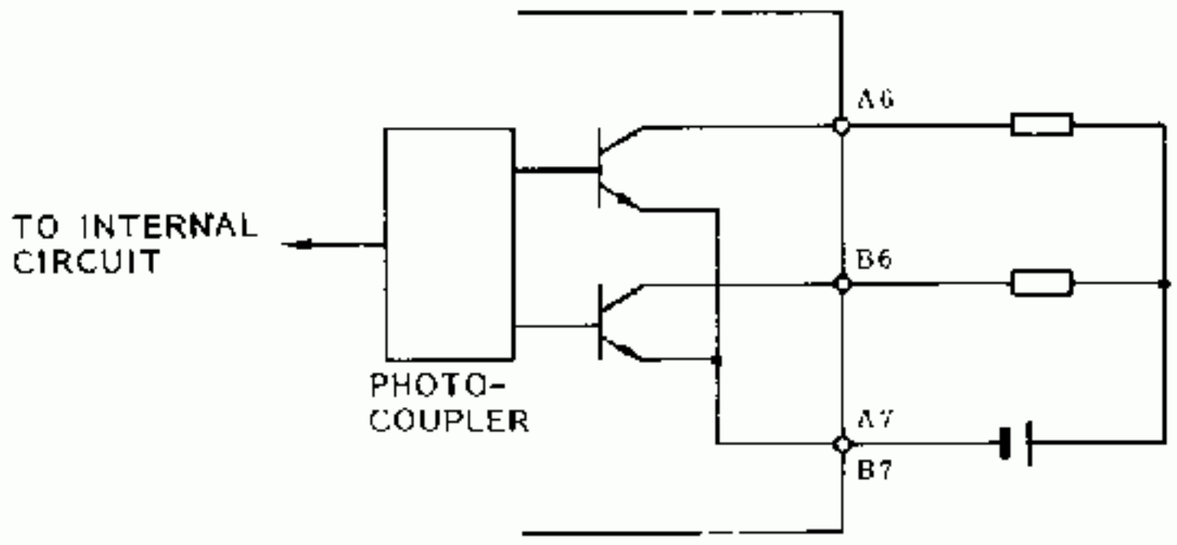


Fig. 3.8 Output Circuit

3.3.6 MEMOBUS Address Switch

The switch sets address for each MEMOBUS port.

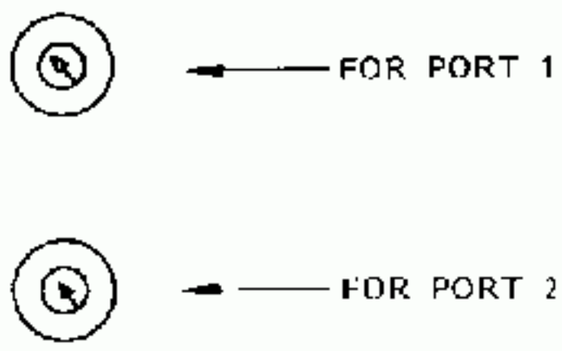


Fig. 3.9 MEMOBUS Address Switch

Addresses 1 to F can be set. To change an address partway through an operation, set the switch at the desired address and depress the reset switch.

3.3.7 Memory Protect Switch

Setting the memory protect switch to ON prohibits a change in allocation or status of a coil, etc.

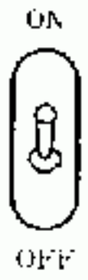
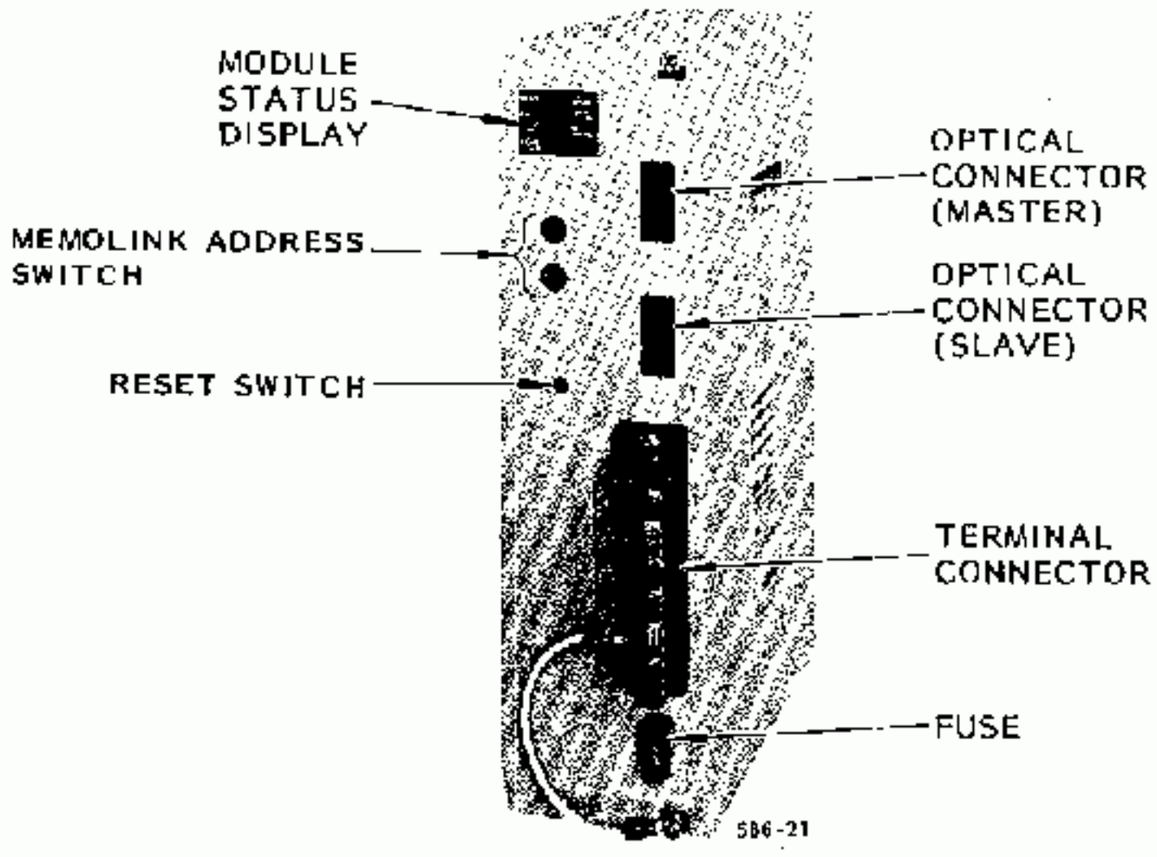


Fig. 3.10 Memory Protect Switch

3.4 SLAVE MODULE (JAMSC-B1085)

This is a MEMOLINK slave module. The PC with a slave module is called slave PC, and a set of a slave PC and slave module(s) is called a slave station.



70 (W) × 250 (H) × 160 (D) in mm
(TWO SPANS OF 1000 SERIES I/O)

Fig. 3.11 Slave Module Type JAMSC-B1085

3.4.1 Modules Status Display

The LED blinks to indicate the module operation status.

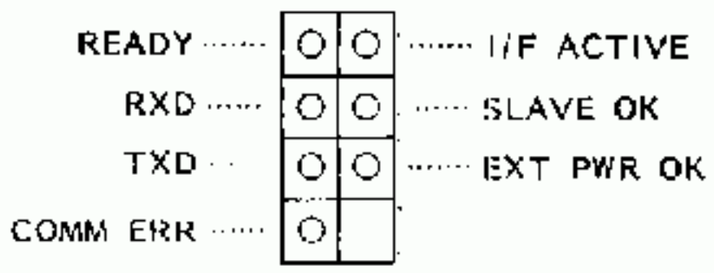


Fig. 3.12 Module Status Display

Table 3.9 Module Status Indication

Status	Indication	Color
READY	Normal in self diagnosis.	Green
RXD	Slave module receives MEMOLINK data.	Green
TXD	Slave module transmits MEMOLINK data.	Green
COMM ERR	Error in MEMOLINK communication (transmit error). Turned off when MEMOLINK communication stops.	Red
I/F ACTIVE	Data exchanged with PC.	Green
SLAVE OK	Normal MEMOLINK communication. Data exchanged with PC.	Green
EXT PWR OK	External power provided.	Green

3.4.2 Terminal Connector

Fig. 3.13 shows terminal connections of the slave module. Refer to Par. 3.4.3 for output (A1). The 24 VDC external power between A4 and A5 (refer to Par. 3.4.6) is used for the MEMOLINK optical connector.

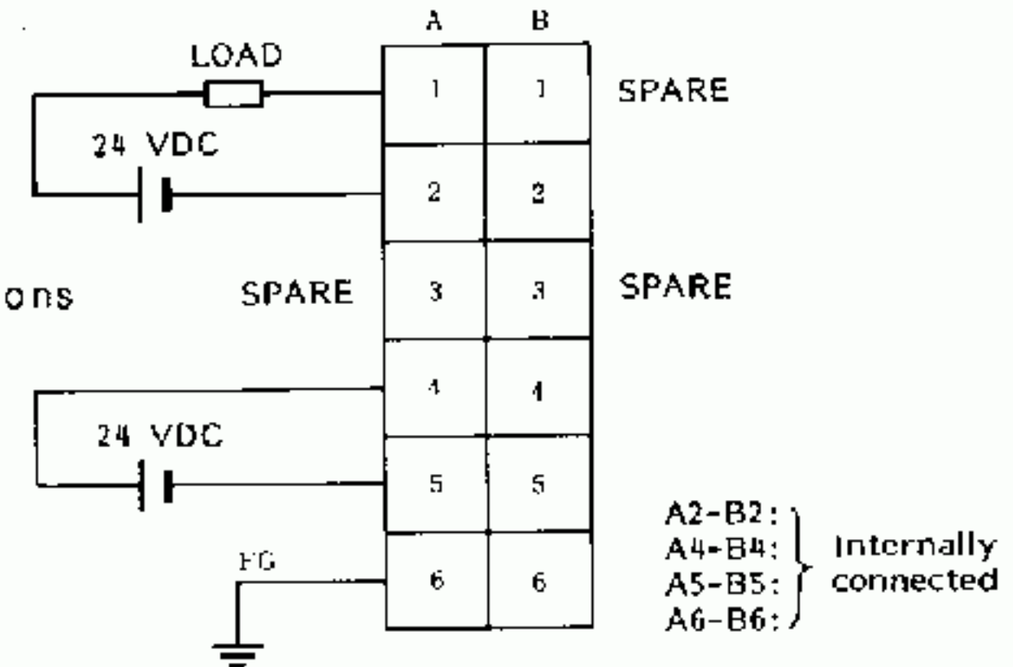


Fig. 3.13 Terminal Connector Connections

3.4.3 Status Output

This is output for "SLAVE OK" and interlocks with the module status indication LED of the same name (Refer to Par. 3.4.1).

Table 3.10 ON Condition

Output	ON Condition	Terminal
SLAVE OK	Normal in MEMOLINK communication. Data communicated with PC.	A1

Table 3.11 Electrical Specifications of Status Output

Item	Specifications
No. of Circuits	1
Rated Voltage	24 VDC (19 to 29 V)
Max Output Current	300 mA/point (continued)
Leakage Current at OFF	1 mA max
ON Voltage	1 V min (at 300 mA)
Response Time	OFF →ON: 1 ms max ON →OFF: 1 ms max
Transient Voltage	35 V (peak value)
Peak Surge Current	1 A (10 ms)
Output Form	Transistor output (open collector)
Isolation	Optical coupler
Dielectric Strength	1500 VAC for a minute
Fuse	None
Output Indication	LED (green) ON at output ON

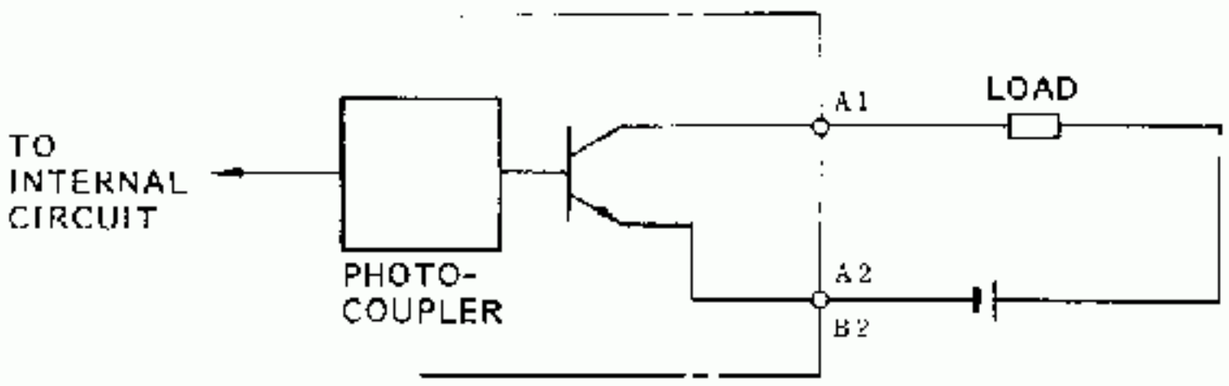


Fig. 3.14 Output Circuit

3.4.4 MEMOLINK Address Switch

This switch sets slave module addresses (station Nos.) 01 to 09, 10, 11 to 19, 20, 21 to 29, 30 and 31. Connection from the master to slave stations is performed in a multi-drop mode.

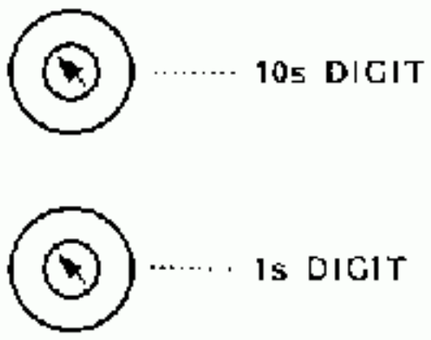


Fig. 3.15 MEMOLINK Address Switch

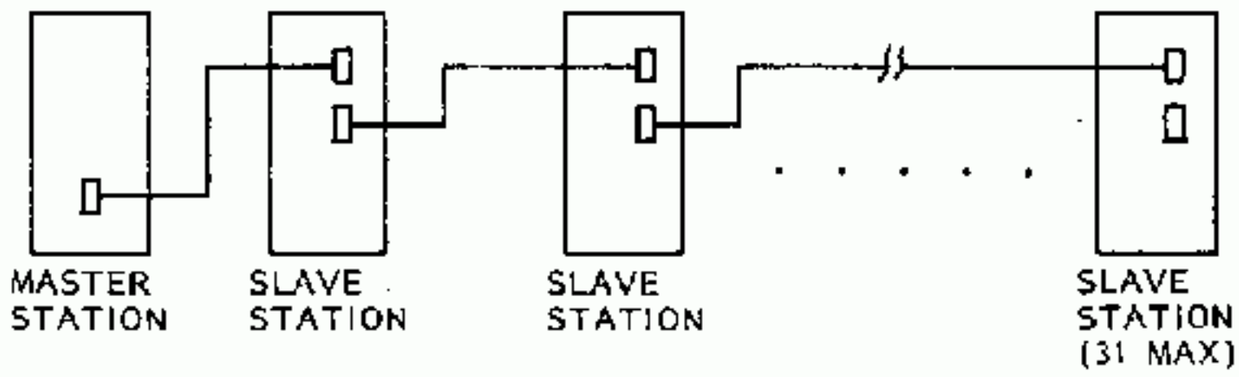


Fig. 3.16 Master and Slave Station Connection

Slave station addresses do not have to be set sequentially beginning with the station which is closest to the master station. It is important not to set the same addresses. However, from the standpoint of maintenance, sequential numbering "01, 02, ... and 31" beginning with the slave station closest to the master station is preferable.

3.4.5 Optical Connectors

One slave module has two optical connectors. Optical fiber cables are connected to them to build a MEMOLINK transmission circuit.

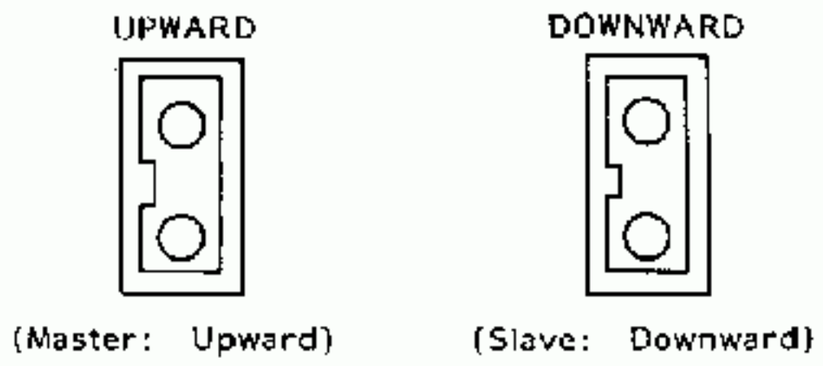


Fig. 3.17 Optical Connectors

Connect the UPWARD optical connector to the upstream side (master station side). Connect the DOWNWARD optical connector to the downstream side (next slave side). The DOWNWARD connector of the final slave station should not be connected with an optical fiber cable. Mount a protective cap on it.

Each station is connected in a multi-drop mode. A broken optical fiber cable or an optical connector power failure along the line completely stops communications with the downstream slave stations.

As mentioned in Par. 3.4.2, power for the optical connectors is supplied from the outside.

3.4.6 Optical Connector Power

Table 3.12 Power Specifications of Optical Connector

Item	Specifications
Input Voltage	21.6 to 26.4 VDC
Input Current	50 mA
Protective Fuse	1 A

3.5 I/O SLAVE MODULE (DISCT-J2040)

This is a MEMOLINK I/O slave module (J2040) used to build a remote I/O system. Actually, the module is combined with the mater module B1084. A slave station with J2040 is one of the 31 slave stations.

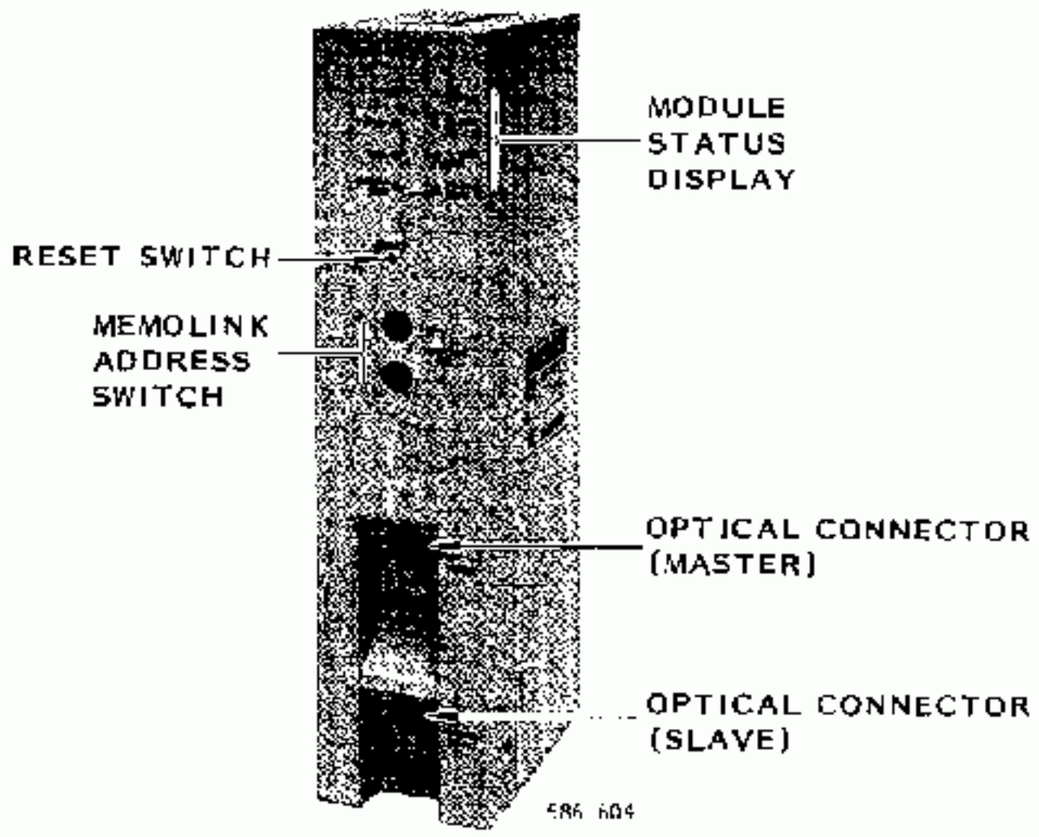


Fig. 3.18 I/O Slave Module Type DISCT-J2040

3.5.1 Module Status Display

READY……○ ○……I/O ACTIVE
RXD……○ ○……SLAVE OK
TXD……○ ○……T-COP ERR
COMM ERR……○ ○……I/O BUS ERR

Fig. 3.19 Module Status Display

Table 3.13 Module Status Indication

Status	Indication	Color
READY	Normal in self diagnosis.	Green
RXD	Slave modue receives MEMOLINK data.	Green
TXD	Slave modue transmits MEMOLINK data.	Green
COMM ERR	Error in MEMOLINK communication (transmit error). Turned off when MEMOLINK communication stops.	Red
I/O ACTIVE	I/O service is performed.	Green
SLAVE OK	Normal in MEMOLINK communication.	Green
T-COP ERR	Mismatch in allocation and module size.	Red
I/O BUS ERR	Error in I/O bus.	Red

Note: For MEMOLINK address switch and optical connector, refer to Pars. 3.4.4 and 3.4.5.

4. DATA LINK

MEMOLINK system does not require a special program and a change of the PC itself. The only necessary information is "FROM - TO" wiring information.

"Use output data of PC of A as input data of PC of B."

The wiring information is registered in the master module as "Link data allocation." Both master (B1084) and slave (B1085) modules are 1000 Series I/O modules, and normal I/O allocarion is performed with PCs of each station. For I/O slave module (J2040), I/O allocation is not required.

4.1 NUMBER OF LINK POINTS

4.1.1 Number of Input and Output Points

The master module (B1084) and slave module (B1085) are I/O modules of the PC. The PC exchanges discrete and register data in accordance with the individual I/O allocations of each PC. Allocation of I/O slots for MEMOLINK modules is of link data in the PC side. The number of I/O points is reduced by allocation of I/O for the link.

I/O is not allocated with the I/O slave module (J2040). The number of I/O points to be used corresponds to them of the slave module.

Table 4.1 No. of I/O Points

Master Module	Discrete Input (DI)	256 points max (allocated in increments of 8 points)
	Discrete Output (DO)	256 points max (allocated in increments of 8 points)
	Register Input (RI)	16 regs max (allocated in increments of 1 reg)
	Register Output(RO)	16 regs max (allocated in increments of 1 reg)
Slave Module	Discrete Input (DI)	128 points max (allocated in increments of 8 points)
	Discrete Output (DO)	128 points max (allocated in increments of 8 points)
	Register Input (RI)	8 regs max (allocated in increments of 1 reg)
	Register Output(RO)	8 regs max (allocated in increments of 1 reg)
I/O Slave Module	Discrete Input (DI)	128 points max (allocated in increments of 8 points)
	Discrete Output (DO)	128 points max (allocated in increments of 8 points)
	Register Input (RI)	8 regs max (allocated in increments of 1 reg)
	Register Output(RO)	8 regs max (allocated in increments of 1 reg)

An identification for input and output is defined from the PC side. One register contains 16 bits.

4.1.2 Link Data

The maximum number of link data is obtained under the following conditions:

- Master and slave modules — where distributing, to all stations, I/O data allocated to each module as link data.
- I/O slave module — where distributing, to all stations, I/O data equalling to the size of the I/O module installed in the rack as link data.

The each maximum number for discrete and register modules is as follows:

- Discrete data — 4224 points ($256 + 128 \times 31$)
- Register data — 264 regs ($16 + 8 \times 31$)

4.1.2 Link Data (Cont'd)

The number of link data points depends on link data allocation.
The maximum link data that can be allocated to each slave stations as follows:

- Discrete data: 128 points
- Register data: 8 regs

4.2 CONNECTION OF B1084 AND B1085

4.2.1 Reference No.

Link data allocation is wiring information between input and output. It is peformed by giving information: "Connect the output of PC of A to the input of PC of B."

Link data are assigned with reference Nos. for identification to clear wiring information.

Table 4.2 Reference Numbers

Data		Module → PC		PC → Module	
Master/ Slave	Station No.	Discrete	Register	Discrete	Register
Master	00	60001 to 60256	80001 to 80016	50001 to 50256	90001 to 90016
Slave	01 to 31	60001 to 60128	80001 to 80008	50001 to 50128	90001 to 90008

Note:
1. A module is B1084 or B1085.
2. Reference Nos. "70001 to 70008" of interrupt signals are called up in the master module. Interrupt signals can be allocated to any station as input relays.

Table 4.3 Relations to References

	Output Coil	Output Register	Input Relay	Input Register
PC	0 xxxx to 0 xxxx + 8 × n_1 −1	4 xxxx to 4 xxxx + n_2 −1	1 xxxx to 1 xxxx + 8 × n_2 −1	3 xxxx to 3 xxxx − n_4 −1
Data Flow	↓	↓	↑	↑
Module	50001 to 50000 + 8 × n_1	90001 to 90000 + n_2	60001 to 60000 + 8 × n_3 or 70001 to 70008	80001 to 80000 + n_4
Data Flow	↓	↓	↑	↑
Module	60 xxx to 60 xxx +8×n′ −1 or 70001 to 70008	8000 x to 8000 x + n_2' −1	50 xxx to 50 xxx − 8×n′ −1	9000 x to 9000 x + n_4' −1
Data Flow	↓	↓	↑	↑
PC	1 xxxx to 1 xxxx + 8×n′ −1	3 xxxx to 3 xxxx − 8×n_3' −1	0 xxxx to 0 xxxx + 8×n′ −1	4 xxxx to 4 xxxx − n′ −1
	Input Relay	Input Register	Output Coil	Output Register

Note: n_1, n_1', n_2, n_2', n_3, n_3', n_4, n_4' are determined by allocation.

4.2.2 Link Data Allocation

Link data are allocated by designating data (5xxxx and 7xxxx) from the station using data (6xxxx and 8xxxx) to be transferred to its PC as a standard. Allocation is performed for each station. Data from the station are called "FROM" data.

(1) Discrete Data Allocation

Allocation is made in units of 8 points. FROM data are designated using station Nos. and reference data. Interrupt signal is allocated finally for the station.

Table 4.4 Master Station Allocation

Master PC Input Reference	Master Module Reference	FROM Data	
		Station No.	Reference
10097 to 10104	60001 to 60003	01	50017 to 50024
10105 to 10112	60009 to 60016	03	50001 to 50008
10113 to 10120	60017 to 60024	05	50001 to 50008
10121 to 10128	60025 to 60032	02	50121 to 50128
•	•	•	•
•	•	•	•
•	•	•	•
10313 to 10320	60217 to 60224	31	50025 to 50032
10321 to 10328	60225 to 60232	00	70001 to 70008
—	60233 to 60240	—	No allocation
—	60241 to 60248	—	No allocation
—	60249 to 60256	—	No allocation

Table 4.5 Slave Station Allocation

Slave PC Input Reference	Salve Module Reference	FROM Data	
		Station No.	Reference
10017 to 10024	60001 to 60008	00	50001 to 50008
10025 to 10032	60009 to 60016	01	50017 to 50024
10033 to 10040	60017 to 60024	04	50113 to 50120
10041 to 10048	60025 to 60032	03	50001 to 50008
•	•	•	•
•	•	•	•
•	•	•	•
10105 to 10112	60089 to 60096	30	50121 to 50128
10113 to 10120	60097 to 60104	00	70001 to 70008
—	60105 to 60112	—	No allocation
—	60113 to 60120	—	No allocation
—	60121 to 60128	—	No allocation

Note:
1. Interrupt signal (70001 to 70008) does not have to be allocated.
2. More allocation is not allowed behind interrupt signal (70001 to 70008).

(2) Register Allocation

Registers are allocated in untis of one register. "FROM" data is designated using the station.

No. and reference data.

Table 4.6 Master Station Allocation

Master PC Input Reference	Master Module Reference	FROM Data	
		Station No.	Reference
3 0 0 0 3	8 0 0 0 1	0 1	9 0 0 0 2
3 0 0 0 4	8 0 0 0 2	0 3	9 0 0 0 2
3 0 0 0 5	8 0 0 0 3	0 0	9 0 0 0 1
3 0 0 0 6	8 0 0 0 4	0 4	9 0 0 0 7
•	•	•	•
•	•	•	•
•	•	•	•
3 0 0 1 6	8 0 0 1 4	2 9	9 0 0 0 3
—	8 0 0 1 5	—	No allocation
—	8 0 0 1 6	—	No allocation

Table 4.7 Slave Station Allocation

Slave PC Input Reference	Slave Module Reference	FROM Data	
		Station No.	Reference
3 0 0 0 9	8 0 0 0 1	0 0	9 0 0 1 1
3 0 0 1 0	8 0 0 0 2	0 1	9 0 0 0 7
3 0 0 1 1	8 0 0 0 3	0 2	9 0 0 0 6
3 0 0 1 2	8 0 0 0 4	0 7	9 0 0 0 3
3 0 0 1 3	8 0 0 0 5	0 5	9 0 0 0 2
—	8 0 0 0 6	—	No allocation
—	8 0 0 0 7	—	No allocation
	8 0 0 0 8	—	No allocation

4.2.3 Master PC I/O Allocation

I/O allocation has to be made to the PC side for slots mounted with a master module. The size of I/O allocation must coincide with that of link data allocation (see Par. 4.2.2).

Allocation should be made to both left and right slots of the master module. The slot on the left side viewed from the front of the module is called the left slot and that on the right side, right slot. The slot with a newest No. is the left slot and one with an oldest No. is the right slot. Registers must be always allocated in binary.

Table 4.8 No. of Allocation Points

	Left Slot	Right Slot
Input Relay	128 points max (unit of 8 points)	128 points max (unit of 8 points)
Output Coil	128 points max (unit of 8 points)	128 points max (unit of 8 points)
Input Register	8 regs max (unit of 1 reg)	8 regs max (unit of 1 reg)
Output Register	8 regs max (unit of 1 reg)	8 regs max (unit of 1 reg)

By justifying to the left slot, the allocation must be performed to match the data amount to be allocated as link data.

Example:

Allocation will be as shown in Table 4.9.

Input relay: 232 points
Output coil: 128 points
Input register: 14 regs
Output register: 7 regs

Table 4.9 Allocation Example

		PC	Module
Input Relay	Left Slot	10097 to 10224 (128 points)	60001 to 60128
	Right Slot	10225 to 10328 (104 points)	60129 to 60232
Output Coil	Left Slot	00009 to 00136 (128 points)	50001 to 50128
	Right Slot	— (0)	—
Input Register	Left Slot	30003 to 30010 (8 regs)	80001 to 80008
	Right Slot	30011 to 30016 (6 regs)	80009 to 80014
Output Register	Left Slot	40001 to 00007 (7 regs)	90001 to 90007
	Right Slot	— (0)	

I/O references on the PC side are actually used in the PC ladder. The No. to be set differs depending on the module mounting position and system. References on the module side cannot be used in the ladder, because of references only for connection.

4.2.4 Slave PC I/O Allocation

I/O allocation has to be made to the PC side for slots mounted with slave modules. The size of I/O allocation must coincide with that of link data allocation (see Par. 4.2.2).

The slave module size is two spans of 1000 series I/O modules. Input and output are allocated only to the left slot. Allocation to the right slot becomes invalid.

Table 4.10 No. of Allocation Points

	Left Slot	Right Slot
Input Relay, Output Coil	128 points max (unit of 8 points)	No allocation
Input Register, Output Register	8 regs max (unit of 1 reg)	

Registers must be always allocated in binary.

Example:

Allocation will be as shown in Table 4.11

Input relay: 128 points
Output coil: 64 points
Input register: 8 regs
Output register: 5 regs

Table 4.11 Allocation Example

		PC	Module
Input Relay	Left Slot	10033 to 10160 (128 points)	60001 to 60128
Output Coil	Left Slot	00017 to 00080 (128 points)	50001 to 50064
Input Register	Left Slot	30001 to 30008 (8 regs)	80001 to 80008
Output Register	Left Slot	40005 to 40009 (5 regs)	90001 to 90005

Note: The right slot is not allocated.

I/O references on the PC side are actually used in the PC ladder. The No. to be set differs depending on the module mounting position and system. References on the module side cannot be used in the a ladder, because of references only for connection.

4.2.5 Actual Allocation Examples

Using simple models, transmission of data of each station to destination stations is shown. Only the connection part is described. There are one master and two slave stations. To simplify the explanation, discrete data only is considered. Tables 4.12 to 4.14 show station allocation. Fig. 4.1 shows ladders.

Table 4.12 Master Station Allocation

Master PC		Master Module		
		Reference	FROM	
			Station No.	Reference
Input Relay	10017 to 10024	60001 to 60008	01	50001 to 50008
	10025 to 10032	60009 to 60016	02	50001 to 50008
	10033 to 10040	60017 to 60024	00	70001 to 70008
Output Coil	00009 to 00016	50001 to 50008	—	
	00017 to 00024	50009 to 50016		

Table 4.13 Slave Station No. 1 Allocation

Slave PC		Slave Module		
		Reference	FROM	
			Station No.	Reference
Input Relay	10001 to 10008	60001 to 60003	00	50001 to 50008
	10009 to 10016	60009 to 60016	02	50001 to 50008
	10017 to 10024	60017 to 60024	00	70001 to 70008
Output Coil	00129 to 00136	50001 to 50008	—	

Table 4.14 Slave Station No. 2 Allocation

Slave PC		Slave Module		
		Reference	FROM	
			Station No.	Reference
Input Relay	10041 to 10048	60001 to 60008	01	50001 to 50008
	10049 to 10056	60009 to 60016	00	50009 to 50016
	10057 to 10064	60017 to 60024	00	70001 to 70008
Output Coil	00057 to 00064	50001 to 50008	—	

Interrupt signal (70001 to 70008) does not have to be allocated. Assume that the master and slave PCs have the following ladders:

Note: AA, BB, and CC do not have a direct relationship with link data.

Fig. 4.1 Ladder of Each Station

Signals will be connected as follows.

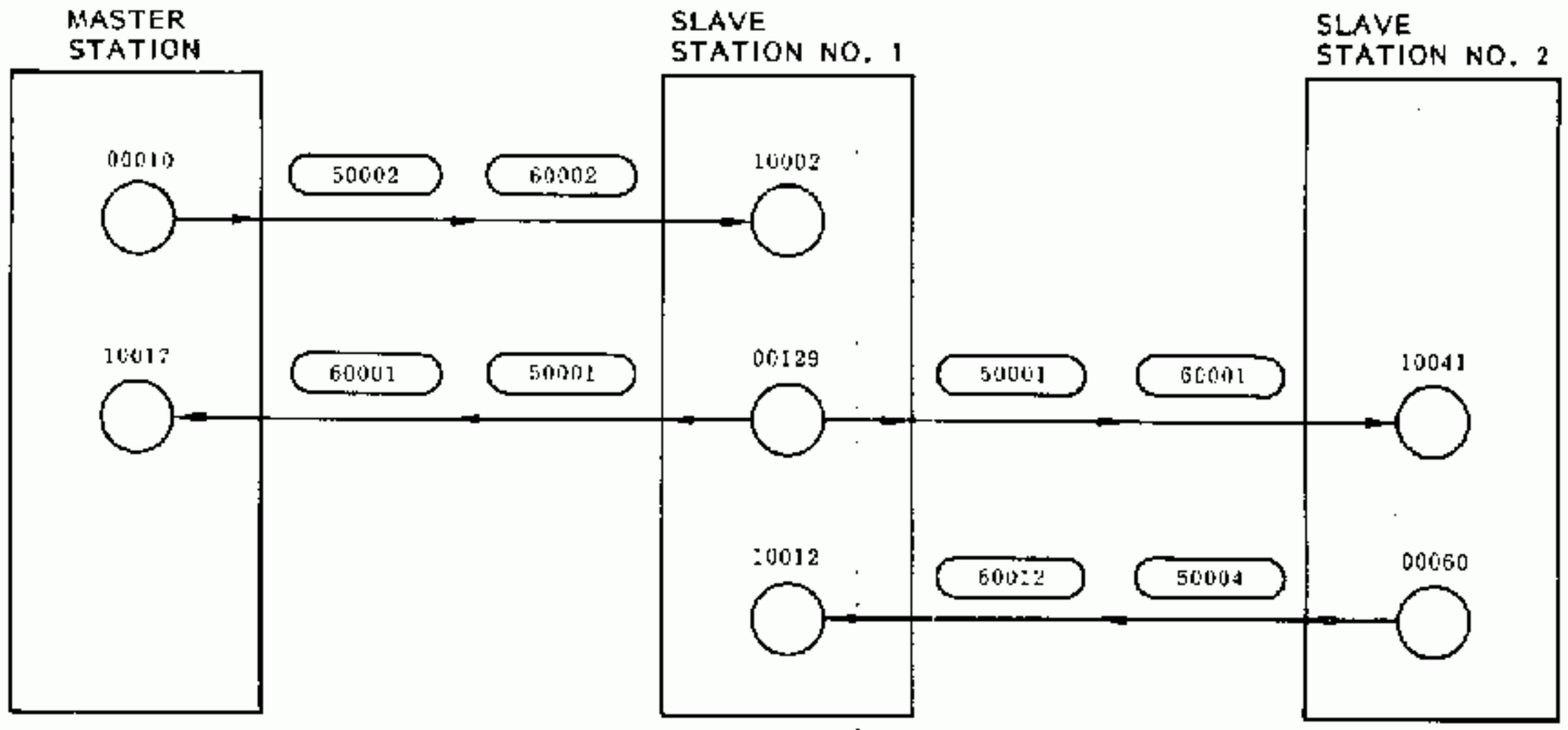


Fig. 4.2

The operation in the example of ladders shown in Fig. 4.1 will be as follows:

① Output coil 00129 is turned on as BB of slave station No. 1 goes on.

② Output coil 00129 of slave station No. 1 goes to input relay 10017 of the master station and input relay 10041 of slave station No. 2. As a result, output coil 00010 of the master station and output coil 00060 of slave station No. 2 are turned on.

③ 00010 of the master station goes to 10002 of slave station No. 1 and 00060 of slave station No. 2 goes to 10012 of slave station No. 1.

④ Output coil 00129 of the master station is turned off. Therefore, if the state of 00129 of slave station No. 1 changes from ON to OFF, it means that this signal has transferred to the master station and slave station No. 2.

NOTE

One scan pules of each PC is hardly transferred.

4.3 CONNECTION OF B1084 AND J2040

4.3.1 I/O Slave Unit

(1) Unit Configuration

The I/O slave unit consists of only one rack. Therefore, this rack can mount a maximum of eight 2000 Series I/O modules.

The I/O slave unit can access discrete, register, and analog modules. The I/O module can be installed in any of the eight slots.

However, for ease of wiring and maintenance, the layout is recommended to be arranged by grouping whenever possible, such as grouping inputs and outputs, voltage levels, and applications, and by filling the slots consequently from slot 1.

Fig. 4.3 shows an example of I/O module layout.

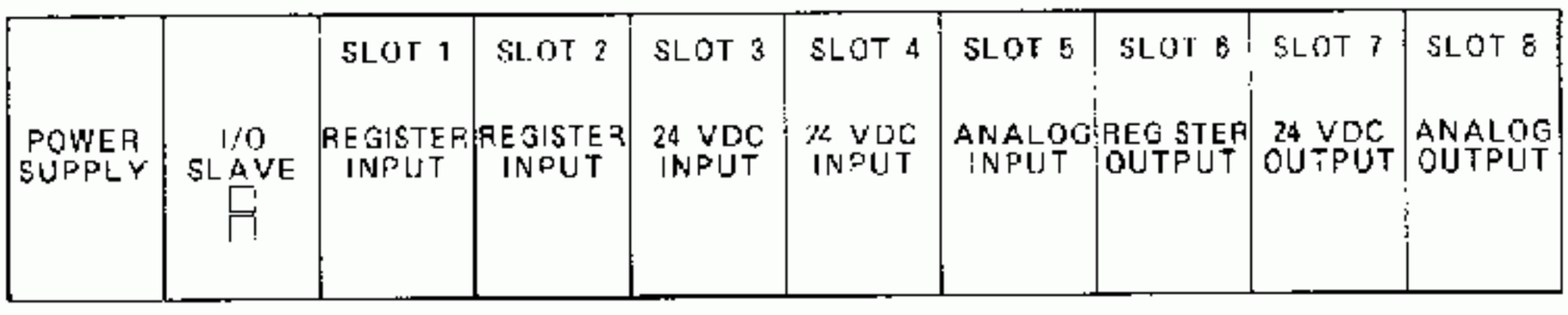


Fig. 4.3 Example of I/O Module Layout

(2) I/O Processing

Fig. 4.4 shows the sequence for input and output processing of the I/O slave module. Individual processing is performed by the module mounted with the slot with a low slot No. Care should be taken when laying out the I/O modules.

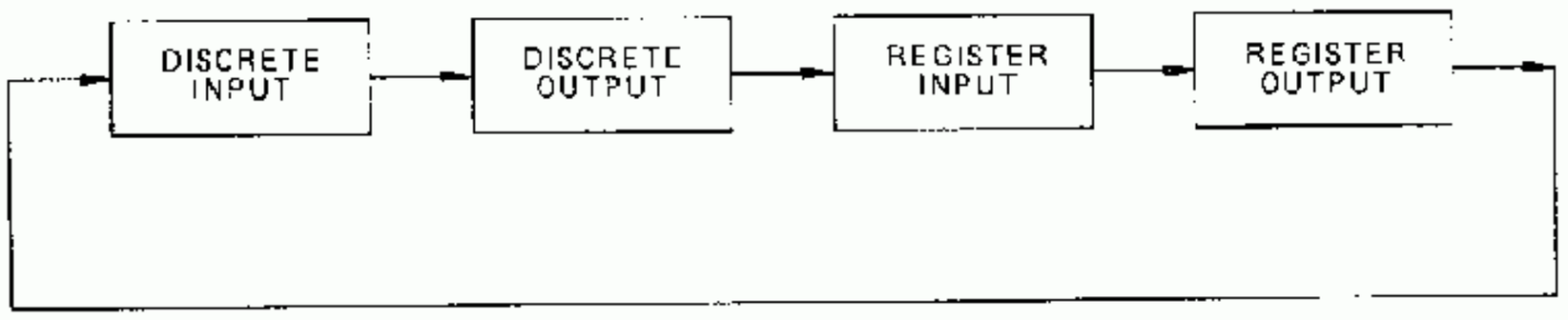


Fig. 4.4 I/O Processing Sequence

4.3.2 Reference No

Link data allocation gives information for connecting I/O's, one after another. It is performed by giving information: "Connect the output of PC of A to the input of PC of B." Where both of A and B are I/O slave units, replace the PC in above information with the I/O module and consider the link data allocation.

Link data are assigned with refernce Nos. for identification to clear wiring information.

Table 4.15 Reference Numbers

Data		J2040→Input Module		Output Module→J2040	
Type	Station No.	Discrete	Register	Discrete	Register
I/O Slave	01 to 31	60001 to 60128	80001 to 80008	50001 to 50128	90001 to 90008

Table 4. 16 Relations to Reference

	Output Coil	Output Register	Input Relay	Input Register
PC	0 xxxx to 0 xxxx − 8 × n_1 − 1	4 xxxx to 4 xxxx + n_2 − 1	1 xxxx to 1 xxxx + 8 × n_3 − 1	3 xxxx to 3 xxxx + n_4 − 1
Data Flow	↓	↓	↑	↑
B 1085 B 1084	50001 to 50000 − 8 × n_1	90001 to 90000 + n_2	60001 to 60000 + 8 × n_3	80001 to 80000 + n_4
Data Flow	↓	↓	↑	↑
J 2040	60xxx to 60xxx + 8 × n'_1 − 1	8000x to 8000x + n'_2 − 1	50xxx to 50xxx + 8 × n'_3 − 1	9000x to 9000x + n'_4 − 1
Data Flow	↓	↓	↑	↑
I/O Module	Discrete output	Register output	Discrete input	Register input

Note: n_1, n'_1, n_2, n'_2, n_3, n'_3, n_4, n'_4 are determined by allocation.

4.3.3 Link Data Allocation

Link data is allocated by designating data (5XXXX, 9XXXX) to be received from the other station using data (6XXXX, 8XXXX) to be given to the I/O module as a reference. Allocation is made in units of one station. The size of attached module and link data allocation must coincide, or the allocation must be smaller.

(1) Discrete Data Allocation

Allocation is made in units of 8 points. "FROM" data are designated using station Nos. and reference data. Interrupt signal is allocated finally for the station.

Table 4.17 Slave Station (J2040) Allocation

I/O Slave Module Reference	FROM Data	
	Station No.	Reference
60001 to60008	00	50017 to 50024
60009 to 60016	05	50001 to 50008
60017 to 60024	06	50001 to 50008
60025 to 60032	01	50113 to 50120
.	.	.
.	.	.
.	.	.
60089 to 60096	31	50009 to 50016
60097 to 60104	20	50121 to 50125
60105 to 60112	.	No allocation
60113 to 60120	—	No allocation
60121 to 60128	—	No allocation

Note:
1. Interrupt signal (70001 to 70008) does not have to be allocated.
2. More allocation is not allowed behind interrupt signal (70001 to 70008).

(2) Register Allocation

Registers are allocated in units of one register. "FROM" data is designated using the station No. and reference data.

Table 4.18 Slave Station (J2040) Allocation

I/O Slave Module Reference	FROM Data	
	Station No.	Reference
80001	00	90012
80002	08	90007
80004	15	90001
80005	07	90004
80006	—	No allocation
80007	—	No allocation
80008	—	No allocation

NOTE

Discrete module can be used as register by J2040. For detailed information, Refer to APPENDIX J2040 REGISTER SERVICE.

4.3.4 Actual Allocation Examples

Assume one master station and one slave station. The slave station is an I/O slave module.

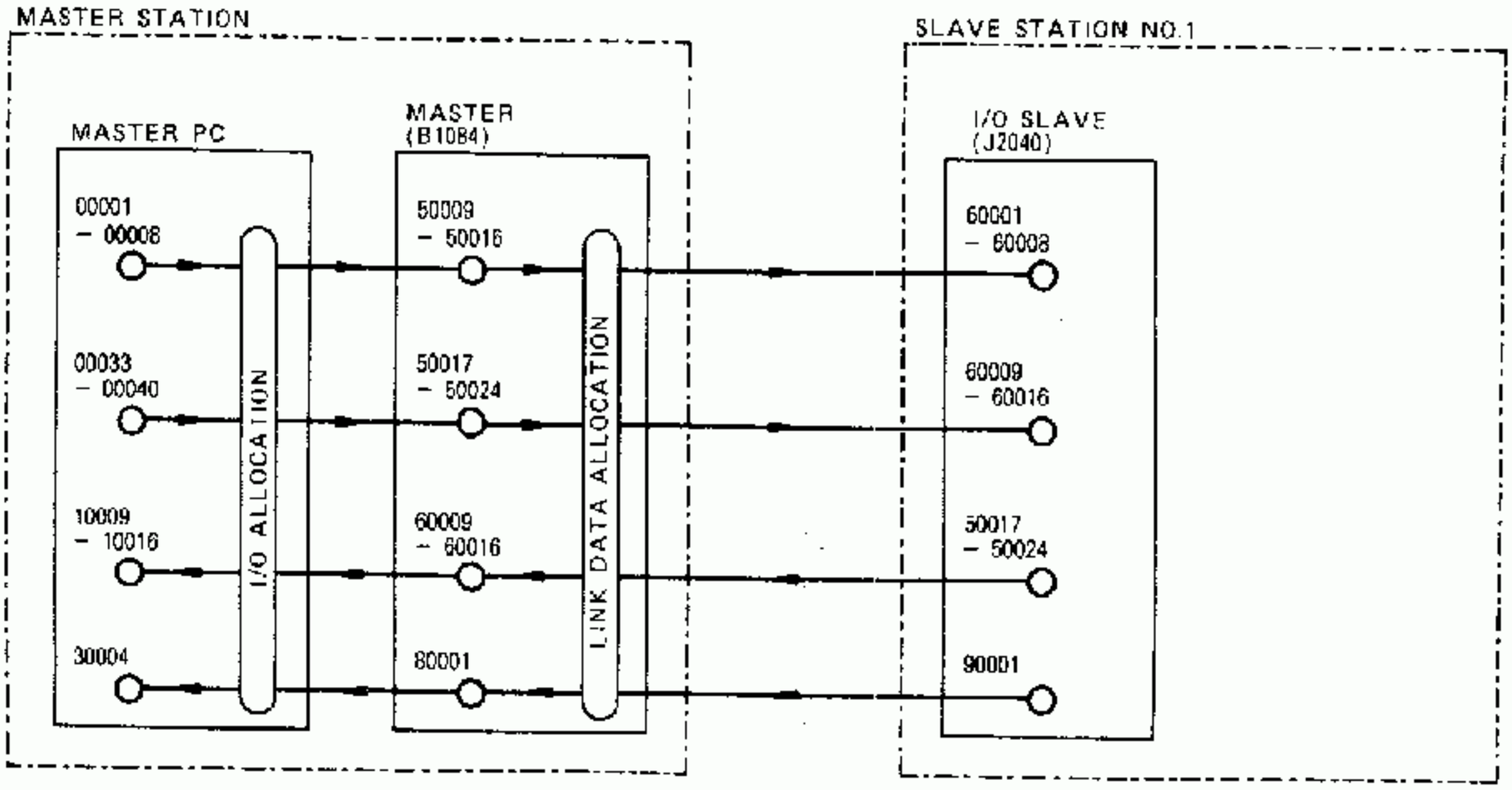


Fig. 4.5 Connection Relationship between B1084 and J2040

① I/O allocation of the master module (B1084) is programmed in the master PC.

② Program the link data allocation of the master module and I/O slave (J2040) in the master module.

I/O modules must be installed in the I/O slave's mounting base as shown in Fig. 4.6.

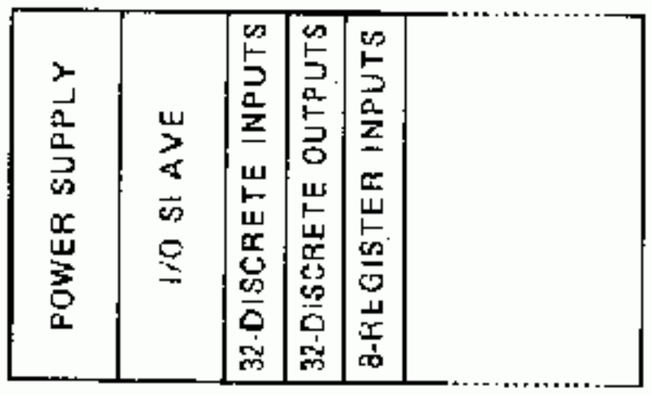


Fig. 4.6 Example of I/O Module Layout

Tables 4.19 and 4.20 show allocation for each station:

Table 4.19 Master Station Allocation

Master PC		Master Module		
		Reference	FROM	
			Station No.	Reference
Input Relay	10009 to 10016	60009 to 60016	01	50017 to 50024
	30004	60001	01	90001
Output Coil	00001 to 00008	50009 to 50016	—	
	00033 to 00040	50017 to 50024		

Table 4.20 Slave Station No.1 Allocation

I/O Module	I/O Slave Module		
	Reference	FROM	
		Station No.	Reference
32-Discrete Outputs	60001 to 60008	00	50009 to 50016
	60009 to 60016	00	50017 to 50024
32-Discrete Inputs	50017 to 50024	—	
8-Register Inputs	90001		

Note: For I/O module, refer to Fig. 4.6.

This allocation enables transmission from the master output to the I/O slave input, and from the I/O slave output to the master input.

4.4 PROCESSING TIME

4.4.1 Transmission Delay Time

Table 4.21 presents the maximum transmission delay time between stations.

Table 4.21 Maximum Transmission Delay Time

Data Flow	Max Transmission Delay Time
Master PC →Slave PC	Master PC 1 scan + 2 × transmission processing time + slave PC 1 scan
Slave PC →Master PC	Slave PC 1 scan + 2 × transmission processing time + master PC 1 scan
Slave PC No. i→Slave PC No. j	Slave PC No. i 1 scan + 3 × transmission processing time + slave PC No. j 1 scan
Interrupt Input→Master PC	Master PC 1 scan
Interrupt Input→Slave PC	10 ms + slave PC 1 scan
Master PC→I/O Slave	Master PC 1 scan + 2 × transmissoin processing time + 10 ms
I/O Slave→Master PC	10 ms + 2 × transmission processing time + master PC 1 scan
I/O Slave→I/O PC	10 ms + 3 × transmission processing time + salve PC 1 scan
I/O Slave→I/O Slave	10 ms + 3 × transmission processing time + 10 ms

Transmission processing time is the time for one cycle to exchange (send and receive) data with all the stations. Communication processing of the MEMOLINK is not synchronized to scanning of the PCs of each station.

$$\text{Transmission Processing Time} = \sum_{i=1}^{n} \left\lceil \frac{\text{Max.}(\text{Ii} + 16,\ \text{Oi}) + 120}{128} \right\rceil \times \frac{\sum_{i=1}^{n} (\text{Ii} + \text{Oi})}{256} \times 1.2 + 0.4 \times (\text{No. of slaves}) - 6.8 \text{ ms}$$

where i : slave station No.

Ii: number of bits from all slave stations to master station

Oi: number of bits from master station to all slave stations

Max (A, B): Whichever is larger between A and B

Number of data bits = number of discrete points + number of registers × 16

⌊x⌋=maximum integer not exceeding x··Example ⌊1.9⌋=1

NOTE

PC 1 scan means form logic solving to actual I/O module accessing.
Therefore, conversion coefficients differ between PCs that perform logic solving and I/O service serially (as in the R84II type)and those that perform in parallel (as in the U84 type).

Table 4.22 Conversion Coefficients

	R84H	U84, Local I/O	U84, Remote I/O
PC ↑ Scan	1	2	3

4.4.2 Data Flow

(1) Master PC and MEMOLINK Communication

Fig. 4.7 shows one scan of the Master PC and MEMOLINK communications. One scan of master PC and MEMOLINK communications are asynchronous.

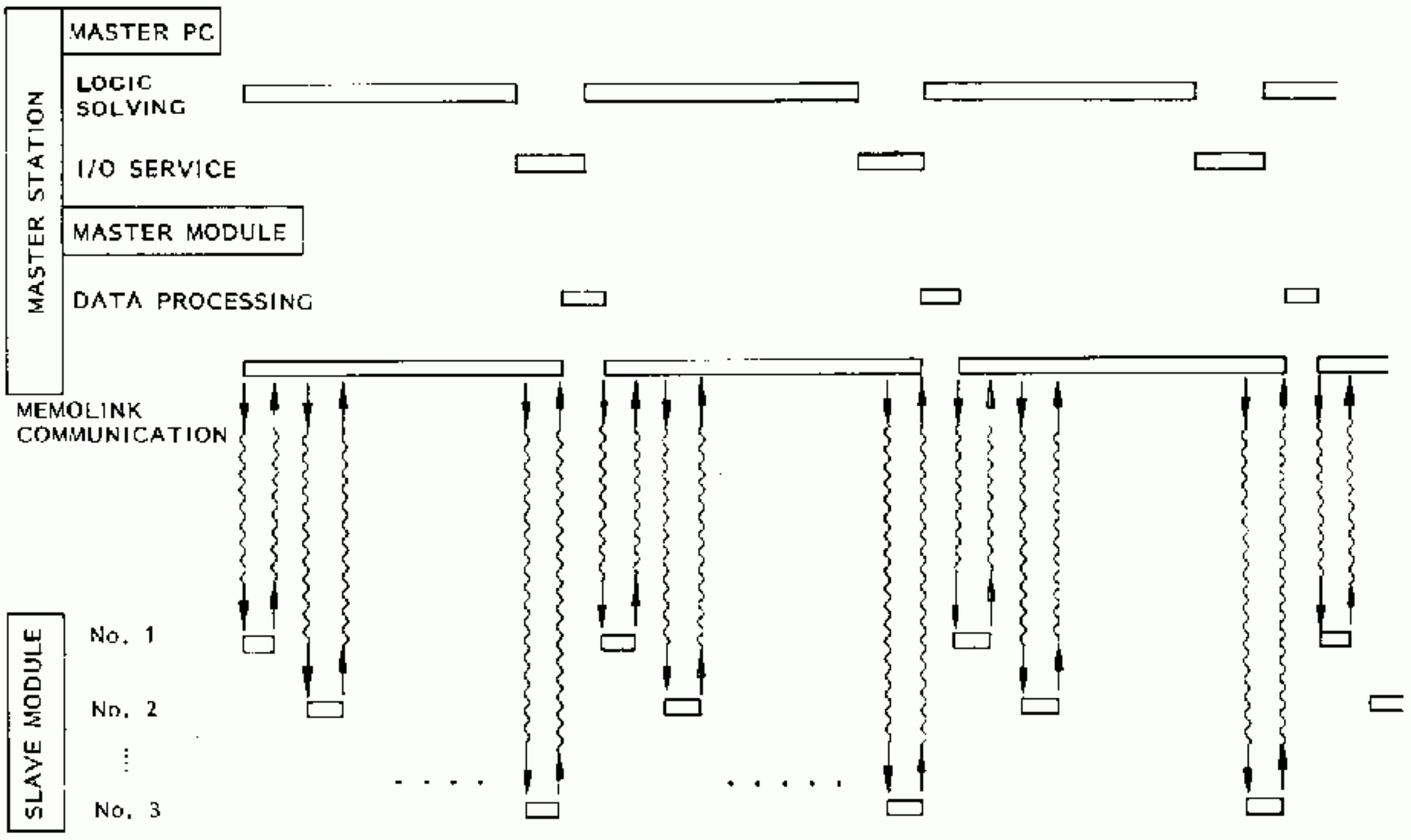


Fig. 4.7 Data Flow

Fig. 4.7 shows data flow between the master station and slave modules. MEMOLINK communications are provided only to those slaves that are actually allocated. Therefore, the MEMOLINK communication cycle becomes shorter as the number of allocated slave stations becomes smaller.

(2) Master PC to Slave PC

Fig. 4.8 shows the data flow from the master PC to the slave PC when there is one slave station. The flow is the same even when there are several slave stations.

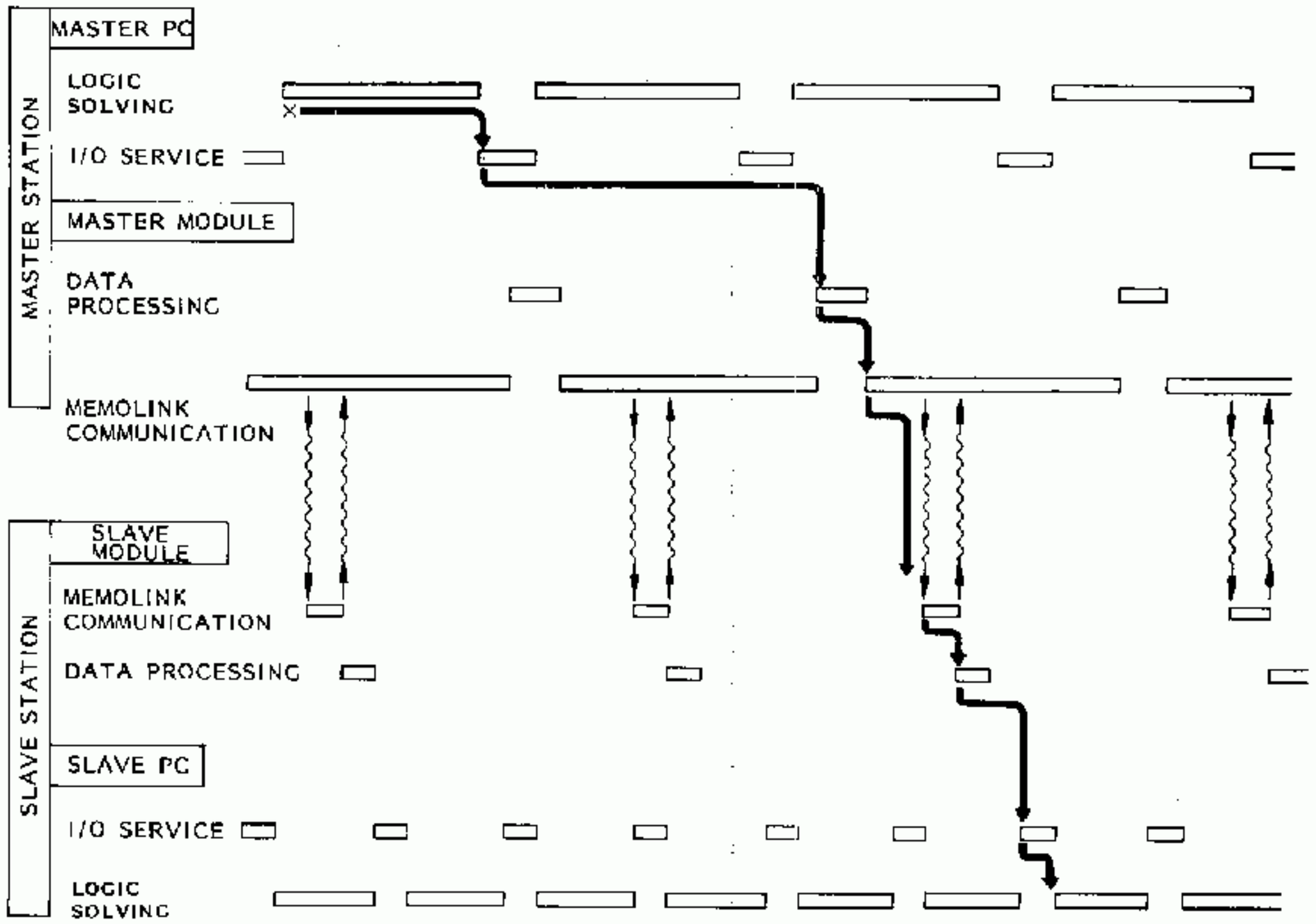


Fig. 4.8 Data Flow

(3) Slave PC to Master PC

Fig. 4.9 shows the data flow from the slave PC to the master PC when there is one slave station. The flow is the same even when there are several slave stations.

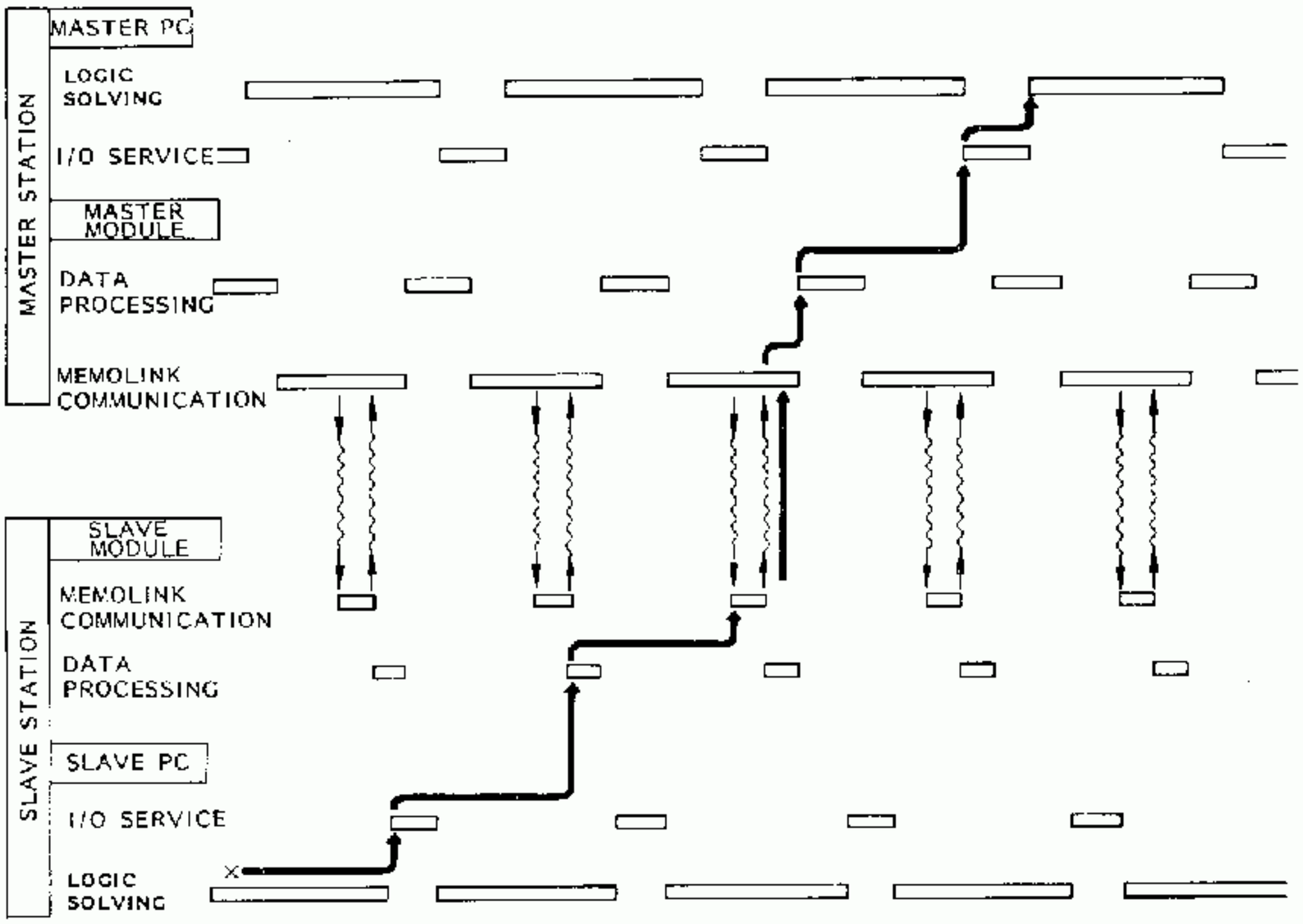


Fig. 4.9 Data Flow

(4) Slave PC to Slave PC

Fig. 4.10 shows the data flow from one slave PC to other slave PCs. The data from the slave PCs is temporarily collected in the master station and is distributed to the slave stations in accordance with the allocation.

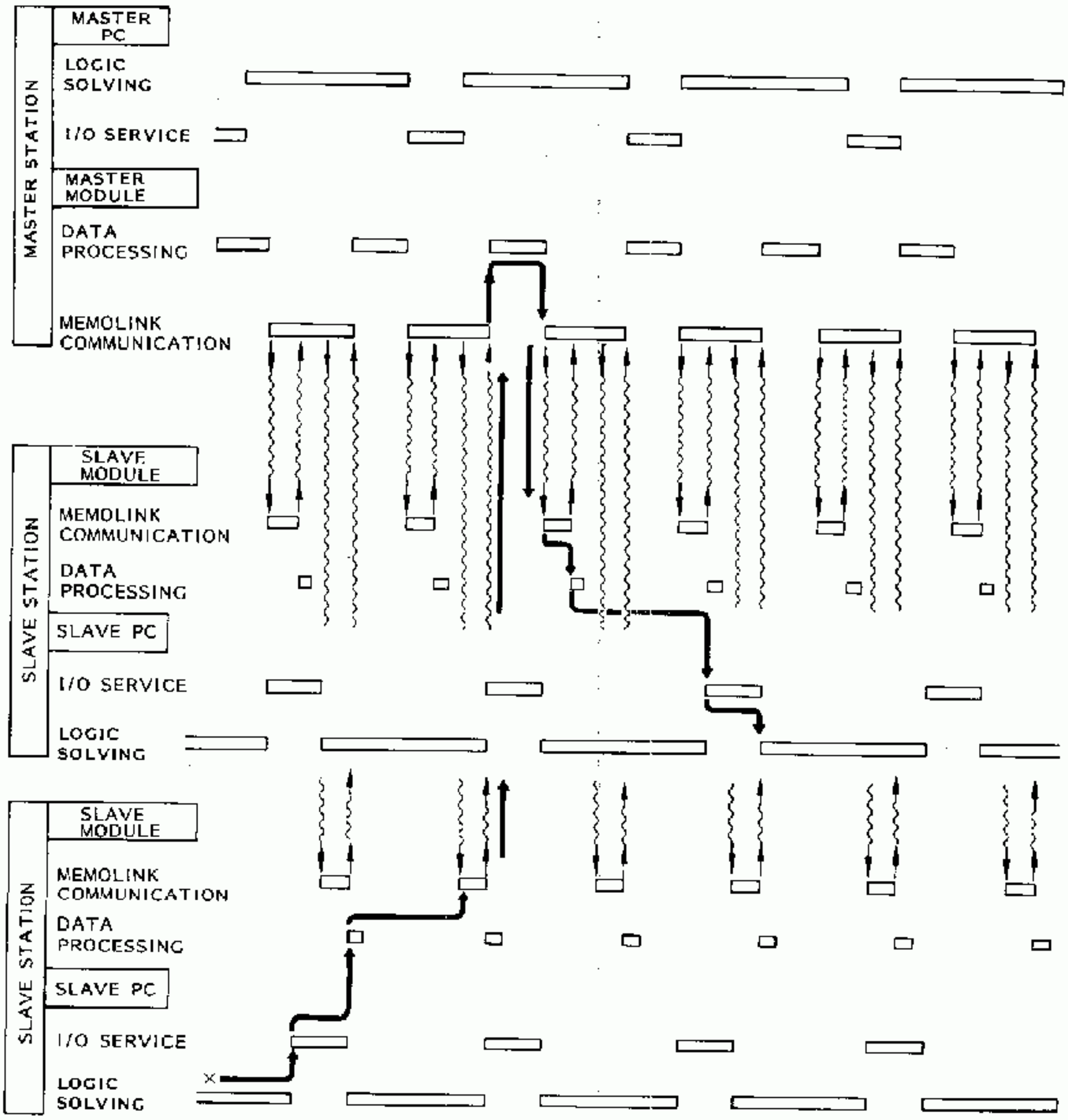
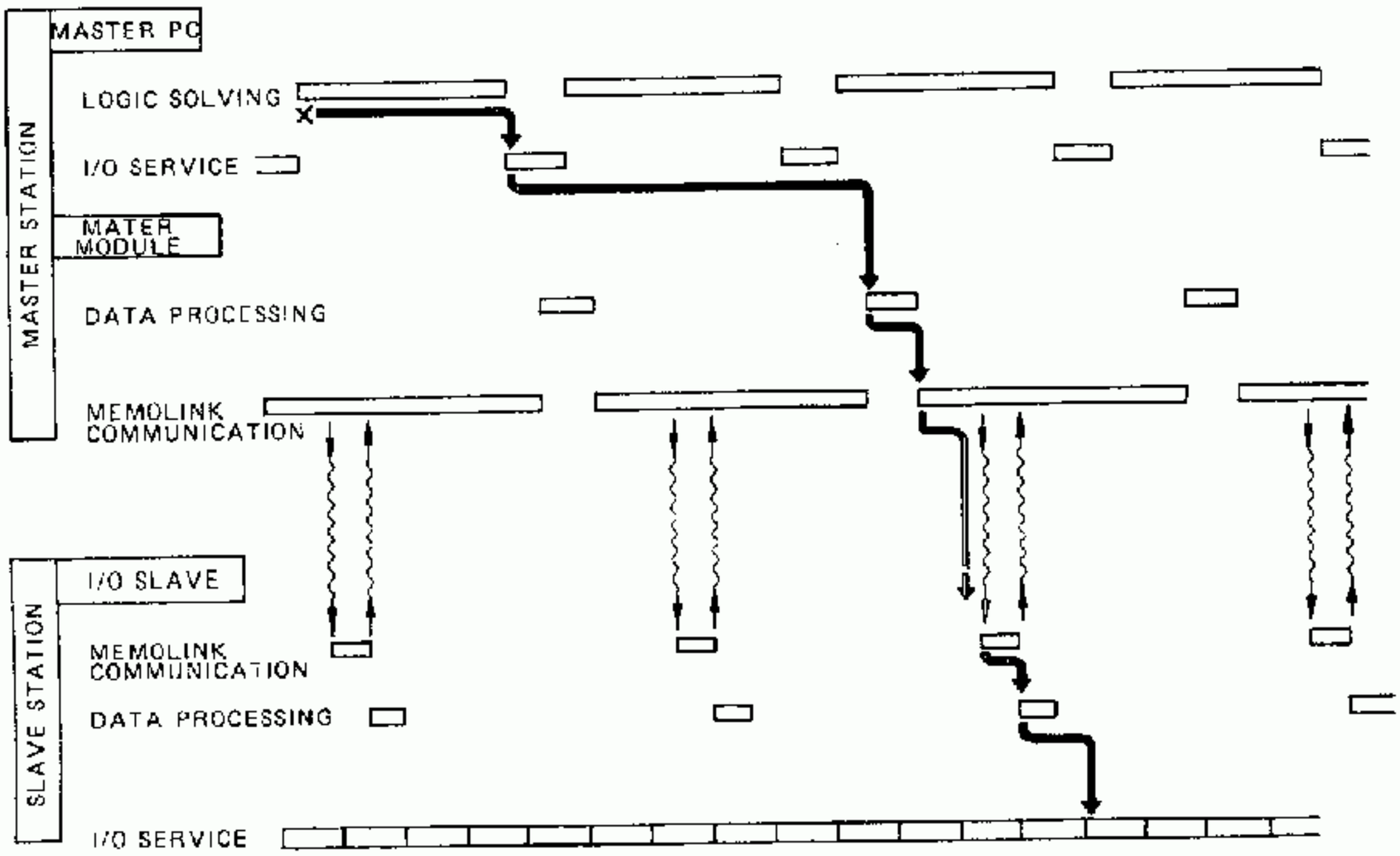


Fig. 4.10 Data Flow

(5) Master PC to I/O Slave

Fig. 4.11 shows the data flow from the master PC to the I/O slave when there is one slave station.

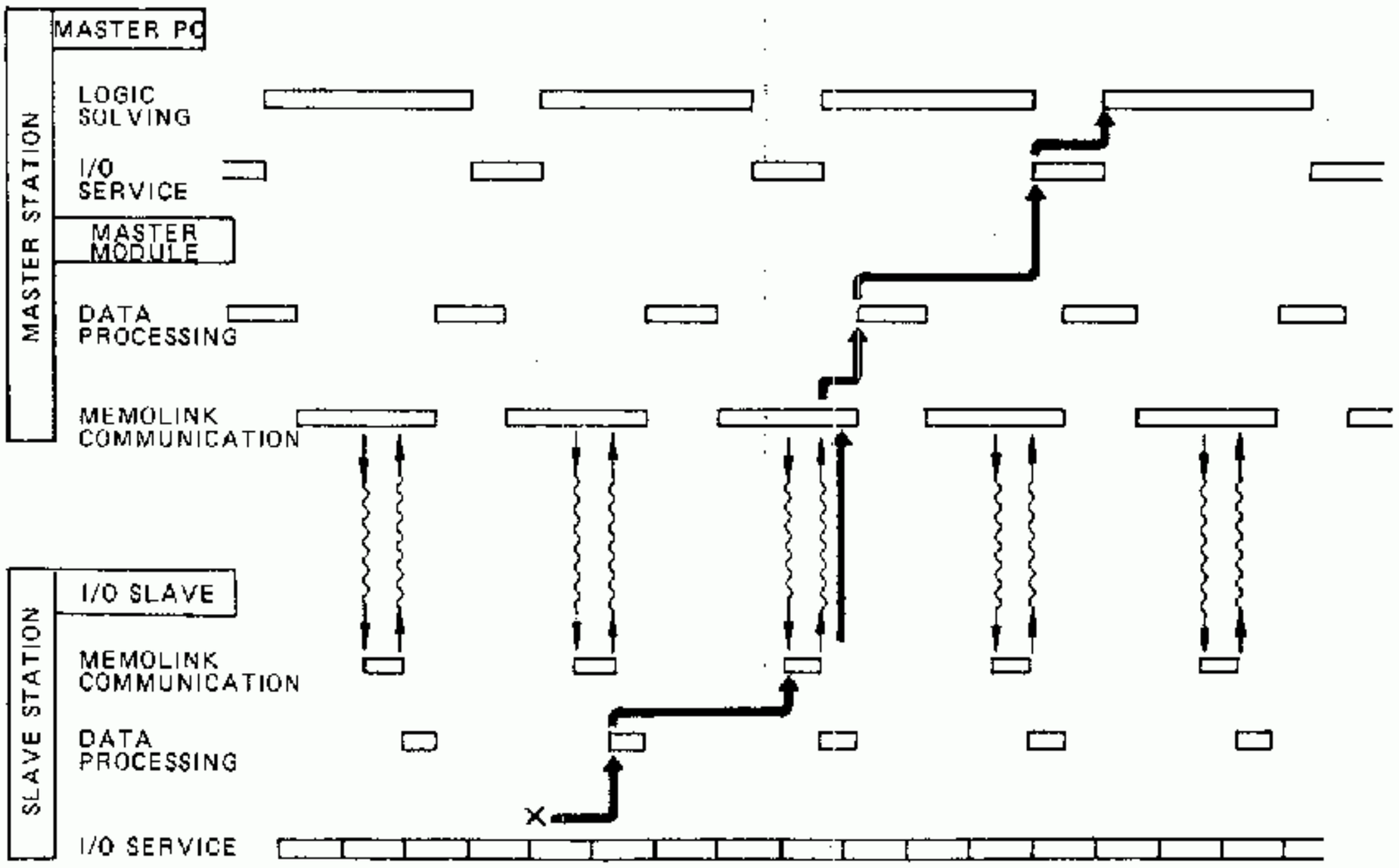


Note:
1. Status changed at "X" position.
2. I/O processing cycle: 10 ms min.

Fig. 4.11 Data Flow

(6) I/O Slave to Master PC

Fig. 4.12 shows the data flow from the I/O slave to the master PC when there is one slave station.

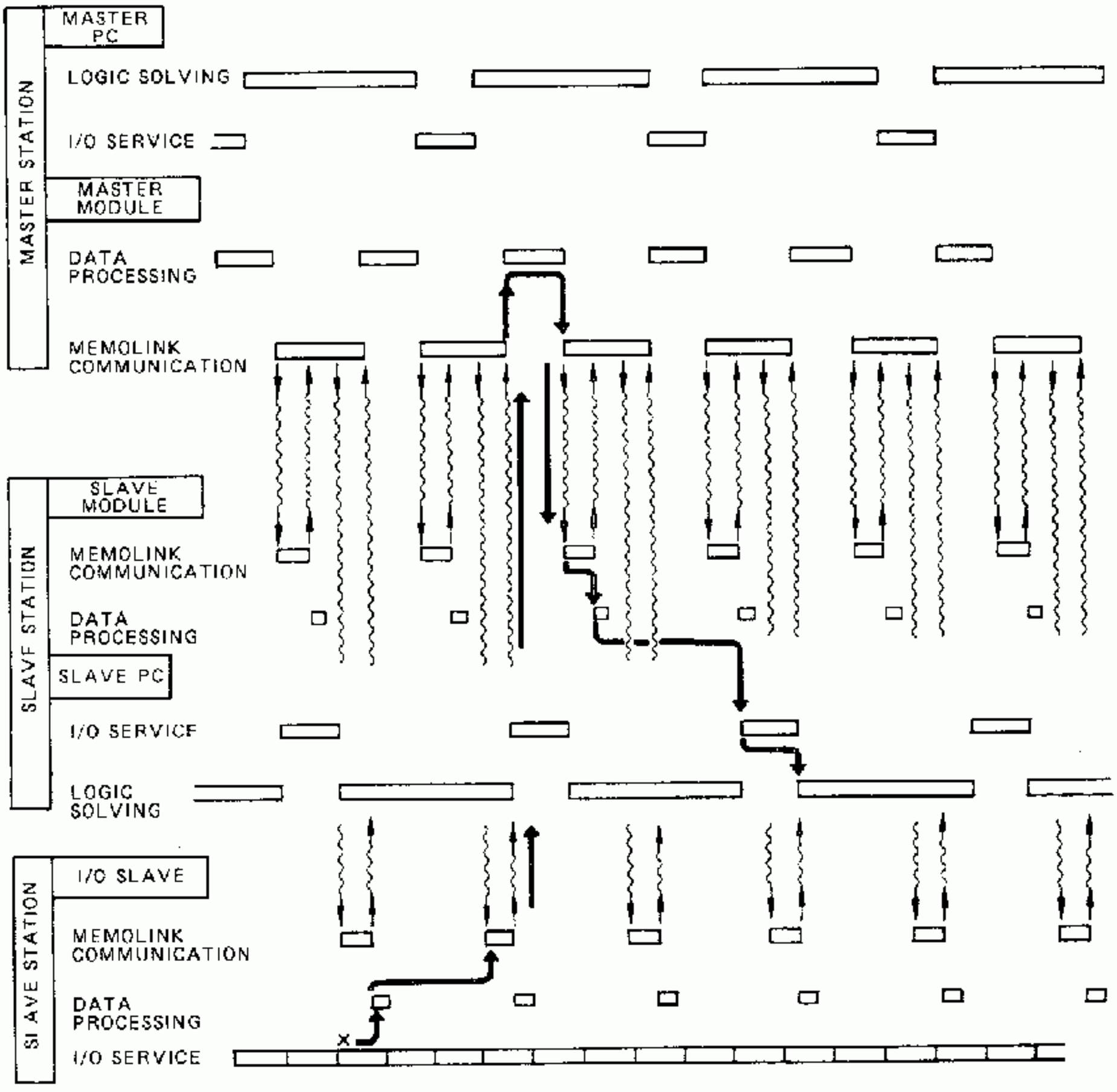


Note:
1. Status changed at "X" position.
2. I/O processing cycle: 10 ms min.

Fig. 4.12 Data Flow

(7) I/O Slave to Slave PC

Fig. 4.13 shows the data flow from one I/O slave to one slave PC. The data from the I/O slave is temporarily collected in the master station and is distributed to each station in accordance with the allocation.

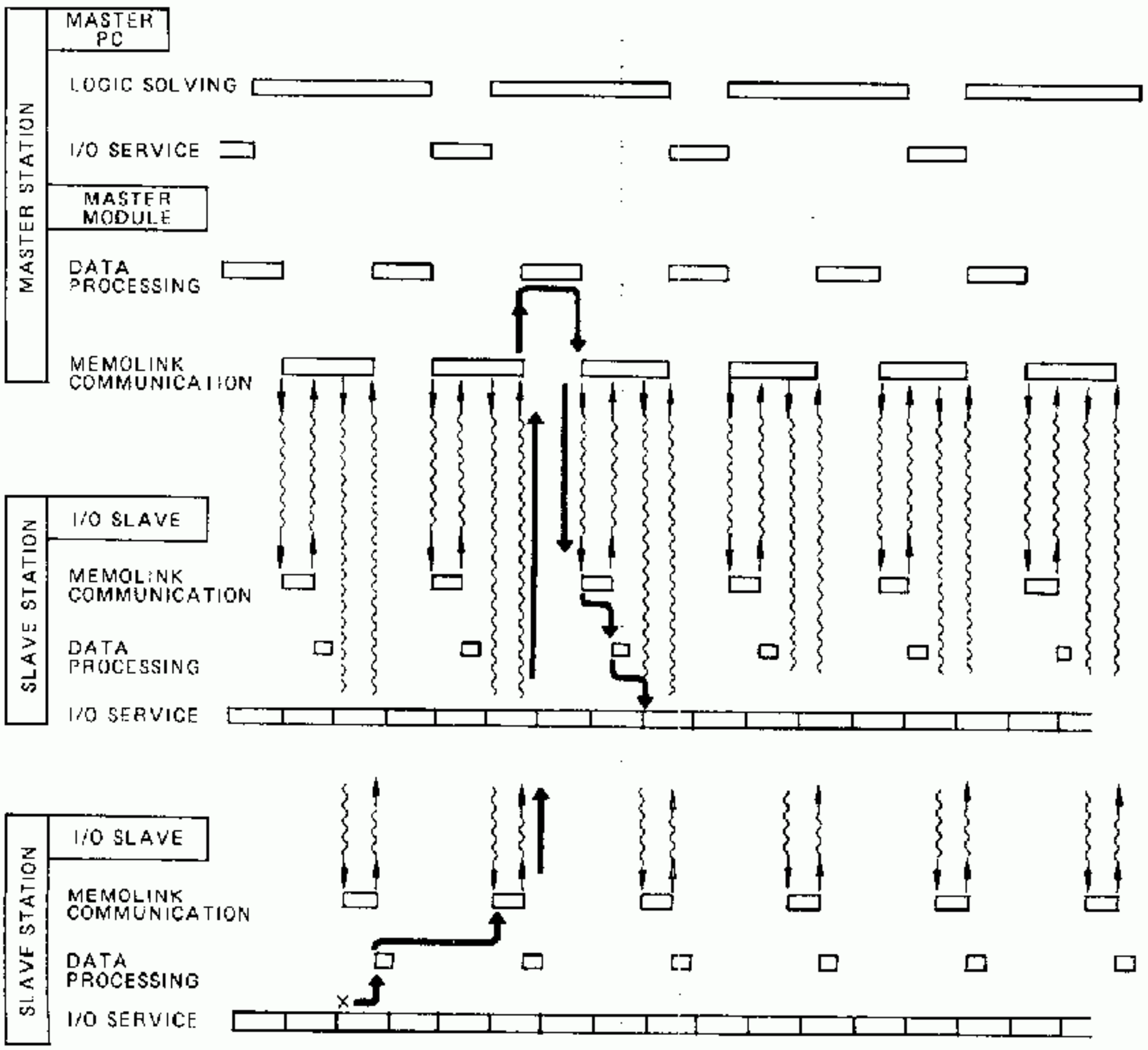


Note:
1. Status changed at "X" position.
2. I/O processing cycle: 10 ms min.

Fig. 4.13 Data Flow

(8) I/O Slave to I/O Slave

Fig. 4.14 shows the data flow from one I/O slave to other I/O slaves. The data from the I/O slave is temporarily collected in the master station and distributed to each station in accordance with the allocation.



Note:
1. Status changed at "X" position.
2. I/O processing cycle: 10 ms min.

Fig. 4.14 Data Flow

5. OPERATION OF PROGRAMMING PANEL

Data of each MEMOLINK station are allocated, monitored, and put into disable operation through P190 programming panel or P150 programming panel.

5.1 P190 PROGRAMMING PANEL

5.1.1 MEMOLINK Operation Flow

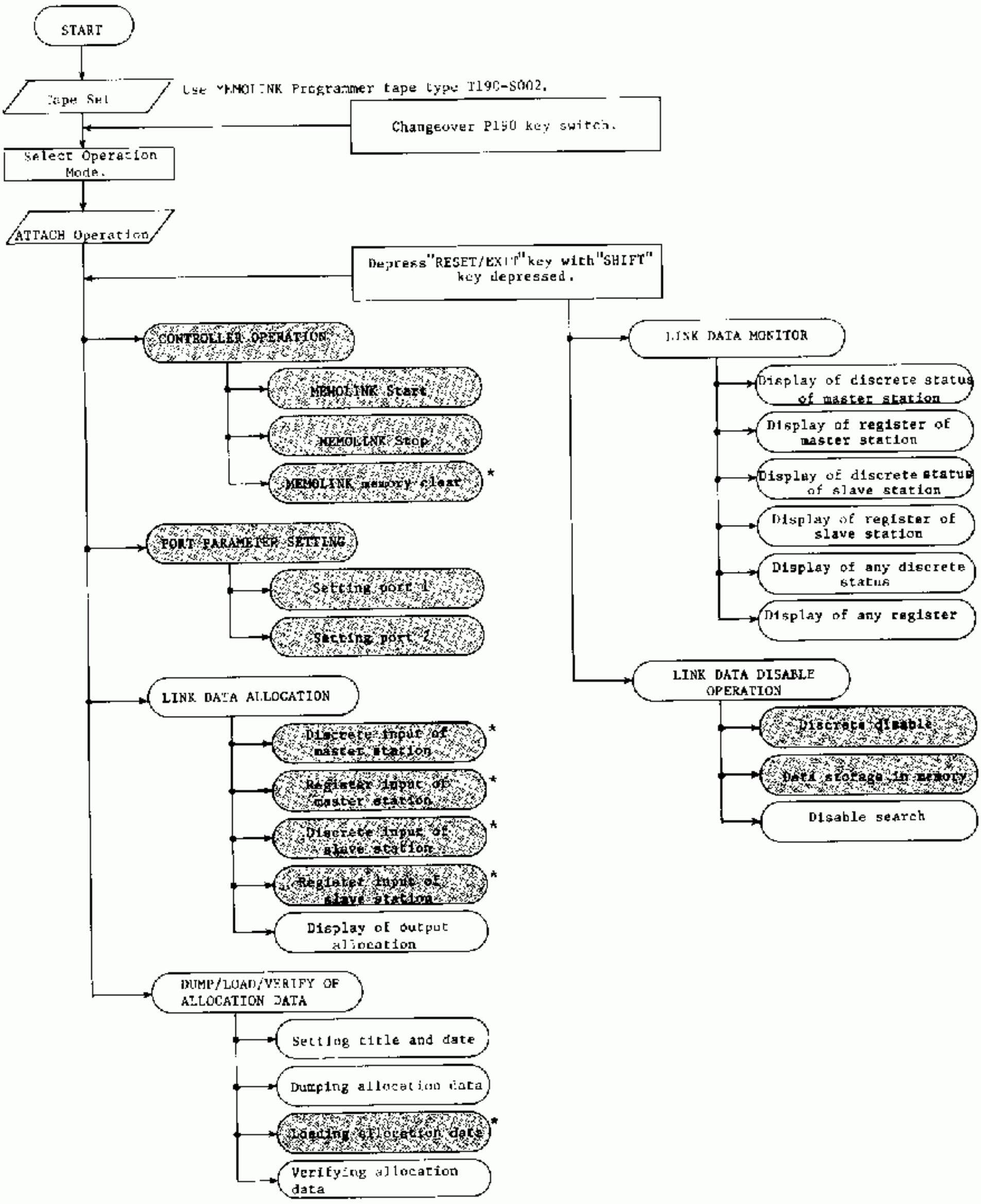


Fig. 5.1.1

NOTE

1. For normal operation, set the switches as shown below, to prevent errors.

   P190 key switch: ON
   MEMOLINK master module memory protect switch: ON

2. In program mode, all operations are possible.

   When MEMOLINK is operating, however, the asterisked operations cannot be accomplished.

3. In monitor mode, the operations in ( ) are not possible.

4. The keys are classified as follows:

   ( ): CRT label keys

   [ ]: Function keys, such as numeric, fixed function, cursor control, and ASCII keys.

5. Eight labels displayed on the screen indicate the functions of the eight keys (CRT label keys: F1 to F8) located at a top of the keyboard.

5.1.2. Preparation

Performing ATTACH operation makes data communication between the P190 and the MEMOLINK master module possible.

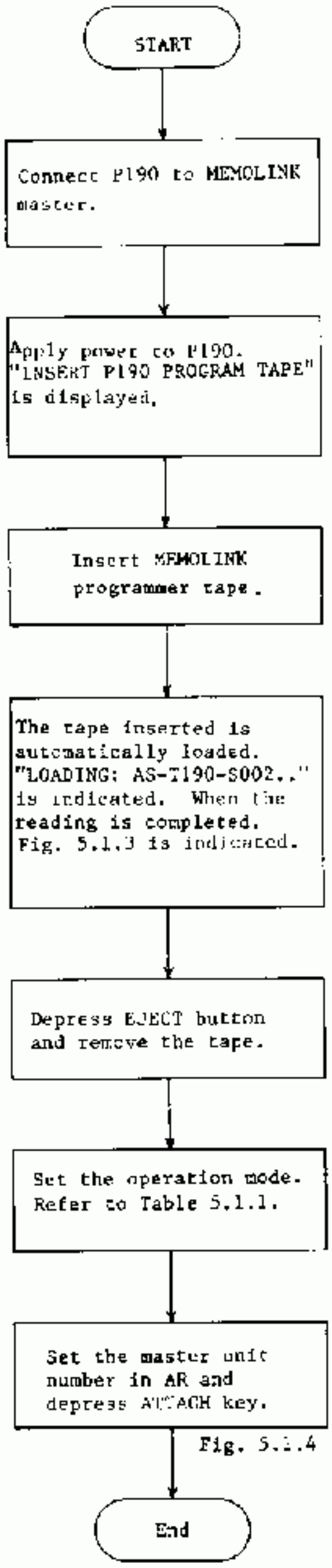


Fig. 5.1.4

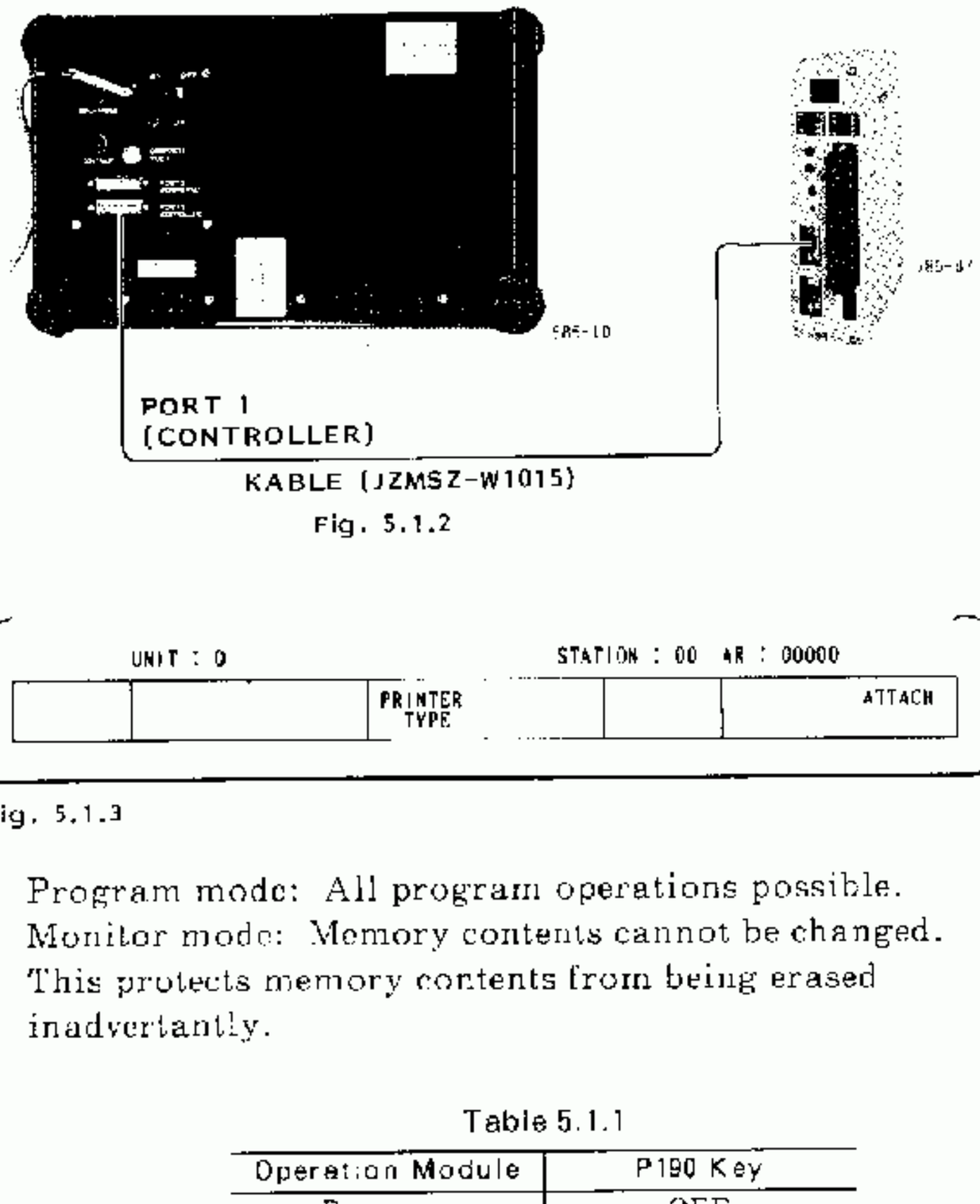


Fig. 5.1.2

Fig. 5.1.3

Program mode: All program operations possible.
Monitor mode: Memory contents cannot be changed. This protects memory contents from being erased inadvertantly.

Table 5.1.1

Operation Module	P190 Key
Program	OFF
Monitor	ON

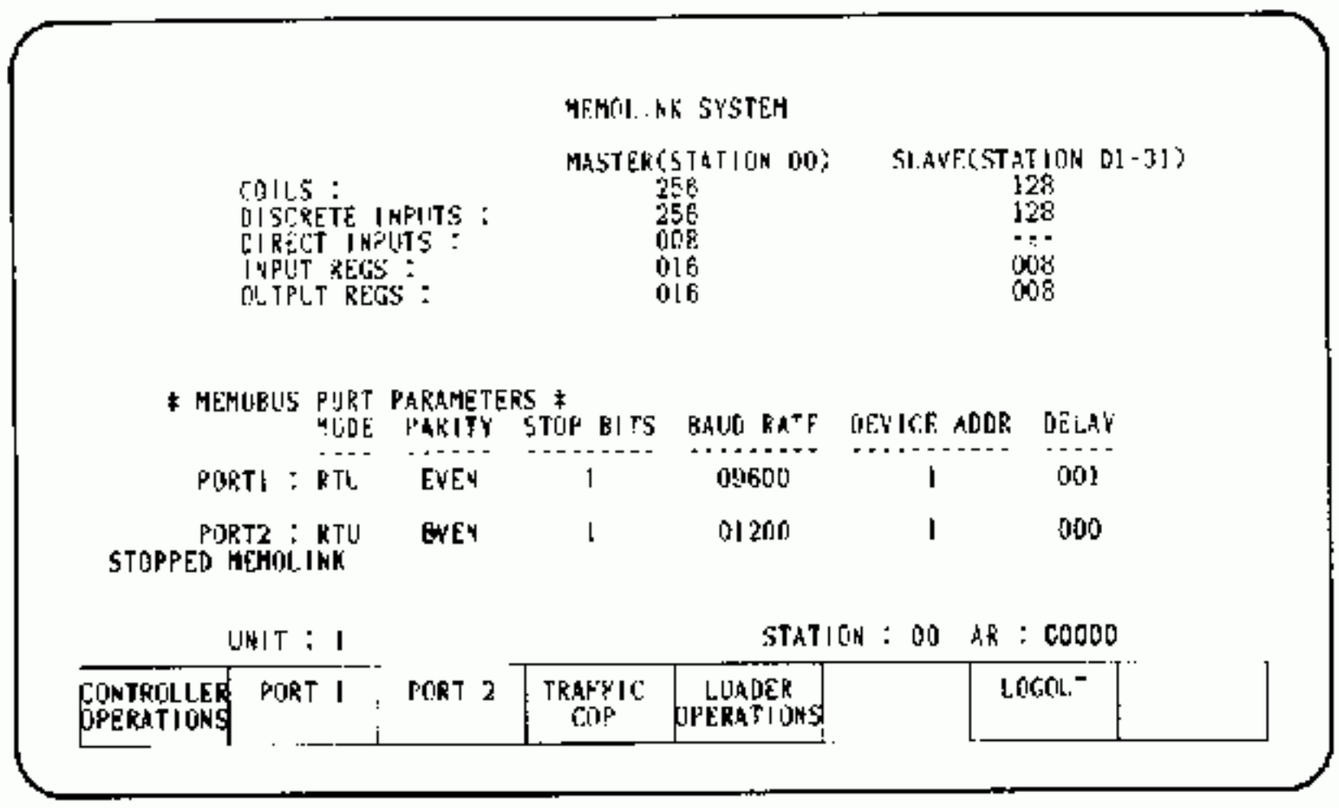


Fig. 5.1.4

NOTE

1. When INIT and INIT LOCK are depressed simultaneously, the state becomes the same as when power is initially supplied to the P190. This can be used to load another tape in the P190 while operating.

2. When a MEMOLINK program tape is removed, place it in the tape container, and store in the specified place.

3. When LOGOUT is depressed (see Fig. 5.1.4) or when the P190 key switch is set first to on and then off, the original state is restored (same as prior to installation).

PRECAUTIONS

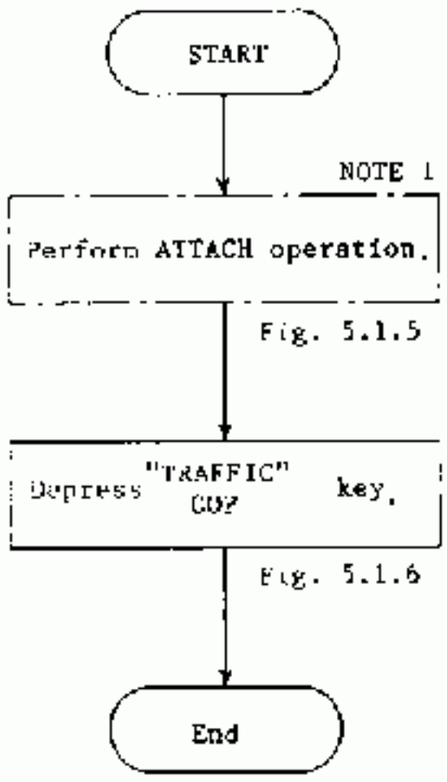
1. Plug the P190 power cord into a properly grounded 100 VAC receptacle.

2. Connect the P190 and MEMOLINK master before connecting to power.

3. Turn off power to the P190 before disconnecting the P190 and MEMOLINK master.

5.1.3 Link Data Allocation

MEMOLINK allocation is carried out by loading connection information "Use 'A' PC output data as 'B' PC input data" into the master module.



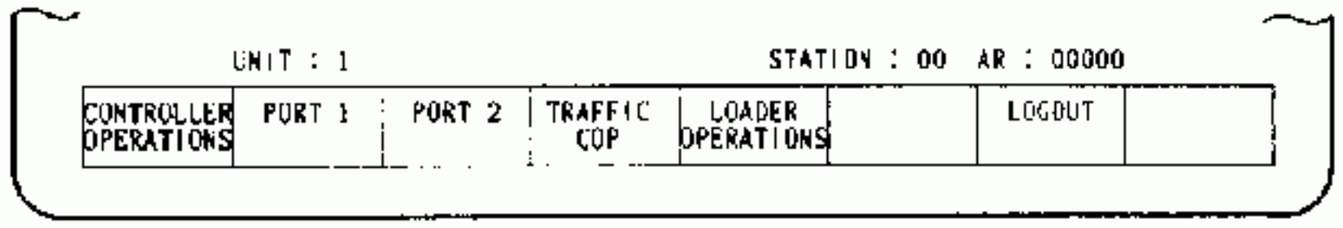


Fig. 5.1.5

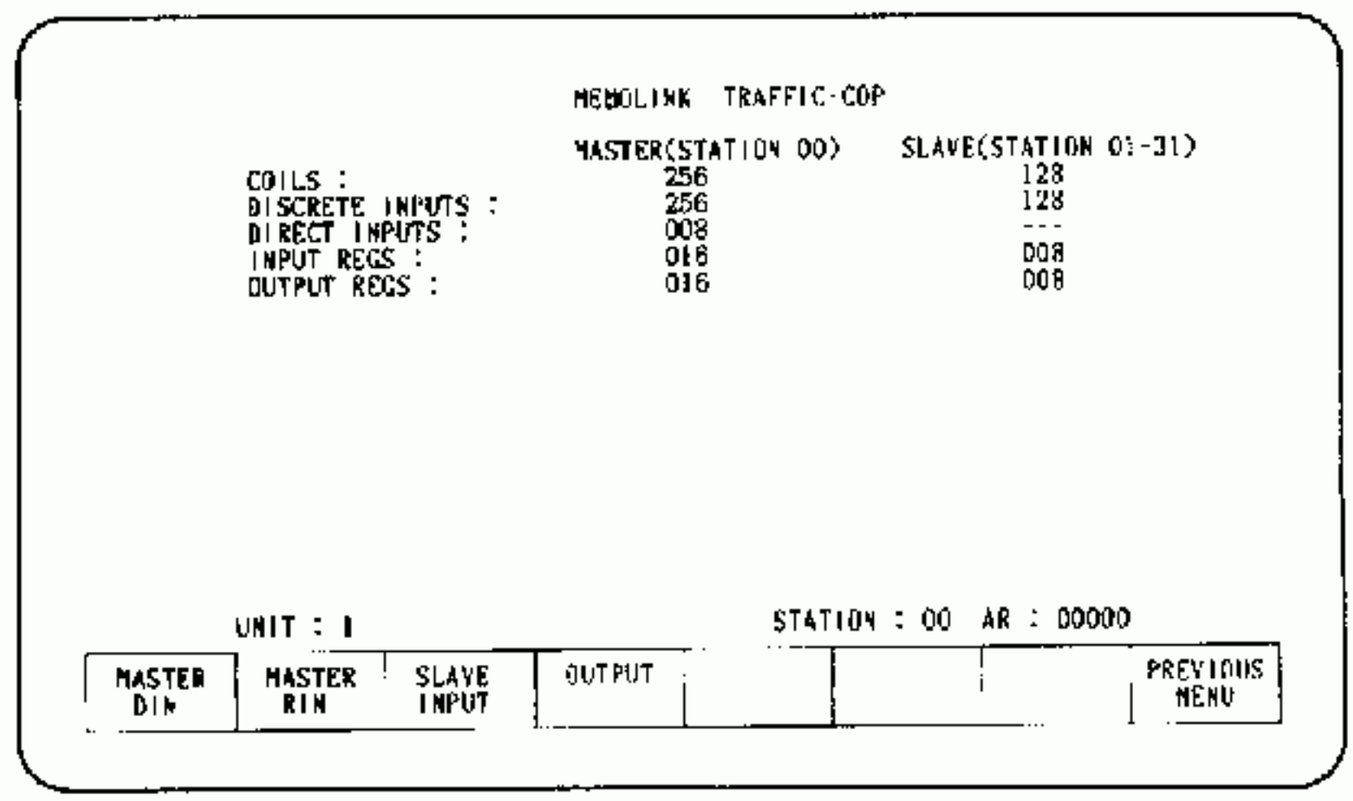


Fig. 5.1.6

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.
2. When "PREVIOUS MENU" key is depressed, the state returns to the state as shown in Fig. 5.1.5.
3. See Section 4 for detailed allocation.

(1) Typical Allocation of Discrete Input in Master Station

Discrete data are allocated in increment of 8 points. Allocation is loaded by setting the station number to STATION and the last three digits (001 to 249) of the first reference numbers to AR and depressing "SET DISCRETE" key. It is not necessary to allocate interrupt signals (70001 to 70008).

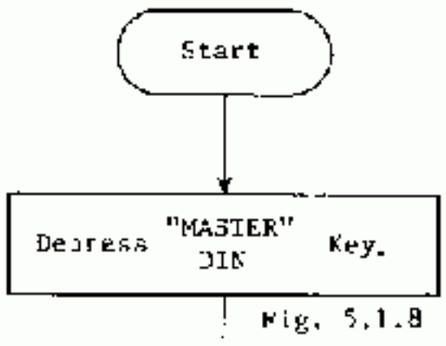


Fig. 5.1.8

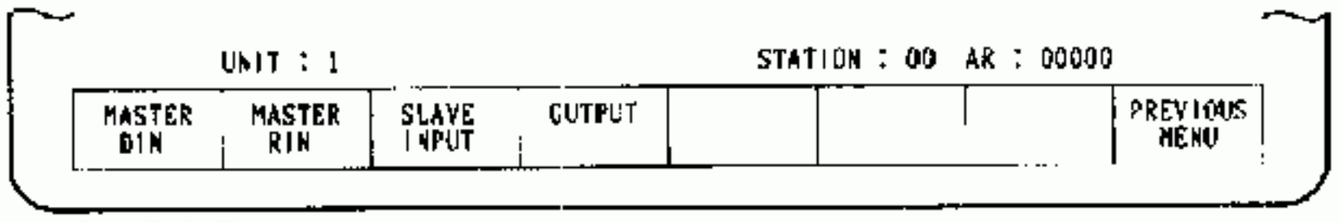


Fig. 5.1.7

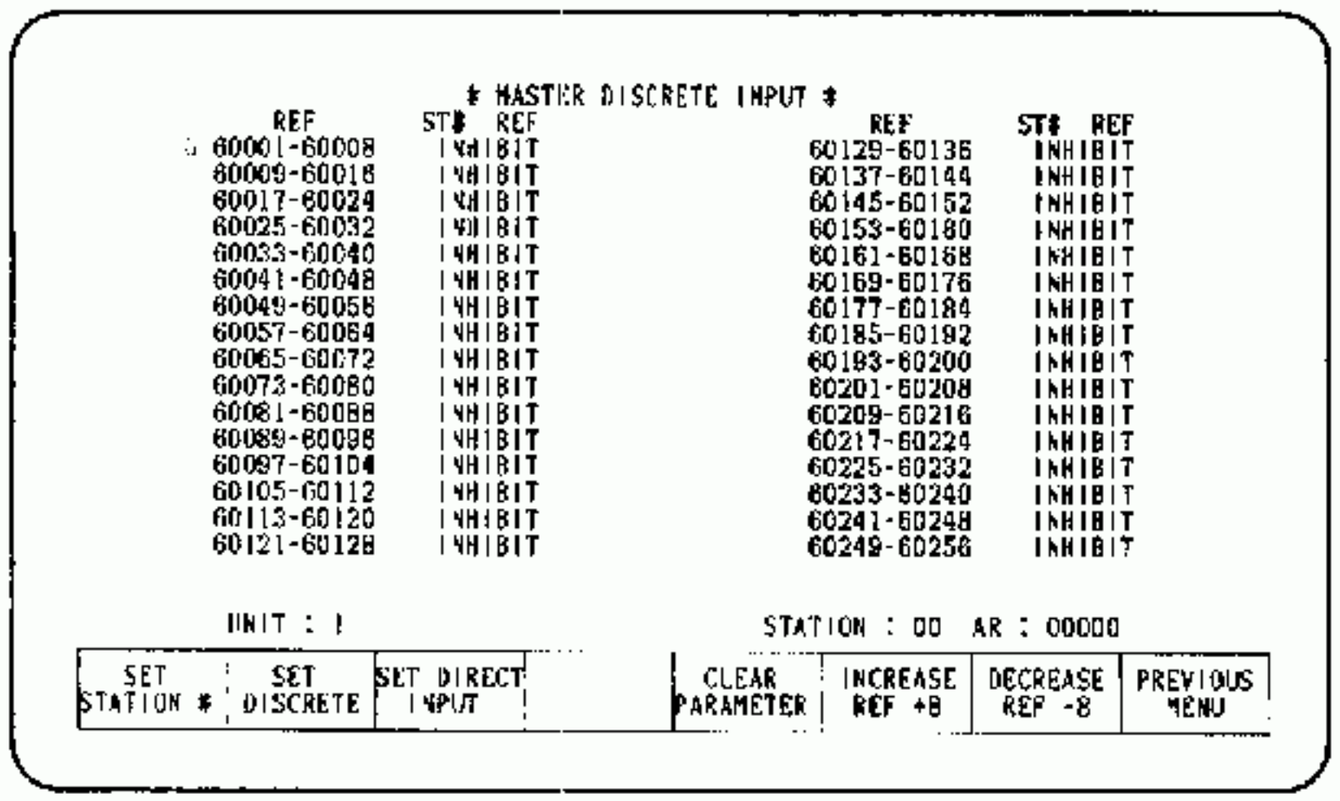


Fig. 5.1.8

Set "1" in AR and depress "SET STATION #" key.

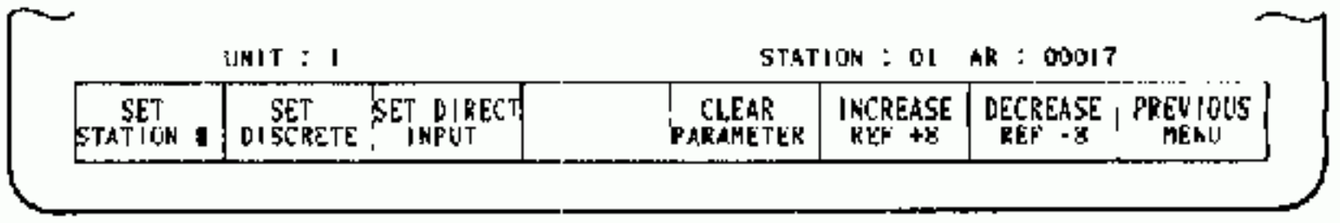


Fig. 5.1.9

Set "17" in AR and depress "SET DISCRETE" key.

The cursor moves downward to the next legal position.

Fig. 5.1.10

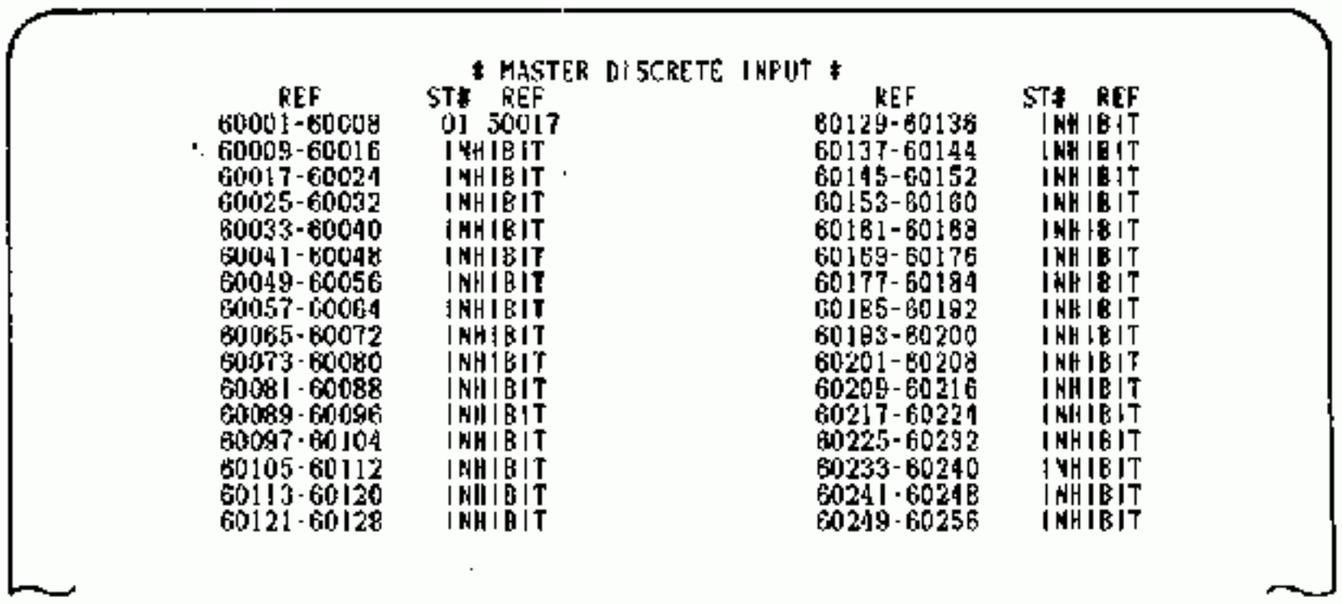


Fig. 5.1.10

(1) Typical Allocation of Discrete Input in Master Station (Cont'd)

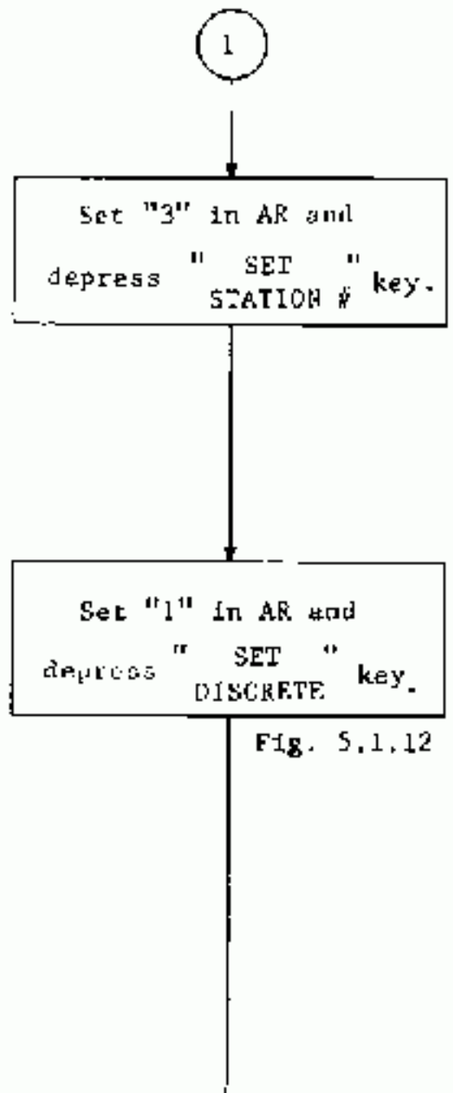


Fig. 5.1.12

Fig. 5.1.13

UNIT : 1 STATION : 03 AR : 00001

SET STATION #	SET DISCRETE	SET DIRECT INPUT		CLEAR PARAMETER	INCREASE REF +8	DECREASE REF -8	PREVIOUS MENU

Fig. 5.1.11

* MASTER DISCRETE INPUT *

REF	ST# REF	REF	ST# REF
60001-60008	01 50017	60129-60136	INHIBIT
60009-60016	03 50001	60137-60144	INHIBIT
60017-60024	INHIBIT	60145-60152	INHIBIT
60025-60032	INHIBIT	60153-60160	INHIBIT
60033-60040	INHIBIT	60161-60168	INHIBIT
60041-60048	INHIBIT	60169-60176	INHIBIT
60049-60056	INHIBIT	60177-60184	INHIBIT
60057-60064	INH BIT	60185-60192	INHIBIT
60065-60072	INHIBIT	60193-60200	INHIBIT
60073-60080	INHIBIT	60201-60208	INHIBIT
60081-60088	INHIBIT	60209-60216	INHIBIT
60089-60096	INHIBIT	60217-60224	INHIBIT
60097-60104	INHIBIT	60225-60232	INHIBIT
60105-60112	INHIBIT	60233-60240	INHIBIT
60113-60120	INHIBIT	60241-60248	INHIBIT
60121-60128	INHIBIT	60249-60256	INHIBIT

Fig. 5.1.12

* MASTER DISCRETE INPUT *

REF	ST# REF	REF	ST# REF
60001-60008	01 50017	60129-60136	INHIBIT
60009-60016	03 50001	60137-60144	INHIBIT
60017-60024	05 50003	60145-60152	INHIBIT
60025-60032	02 50121	60153-60160	INHIBIT
60033-60040	04 50025	60161-60168	INHIBIT
60041-60048	06 50049	60169-60176	INHIBIT
60049-60056	10 50001	60177-60184	INHIBIT
60057-60064	10 50009	60185-60192	INHIBIT
60065-60072	07 50017	60193-60200	INHIBIT
60073-60080	INHIBIT	60201-60208	INHIBIT
60081-60088	INHIBIT	60209-60216	INHIBIT
60089-60096	INHIBIT	60217-60224	INHIBIT
60097-60104	INHIBIT	60225-60232	INHIBIT
60105-60112	INHIBIT	60233-60240	INHIBIT
60113-60120	INHIBIT	60241-60248	INHIBIT
60121-60128	INHIBIT	60249-60256	INHIBIT

UNIT : 1 STATION : 07 AR : 00017

SET STATION #	SET DISCRETE	SET DIRECT INPUT		CLEAR PARAMETER	INCREASE REF +8	DECREASE REF -8	PREVIOUS MENU

Fig. 5.1.13

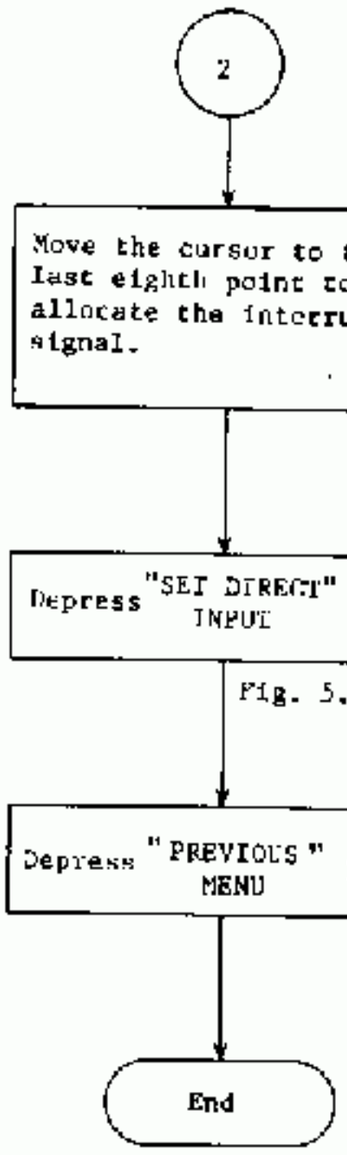


Fig. 5.1.14

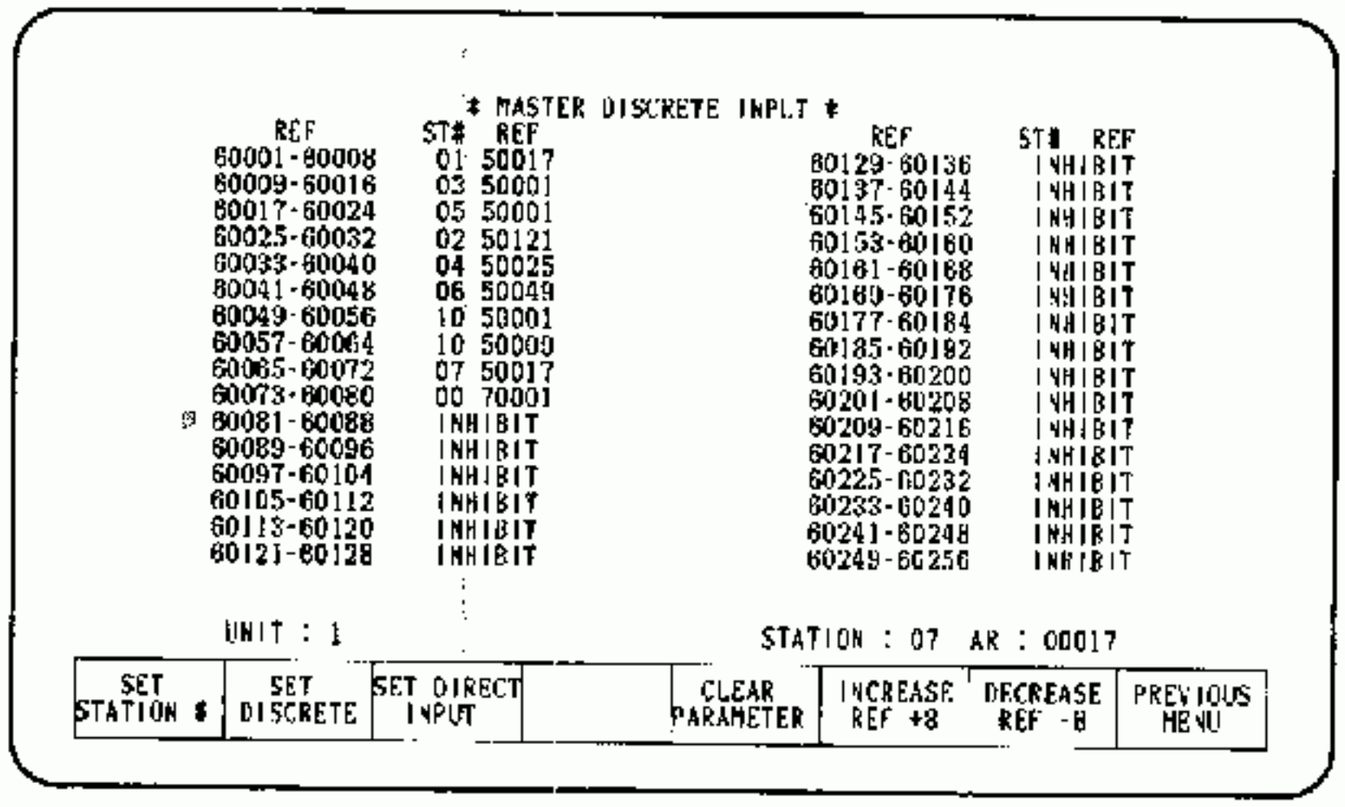


Fig. 5.1.14

NOTE

1. In monitor mode, only label "PREVIOUS MENU" appears.
2. When "INCREASE REF + 8" is depressed, the AR content increases to become 8N - 1 (N = 0, 1, 2, .., 31) nearest the value set in AR.
3. When "DECREASE REF - 8" is depressed, the AR content decreases to become 8N - 1 (N = 0, 1, 2, .., 31) nearest the value set in AR.
4. When "CLEAR PARAMETER" is depressed, the allocation at the cursor is cleared.
5. Once an interrupt signal is allocated, succeeding discrete data cannot be allocated.

(2) Typical Allocation of Register Input in Master Station

Registers are input one by one. Allocation is loaded by setting the station number to STATION and the last two digits (01 to 16) of the reference numbers to AR and depressing " SET REGISTER ".

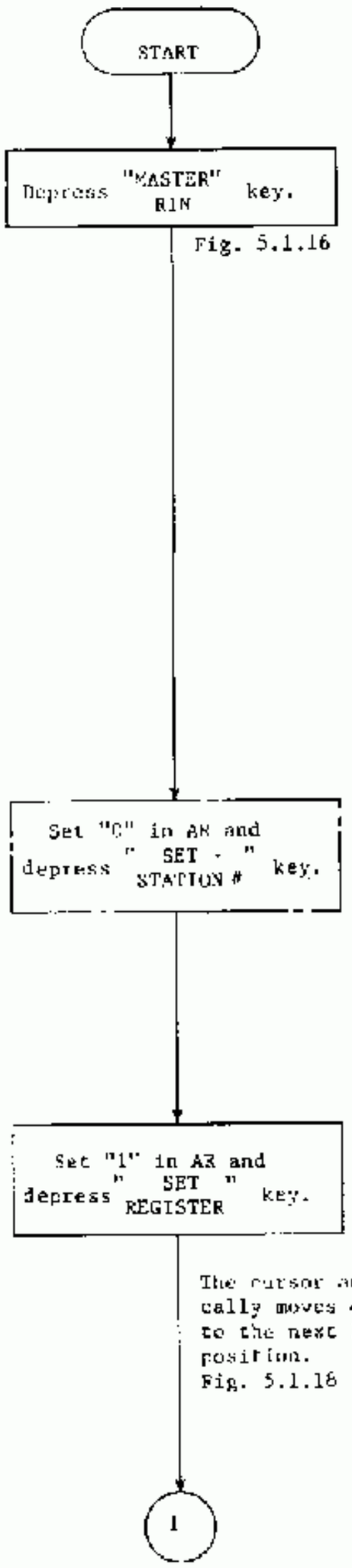


Fig. 5.1.16

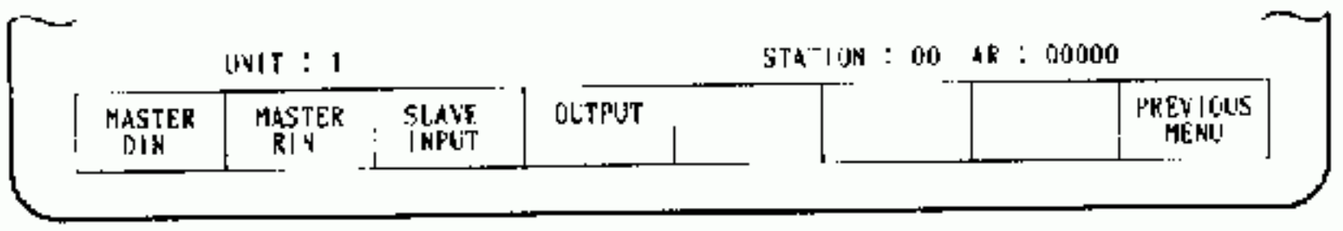


Fig. 5.1.15

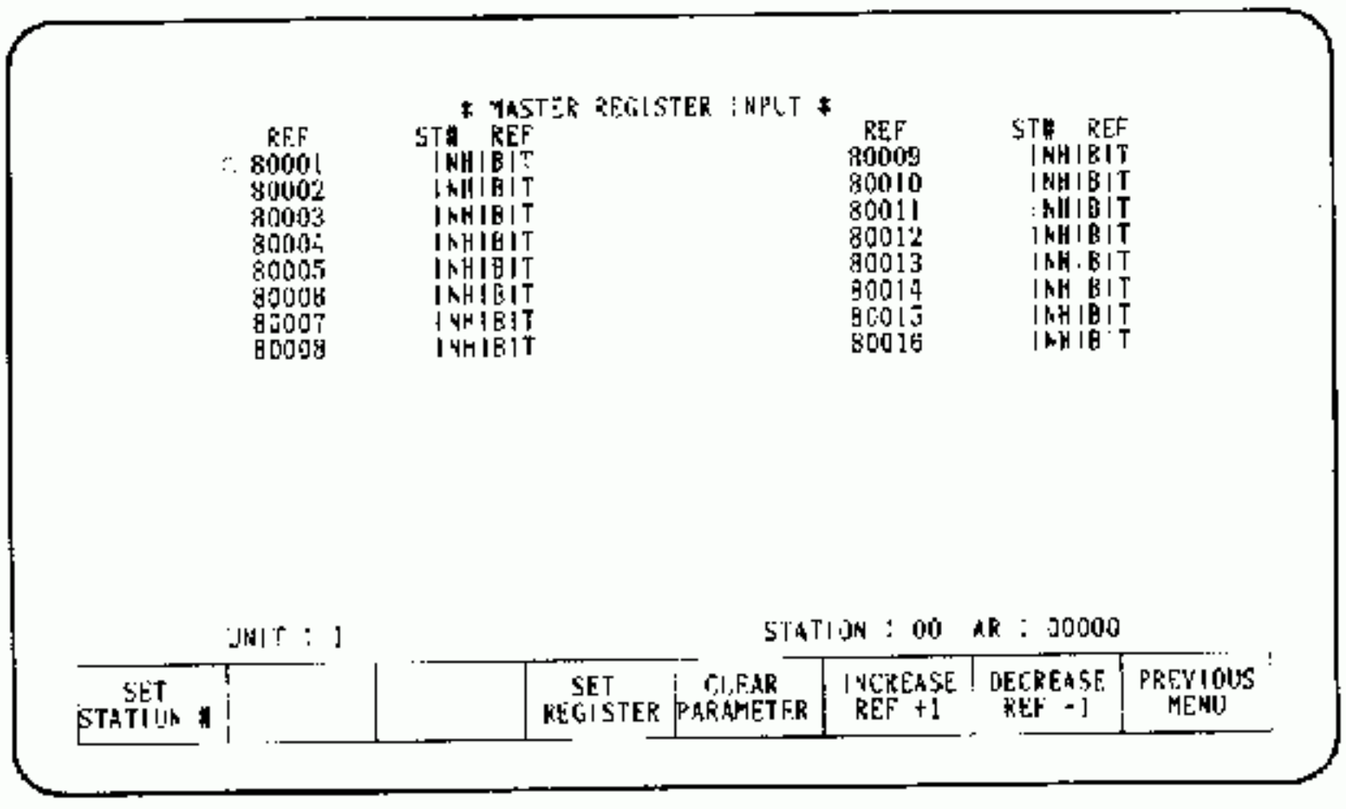


Fig. 5.1.16

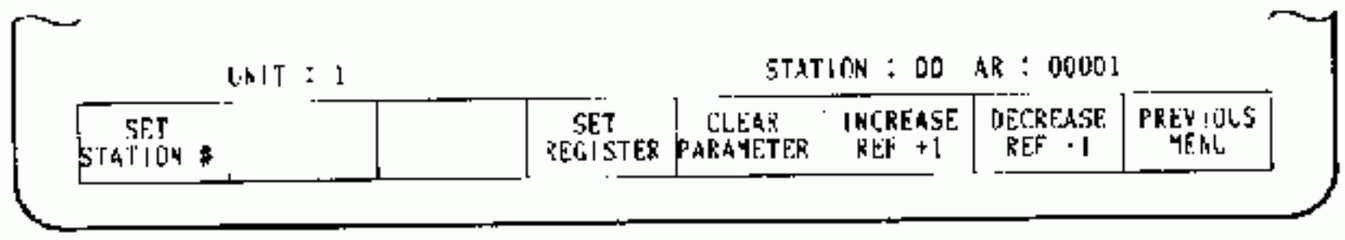


Fig. 5.1.17

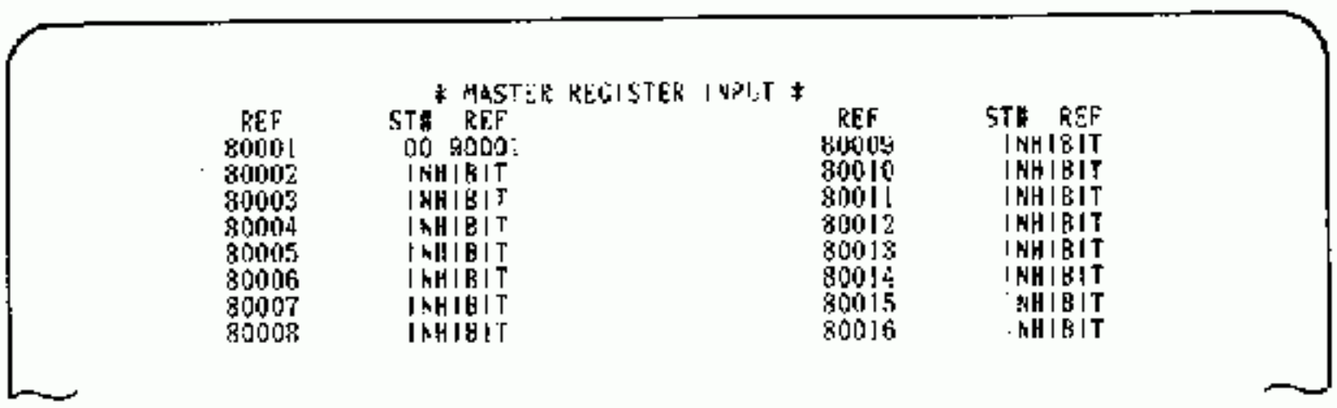


Fig. 5.1.18

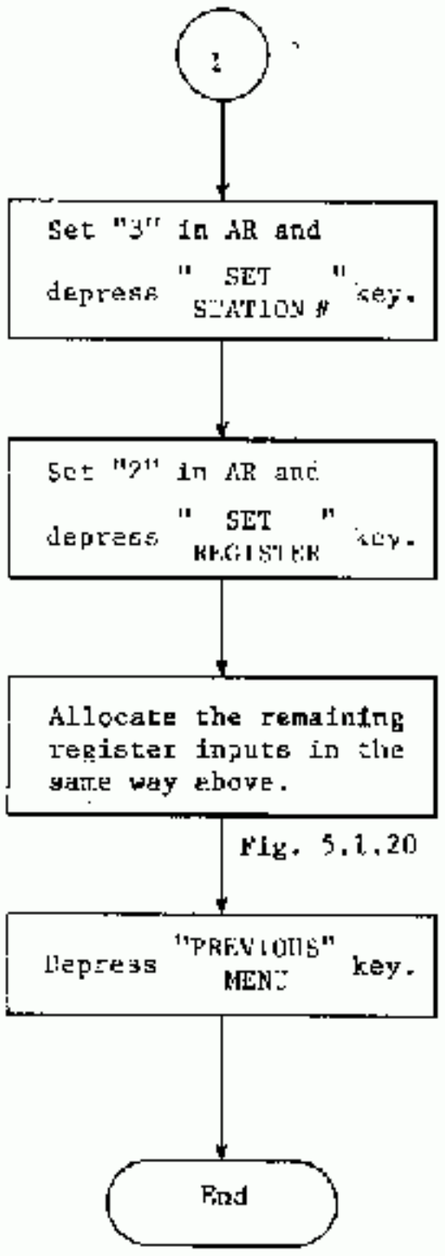


Fig. 5.1.19

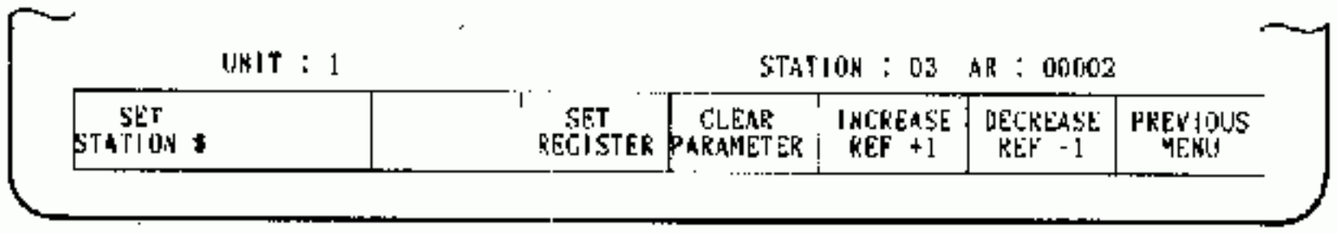


Fig. 5.1.20

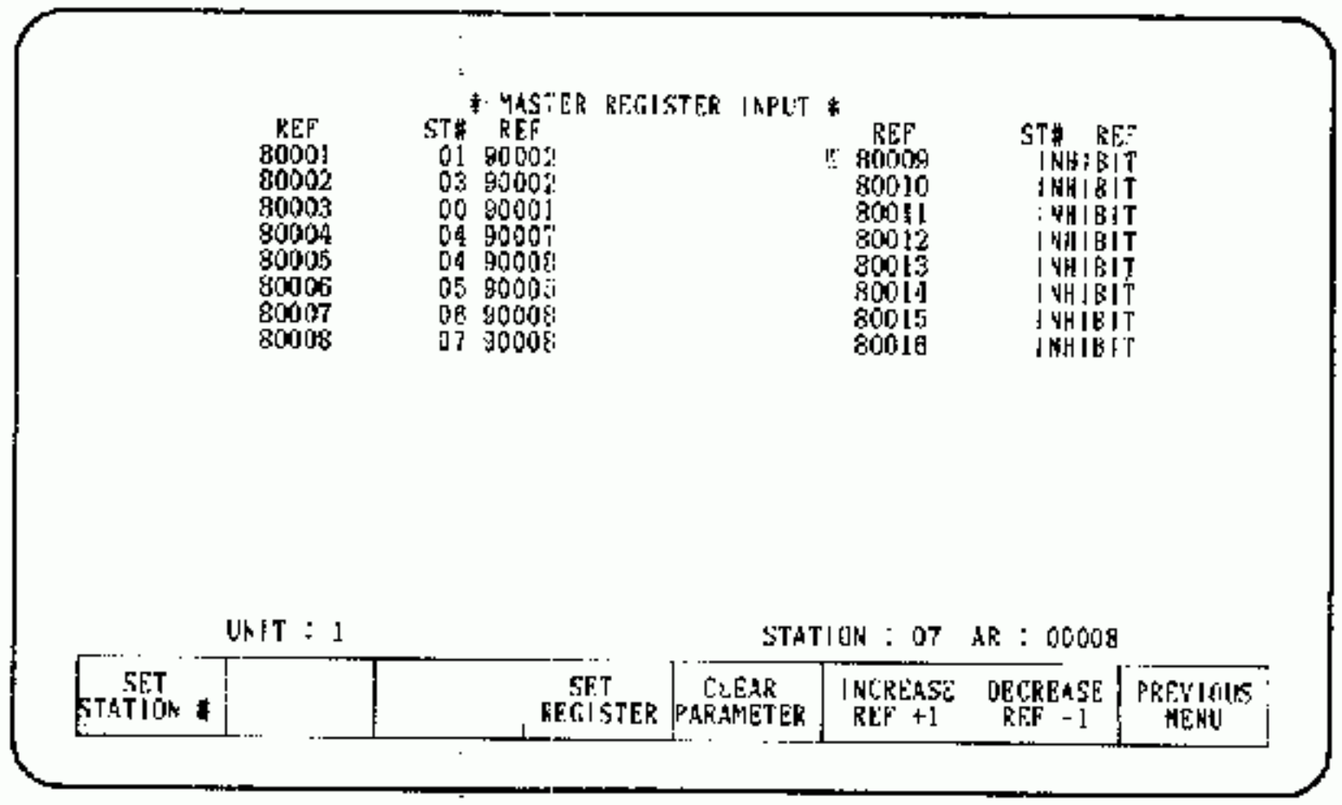


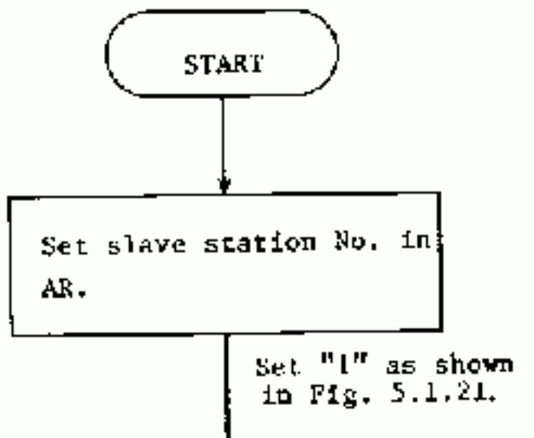
Fig. 5.1.20

NOTE

1. In monitor mode, only "PREVIOUS MENU" appears.
2. When "INCREASE REF + 1" is depressed, the AR content increases by 1.
3. When "DECREASE REF − 1" is depressed, the AR content decreases by 1.
4. When " CLEAR PARAMETER " is depressed, the allocation at the cursor is cleared.

(3) Typical Allocation of Discrete Input in Slave Station

Discrete data are allocated in increment of 8 points. Allocation is loaded by setting the station number to STATION and the last three digits (001 to 249) of the first reference numbers to AR and depressing "SET DISCRETE". It is not necessary to allocate interrupt signals (70001 to 70008).




```
UNIT : 1                                          STATION : 00  AR : 00001
| MASTER DIN | MASTER RIN | SLAVE INPUT | OUTPUT |  |  | PREVIOUS MENU |
```

Fig. 5.1.21

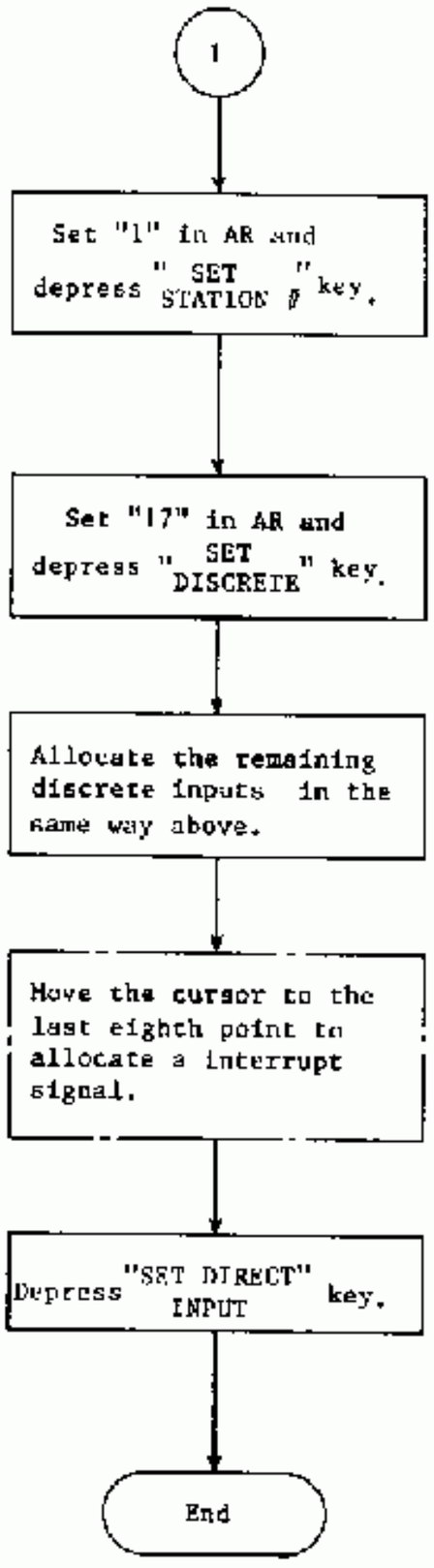
```
        DISCRETE      # SLAVE 01 INPUT #        REGISTER
     REF        ST#  REF                    REF        ST#  REF
 60001-60008    INHIBIT                    80001      INHIBIT
 60009-60016    INHIBIT                    80002      INHIBIT
 60017-60024    INHIBIT                    80003      INHIBIT
 60025-60032    INHIBIT                    80004      INHIBIT
 60033-60040    INHIBIT                    80005      INHIBIT
 60041-60048    INHIBIT                    80006      INHIBIT
 60049-60056    INHIBIT                    80007      INHIBIT
 60057-60064    INHIBIT                    80008      INHIBIT
 60065-60072    INHIBIT
 60073-60080    INHIBIT
 60081-60088    INHIBIT
 60089-60096    INHIBIT
 60097-60104    INHIBIT
 60105-60112    INHIBIT
 60113-60120    INHIBIT
 60121-60128    INHIBIT

UNIT : 1                                          STATION : 00  AR : 00001
| SET STATION # | SET DISCRETE | SET DIRECT INPUT |  | CLEAR PARAMETER | INCREASE REF +8 | DECREASE REF -8 | PREVIOUS MENU |
```

Fig. 5.1.22

```
        DISCRETE      # SLAVE 01 INPUT #        REGISTER
     REF        ST#  REF                    REF        ST#  REF
 60001-60008    00 50001                   80001      INHIBIT
 60009-60016    INHIBIT                    80002      INHIBIT
 60017-60024    INHIBIT                    80003      INHIBIT
 60025-60032    INHIBIT                    80004      INHIBIT
 60033-60040    INHIBIT                    80005      INHIBIT
 60041-60048    INHIBIT                    80006      INHIBIT
 60049-60056    INHIBIT                    80007      INHIBIT
 60057-60064    INHIBIT                    80008      INHIBIT
 60065-60072    INHIBIT
 60073-60080    INHIBIT
 60081-60088    INHIBIT
 60089-60096    INHIBIT
 60097-60104    INHIBIT
 60105-60112    INHIBIT
 60113-60120    INHIBIT
 60121-60128    INHIBIT
```

Fig. 5.1.23



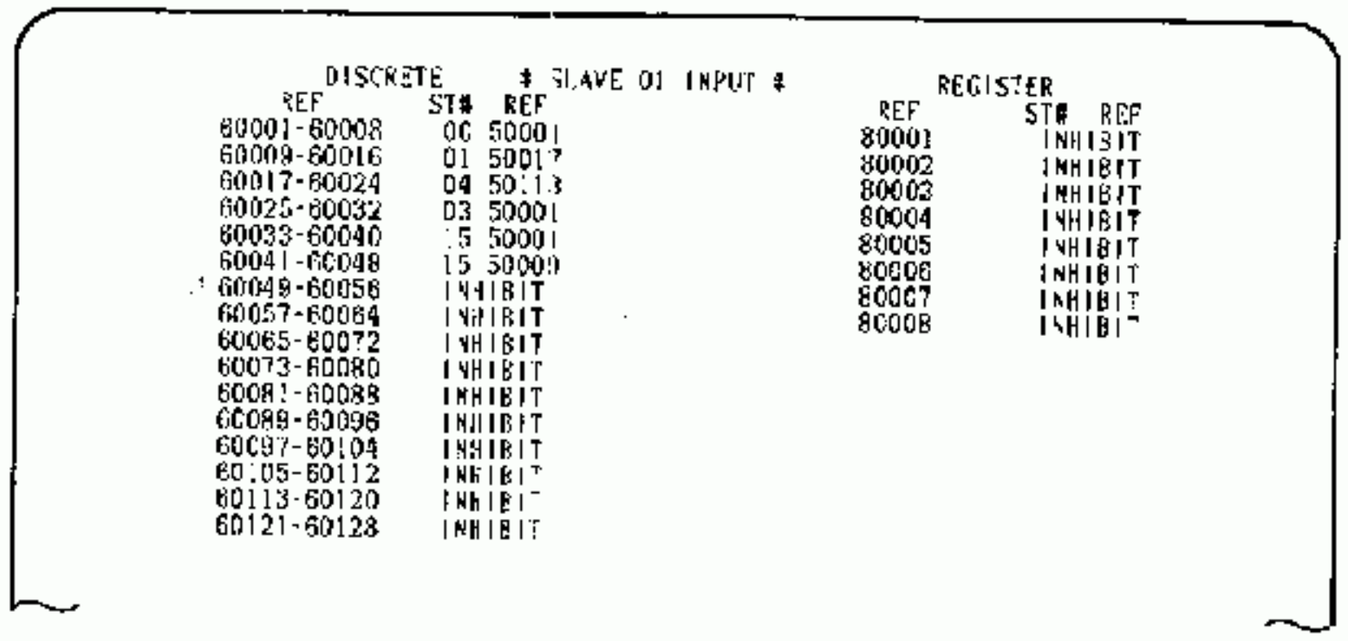


Fig. 5.1.24

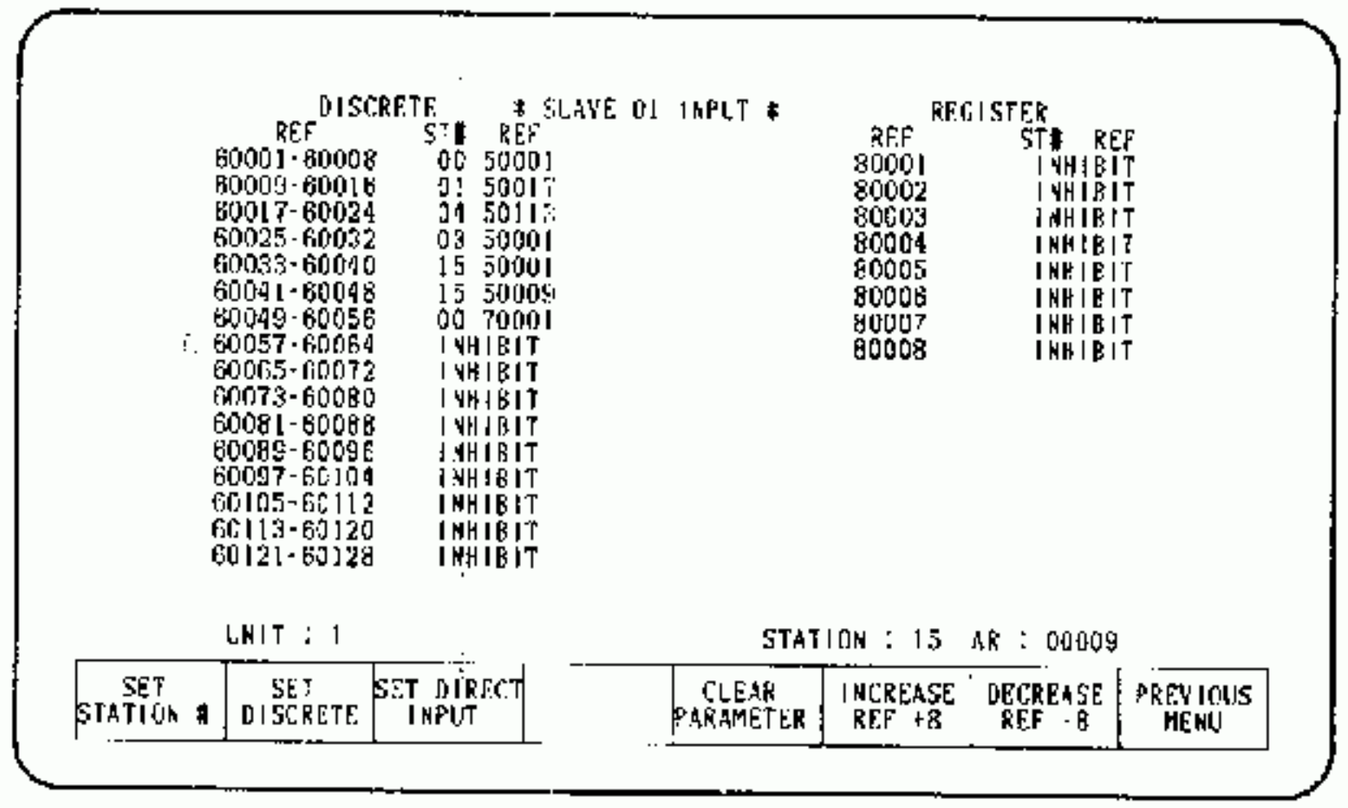


Fig. 5.1.25

NOTE

1. In monitor mode, only "PREVIOUS MENU" appears.

2. When "INCREASE REF + 8" is depressed, the AR content increases to become 8N + 1 (N = 0, 1, 2, ... 31) nearest the value set in AR.

3. When "DECREASE REF - 8" is depressed, the AR content decreases to become 8N + 1 (N = 0, 1, 2, ... 31) nearest the value set in AR.

4. When "CLEAR PARAMETER" is depressed, the allocation at the cursor is cleared.

5. Once an interrupt signal is allocated, succeeding discrete data cannot be allocated.

(4) Typical Allocation of Register Input in Slave Station

Registers are input one by one. Allocation is loaded by setting the station number to STATION and the last two digits (01 to 16) of the reference number to AR and depressing "SET REGISTER".

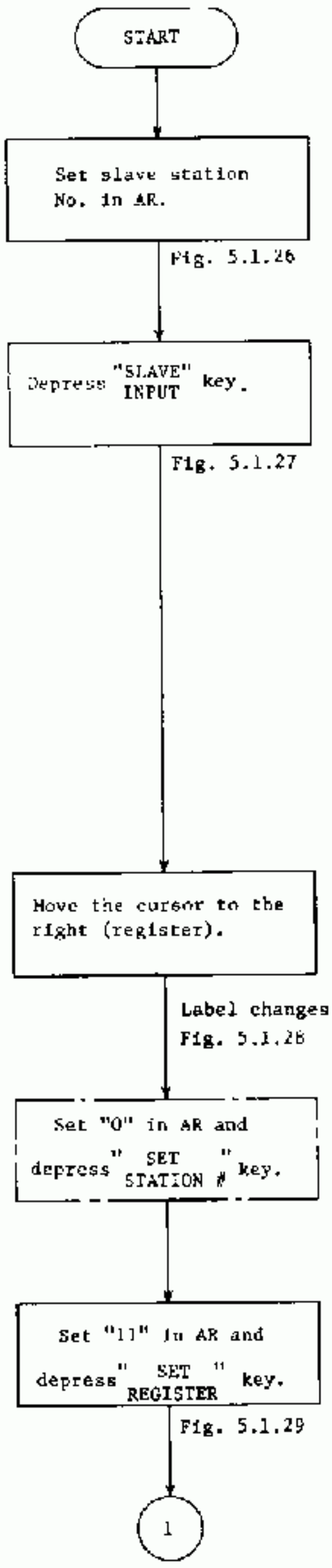
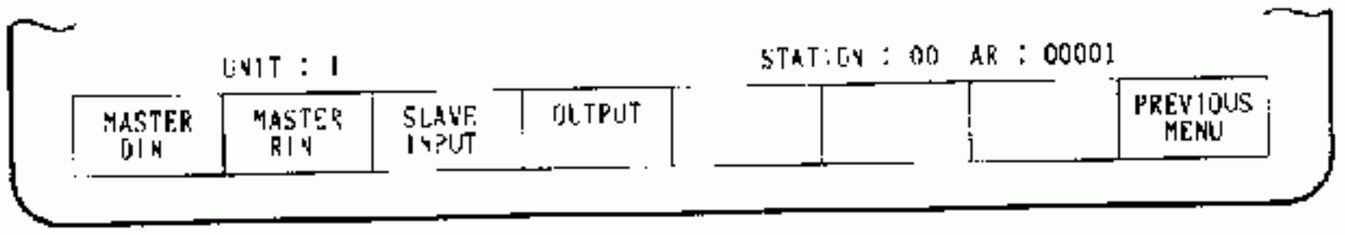


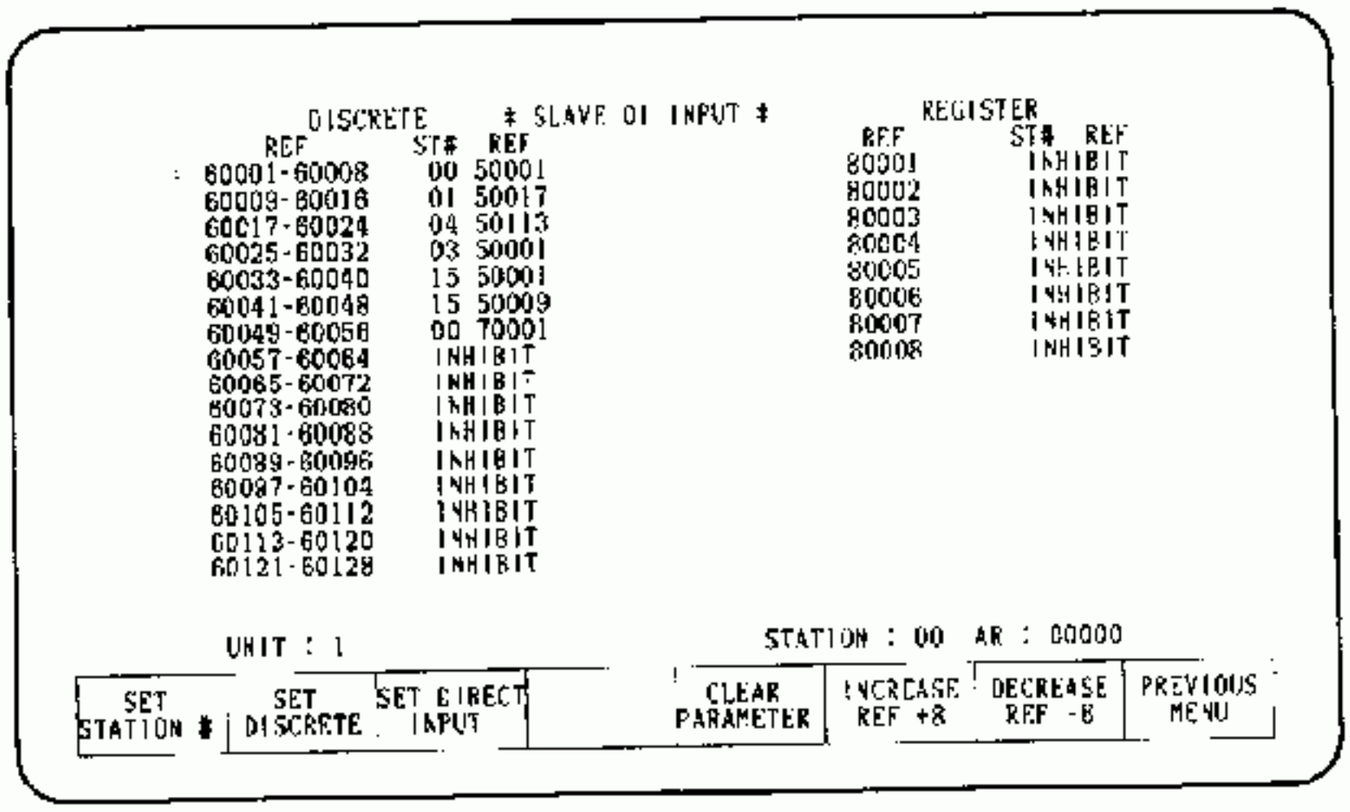
Fig. 5.1.26

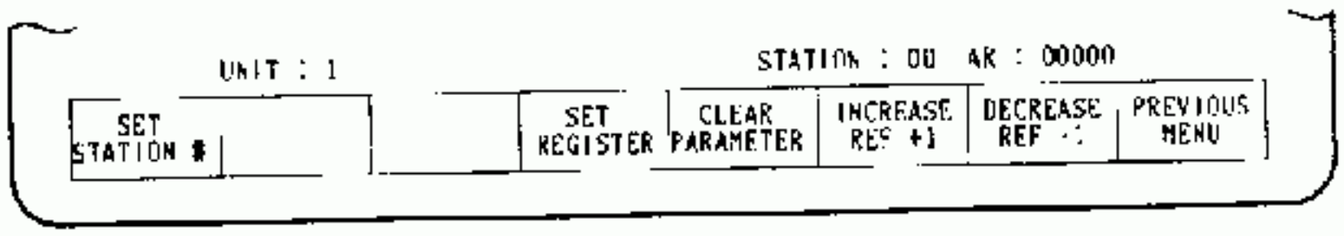
Fig. 5.1.27

Fig. 5.1.28

Fig. 5.1.29







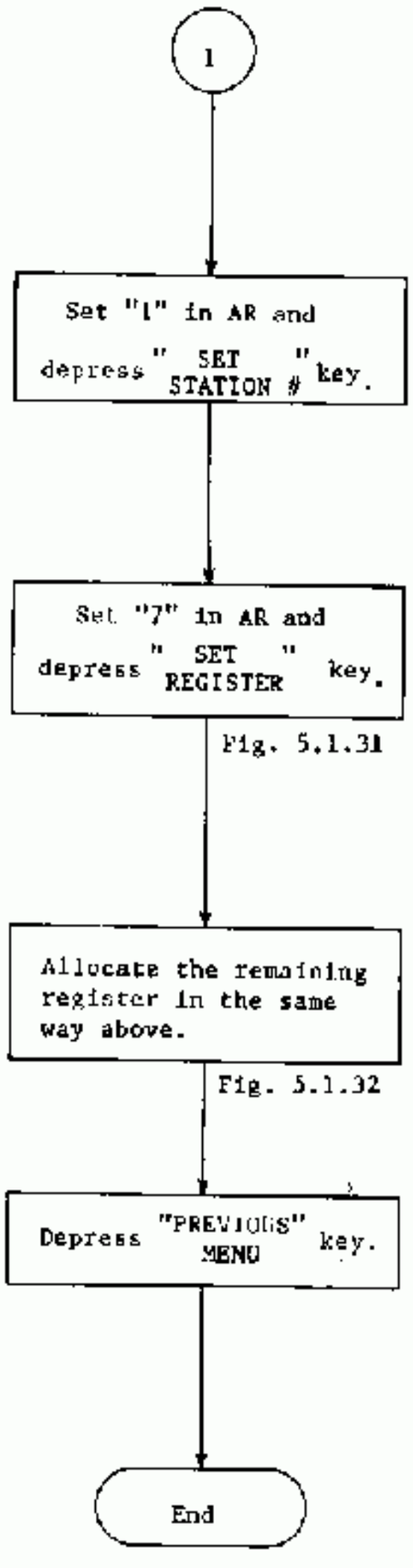


Fig. 5.1.31

Fig. 5.1.32

UNIT : 1 STATION : 01 AR : 00007

SET STATION #		SET REGISTER	CLEAR PARAMETER	INCREASE REF +1	DECREASE REF -1	PREVIOUS MENU

Fig. 5.1.30

DISCRETE # SLAVE 01 INPUT # REGISTER

DISCRETE REF	ST#	DISCRETE REF	REGISTER REF	ST#	REGISTER REF
60001-60008	00	50001	80001	00	90011
60009-60016	01	50017	80002	01	90007
60017-60024	04	50113	⇒ 80003	INHIBIT	
60025-60032	03	50001	80004	INHIBIT	
60033-60040	15	50001	80005	INHIBIT	
60041-60048	15	50009	80006	INHIBIT	
60049-60056	00	70001	80007	INHIBIT	
60057-60064	INHIBIT		80008	INHIBIT	
60065-60072	INHIBIT				
60073-60080	INHIBIT				
60081-60088	INHIBIT				
60089-60096	INHIBIT				
60097-60104	INHIBIT				
60105-60112	INHIBIT				
60113-60120	INHIBIT				
60121-60128	INHIBIT				

Fig. 5.1.31

DISCRETE # SLAVE 01 INPUT # REGISTER

DISCRETE REF	ST#	DISCRETE REF	REGISTER REF	ST#	REGISTER REF
60001-60008	00	50001	80001	00	90011
60009-60016	01	50017	80002	01	90007
60017-60024	04	50113	80003	02	90006
60025-60032	03	50001	80004	07	90003
60033-60040	15	50001	80005	05	90002
60041-60048	15	50009	⇒ 80006	INHIBIT	
60049-60056	00	70001	80007	INHIBIT	
60057-60064	INHIBIT		80008	INHIBIT	
60065-60072	INHIBIT				
60073-60080	INHIBIT				
60081-60088	INHIBIT				
60089-60096	INHIBIT				
60097-60104	INHIBIT				
60105-60112	INHIBIT				
60113-60120	INHIBIT				
60121-60128	INHIBIT				

UNIT : 1 STATION : 02 AR : 00002

SET STATION #			SET REGISTER	CLEAR PARAMETER	INCREASE REF +1	DECREASE REF -1	PREVIOUS MENU

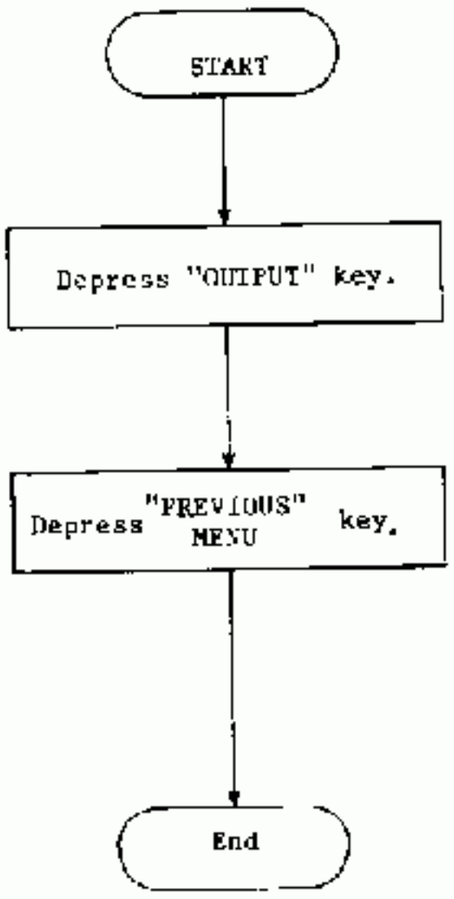
Fig. 5.1.32

NOTE

1. In monitor mode, only "PREVIOUS MENU" appears.
2. When "INCREASE REF + 1" is depressed, the AR content increases by 1.
3. When "DECREASE REF − 1" is depressed, the AR content decreases by 1.
4. When "CLEAR PARAMETER" is depressed, the allocation at the cursor is cleared.

(5) Output Allocation Display

Every station number output allocation is indicated.



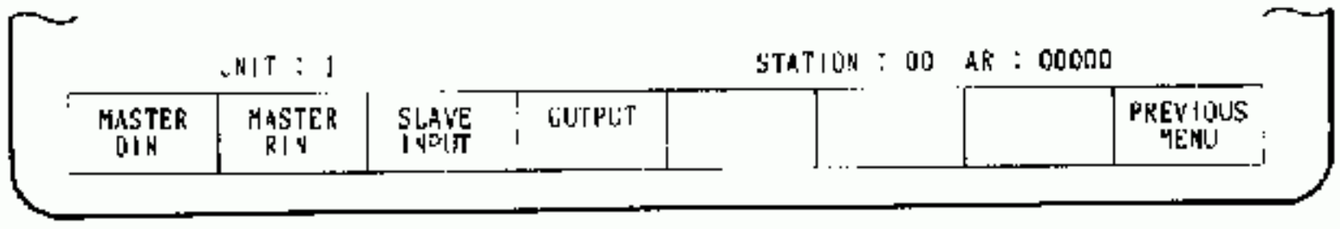


Fig. 5.1.33

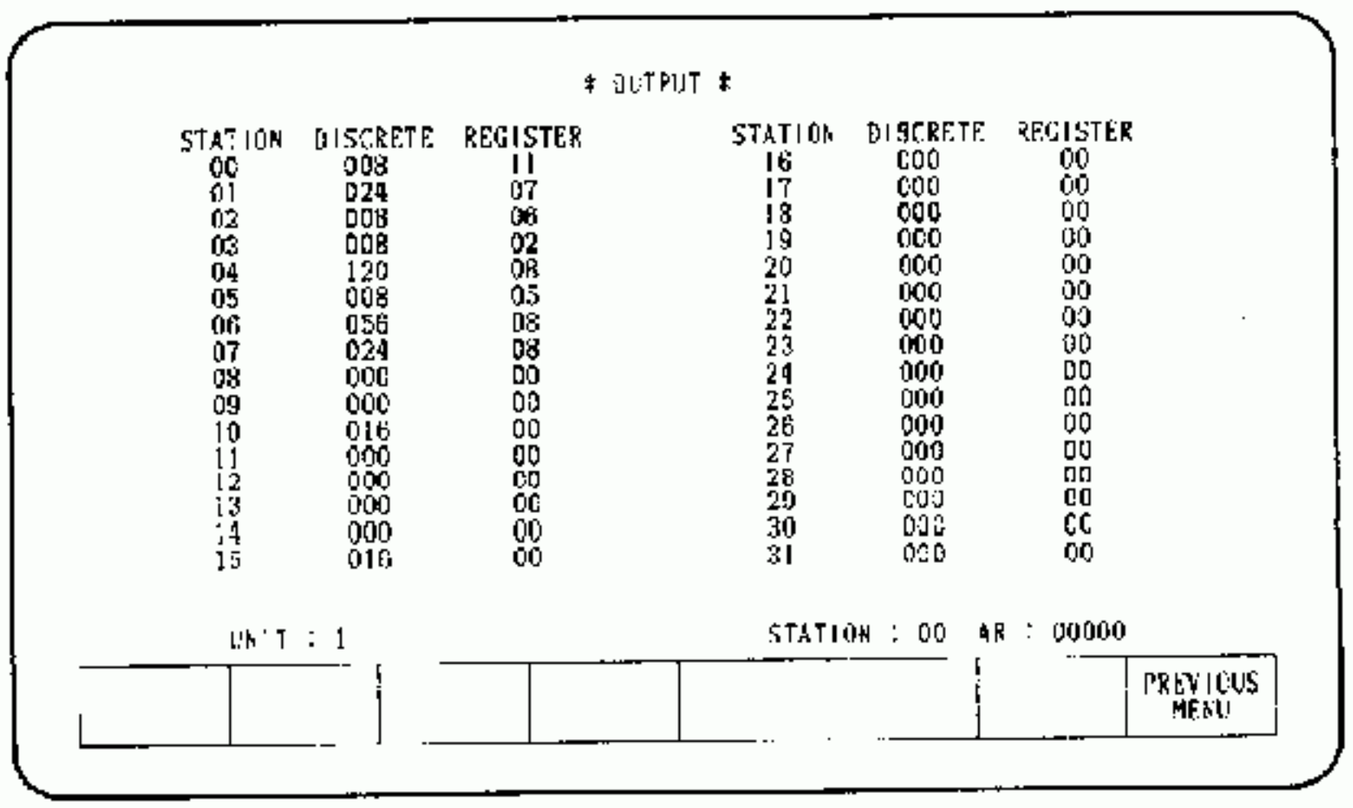


Fig. 5.1.34

NOTE

The output allocation display indicates the PC output capacity of each station, corresponding to the number of inputs of discrete data and registers allocated to each station.

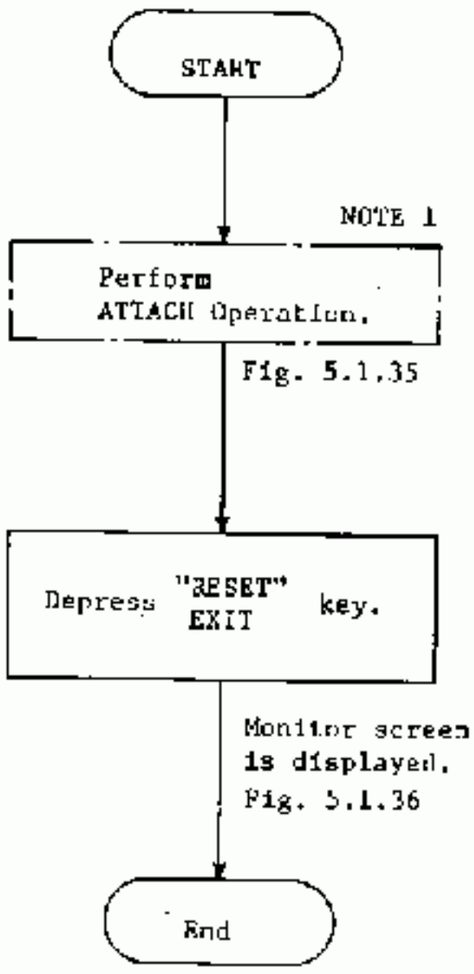
5.1.4 Link Data Monitor

(1) Discrete Data Status Indication in Master Station

Discrete data appear in increment of 16 points, as shown below (1 indicates ON; 0 indicates OFF). The underlined numerals are in disabled state. An interrupt signal appers in 8 points

Example: 60001 – 60016 = 1000<u>1</u>1000<u>1</u>000010

↑ 60001 ↑ 60016



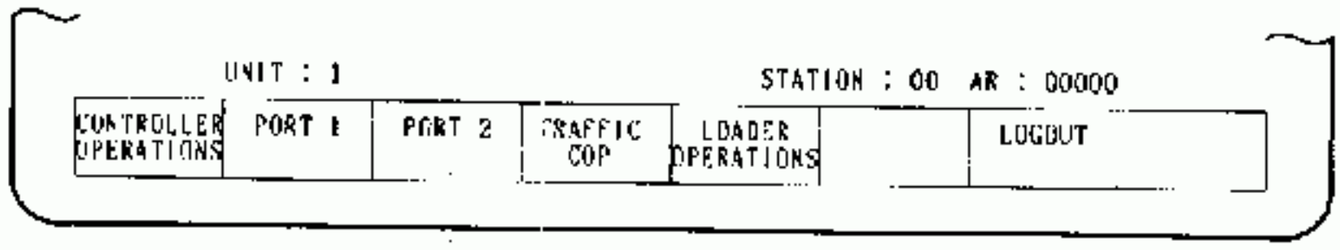


Fig. 5.1.35

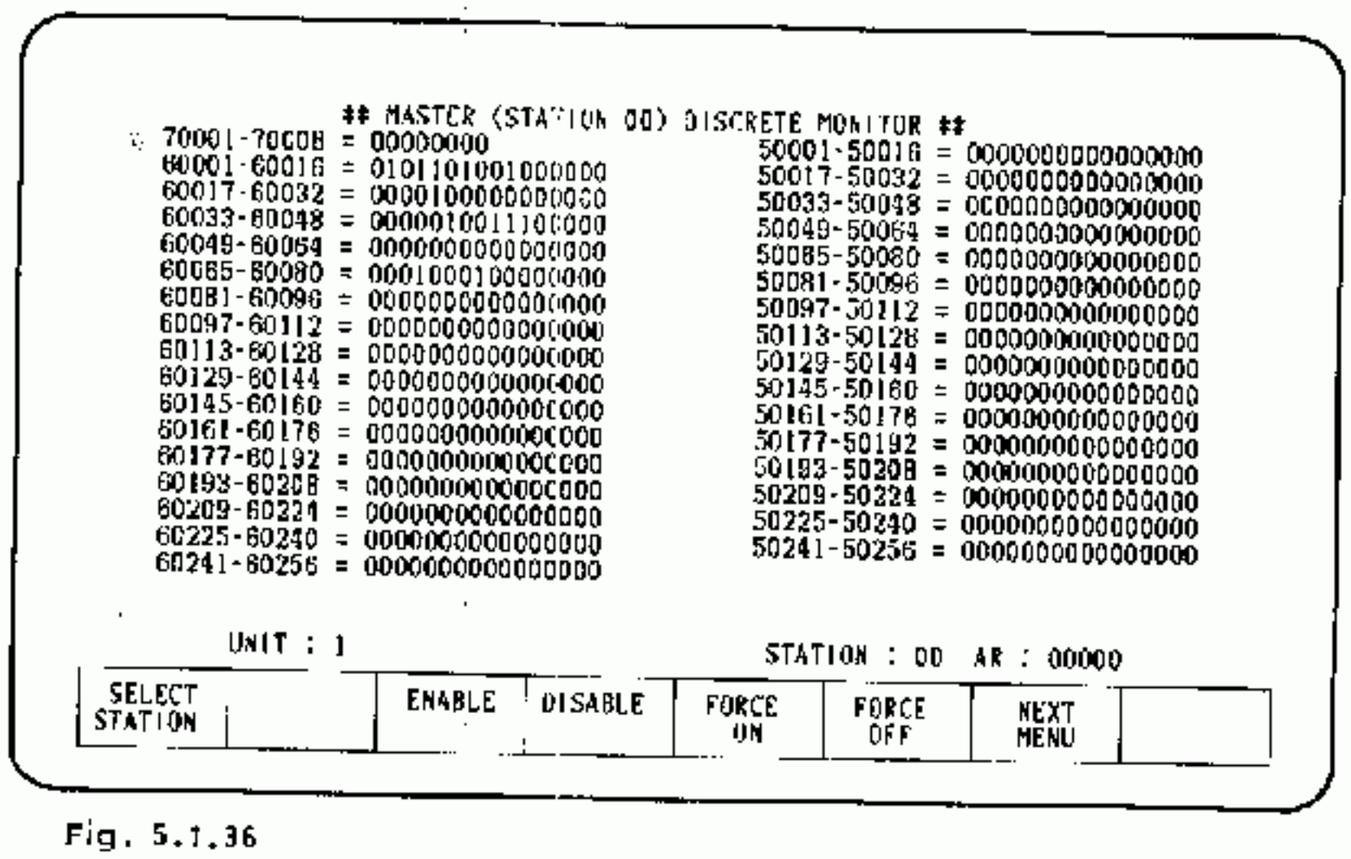


Fig. 5.1.36

NOTE

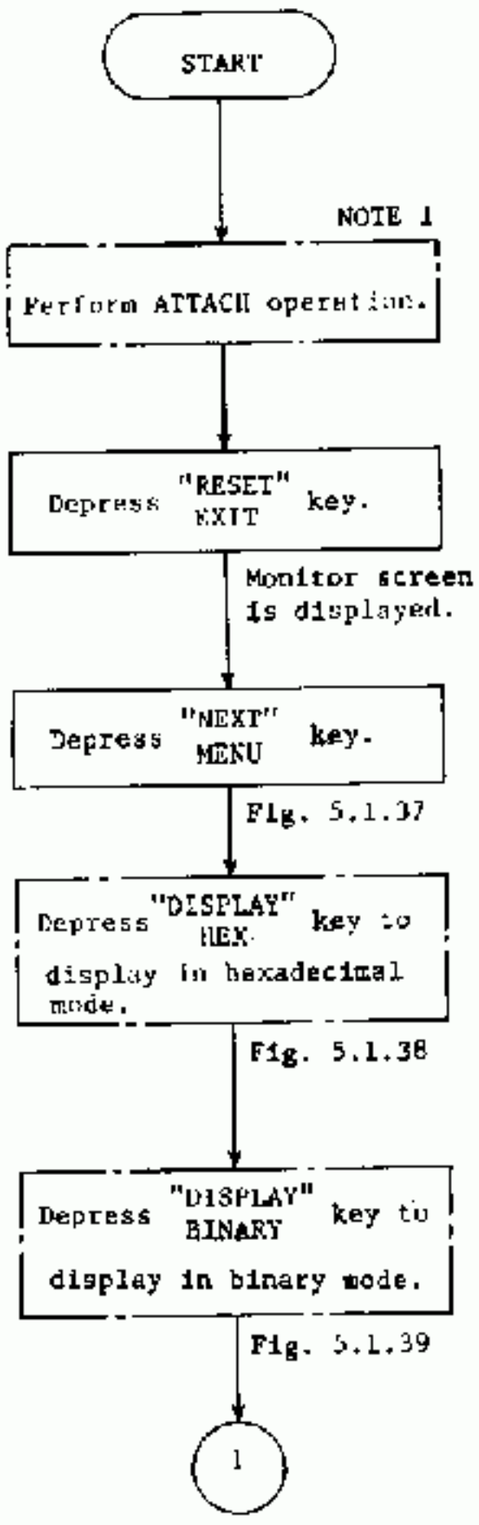
1. This step can be skipped, if ATTACH operation has already been completed.

2. In monitor mode, "ENABLE," "DISABLE," "FORCE ON," "FORCE OFF," and small cursor do not appear.

3. When "SHIFT" and "RESET EXIT" are depressed simultaneously, the display returns to that shown in Fig. 5.1.35.

(2) Indication of Register Contents in Master Station

Initially, the register contents appear in decimal, but can appear in decimal, hexadecimal, binary, or ASCII.




```
                ** MASTER (STATION 00) REGISTER MONITOR **
> 80001 = 0000 DECIMAL                    90001 = 0000 DECIMAL
  80002 = 0005 DECIMAL                    90002 = 0000 DECIMAL
  80003 = 0025 DECIMAL                    90003 = 0000 DECIMAL
  80004 = 0000 DECIMAL                    90004 = 0000 DECIMAL
  80005 = 0000 DECIMAL                    90005 = 0000 DECIMAL
  80006 = 0256 DECIMAL                    90006 = 0000 DECIMAL
  80007 = 0000 DECIMAL                    90007 = 0000 DECIMAL
  80008 = 1230 DECIMAL                    90008 = 0000 DECIMAL
  80009 = 0010 DECIMAL                    90009 = 0000 DECIMAL
  80010 = 0000 DECIMAL                    90010 = 0000 DECIMAL
  80011 = 0022 DECIMAL                    90011 = 0000 DECIMAL
  80012 = 0022 DECIMAL                    90012 = 0000 DECIMAL
  80013 = 0000 DECIMAL                    90013 = 0000 DECIMAL
  80014 = 0000 DECIMAL                    90014 = 0000 DECIMAL
  80015 = 0000 DECIMAL                    90015 = 0000 DECIMAL
  80016 = 0000 DECIMAL                    90016 = 0000 DECIMAL

UNIT : 1                                  STATION : 00  AR : 00000
```

SELECT STATION	DISPLAY DECIMAL	DISPLAY HEX	DISPLAY BINARY	DISPLAY ASCII	ENABLE	DISABLE	PREVIOUS MENU

Fig. 5.1.37

```
                ** MASTER (STATION 00) REGISTER MONITOR **
> 80001 = 0000 HEXADECIMAL                90001 = 0000 DECIMAL
  80002 = 0005 DECIMAL                    90002 = 0000 DECIMAL
  80003 = 0025 DECIMAL                    90003 = 0000 DECIMAL
  80004 = 0000 DECIMAL                    90004 = 0000 DECIMAL
  80005 = 0000 DECIMAL                    90005 = 0000 DECIMAL
  80006 = 0256 DECIMAL                    90006 = 0000 DECIMAL
  80007 = 0000 DECIMAL                    90007 = 0000 DECIMAL
  80008 = 1230 DECIMAL                    90008 = 0000 DECIMAL
  80009 = 0010 DECIMAL                    90009 = 0000 DECIMAL
  80010 = 0000 DECIMAL                    90010 = 0000 DECIMAL
  80011 = 0022 DECIMAL                    90011 = 0000 DECIMAL
  80012 = 0022 DECIMAL                    90012 = 0000 DECIMAL
  80013 = 0000 DECIMAL                    90013 = 0000 DECIMAL
  80014 = 0000 DECIMAL                    90014 = 0000 DECIMAL
  80015 = 0000 DECIMAL                    90015 = 0000 DECIMAL
  80016 = 0000 DECIMAL                    90016 = 0000 DECIMAL
```

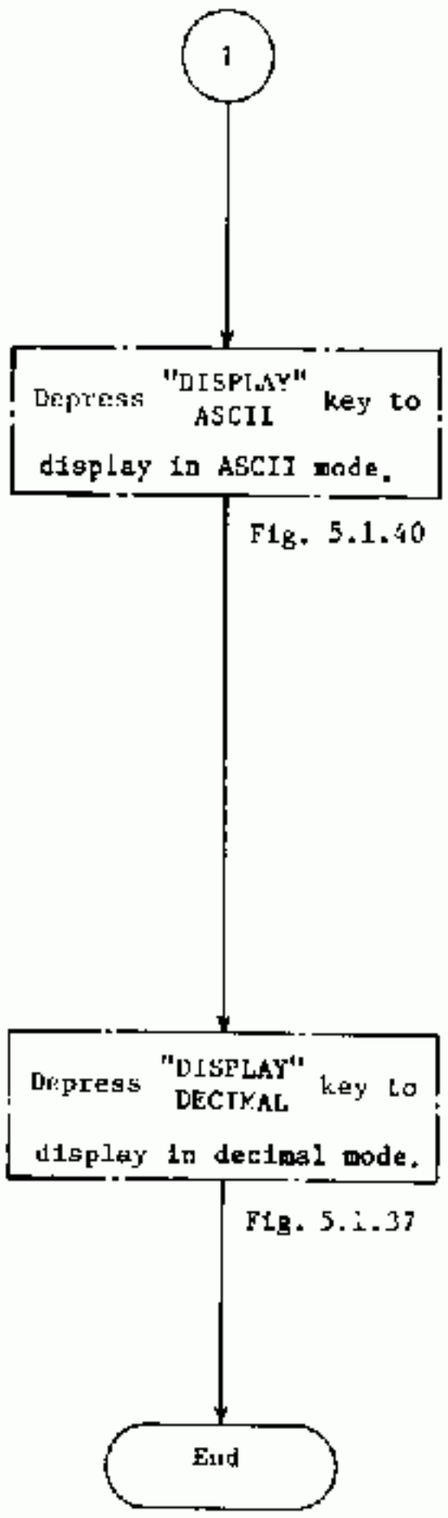
Fig. 5.1.38

```
                ** MASTER (STATION 00) REGISTER MONITOR **
> 80001 = 0000000000000000                90001 = 0000 DECIMAL
  80002 = 0005 DECIMAL                    90002 = 0000 DECIMAL
  80003 = 0025 DECIMAL                    90003 = 0000 DECIMAL
  80004 = 0000 DECIMAL                    90004 = 0000 DECIMAL
  80005 = 0000 DECIMAL                    90005 = 0000 DECIMAL
  80006 = 0256 DECIMAL                    90006 = 0000 DECIMAL
  80007 = 0000 DECIMAL                    90007 = 0000 DECIMAL
  80008 = 1230 DECIMAL                    90008 = 0000 DECIMAL
  80009 = 0010 DECIMAL                    90009 = 0000 DECIMAL
  80010 = 0000 DECIMAL                    90010 = 0000 DECIMAL
  80011 = 0022 DECIMAL                    90011 = 0000 DECIMAL
  80012 = 0022 DECIMAL                    90012 = 0000 DECIMAL
  80013 = 0000 DECIMAL                    90013 = 0000 DECIMAL
  80014 = 0000 DECIMAL                    90014 = 0000 DECIMAL
  80015 = 0000 DECIMAL                    90015 = 0000 DECIMAL
  80016 = 0000 DECIMAL                    90016 = 0000 DECIMAL

UNIT : 1                                  STATION : 00  AR : 00000
```

SELECT STATION	DISPLAY DECIMAL	DISPLAY HEX	NEXT MENU	DISPLAY ASCII	ENABLE	DISABLE	PREVIOUS MENU

Fig. 5.1.39



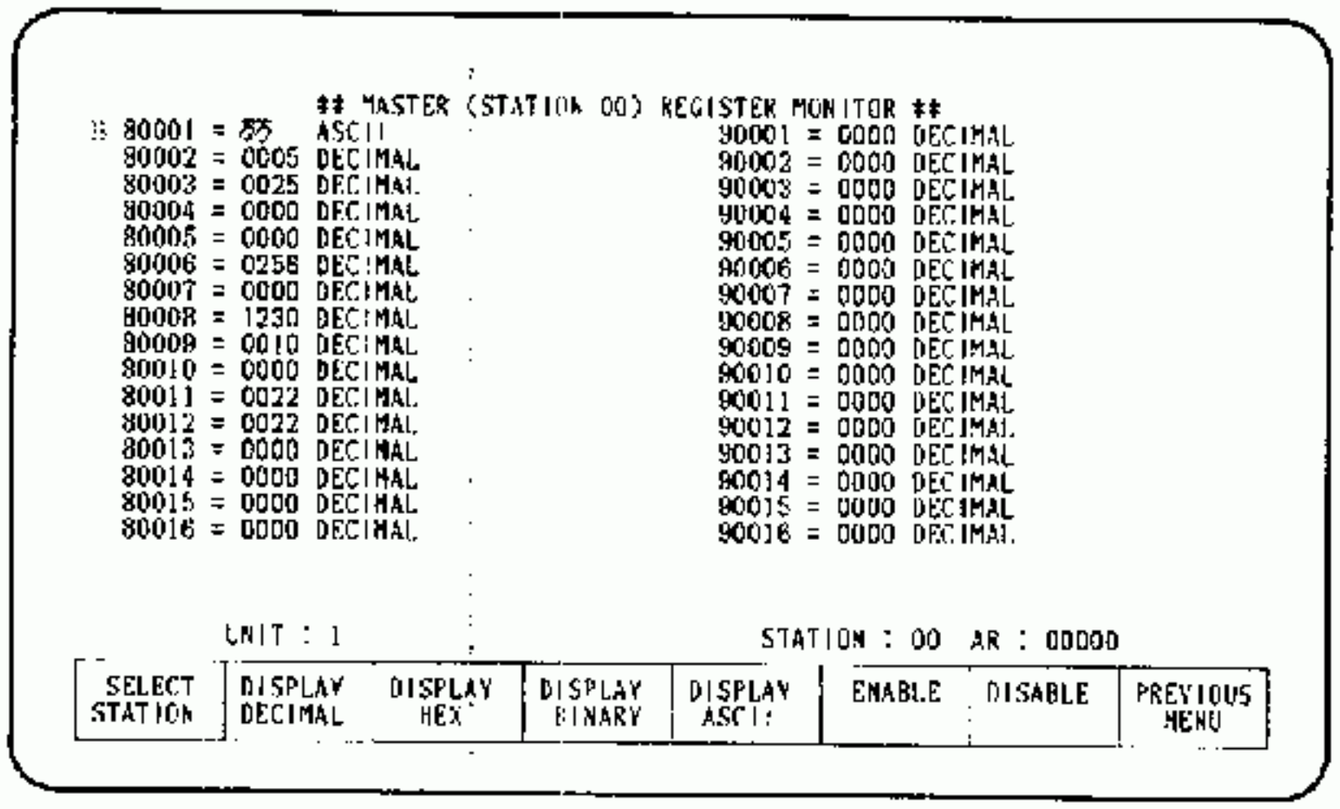


Fig. 5.1.40

NOTE

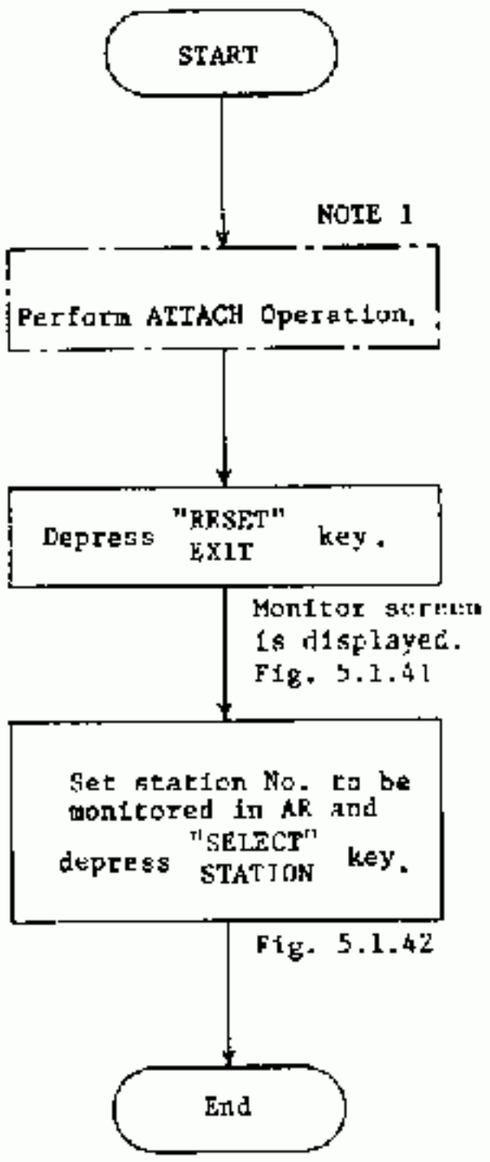
1. This step can be skipped, if ATTACH operation has already been completed.
2. In monitor mode, "ENABLE" and "DISABLE" do not appear. Also, "NEXT MENU" (see Fig. 5.1.39) and small cursor do not appear.
3. When "PREVIOUS MENU" is depressed, the display returns to that shown in Fig. 5.1.36.

(3) Discrete Status Indication in Slave Station

As in the master module, discrete data appear in increment of 16 points, (1 indicates ON; 0 indicates OFF.) The underlined numerals are in disabled state.

Example: 60001 – 60016 = 1000<u>1</u>10001000<u>0</u>10

60001 60016



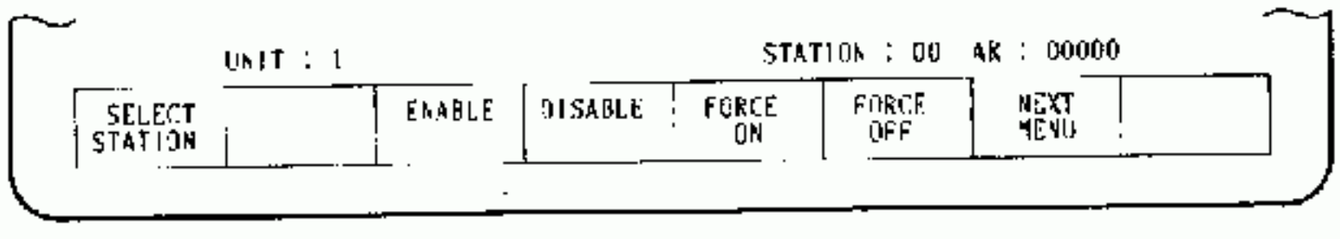


Fig. 5.1.41

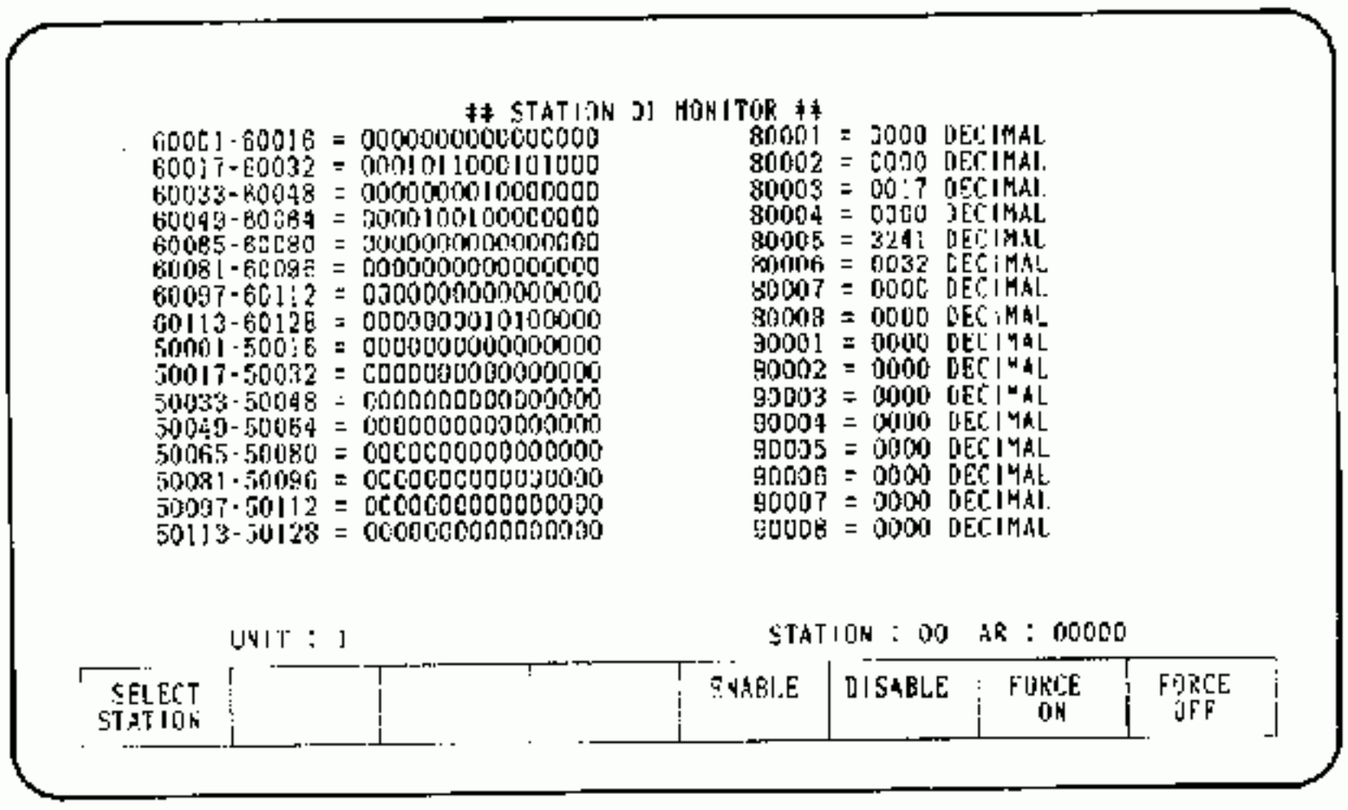


Fig. 5.1.42

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.
2. In monitor mode, "ENABLE," "DISABLE," "FORCE ON," "FORCE OFF," and small cursor do not appear.
3. When "SHIFT" and "RESET EXIT" are depressed simultaneously, the display returns to that shown in Fig. 5.1.35.

(4) Indication of Register Contents in Slave Station

Initially, the register contents appear in decimal, but can appear in decimal, hexadecimal, binary, or ASCII.

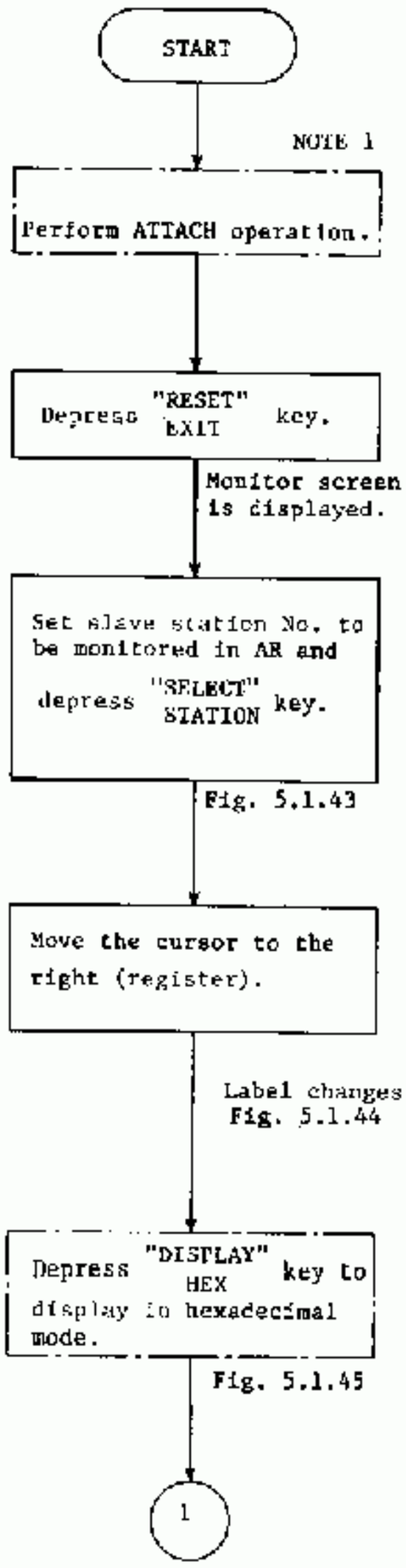


Fig. 5.1.43

Fig. 5.1.44

Fig. 5.1.45

```
                    ** STATION 01 MONITOR **
60001-60016 = 0000000000000000          80001 = 0000 DECIMAL
60017-60032 = 0001011000101000          80002 = 0000 DECIMAL
60033-60048 = 0000000010000000          80003 = 0017 DECIMAL
60049-60064 = 0000100100000000          80004 = 0000 DECIMAL
60065-60080 = 0000000000000000          80005 = 3241 DECIMAL
60081-60096 = 0000000000000000          80006 = 0032 DECIMAL
60097-60112 = 0000000000000000          80007 = 0000 DECIMAL
60113-60128 = 0000000010100000          80008 = 0000 DECIMAL
50001-50016 = 0000000000000000          90001 = 0000 DECIMAL
50017-50032 = 0000000000000000          90002 = 0000 DECIMAL
50033-50048 = 0000000000000000          90003 = 0000 DECIMAL
50049-50064 = 0000000000000000          90004 = 0000 DECIMAL
50065-50080 = 0000000000000000          90005 = 0000 DECIMAL
50081-50096 = 0000000000000000          90006 = 0000 DECIMAL
50097-50112 = 0000000000000000          90007 = 0000 DECIMAL
50113-50128 = 0000000000000000          90008 = 0000 DECIMAL

UNIT : 1                                STATION : 00  AR : 00000

| SELECT STATION |  |  | ENABLE | DISABLE | FORCE ON | FORCE OFF |
```

```
UNIT : 1                                STATION : 00  AR : 00000

| SELECT STATION | DISPLAY DECIMAL | DISPLAY HEX | DISPLAY BINARY | DISPLAY ASCII | ENABLE | DISABLE |  |
```

```
                    ** STATION 01 MONITOR **
60001-60016 = 0000000000000000          80001 = 0000 HEXADECIMAL
60017-60032 = 0001011000101000          80002 = 0000 DECIMAL
60033-60048 = 0000000010000000          80003 = 0017 DECIMAL
60049-60064 = 0000100100000000          80004 = 0000 DECIMAL
60065-60080 = 0000000000000000          80005 = 3241 DECIMAL
60081-60096 = 0000000000000000          80006 = 0032 DECIMAL
60097-60112 = 0000000000000000          80007 = 0000 DECIMAL
60113-60128 = 0000000010100000          80008 = 0000 DECIMAL
50001-50016 = 0000000000000000          90001 = 0000 DECIMAL
50017-50032 = 0000000000000000          90002 = 0000 DECIMAL
50033-50048 = 0000000000000000          90003 = 0000 DECIMAL
50049-50064 = 0000000000000000          90004 = 0000 DECIMAL
50065-50080 = 0000000000000000          90005 = 0000 DECIMAL
50081-50096 = 0000000000000000          90006 = 0000 DECIMAL
50097-50112 = 0000000000000000          90007 = 0000 DECIMAL
50113-50128 = 0000000000000000          90008 = 0000 DECIMAL

UNIT : 1                                STATION : 00  AR : 00000

| SELECT STATION | DISPLAY DECIMAL | DISPLAY HEX | DISPLAY BINARY | DISPLAY ASCII | ENABLE | DISABLE |  |
```

(4) Indication of Register Contents in Slave Station (Cont'd)

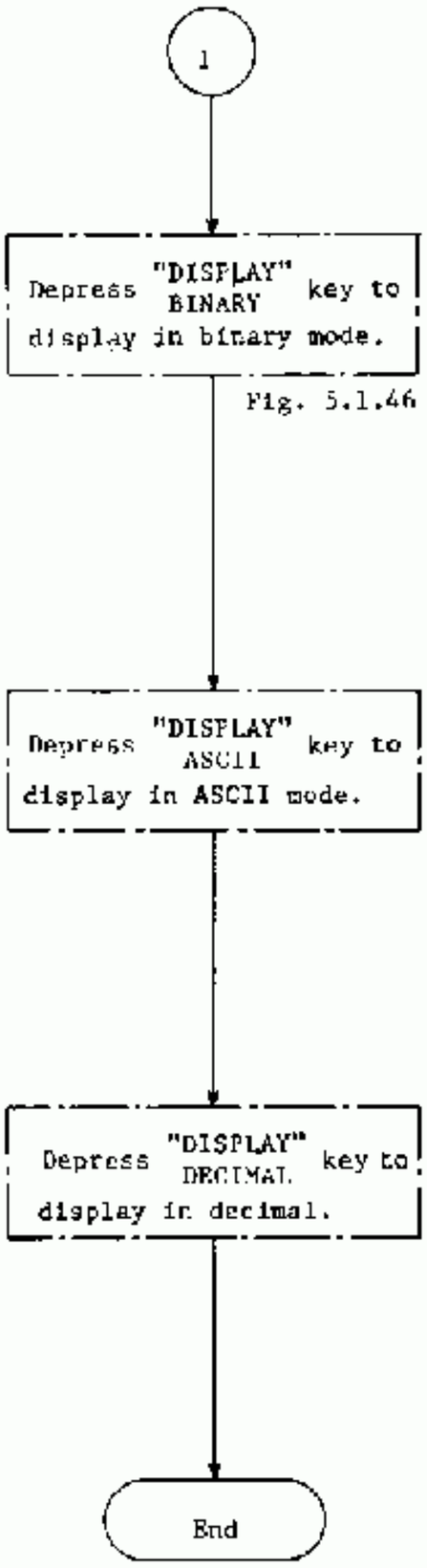


Fig. 5.1.46

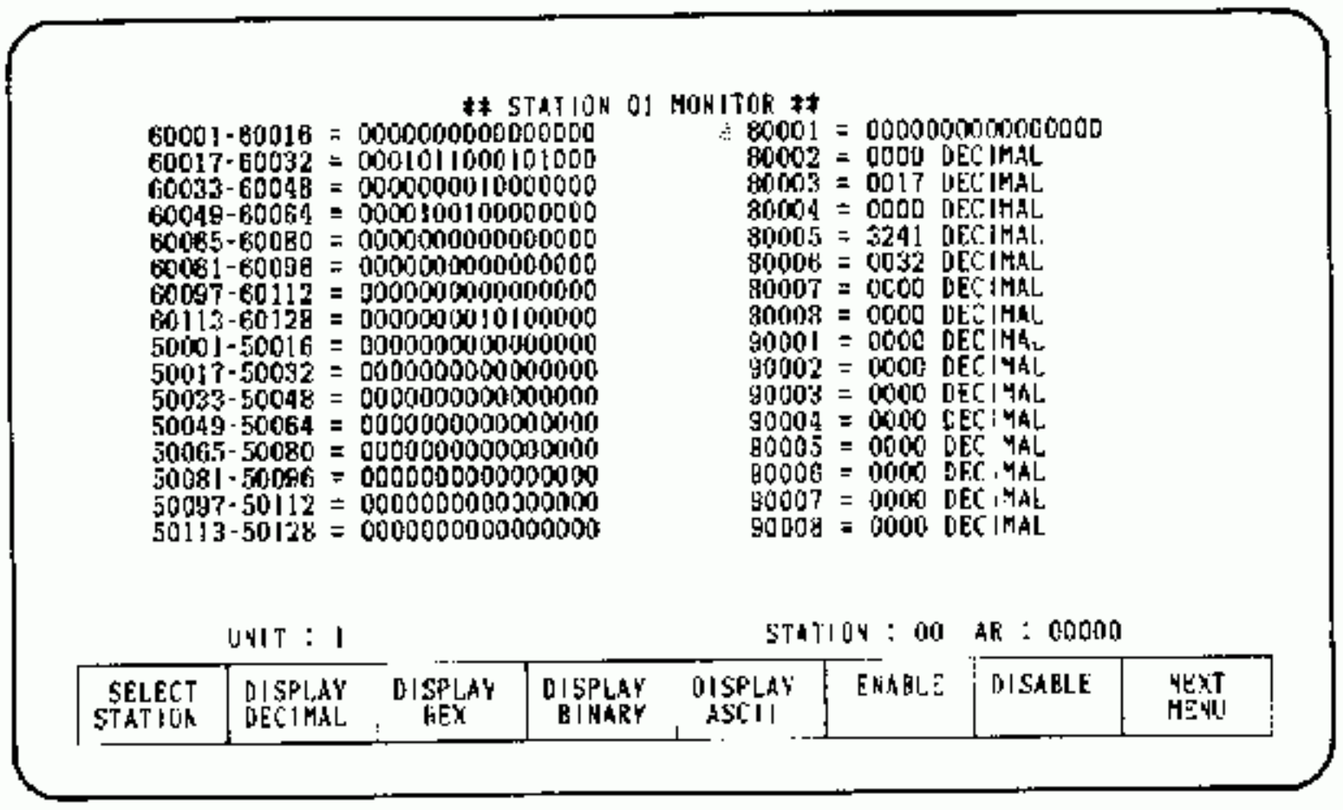


Fig. 5.1.46

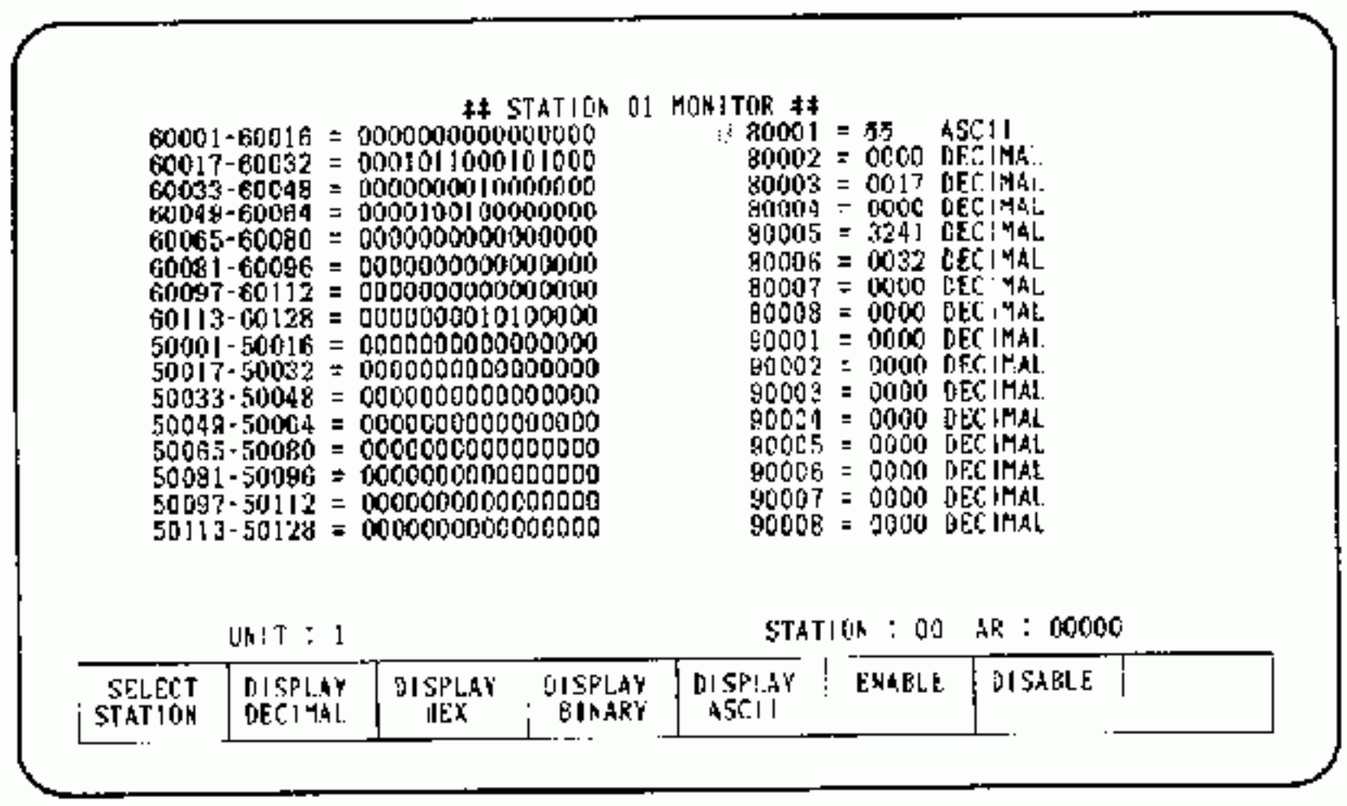


Fig. 5.1.47

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

2. In monitor mode, "ENABLE," "DISABLE" do not appear.
   Also, "NEXT MENU" (Fig. 5.1.46) and small cursor do not appear.

3. When "SHIFT" and "RESET EXIT" are depressed simultaneously, the display returns to that shown in Fig. 5.1.35.

4. If a register content that is more than 9999 is set to decimal indication, it appears as follows:
   Example: 90001 = > 9999 OVERFLOW

5. If the register content that cannot be indicated in ASCII is so set, it appears as follows:
   Example: 90001= 万万 ASCII

(5) Indication of Any Discrete State

When " CHG / SCREEN " is depressed while the minotor display appears, the expansion reference area appears as shown in Fig. 5.1.48, so that up to 36 desired discrete data can be indicated in colums of 18 lines each.

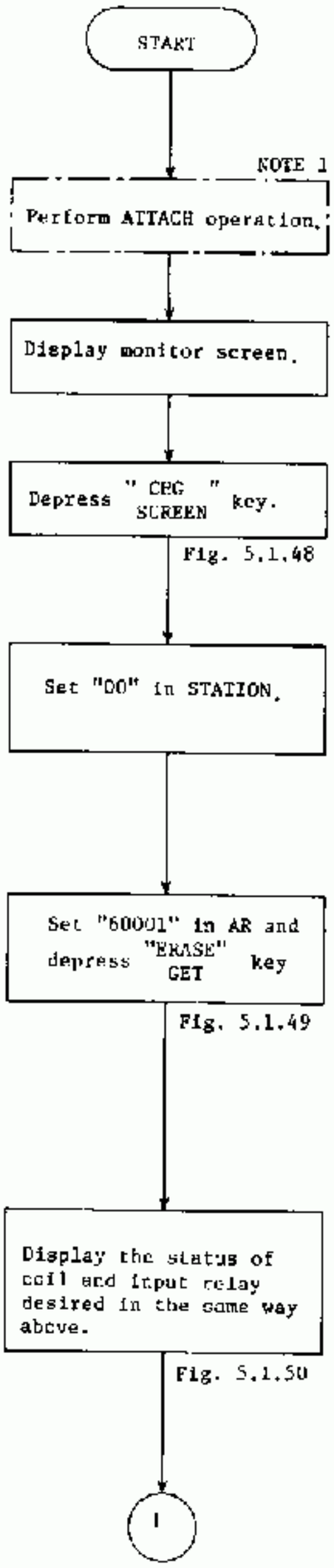
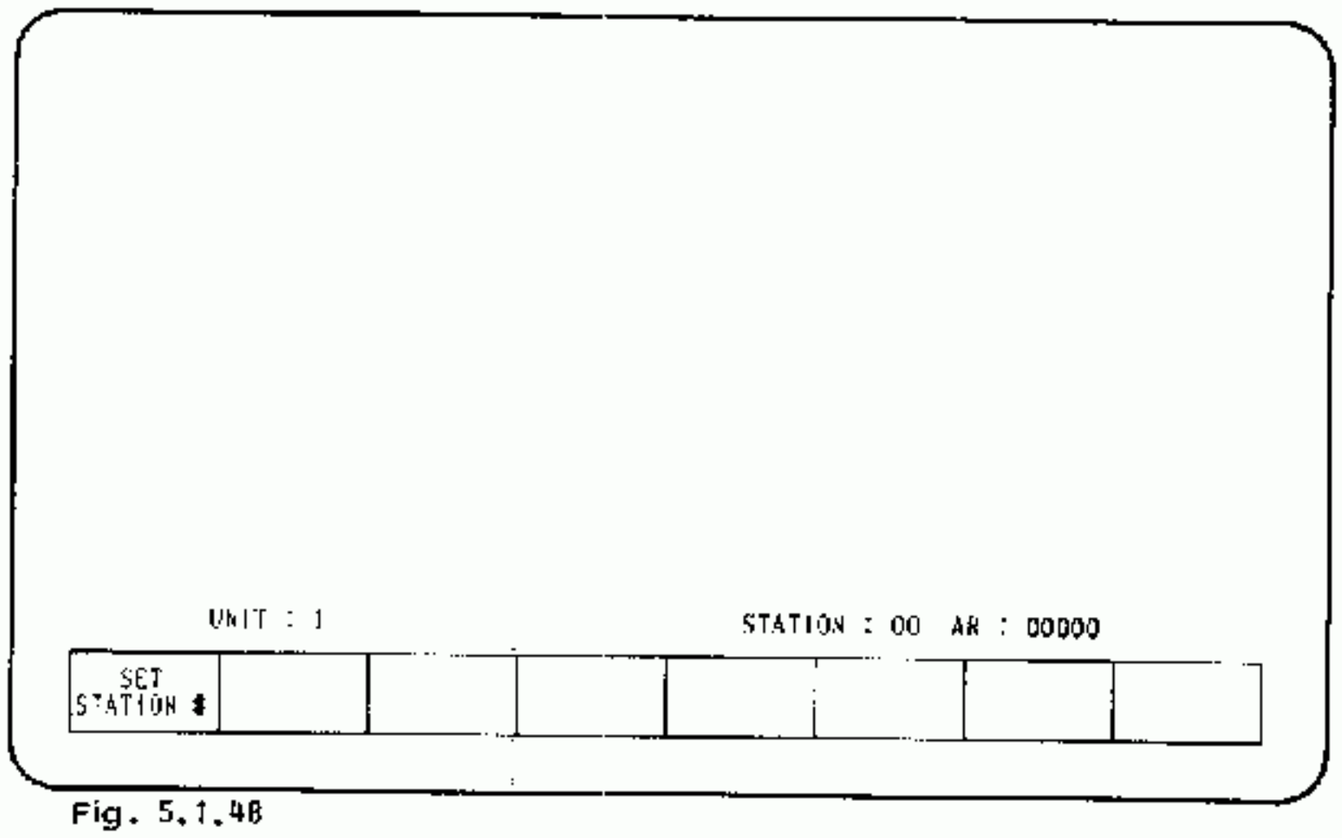
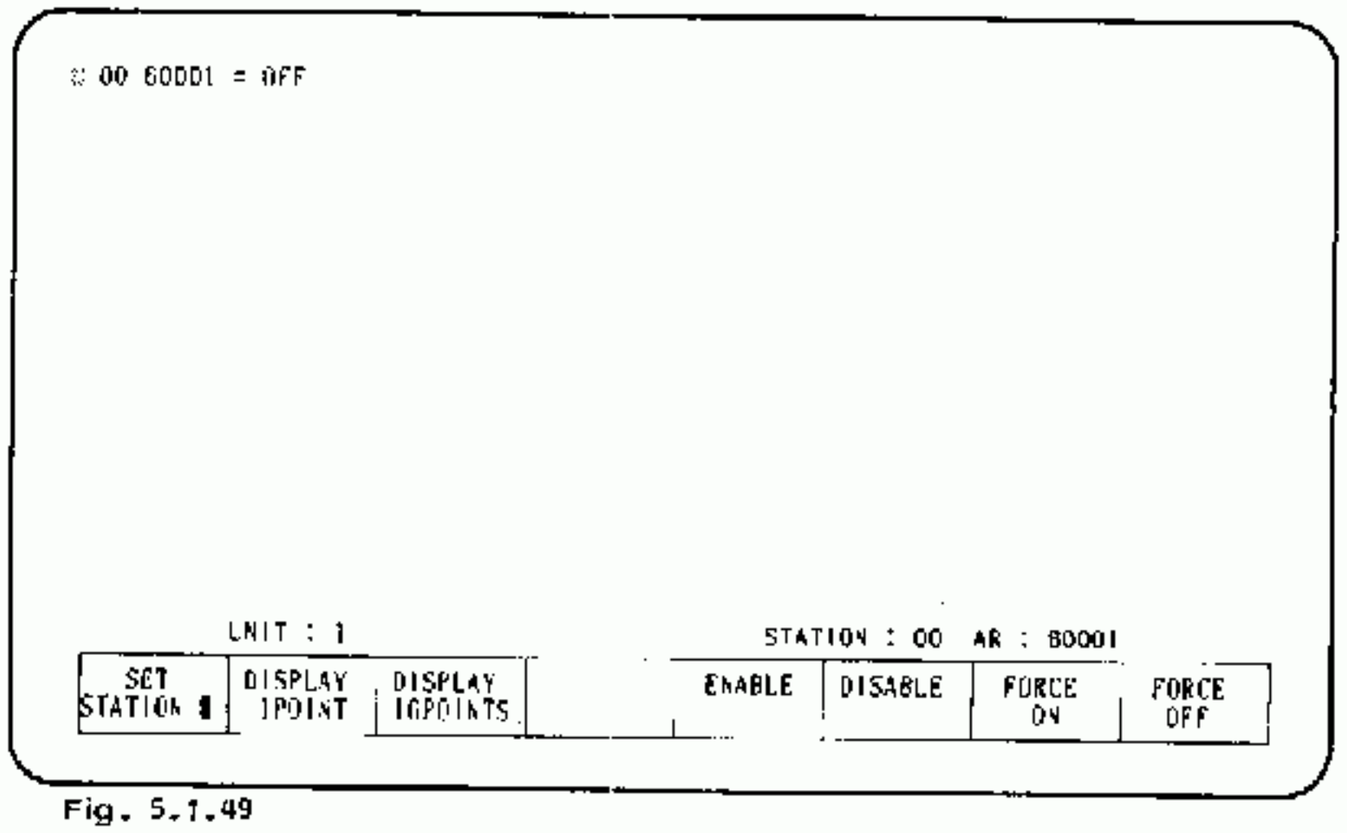


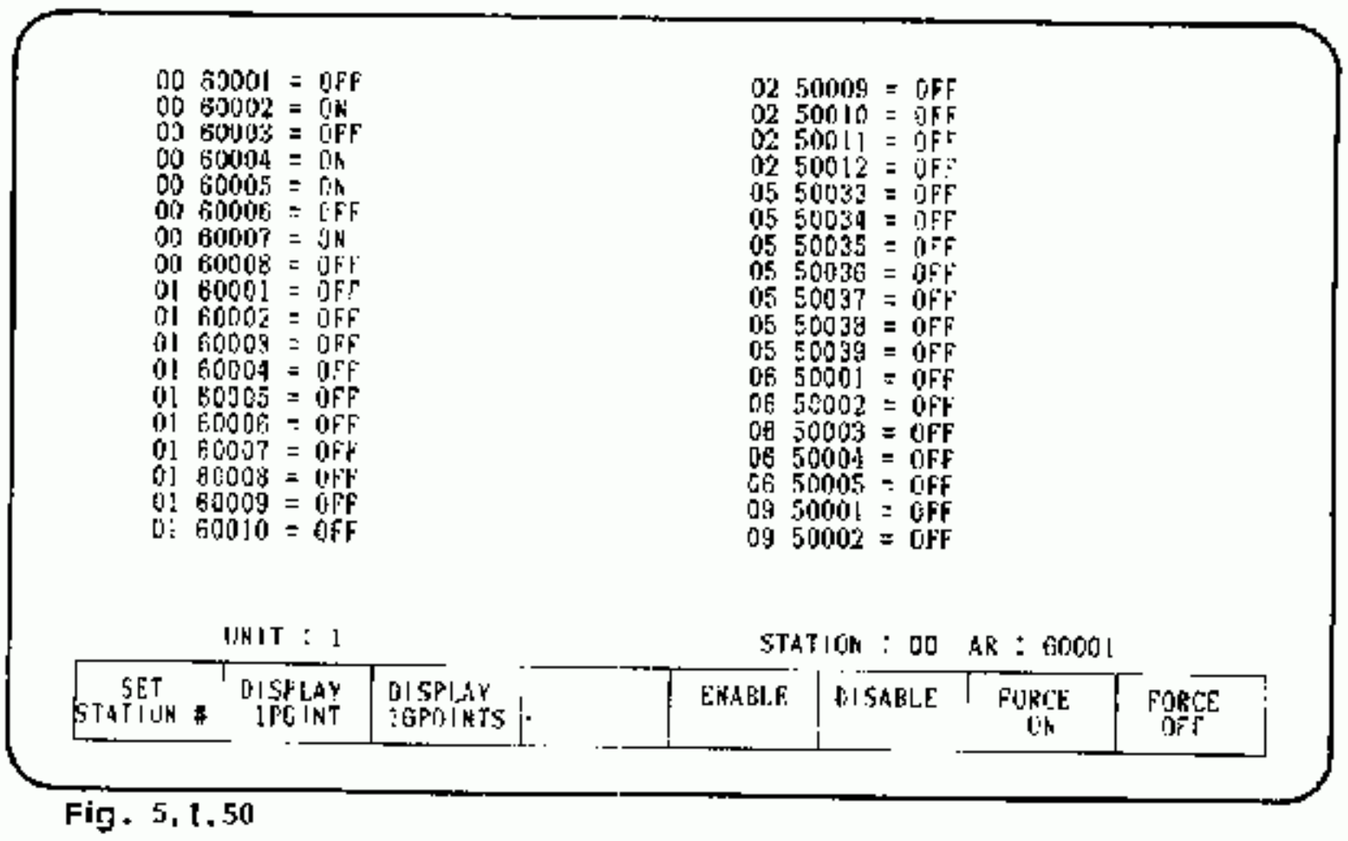
Fig. 5.1.48

Fig. 5.1.49

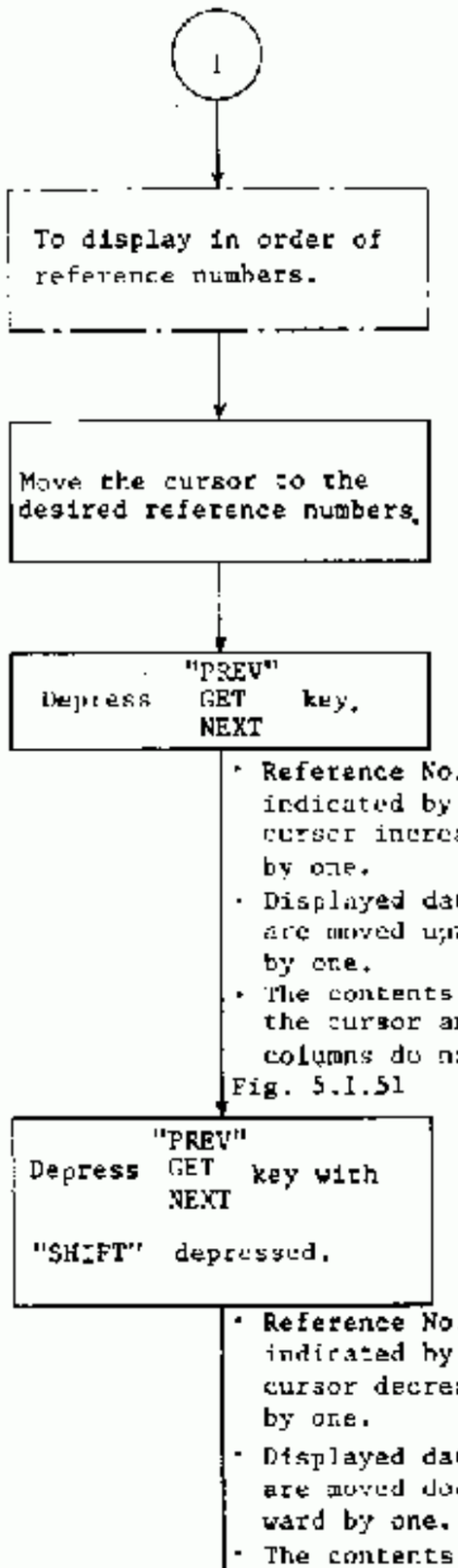
Fig. 5.1.50







(5) Indication of Any Discrete State (Cont'd)




```
00 60001 = OFF                    02 50010 = OFF
00 60002 = ON                     02 50011 = OFF
00 60003 = OFF                    02 50012 = OFF
00 60004 = ON                     05 50033 = OFF
00 60005 = ON                     05 50034 = OFF
00 60006 = OFF                    05 50035 = OFF
00 60007 = ON                     05 50036 = OFF
00 60008 = OFF                    05 50037 = OFF
01 60001 = OFF                    05 50038 = OFF
01 60002 = OFF                    05 50039 = OFF
01 60003 = OFF                    06 50001 = OFF
01 60004 = OFF                    06 50002 = OFF
01 60005 = OFF                    06 50002 = OFF
01 60006 = OFF                    06 50003 = OFF
01 60007 = OFF                    06 50004 = OFF
01 60008 = OFF                    06 50005 = OFF
01 60009 = OFF                    09 50001 = OFF
01 60010 = OFF

UNIT : 1                          STATION : 00  AR : 60001

| SET STATION # | DISPLAY 1POINT | DISPLAY 16POINTS | ENABLE | DISABLE | FORCE ON | FORCE OFF |
```

Fig. 5.1.51

```
00 60001 = OFF                    02 50010 = OFF
00 60002 = ON                     02 50011 = OFF
00 60003 = OFF                    02 50012 = OFF
00 60004 = ON                     05 50033 = OFF
00 60005 = ON                     05 50034 = OFF
00 60006 = OFF                    05 50035 = OFF
00 60007 = ON                     05 50036 = OFF
00 60008 = OFF                    05 50037 = OFF
01 60001 = OFF                    05 50038 = OFF
01 60002 = OFF                    05 50039 = OFF
01 60003 = OFF                    06 50001 = OFF
01 60004 = OFF                    06 50001 = OFF
01 60005 = OFF                    06 50002 = OFF
01 60006 = OFF                    06 50002 = OFF
01 60007 = OFF                    06 50003 = OFF
01 60008 = OFF                    06 50004 = OFF
01 60009 = OFF                    06 50005 = OFF
01 60010 = OFF                    09 50001 = OFF

UNIT : 1                          STATION : 00  AR : 60001

| SET STATION # | DISPLAY 1POINT | DISPLAY 16POINTS | ENABLE | DISABLE | FORCE ON | FORCE OFF |
```

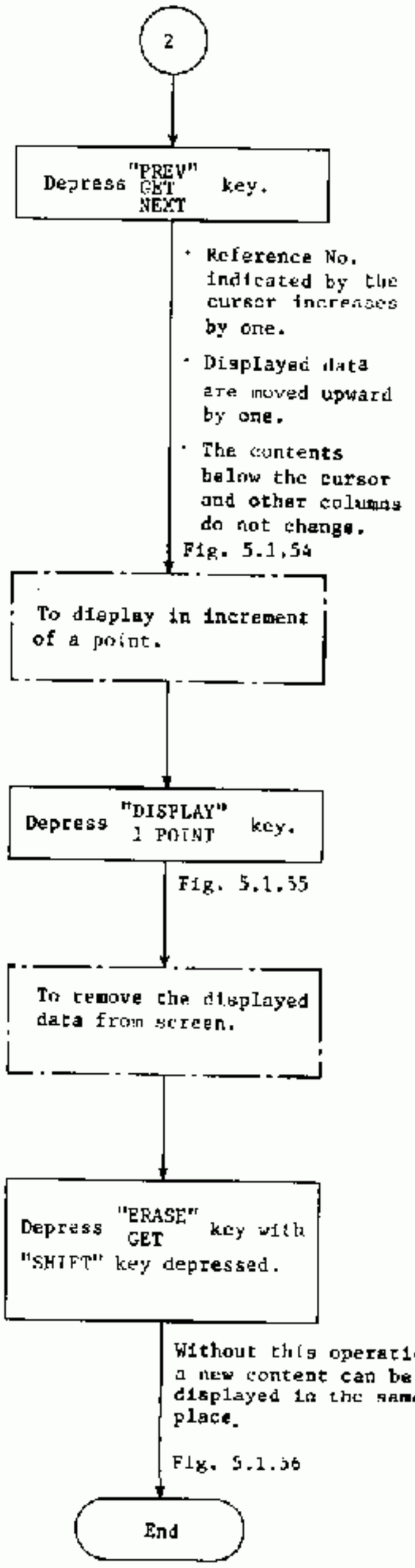
Fig. 5.1.52

```
00 60001 = OFF                    02 50010 = OFF
00 60002 = ON                     02 50011 = OFF
00 60003 = OFF                    02 50012 = OFF
00 60004 = ON                     05 50033 = OFF
00 60005 = ON                     05 50034 = OFF
00 60006 = OFF                    05 50035 = OFF
00 60007 = ON                     05 50036 = OFF
00 60008 = OFF                    05 50037 = OFF
01 60001 = OFF                    05 50038 = OFF
01 60002 = OFF                    05 50039 = OFF
01 60003 = OFF                    06 50001 = OFF
01 60004 = OFF                    06 50001 = OFF
01 60005 = OFF                    06 50002 = OFF
01 60006 = OFF                    06 50002 = OFF
01 60007 = OFF                    06 50003 = OFF
01 60008 = OFF                    06 50004 = OFF
01 60009 = OFF                    06 50005 = OFF
01 60010 = OFF                    09 50001-50016 = 0000000000000000

UNIT : 1                          STATION : 00  AR : 60001

| SET STATION # | DISPLAY 1POINT | DISPLAY 16POINTS | ENABLE | DISABLE | FORCE ON | FORCE OFF |
```

Fig. 5.1.53




```
00 60001 = OFF                    02 50011 = OFF
00 60002 = ON                     02 50012 = OFF
00 60003 = OFF                    05 50033 = OFF
00 60004 = ON                     05 50034 = OFF
00 60005 = ON                     05 50035 = OFF
00 60006 = OFF                    05 50036 = OFF
00 60007 = ON                     05 50037 = OFF
00 60008 = OFF                    05 50038 = OFF
01 60001 = OFF                    05 50039 = OFF
01 60002 = OFF                    06 50001 = OFF
01 60003 = OFF                    06 50001 = OFF
01 60004 = OFF                    06 50002 = OFF
01 60005 = OFF                    06 50002 = OFF
01 60006 = OFF                    06 50003 = OFF
01 60007 = OFF                    06 50004 = OFF
01 60008 = OFF                    06 50005 = OFF
01 60009 = OFF                    09 50001-50016 = 0000000000000000
01 60010 = OFF                    08 50002-50017 = 0000000000000000

UNIT : 1                          STATION : 00  AR : 60001

SET STATION # | DISPLAY 1POINT | DISPLAY 16POINTS |  | ENABLE | DISABLE | FORCE ON | FORCE OFF
```

Fig. 5.1.54

```
00 60001 = OFF                    02 50011 = OFF
00 60002 = ON                     02 50012 = OFF
00 60003 = OFF                    05 50033 = OFF
00 60004 = ON                     05 50034 = OFF
00 60005 = ON                     05 50035 = OFF
00 60006 = OFF                    05 50036 = OFF
00 60007 = ON                     05 50037 = OFF
00 60008 = OFF                    05 50038 = OFF
01 60001 = OFF                    05 50039 = OFF
01 60002 = OFF                    06 50001 = OFF
01 60003 = OFF                    06 50001 = OFF
01 60004 = OFF                    06 50002 = OFF
01 60005 = OFF                    06 50002 = OFF
01 60006 = OFF                    06 50003 = OFF
01 60007 = OFF                    06 50004 = OFF
01 60008 = OFF                    06 50005 = OFF
01 60009 = OFF                    09 50001-50016 = 0000000000000000
01 60010 = OFF                    09 50002 = OFF

UNIT : 1                          STATION : 00  AR : 60001

SET STATION # | DISPLAY 1POINT | DISPLAY 16POINTS |  | ENABLE | DISABLE | FORCE ON | FORCE OFF
```

Fig. 5.1.55

```
00 60001 = OFF                    02 50011 = OFF
00 60002 = ON                     02 50012 = OFF
00 60003 = OFF                    05 50033 = OFF
00 60004 = ON                     05 50034 = OFF
00 60005 = ON                     05 50035 = OFF
00 60006 = OFF                    05 50036 = OFF
00 60007 = ON                     05 50037 = OFF
00 60008 = OFF                    05 50038 = OFF
01 60001 = OFF                    05 50039 = OFF
01 60002 = OFF                    06 50001 = OFF
01 60003 = OFF                    06 50001 = OFF
01 60004 = OFF                    06 50002 = OFF
01 60005 = OFF                    06 50002 = OFF
01 60006 = OFF                    06 50003 = OFF
01 60007 = OFF                    06 50004 = OFF
01 60008 = OFF                    06 50005 = OFF
01 60009 = OFF                    09 50001-50016 = 0000000000000000
01 60010 = OFF

UNIT : 1                          STATION : 00  AR : 60001

SET STATION # | DISPLAY 1POINT | DISPLAY 16POINTS |  | ENABLE | DISABLE | FORCE ON | FORCE OFF
```

Fig. 5.1.56

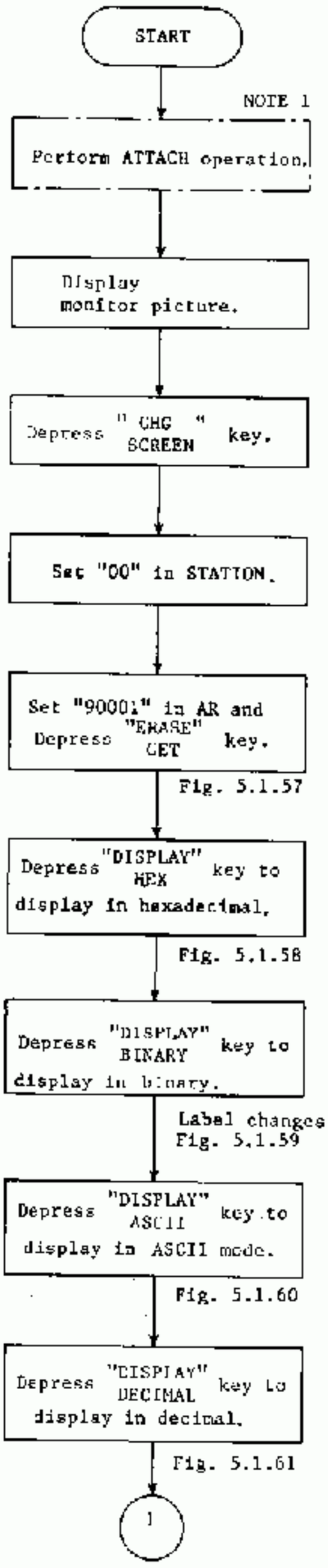
(5) Indication of Any Discrete State (Cont'd)

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.
2. When " CHG / SCREEN " is depressed, an alternate operation occurs. (This does not clear the contents on the screen.)
3. In monitor mode, "ENABLE," "DISABLE," "FORCE / ON ," and "FORCE / OFF" do not appear.

(6) Indication of Desired Register State

When " CHG SCREEN " is depressed while the monitor display appears, the expansion reference area appears as shown in Fig. 5.1.57, so that up to 36 desired registers can be indicated in 2 columns of 18 lines each.



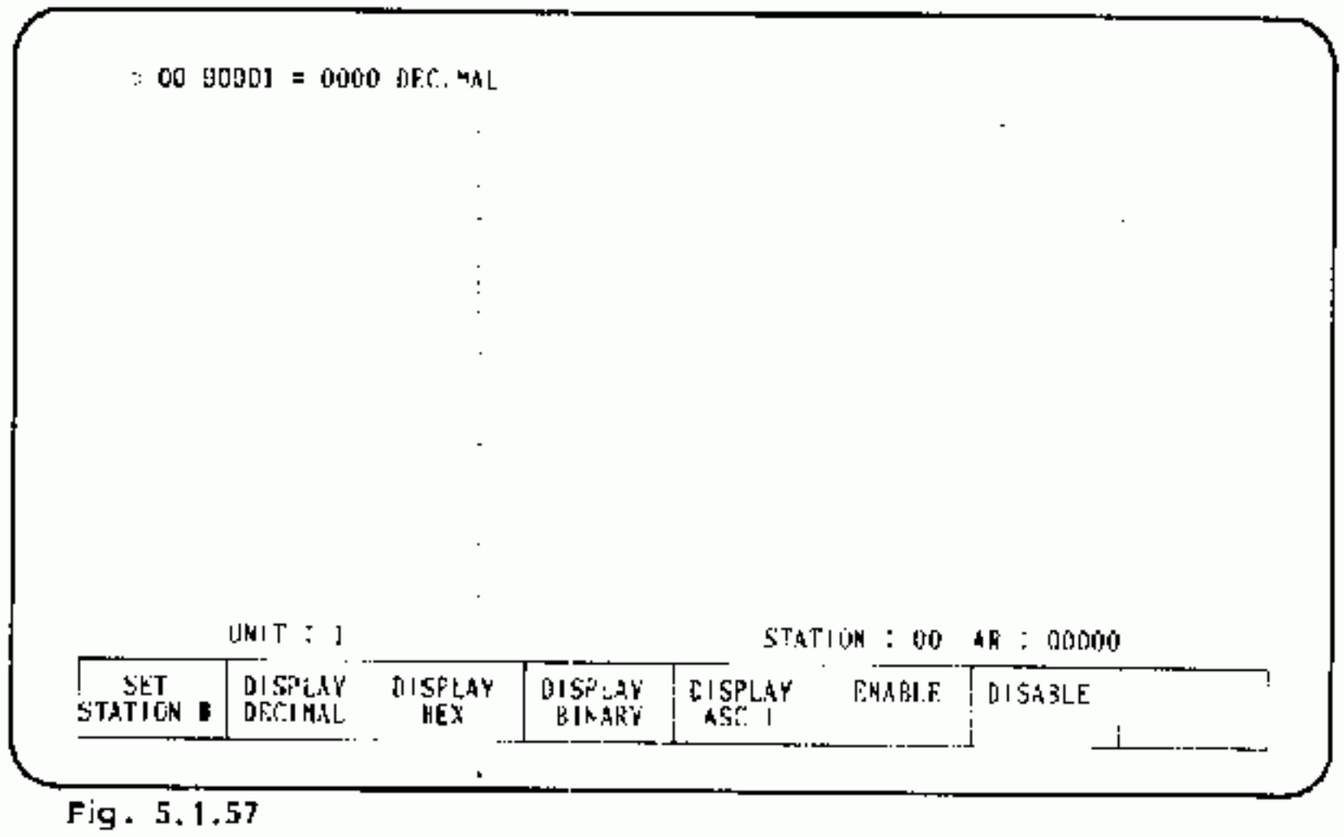


Fig. 5.1.57

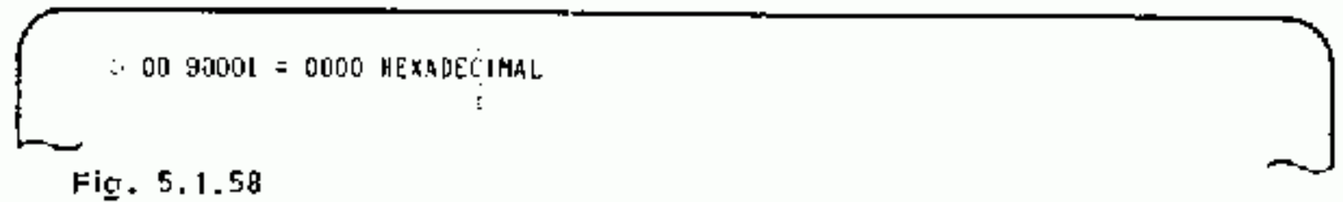


Fig. 5.1.58

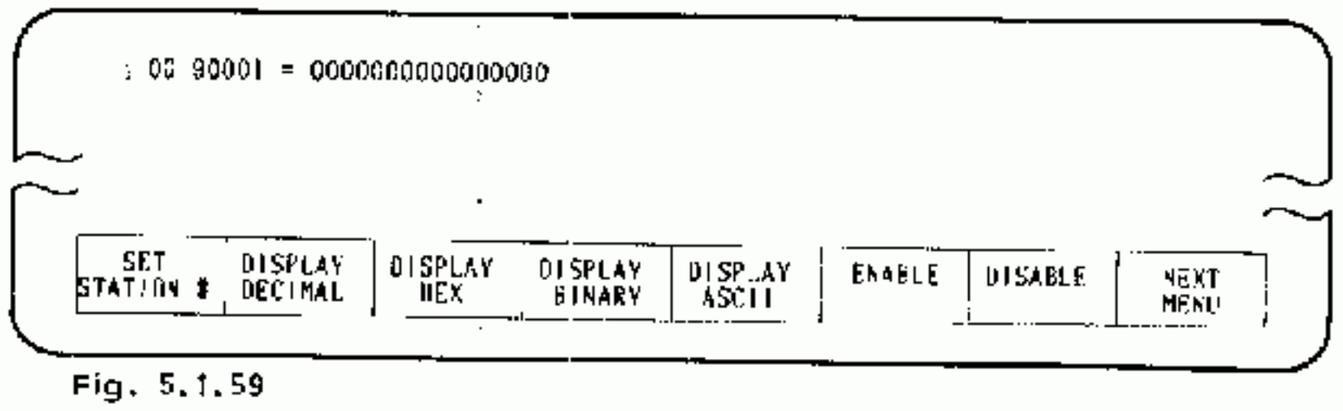
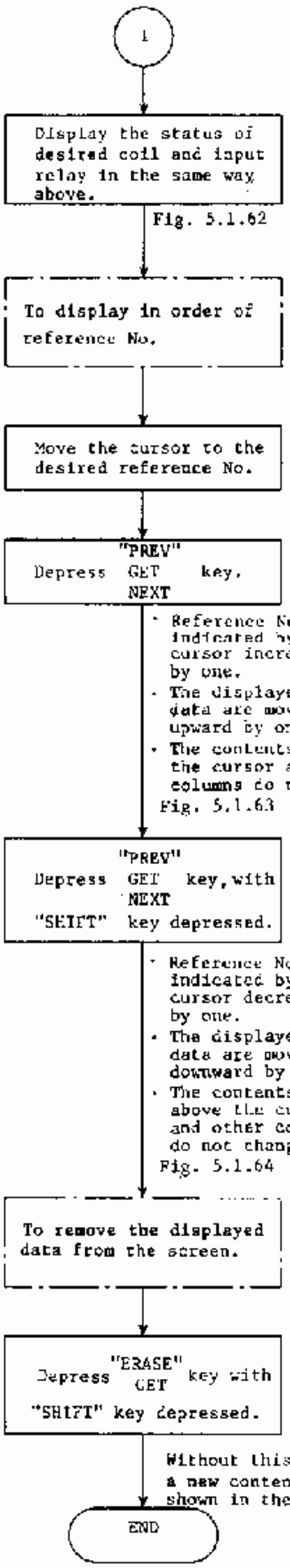


Fig. 5.1.59

Fig. 5.1.60

Fig. 5.1.61

(6) Indication of Desired Register State (Cont'd)



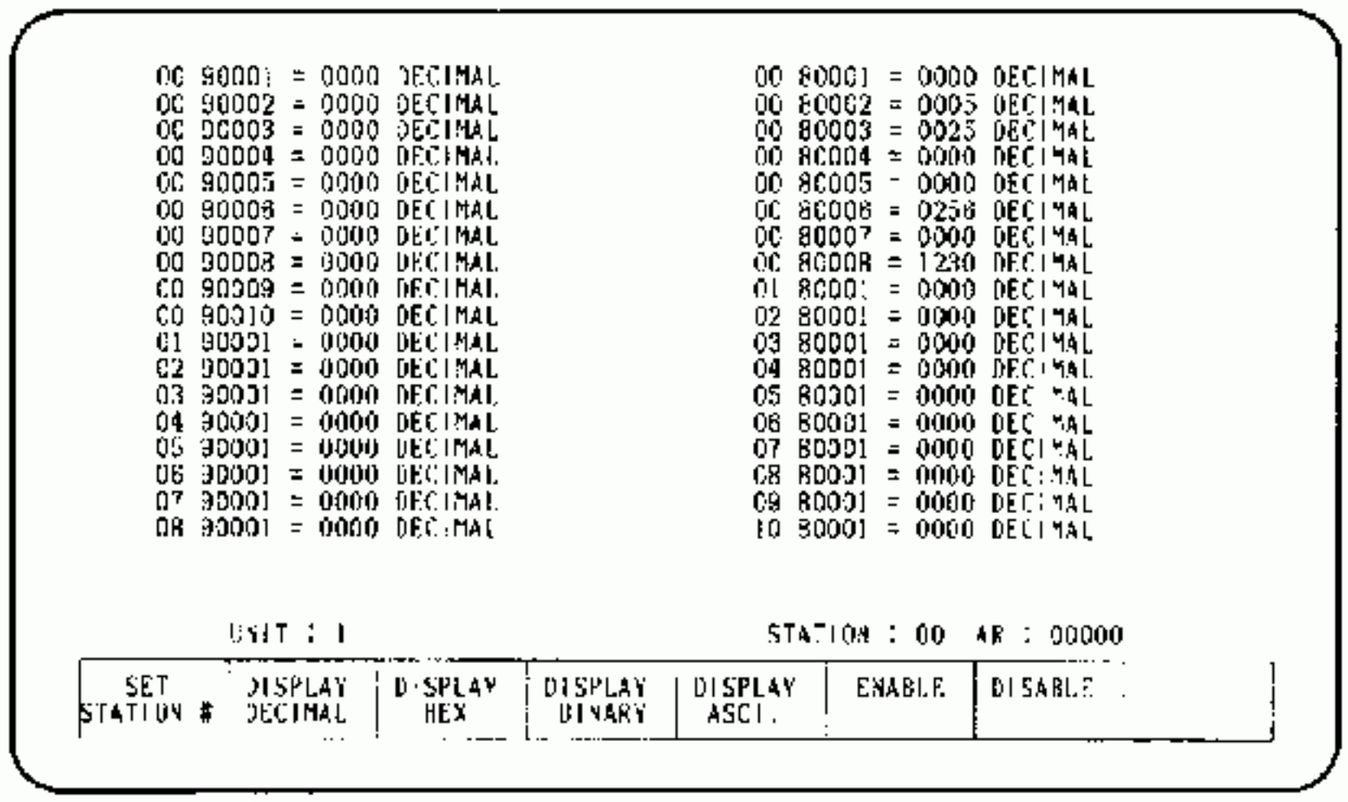


Fig. 5.1.62

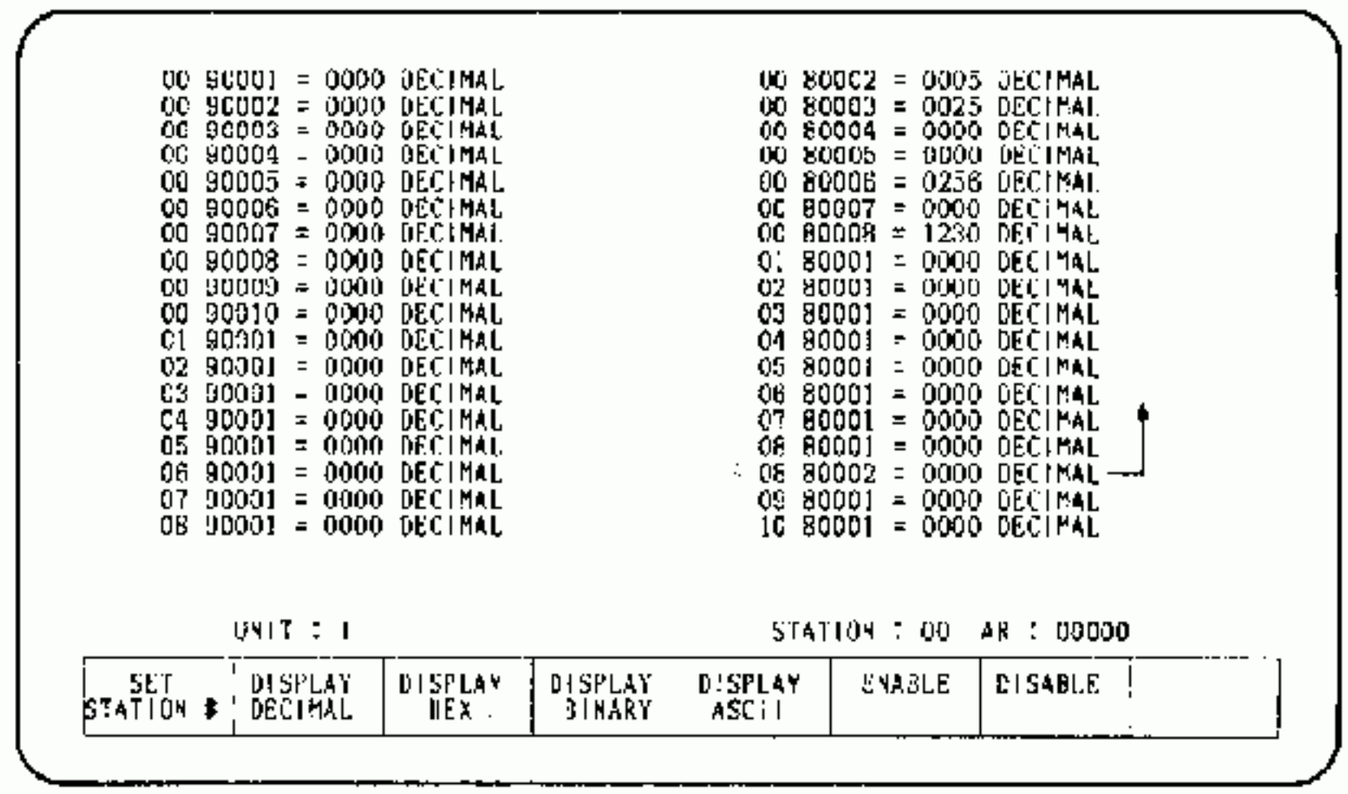


Fig. 5.1.63

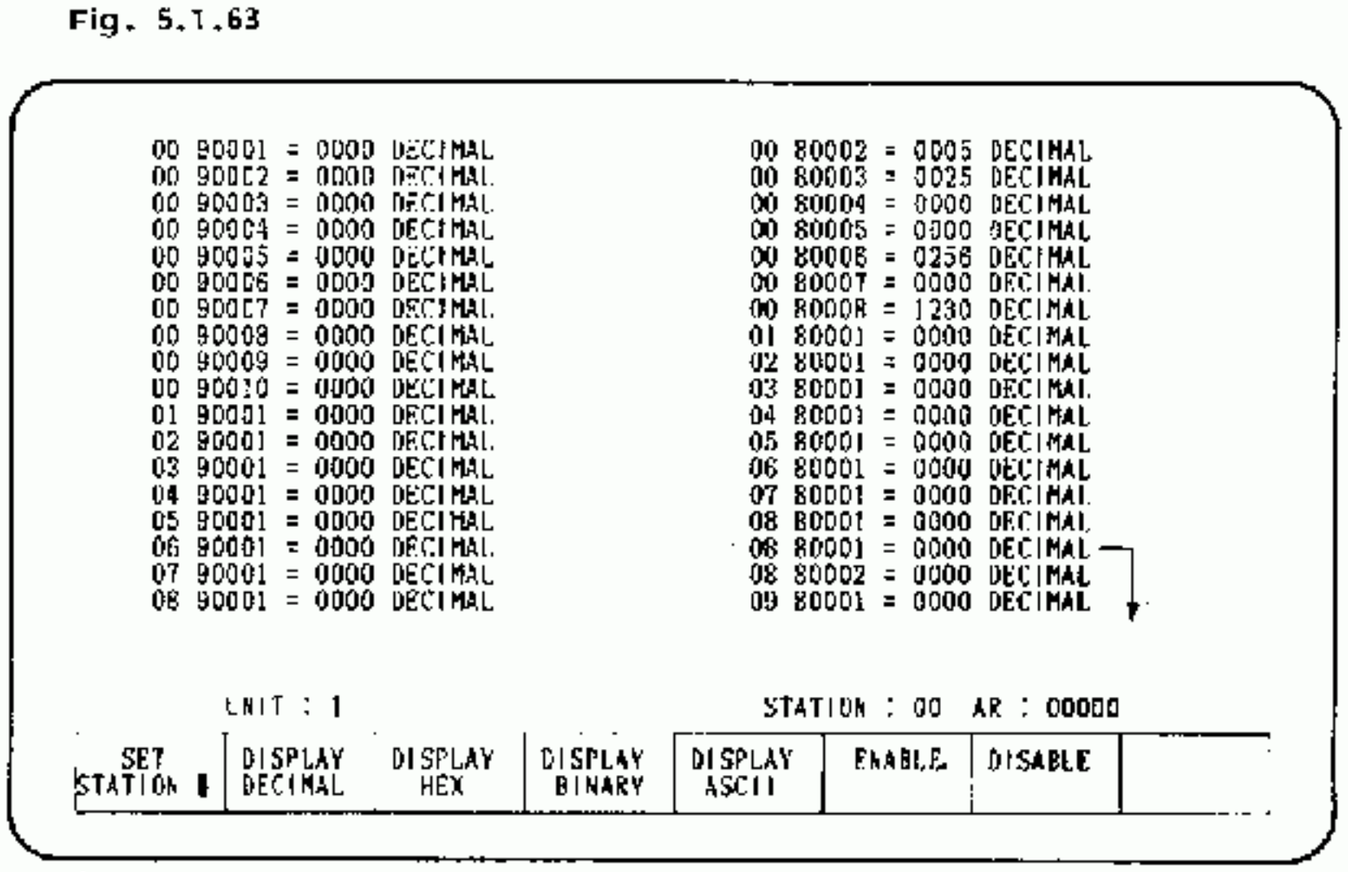


Fig. 5.1.64

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

2. When " CHG SCREEN " is depressed, an alternate operation occurs. (This does not clear the contents on the screen.)

3. In monitor mode, "ENABLE," "DISABLE," " NEXT MENU " and small cursor do not appear.

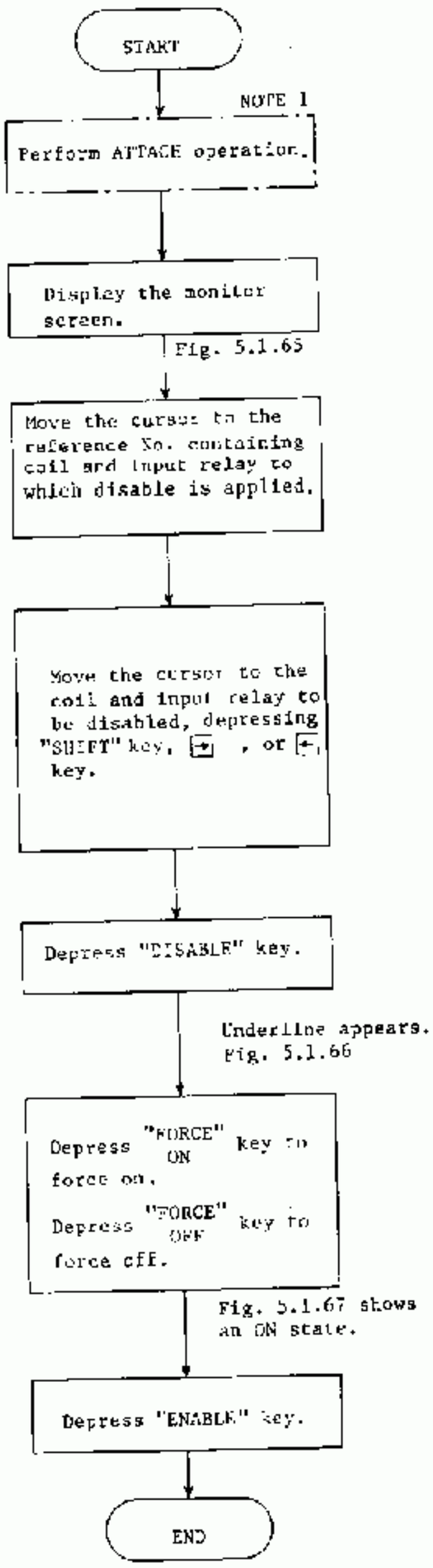
4. If a register content that is more than 9999 is set to decimal indication, it appears as follows:
   Example: 90001 = > 9999 OVERFLOW

5. If the register content that cannot be indicated in ASCII is so set, it apears as follows:
   Example: 90001 = 万万 ASCII

5.1.5 Link Data Disable Operation

(1) Disabling Coils and Input Relays

While the monitor display or expansion reference area appears, a disable operation (forced ON and OFF operations) can be carried out by specifying disable to the desired coil or input relay.




```
          ** MASTER (STATION 00) DISCRETE MONITOR **
70001-70008 = 00000000                  50001-50016 = 0000000000000000
60001-60016 = 0101101001000000          50017-50032 = 0000000000000000
60017-60032 = 0000100000000000          50033-50048 = 0000000000000000
60033-60048 = 0000010011100000          50049-50064 = 0000000000000000
60049-60064 = 0000000000000000          50065-50080 = 0000000000000000
60065-60080 = 0001000100000000          50081-50096 = 0000000000000000
60081-60096 = 0000000000000000          50097-50112 = 0000000000000000
60097-60112 = 0000000000000000          50113-50128 = 0000000000000000
60113-60128 = 0000000000000000          50129-50144 = 0000000000000000
60129-60144 = 0000000000000000          50145-50160 = 0000000000000000
60145-60160 = 0000000000000000          50161-50176 = 0000000000000000
60161-60176 = 0000000000000000          50177-50192 = 0000000000000000
60177-60192 = 0000000000000000          50193-50208 = 0000000000000000
60193-60208 = 0000000000000000          50209-50224 = 0000000000000000
60209-60224 = 0000000000000000          50225-50240 = 0000000000000000
60225-60240 = 0000000000000000          50241-50256 = 0000000000000000
60241-60256 = 0000000000000000

UNIT : 1                                STATION : 00  AR : 00000

| SELECT STATION |  | ENABLE | DISABLE | FORCE ON | FORCE OFF | NEXT MENU |  |
```

Fig. 5.1.65

```
60081-60096 = 0000000000000000          50097-50112 = 0000000000000000
```

Fig. 5.1.66

```
60081-60096 = 0010000000000000          50097-50112 = 0000000000000000
```

Fig. 5.1.67

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

2. When the discrete data is indicated as a one-point increment, a disable operation indicates the following: 00 60001 = OFF DISABLED

3. In the monitor mode, no disable operation can be applied.

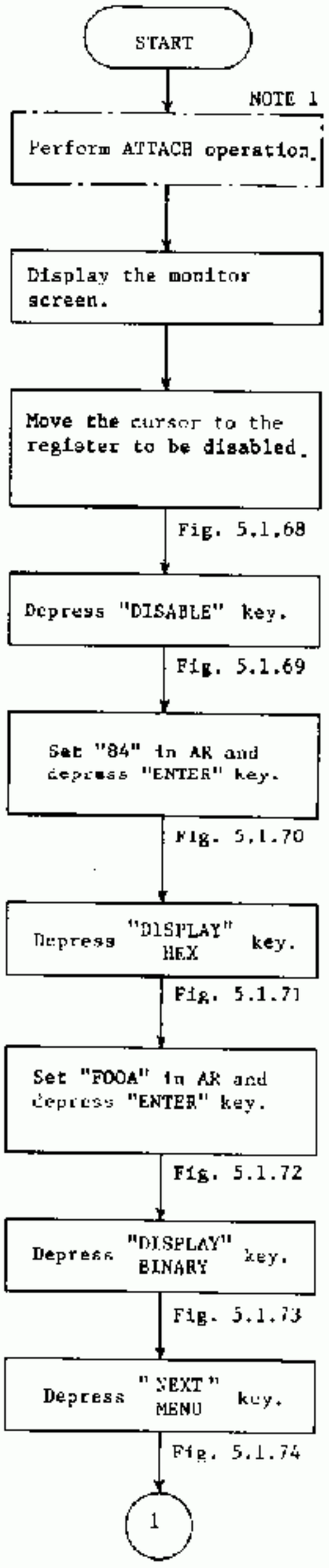
4. Disabled coil or input coil must be returned to enable state, when it is not necessary.

(2) Storing Data in Register

While the monitor display or expansion reference area appears, the desired numerics can be stored in a register. This is possible only when the register is disabled.

Data types that can be stored

Decimal: 0000 to 9999
Hexadecimal: 0000 to FFFF
Binary: Any 16-bit pattern
ASCII: Any 2 ASCII characters




```
                ** MASTER (STATION 00) REGISTER MONITOR **
 80001 = 0000 DECIMAL                          90001 = 0000 DECIMAL
 80002 = 0005 DECIMAL                          90002 = 0000 DECIMAL
 80003 = 0025 DECIMAL                          90003 = 0000 DECIMAL
 80004 = 0000 DECIMAL                          90004 = 0000 DECIMAL
 80005 = 0000 DECIMAL                          90005 = 0000 DECIMAL
 80006 = 0256 DECIMAL                          90006 = 0000 DECIMAL
 80007 = 0000 DECIMAL                          90007 = 0000 DECIMAL
 80008 = 1230 DECIMAL                          90008 = 0000 DECIMAL
 80009 = 0010 DECIMAL                          90009 = 0000 DECIMAL
 80010 = 0000 DECIMAL                          90010 = 0000 DECIMAL
 80011 = 0022 DECIMAL                          90011 = 0000 DECIMAL
 80012 = 0022 DECIMAL                          90012 = 0000 DECIMAL
 80013 = 0000 DECIMAL                          90013 = 0000 DECIMAL
 80014 = 0000 DECIMAL                          90014 = 0000 DECIMAL
 80015 = 0000 DECIMAL                          90015 = 0000 DECIMAL
 80016 = 0000 DECIMAL                          90016 = 0000 DECIMAL

        UNIT : 1                                STATION : 00  AR : 00000
| SELECT STATION | DISPLAY DECIMAL | DISPLAY HEX | DISPLAY BINARY | DISPLAY ASCII | ENABLE | DISABLE | PREVIOUS MENU |
```

Fig. 5.1.68

```
 80001 = 0000 DECIMAL     DISABLED     90001 = 0000 DECIMAL
```

Fig. 5.1.69

```
 80001 = 0084 DECIMAL     DISABLED     90001 = 0000 DECIMAL
```

Fig. 5.1.70

```
 80001 = 0054 HEXADECIMAL DISABLED     90001 = 0000 DECIMAL
```

Fig. 5.1.71

```
 80001 = FOOA HEXADECIMAL DISABLED     90001 = 0000 DECIMAL
```

Fig. 5.1.72

```
 80001 = 1111000000001010 DISABLED     90001 = 0000 DECIMAL
```

Fig. 5.1.73

```
        UNIT : 1                        STATION : 00  AR : 00000
|  |  |  | SET BIT | CLEAR BIT | SET ALL | CLEAR ALL | PREVIOUS MENU |
```

Fig. 5.1.74

(2) Storing Data in Register (Cont'd)

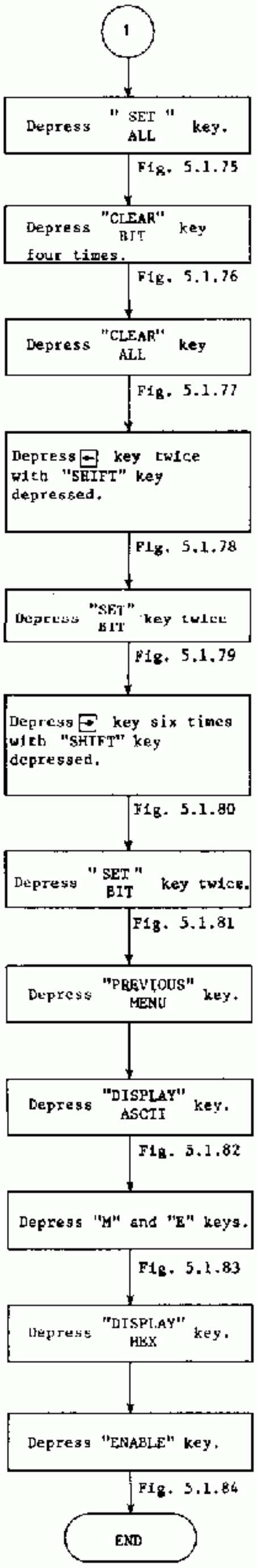


Fig. 5.1.75

Fig. 5.1.76

Fig. 5.1.77

Fig. 5.1.78

Fig. 5.1.79

Fig. 5.1.80

Fig. 5.1.81

Fig. 5.1.82

Fig. 5.1.83

Fig. 5.1.84

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

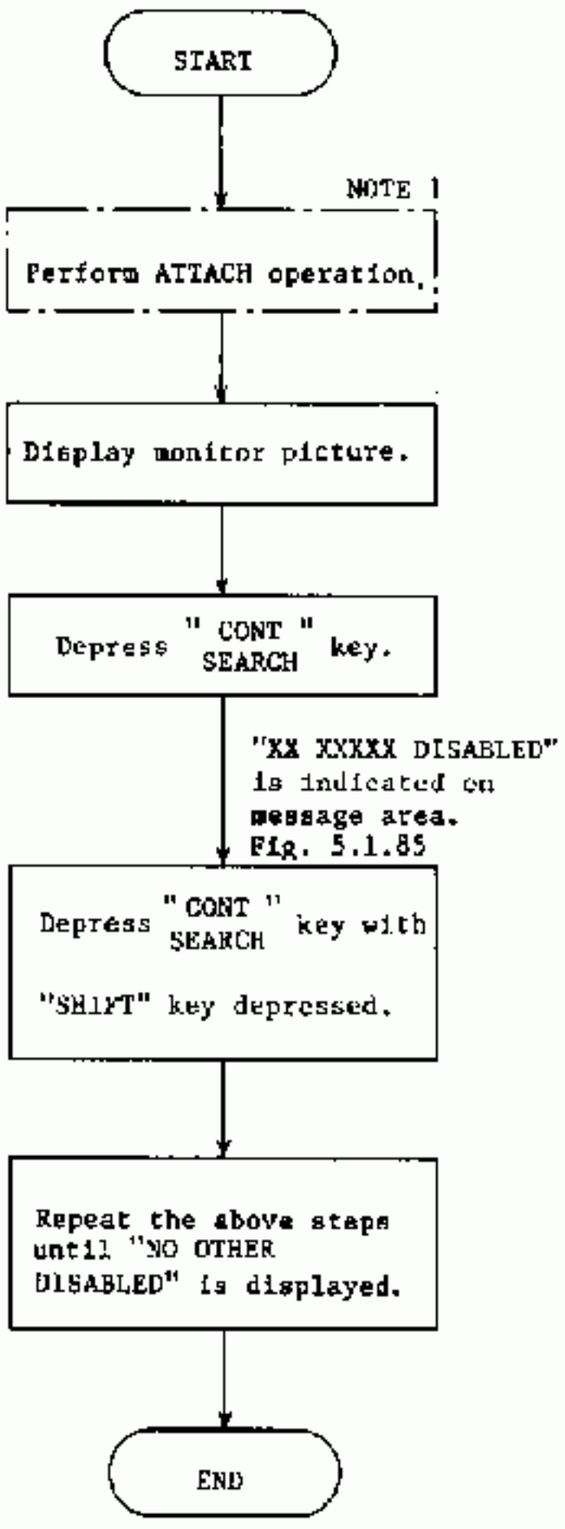
2. If a register content that is more than 9999 is set to decimal indication, it appears as follows:
   Example: 900001 -> 9999 OVERFLOW

3. If the register content that cannot be indicated in ASCII is so set, it appears as follows:
   Example: 90001 - 万万 ASCII

4. In the monitor mode, no numerics can be stored.

(3) Searching for Disabled Items

Disabled coils, input relays and registers can be searched for. This is used when disabeld states have not been released.



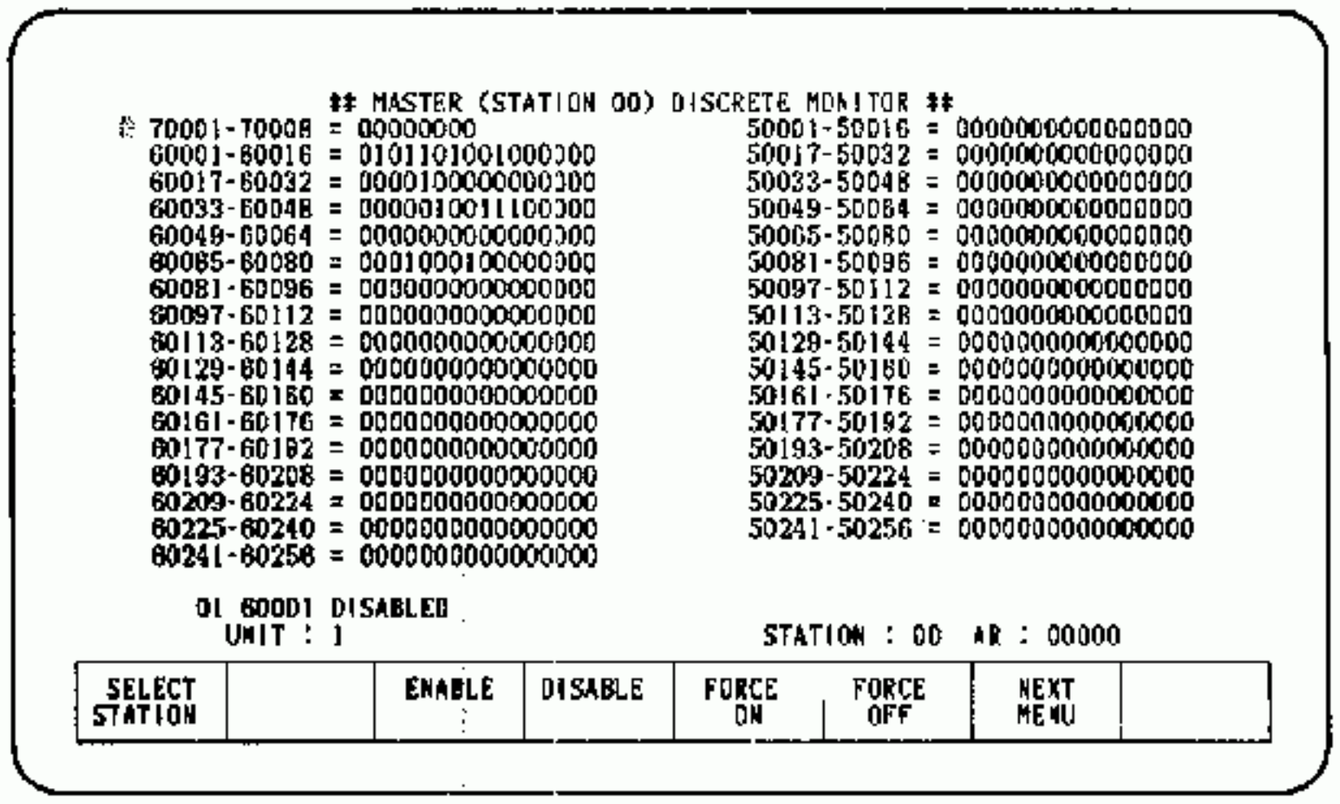


Fig. 5.1.85

NOTE

This step can be skipped, if ATTACH operation has already been completed.

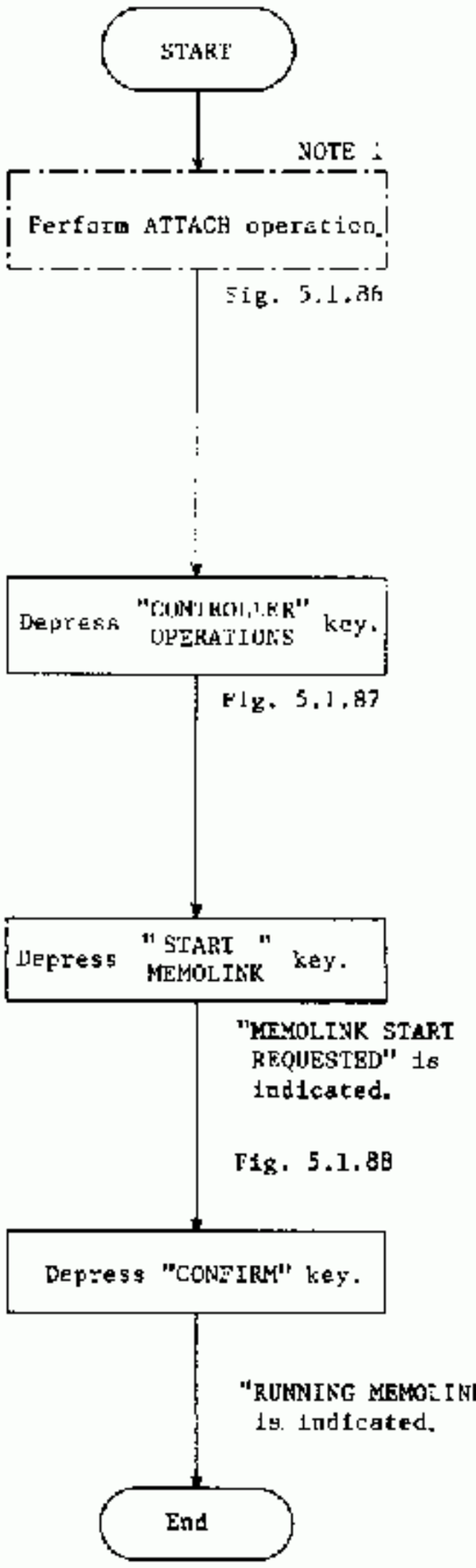
5.1.6 Controller Operation

(1) Start

This operation restarts MEMOLINK that is in the process of stopping.

POINT

Port parameter setting and disable operations can be carried out whether MEMOLINK is running or stopping. Clearing memory, allocation, and load operations can be done only when MEMOLINK is stopping.



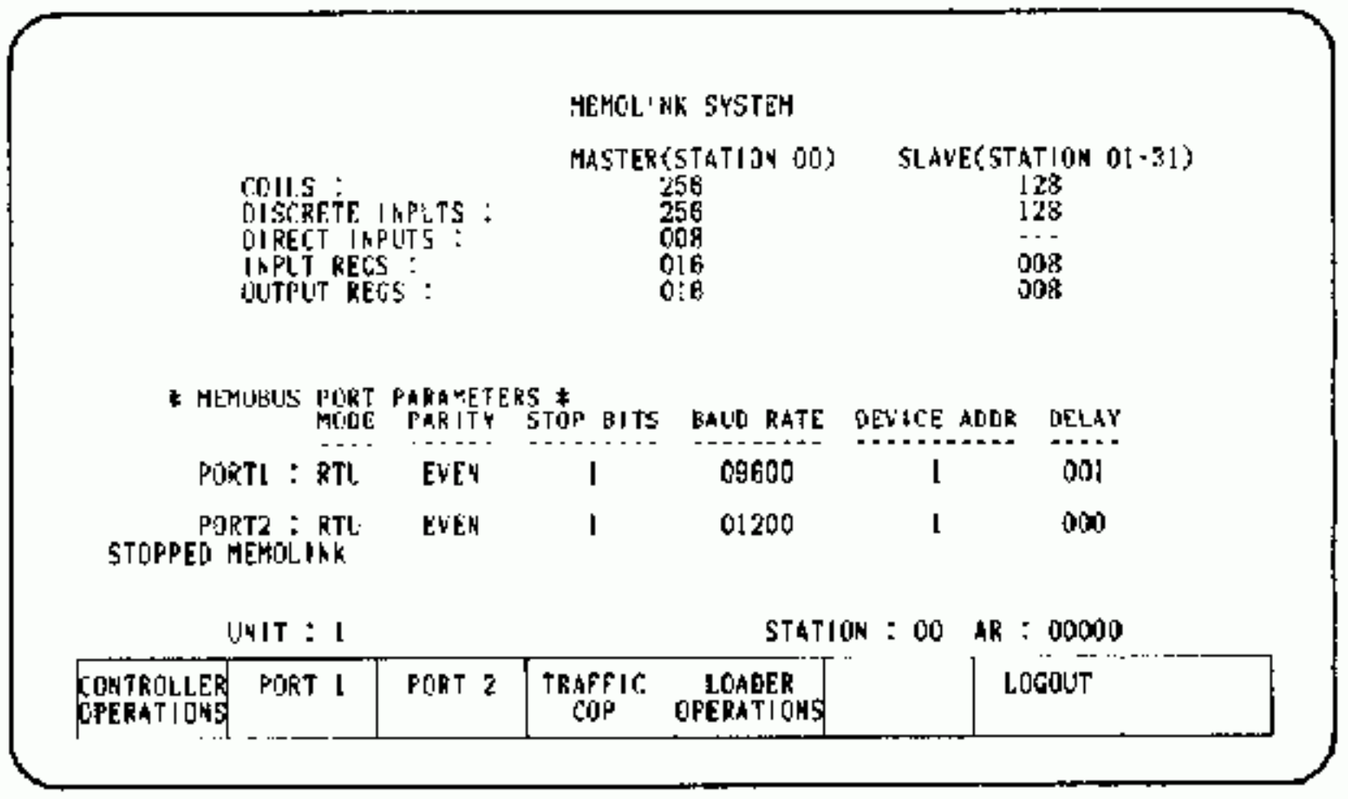


Fig. 5.1.86

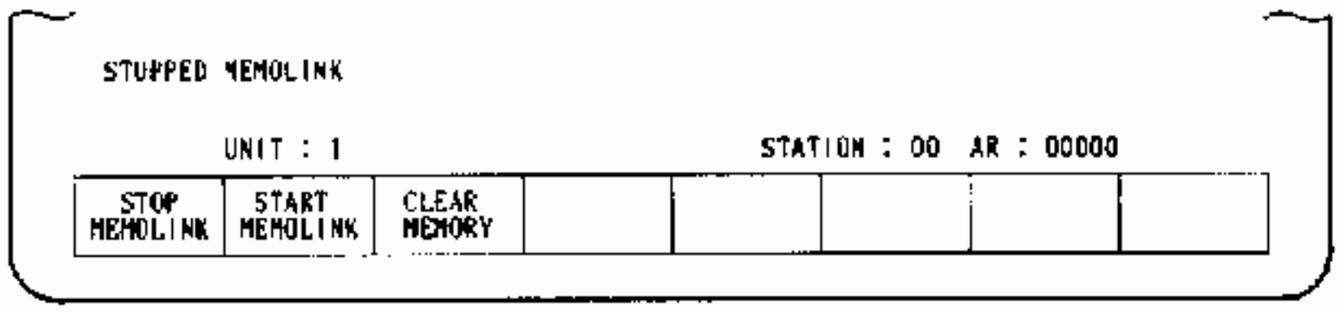


Fig. 5.1.87

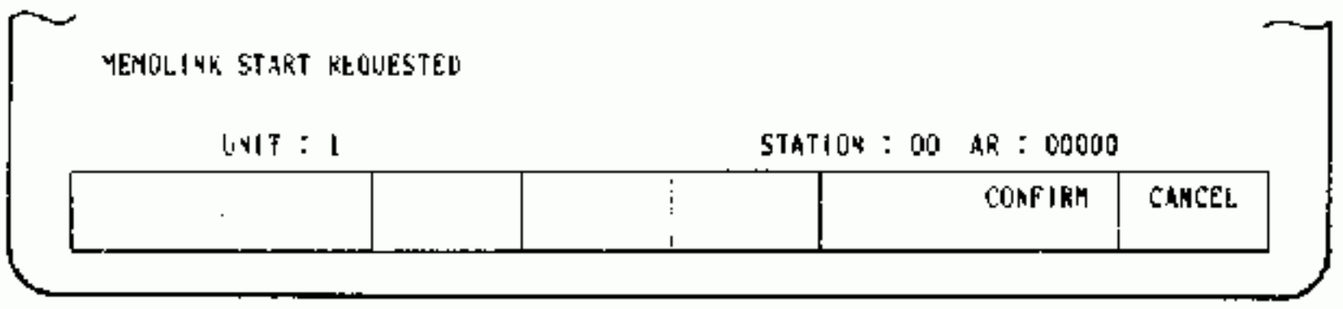


Fig. 5.1.88

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

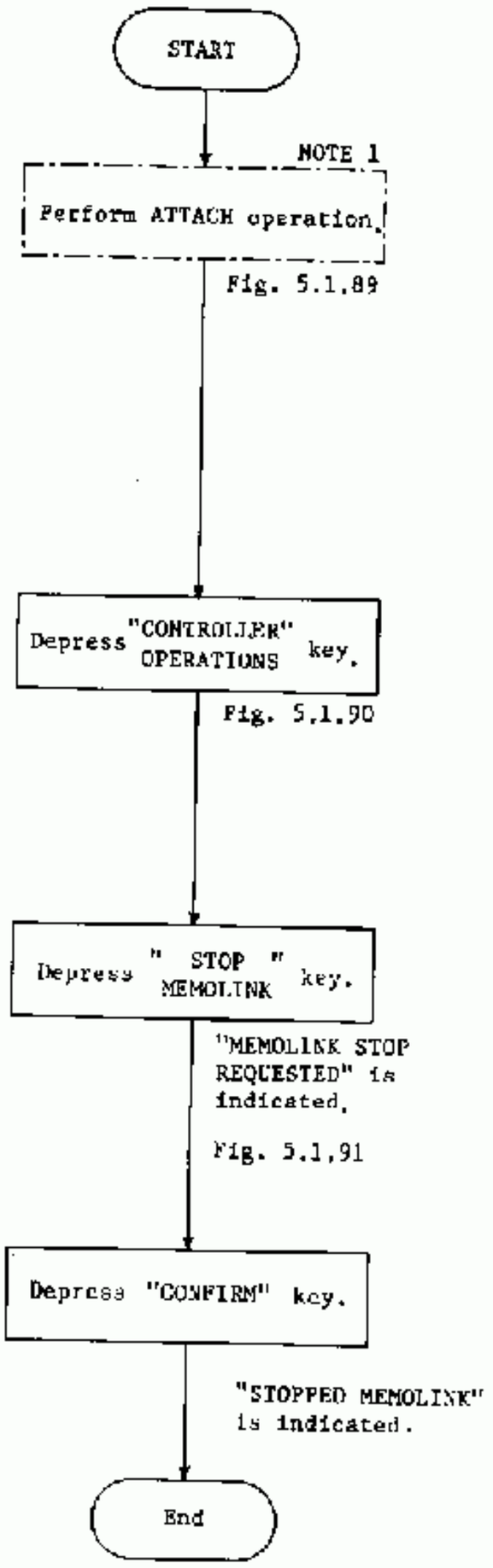
2. If "CANCEL" is depressed instead of "CONFIRM," nothing happens, and the display returns to that shown in Fig. 5.1.87.

(2) Stop

This operation stops MEMOLINK that is running.

POINT

All operations are possible when MEMOLINK is stopping. Note that clearing memory, allocation, and load operations can be done only when MEMOLINK is stopping.



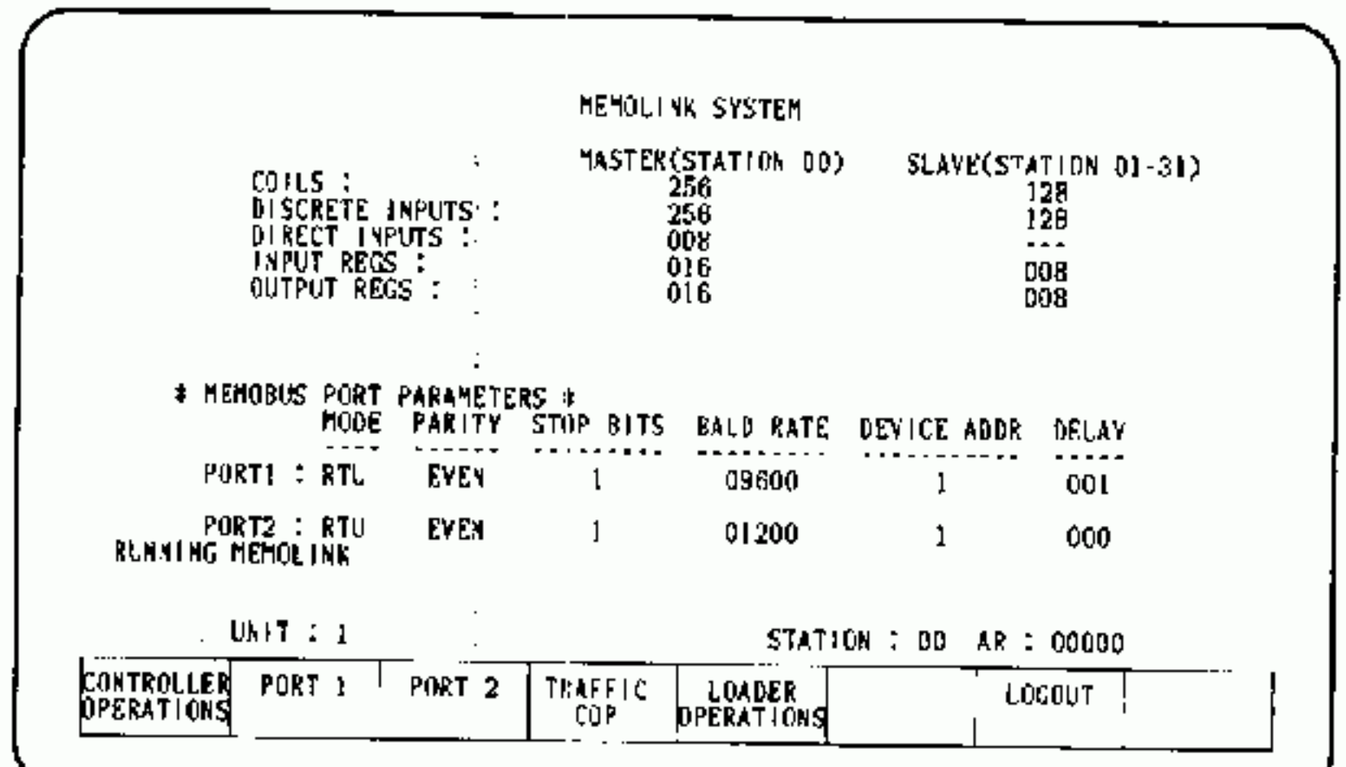


Fig. 5.1.89

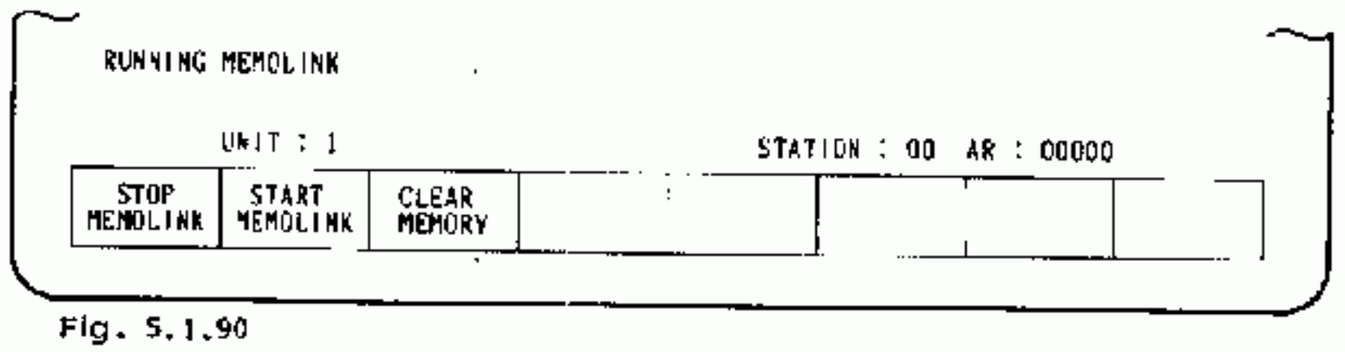


Fig. 5.1.90

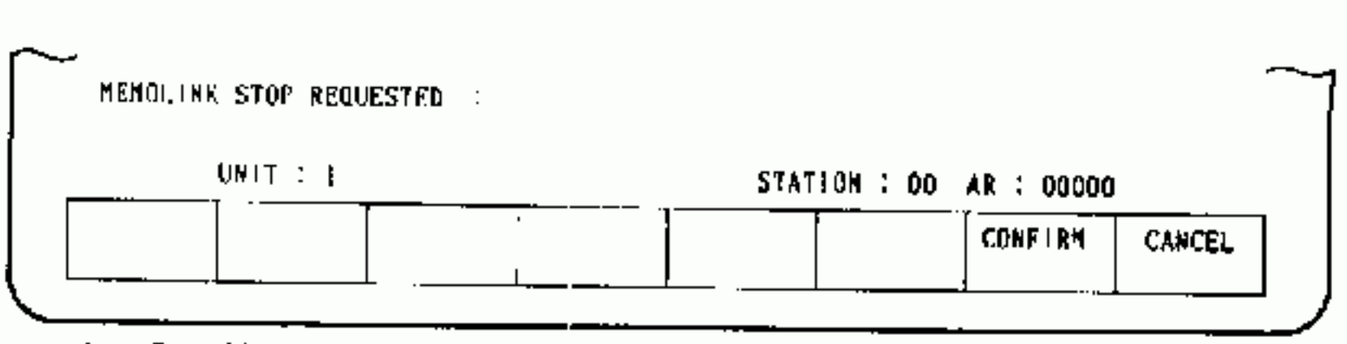


Fig. 5.7.91

NOTE

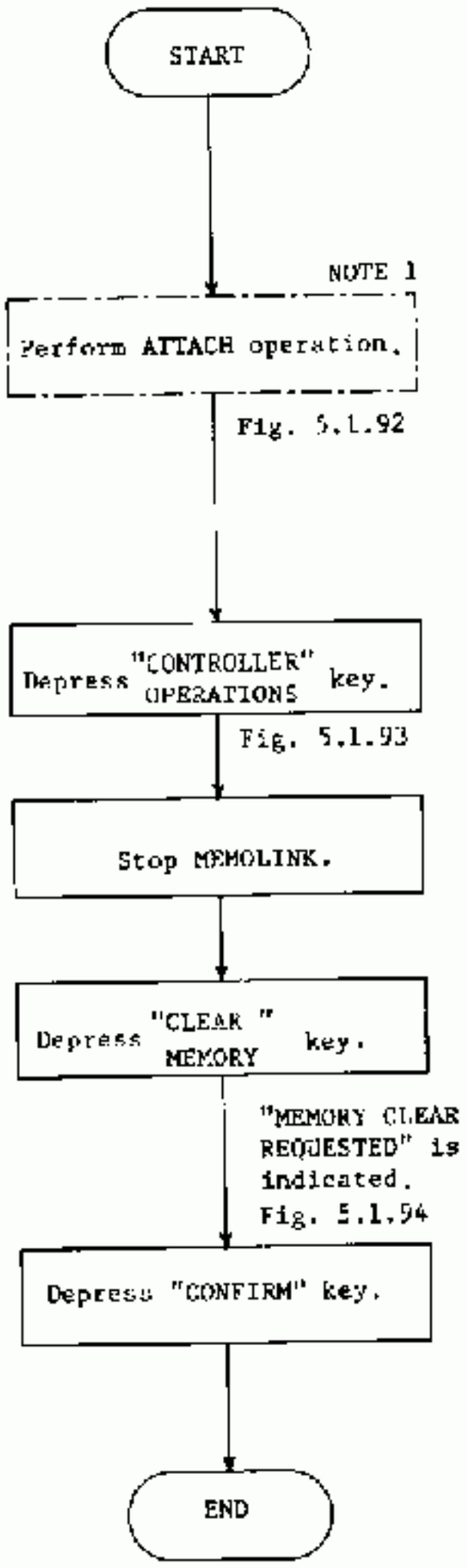
1. This step can be skipped, if ATTACH operation has already been completed.
2. If "CANCEL" is depressed instead of "CONFIRM," nothing happens, and the display returns to that shown in Fig. 5.1.90.

(3) Clearing Memory

This operation clears the contents of I/O allocation table, disable table, and status table.

POINT

MEMOLINK must be stopped.




```
                                MEMOLINK SYSTEM

                                MASTER(STATION 00)     SLAVE(STATION 01-31)
COILS :                                256                    128
DISCRETE INPUTS :                      256                    128
DIRECT INPUTS :                        008                    --
INPUT REGS :                           016                    008
OUTPUT REGS :                          016                    008


  * MEMOBUS PORT PARAMETERS *
            MODE   PARITY   STOP BITS   BAUD RATE   DEVICE ADDR   DELAY
            ----   ------   ---------   ----------   -----------   -----
  PORT1 :   RTU    EVEN        1          09600          1          001

  PORT2 :   RTU    EVEN        1          01200          1          000
STOPPED MEMOLINK

          UNIT : 1                                  STATION : 00  AR : 0C000

| CONTROLLER OPERATIONS | PORT 1 | PORT 2 | TRAFFIC CUP | LOADER OPERATIONS |  | LOGOUT |  |
```

Fig. 5.1.92

```
STOPPED MEMOLINK

          UNIT : 1                                  STATION : 00  AR : 00000

| STOP MEMOLINK | START MEMOLINK | CLEAR MEMORY |  |  |  |  |  |
```

Fig. 5.1.93

```
MEMORY CLEAR REQUESTED

          UNIT : 1                                  STATION : 00  AR : 00000

|  |  |  |  |  |  | CONFIRM | CANCEL |
```

Fig. 5.1.94

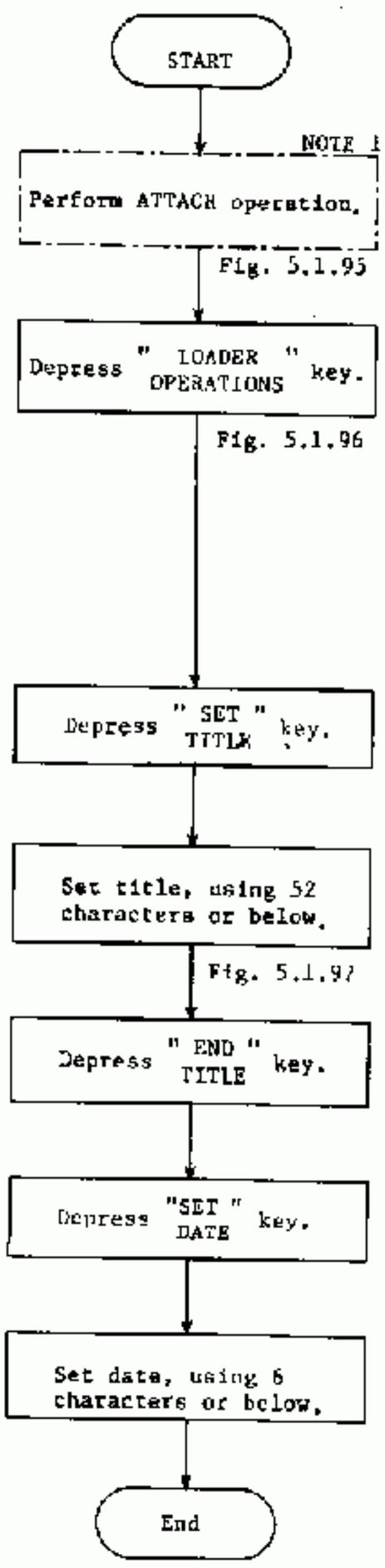
NOTE

1. This step can be skipped, if ATTACH operation has already been completed.
2. If "CANCEL" is depressed instead of "CONFIRM," nothing happens and the display returns to that shown in Fig. 5.1.93.

5.1.7 Dump/Load/Verify of Allocation Data

(1) Setting Titles and Date

When title and data are set before recording allocation data, they can be recorded together with the allocatin data. If not required, this operation need not be done.



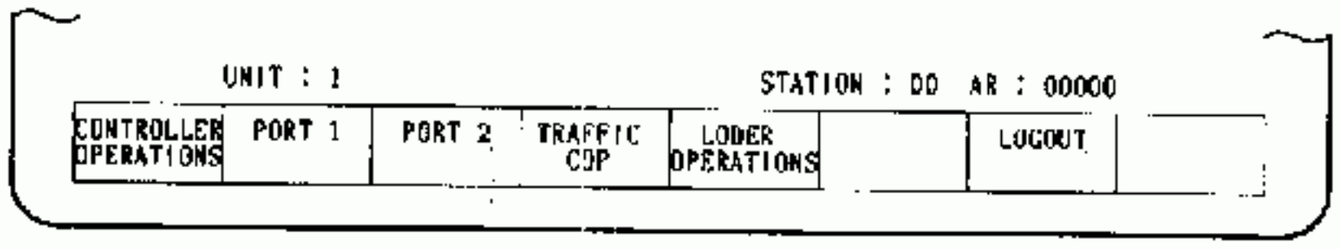


Fig. 5.1.95

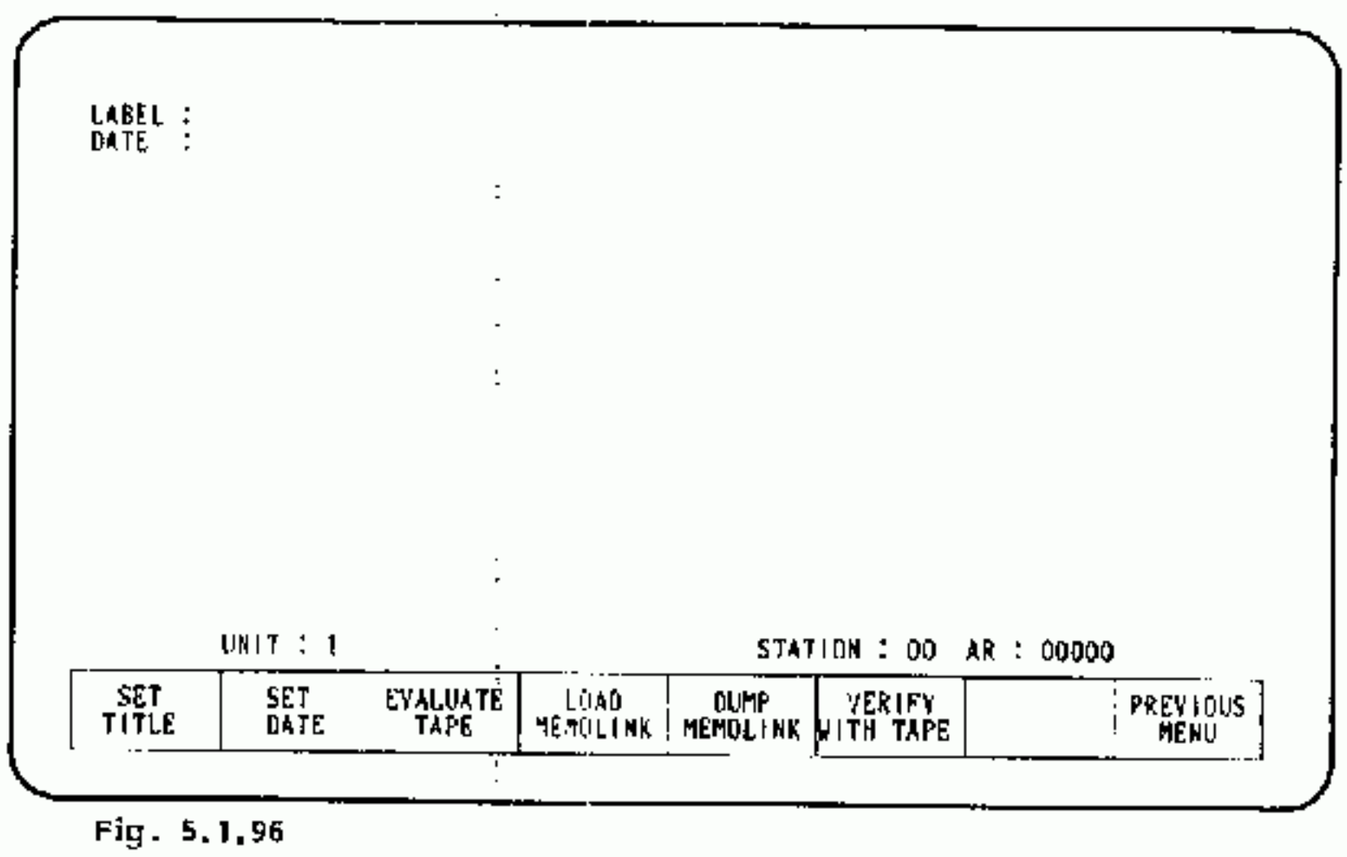


Fig. 5.1.96

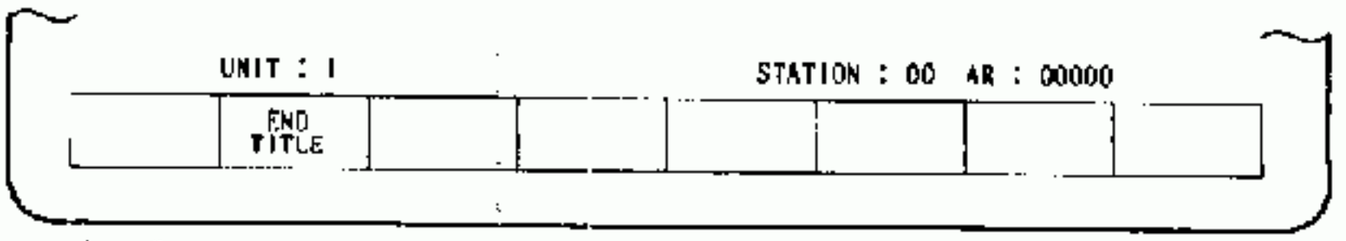


Fig. 5.1.97

NOTE

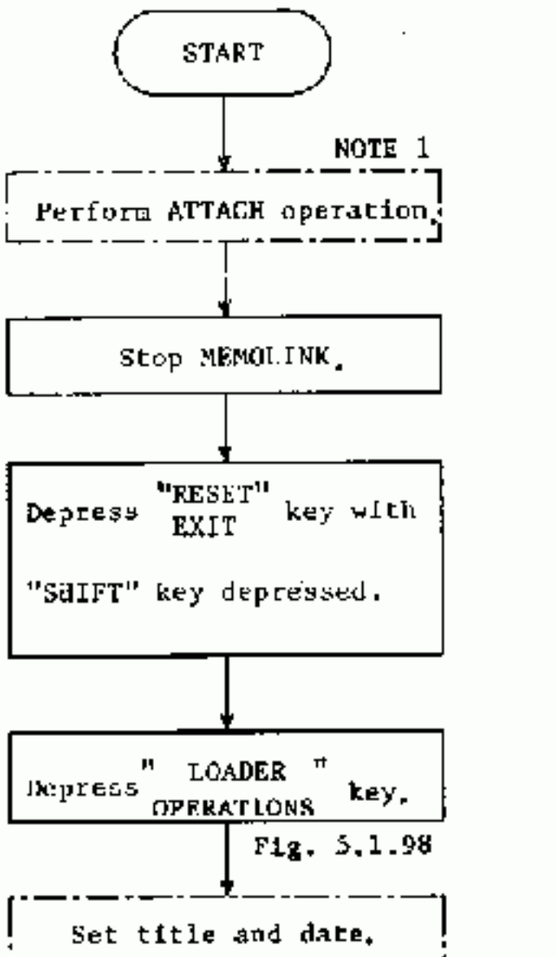
1. This step can be skipped, if ATTACH operation has already been completed.

2. Set data and title, using numerics, alphabet, and symbols. If an error is found during setting, depress "RUBOUT BKSP" and make correction.

3. When data is set with 6 characters, the display automatically returns to that shown in Fig. 5.1.96.

(2) Dumping Allocation Data

The memory contents of MEMOLINK master module can be dumped on a blank tape by the following operation. After dumping, check the contents and store the tape. If the programs are destroyed, this tape can be used to restore them by loading.



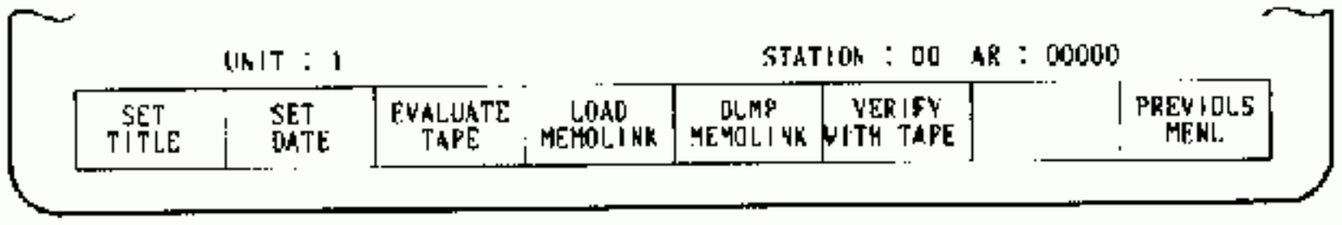


Fig. 5.1.98

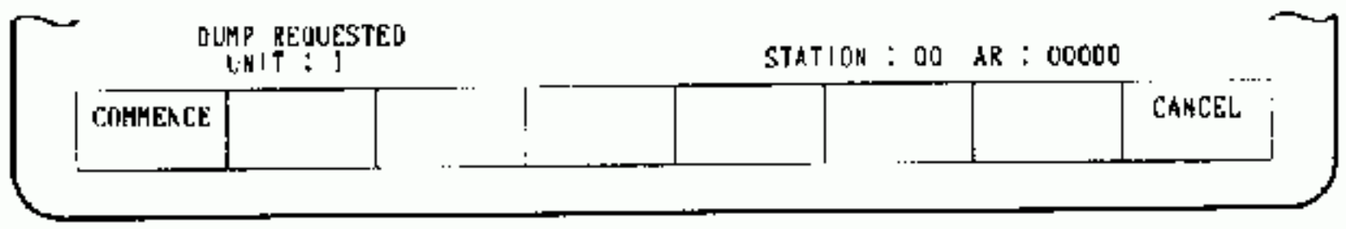


Fig. 5.1.99

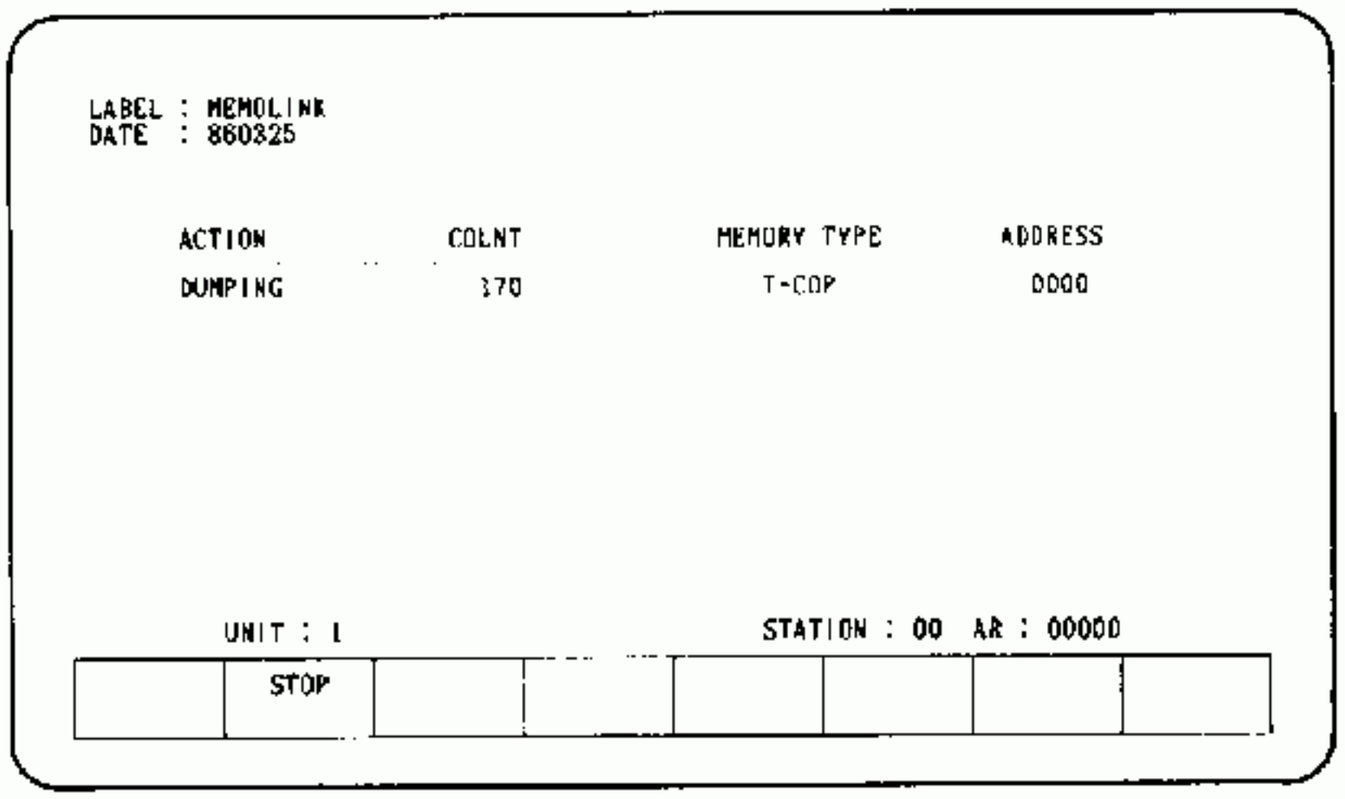


Fig. 5.1.100

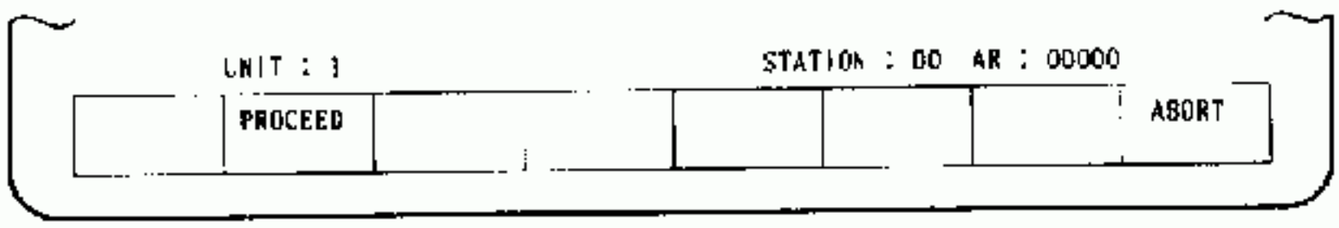
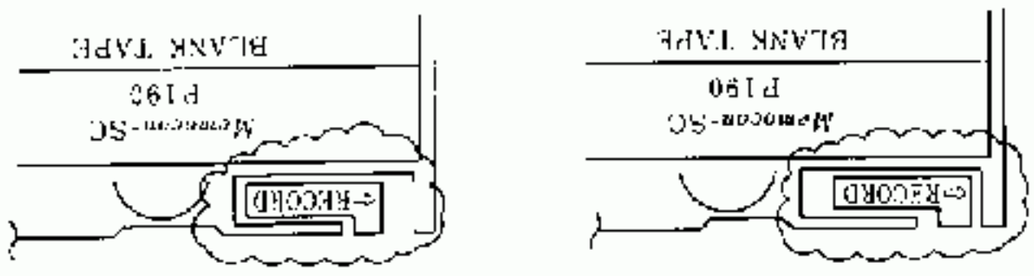


Fig. 5.1.101



(a) Recording Prohibited (b) Recording Ready

Fig. 5.1.102 Tape Cartridge Switch

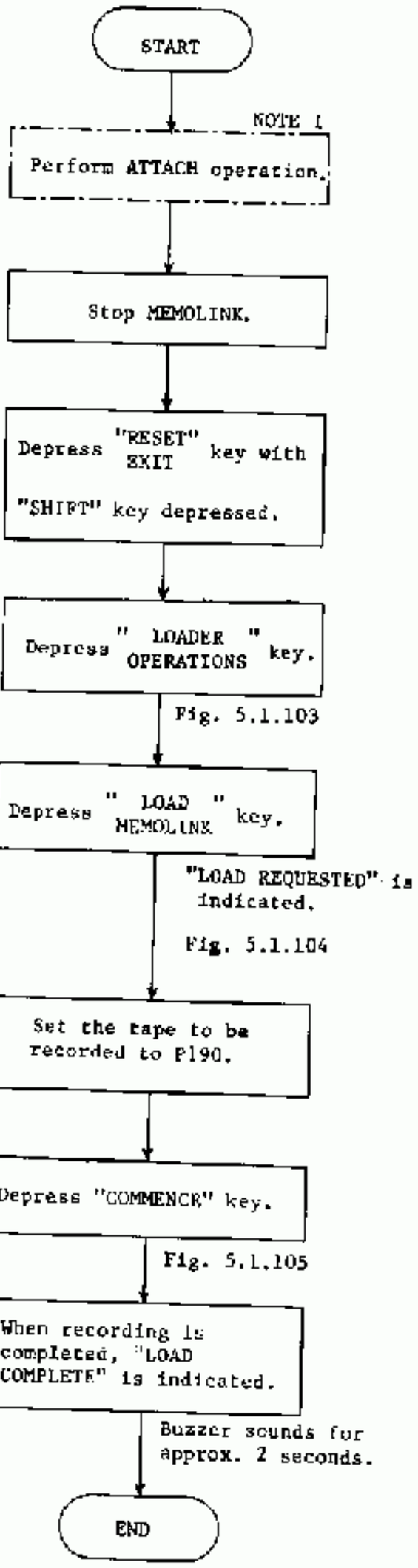
NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

2. If "STOP" is depressed in Fig. 5.1.100, Fig.5.1.101 is diplayed. If "PROCEED" is depressed, the dump is continued. If "ABORT" is depressed, the operation stops, and Fig.5.1.98 is displayed again.

(3) Loading Allocation Data

Data dumped on tape can be written into the master module. Before this operation, MEMOLINK must be sotpped. When loading is finished, check the contents and remove the tape.



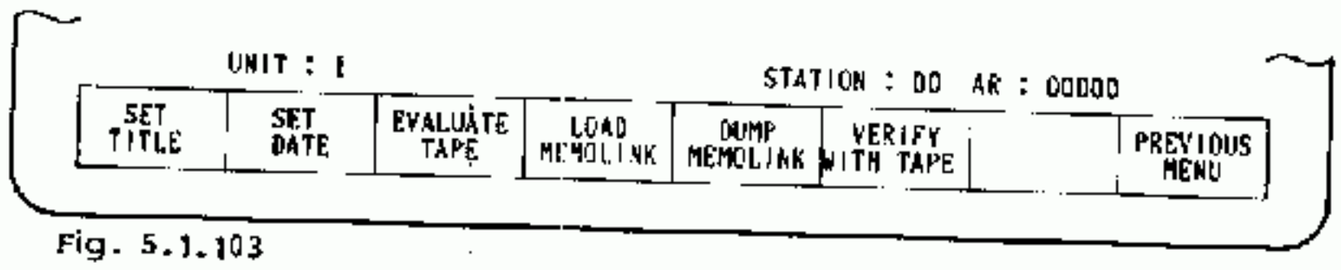


Fig. 5.1.103

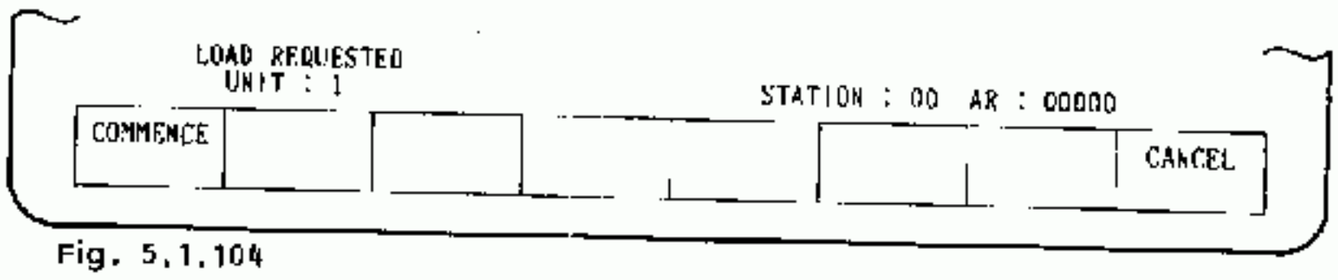


Fig. 5.1.104

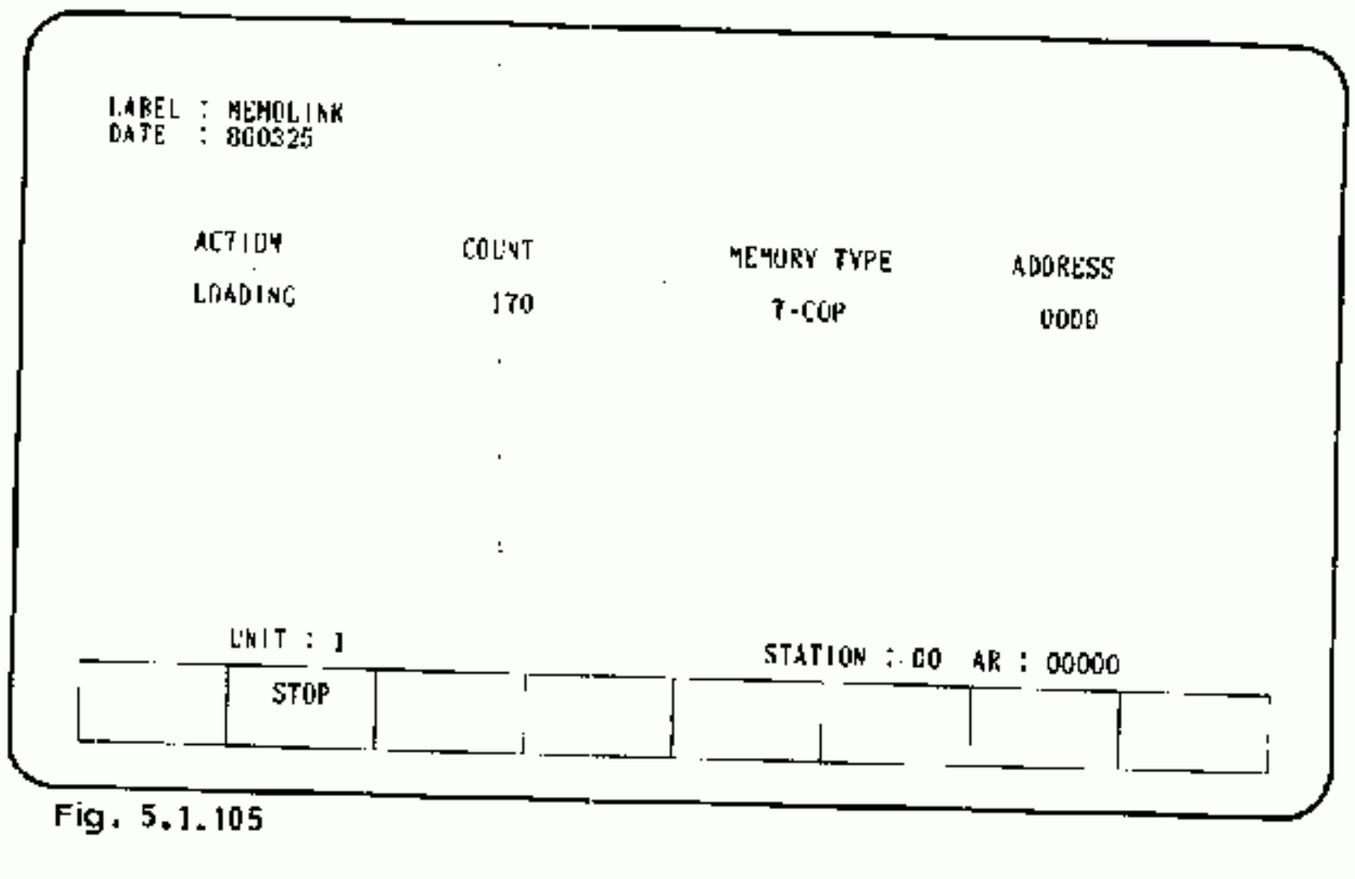


Fig. 5.1.105

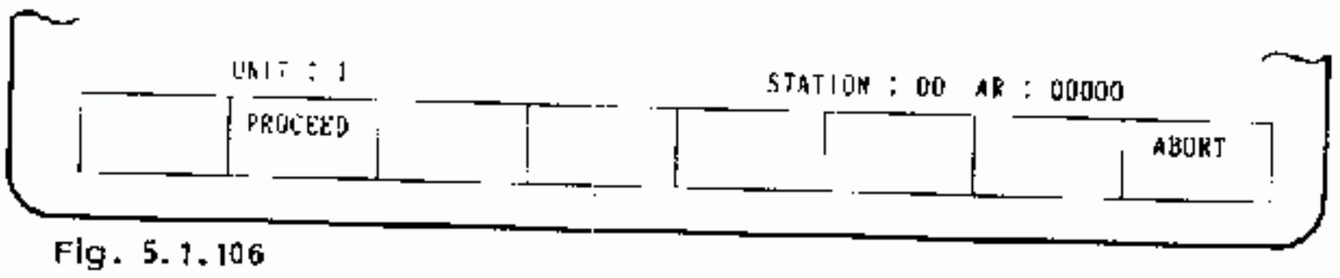


Fig. 5.1.106

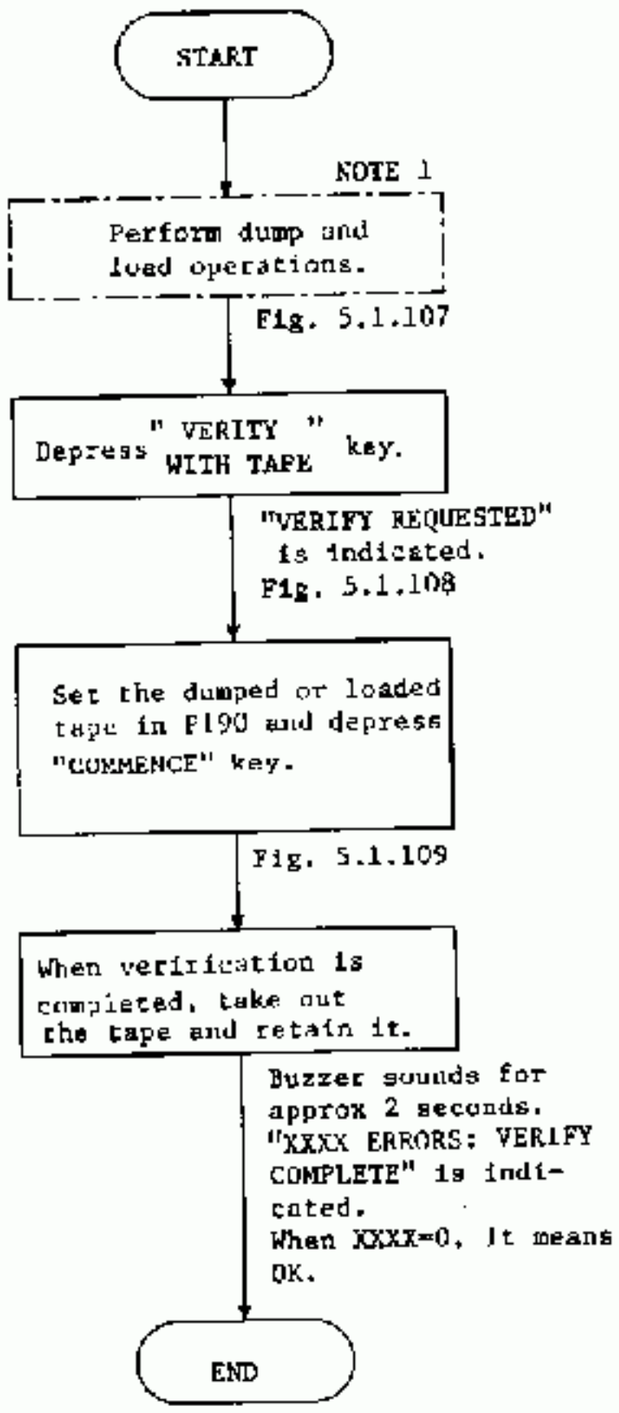
NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

2. If "STOP" is depressed in Fig. 5.1.105, Fig.5.1.106 is displayed. If "PROCEED" is depressed, the load is continued. If "ABORT" is depressed, the operation stops, and Fig.5.1.103 is displayed again.

(4) Verifying Allocation Data

This operation is used for verification of tape data and data in MEMOLINK master module. After dumping and loading are completed, the operation must be accomplished.



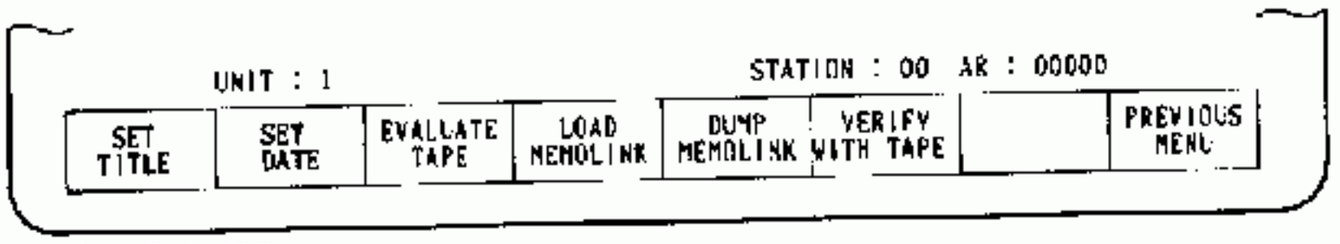


Fig. 5.1.107

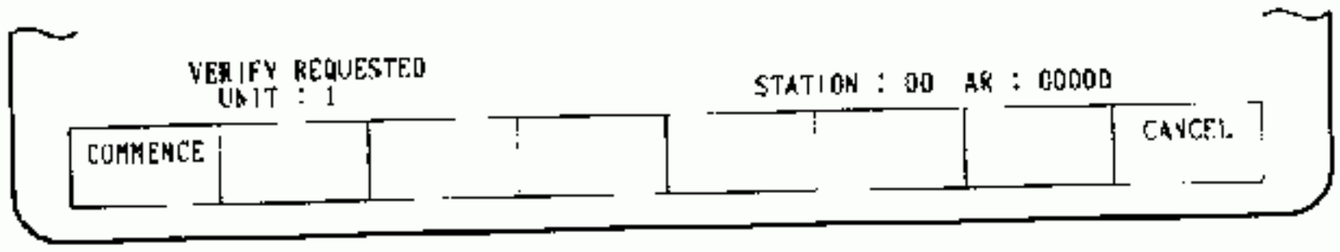


Fig. 5.1.108

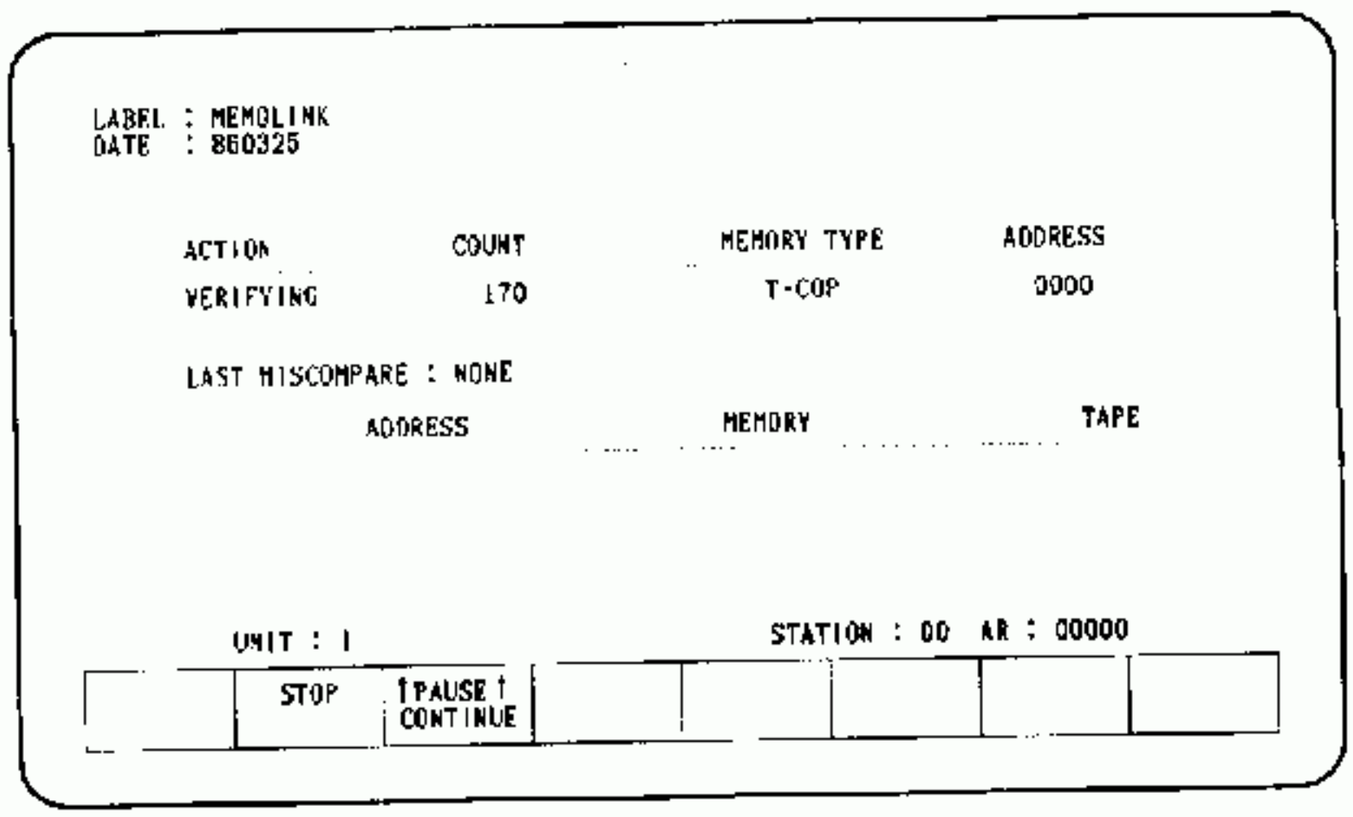


Fig. 5.1.109

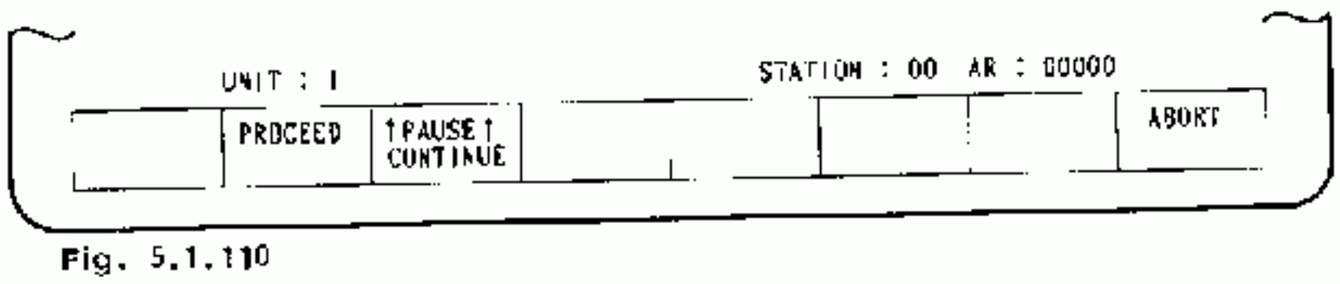


Fig. 5.1.110

NOTE

1. After dump or load operation and before starting MEMOLLINK, perform a verification check.

2. If a miscomparison is found during a verification check, Fig.5.1.110 is displayed. If "PROCEED" is depressed, the verify operation is continued. If "ABORT" is depressed, the operation stops, and Fig.5.1.107 is displayed again.

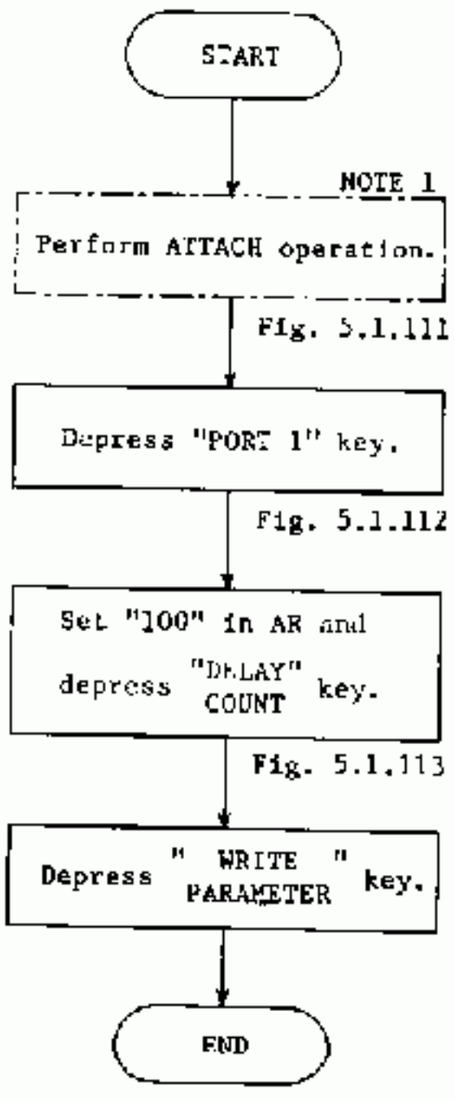
3. When label "↑PAUSE↑ CONTINUE" is toggled to "PAUSE ↓CONTINUE" by depressing "↑PAUSE↑ CONTINUE" key, the verify operation is continued even if an error exists. For example, "0023 ERRORS: VERIFY COMPLETE" (meaning 23 errors) is displayed in the message area.

5.1.8 Setting Port Parameters

This operation sets transmission conditions for communications when a high-level computer or P190 is connected. The initial condition is preset before shipment so that P190 can be connected unconditionally and the port parameters need not be changed. Always check that the setting is correct.

(1) Typical Setting of Port 1

Usually, port 1 is connected to P190 (using cable type JZMSZ-W1015). Note that only delay count* can be set.



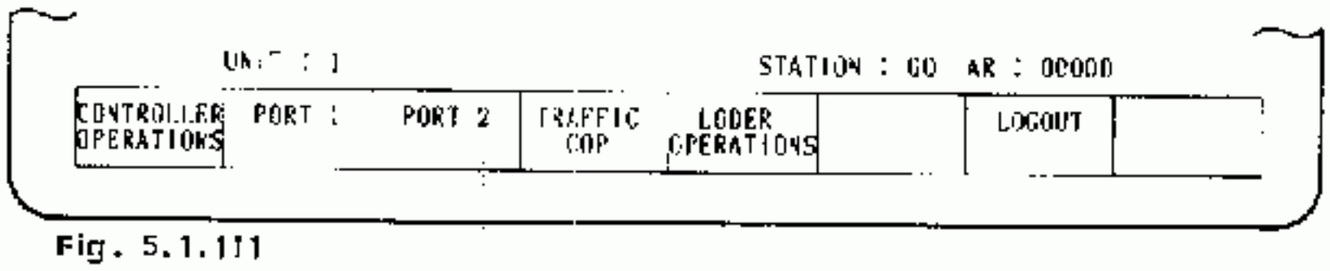


Fig. 5.1.111

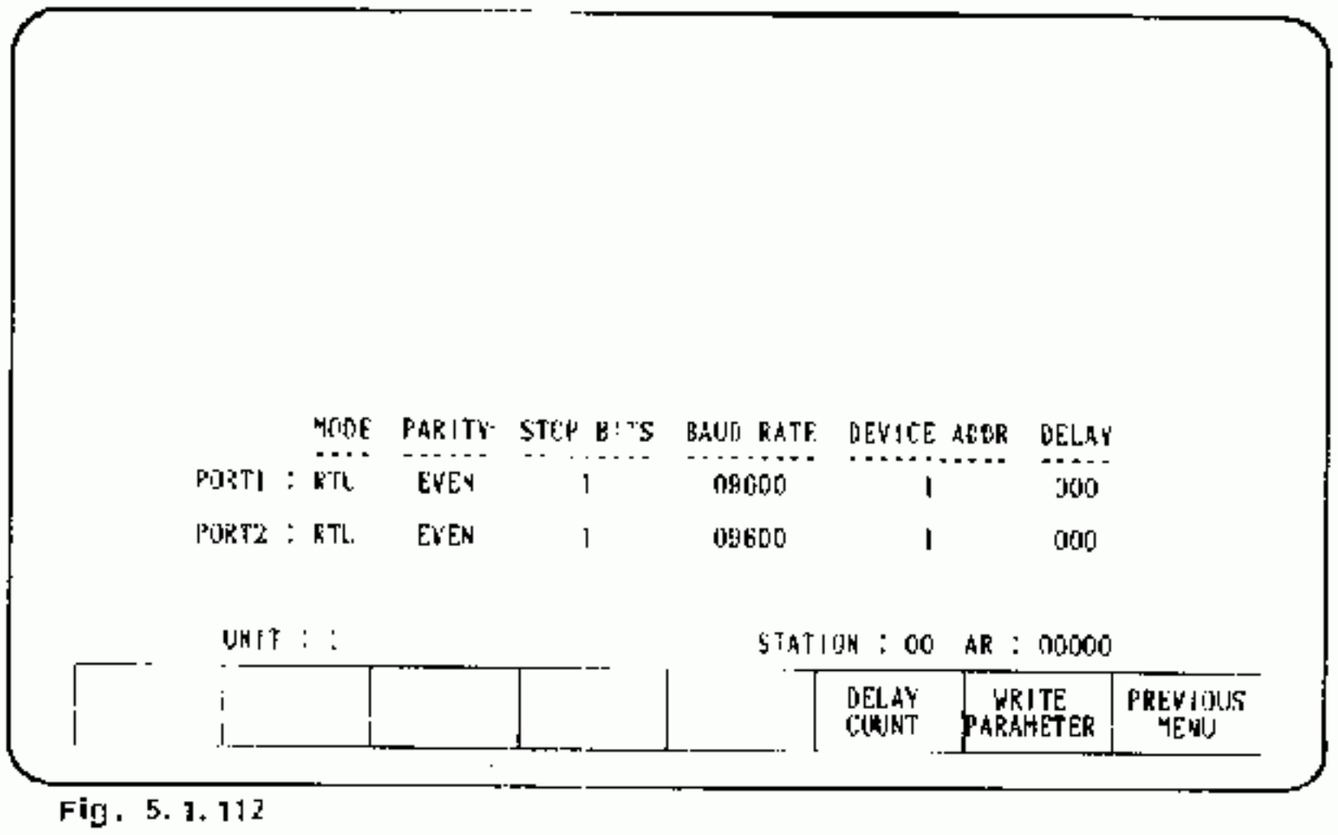


Fig. 5.1.112

Fig. 5.1.113

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

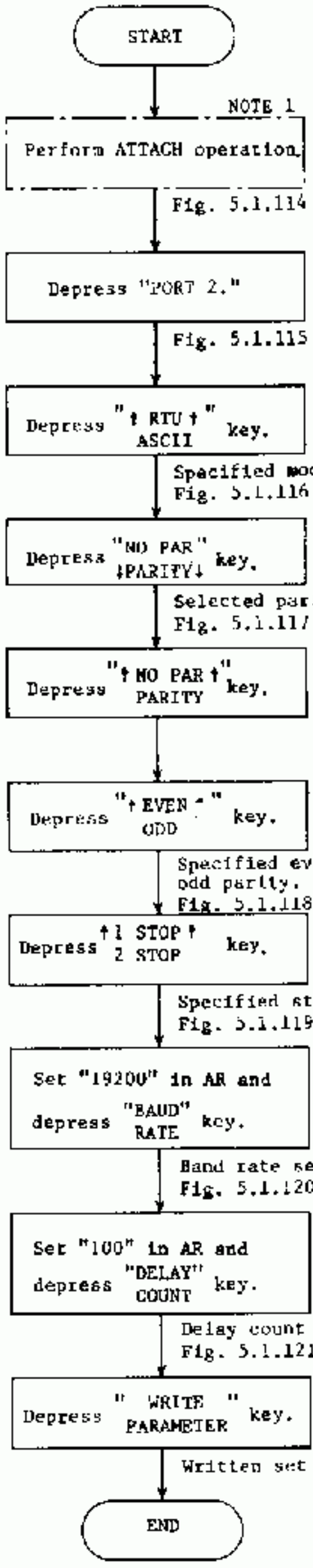
2. Set delay count in a range of 0 to 255 .

3. When "PREVIOUS MENU" is depressed (Fig. 5.1.112), the set data is not written, and the display returns to that shown in Fig. 5.1.111.

* Delay count is a function to give the specified delay time to the period from the MEMOLINK receiving the port parameter to the start of an answer and sending the data. This can usually be set to 0 .

(2) Typical Setting of Port 2

Usually, port 2 is connected to a high-level computer. Set the port parameter to the proper value.



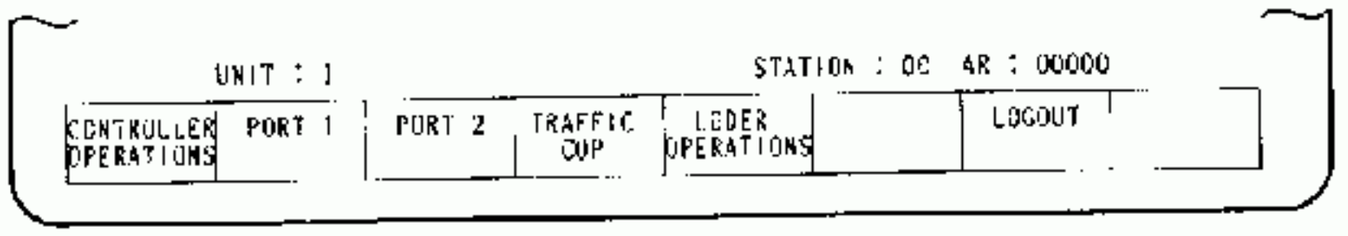


Fig. 5.1.114

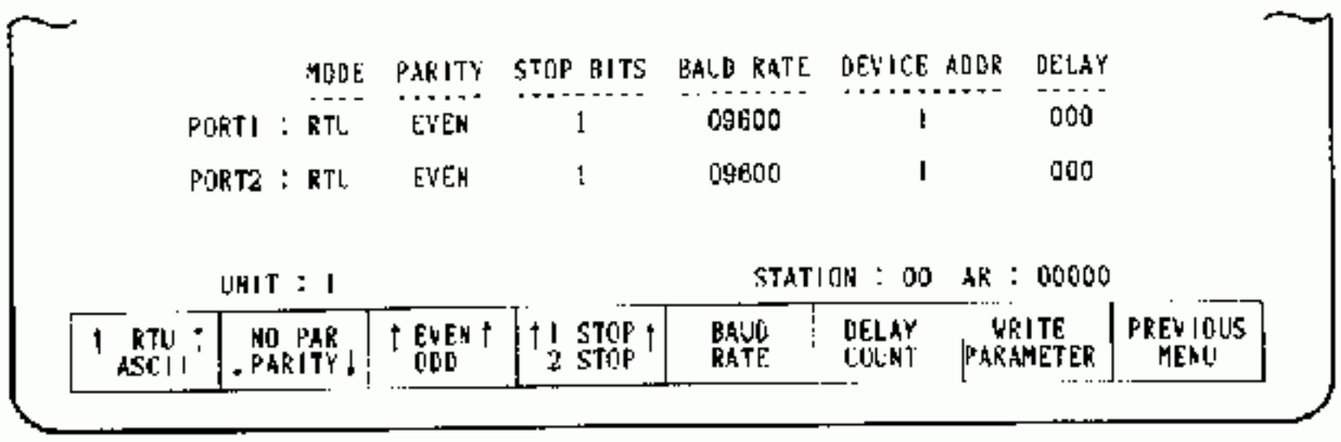


Fig. 5.1.115

Fig. 5.1.116

Fig. 5.1.117

Fig. 5.1.118

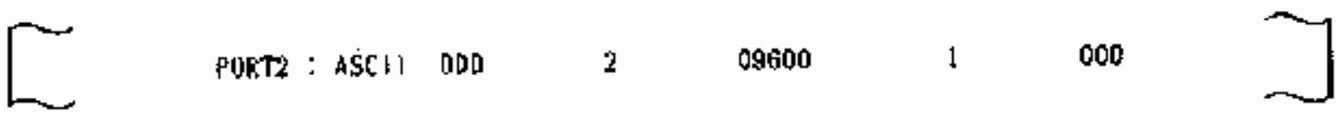


Fig. 5.1.119

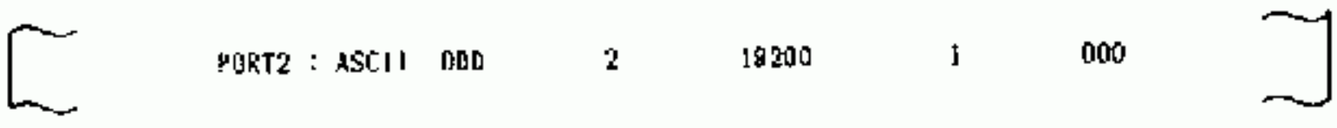


Fig. 5.1.120

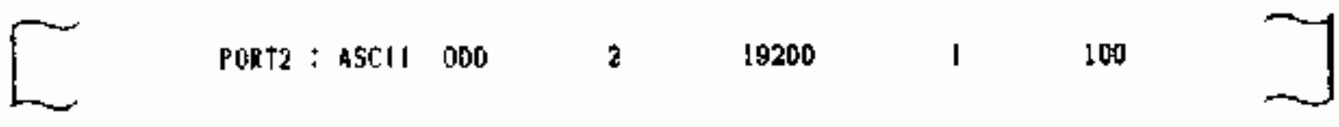


Fig. 5.1.121

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

2. Set the baud rate to 150, 300, 600, 1200,2400, 4800, 9600, or 19200.

3. Set delay count in a range of 0 to 255 .

4. When "PREVIOUS" MENU is depressed (Fig. 5.1.115), the set data is not written, and the display returns to that shown in Fig. 5.1.114.

5.1.9 Hard Copy

The P190 has RS -232C peripheral port (PORT 2, PERIPHERAL). When a serial printer (available on the market) is connected to this port, and "PRINT" is depressed, the display hard copy is printed. The CRT label, however, is not printed.

(1) Applicable Printers

Recommened Printer:
- Type FP-80, #8145 (RS -232C interface) } Made by Epson Co., Ltd.
- Type SP-850A-RE (RS-232C interface incorporated) } Made by Nada Electronic Laboratry, Ltd.

In addition to the above, printers with the following specifications may be used.

(a) Interface : EIA RS-232C

(b) Baud rate: 110, 200, 300, 600, 1200, 2400, 4800, or 9600 bauds.

(c) Data format:
- Data – 7 or 8 bits
- Stop bit – 1 or 2 bits
- Parity check – Even, odd, or none

(d) Character code: ASCII

Note: JIS C 6220 characters can be used as well.
In this case, NC contact print is ⊣ ¥ ⊢ instead of –|\|– .

(e) Printing width: 80 characters/line minimum

(2) Accessories

In addition to MEMOLINK master module, P190, their connecting cable (Type JZMSZ-W1015), and MEMOLINK programmer tape, the following accessories are required.

Table 5.1.2

Name	Type	Q'ty	Manufacturer	Remarks
Cable between Printer and P190	JZMSZ W193-T01	1	Yaskawa	Cable length:2.5m
Printer (recommended)	FP-80 (with #8145) SP-850A-RE	1	Epson Nada	Purchased from maker or agents.
Printing Paper	—	1 set	—	

(3) Setting Communication Parameters (Recommended Example)

9600 bauds, 7-bit data, 2-stop bit, parity disable

POINT

- Before setting the printer, turn off the power.
- The P190 has been preset to the above condition prior to shipment.
- For setting the P190, see the next page.

(a) Typical FP-80 setting for the recommended communication parameters

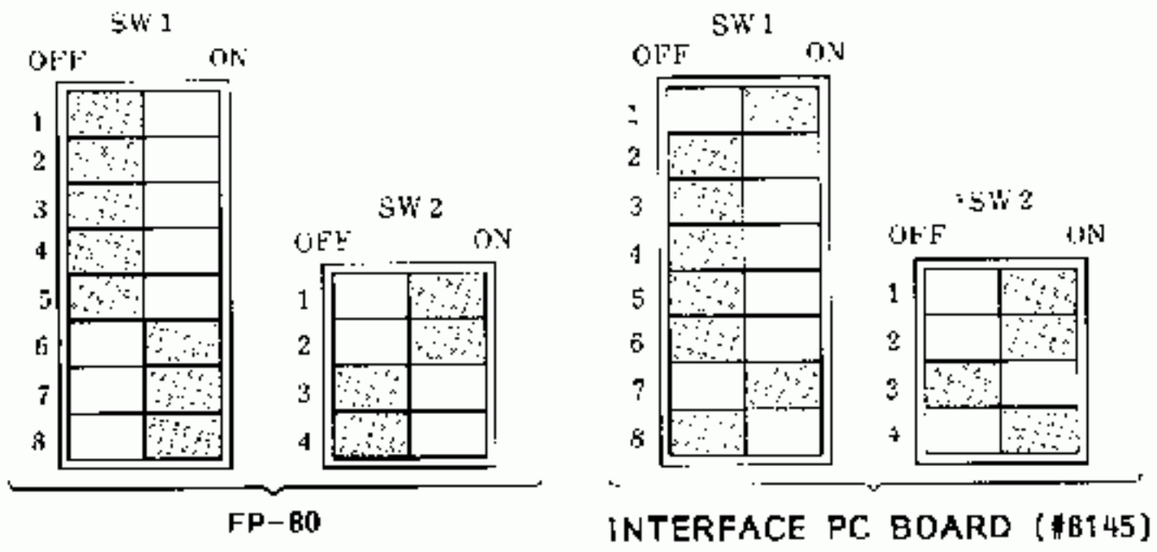


Fig. 5.1.122 Example of FP-80 Setting

(b) Typical SP-850A-RE setting for the recommended communication parameters

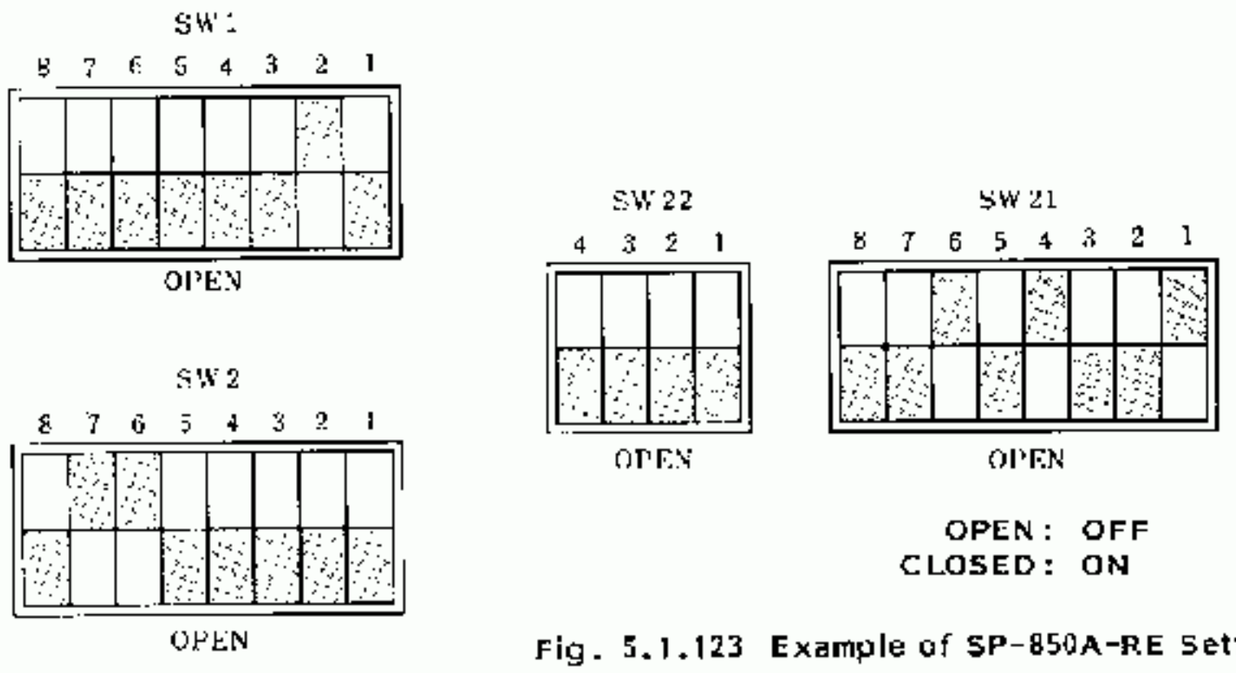


Fig. 5.1.123 Example of SP-850A-RE Setting

NOTE

For details of switch setting, see the applicable printer manual.

(4) Setting P190 Communication Parameters

- Set P190 communication parameters using DIP switch.
  PORT 1 (CONTROLLER): Connect to PORT 1 or 2 of MEMOLINK master module.
  PORT 2 (PERIPHERAL): Connect to printer, etc.

POINT

- Before changing the DIP switch setting, turn off the P190 power.
- The P190 DIP switch has been preset to the state of mark ▒▒▒▒ prior to shipment as shown in Fig.5.1.124.
- MEMOLINK can be connected, without changing the setting condition as shown in Fig. 5.1.124.

Table 5.1.3 Setting List of P190 DIP Switch (Common to PORT 1, and PORT 2)

BAUD RATE	S1	S2	S3	S4	
19,200	1	1	1	1	
9,600	1	1	1	0	← 9600 bauds
7,200	1	1	0	1	
4,800	1	1	0	0	
3,600	1	0	1	1	
2,400	1	0	1	0	
2,000	1	0	0	1	
1,800	1	0	0	0	
1,200	0	1	1	1	
600	0	1	1	0	
300	0	1	0	1	
150	0	1	0	0	
134.5	0	0	1	1	
110	0	0	1	0	
75	0	0	0	1	
50	0	0	0	0	

S5	1	PARITY ENABLE
	0	PARITY DISABLE
S6	1	EVEN PARITY
	0	ODD PARITY
S7	1	1 STOP BIT
	0	2 STOP BIT
S8	1	8 DATA BIT
	0	7 DATA BIT

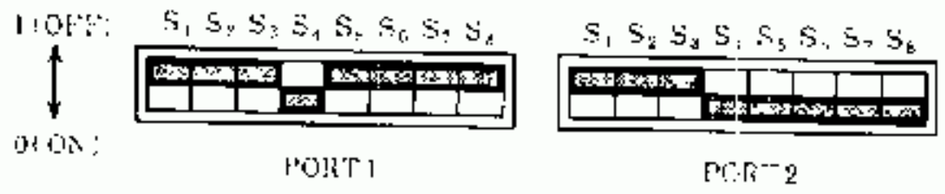


Fig. 5.1.124 P190 DIP Switch Setting

(5) Cable Connecting P190 and Printer

The following two cables are available:

- Type JZMSZ-W193-T01 (2.5 M) applicable to FP-80, SP-850-RE
- Type JZMSZ-W181 (2.5 M) applicable to FP-80

Table 5.1.4 Connections of W193-T01

P190		Signal Direction	Printer	
Signal Name	Pin No.		Pin No.	Signal Name
P-GND	1	←——→	1	P-GND
XMT	2	——→	2	XMT
RCV	8	←——	3	RCV
RTS	4	——→		
CTS	5	←——	5	CTS
DSR	6	←——	6	DSR
DTR	20	——→	20	DTR
S-GND	7	←——→	7	S GND

Table 5.1.5 Connections of W181

P190		Signal Direction	Printer	
Signal Name	Pin No.		Pin No.	Signal Name
P-GND	1	←——→	1	P-GND
XMT	2	——→	2	XMT
RCV	3	←——	3	RCV
CTS	5	←——	11	REV (BUSY)
DSR	6	←——	6	DSR
DTR	20	——→	8	DCD
			20	DTR
S-GND	7	←——→	7	S GND

(6) Setting Printer Type

To use a printer which cannot accept a form-feed code, select "NO FORM FEED".

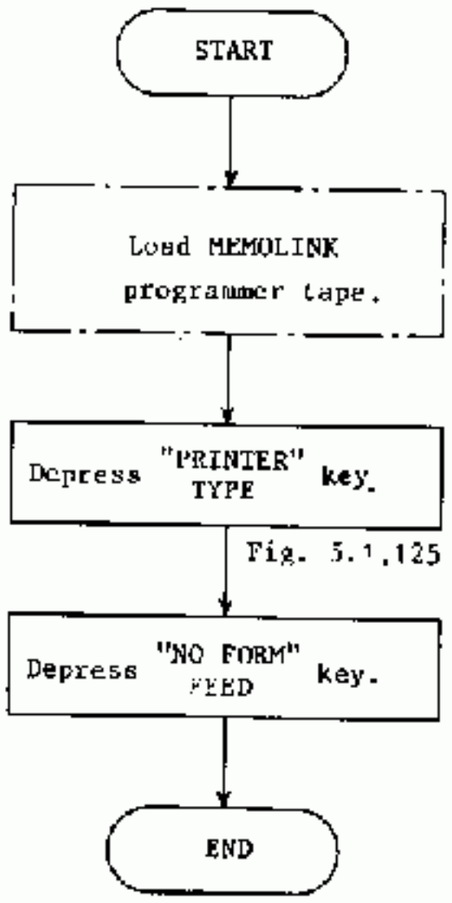


Fig. 5.1.125

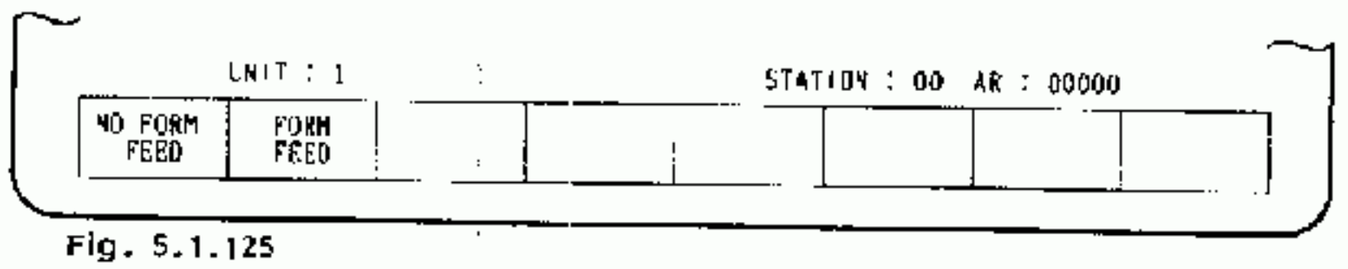


Fig. 5.1.125

NOTE

If ATTACH operation has already been completed, depress "LOGOUT" (Fig. 5.1.4), or turn the P190 key switch on and then off.

5.2 P150 PROGRAMMING PANEL

5.2.1 MEMOLINK Operation Flow

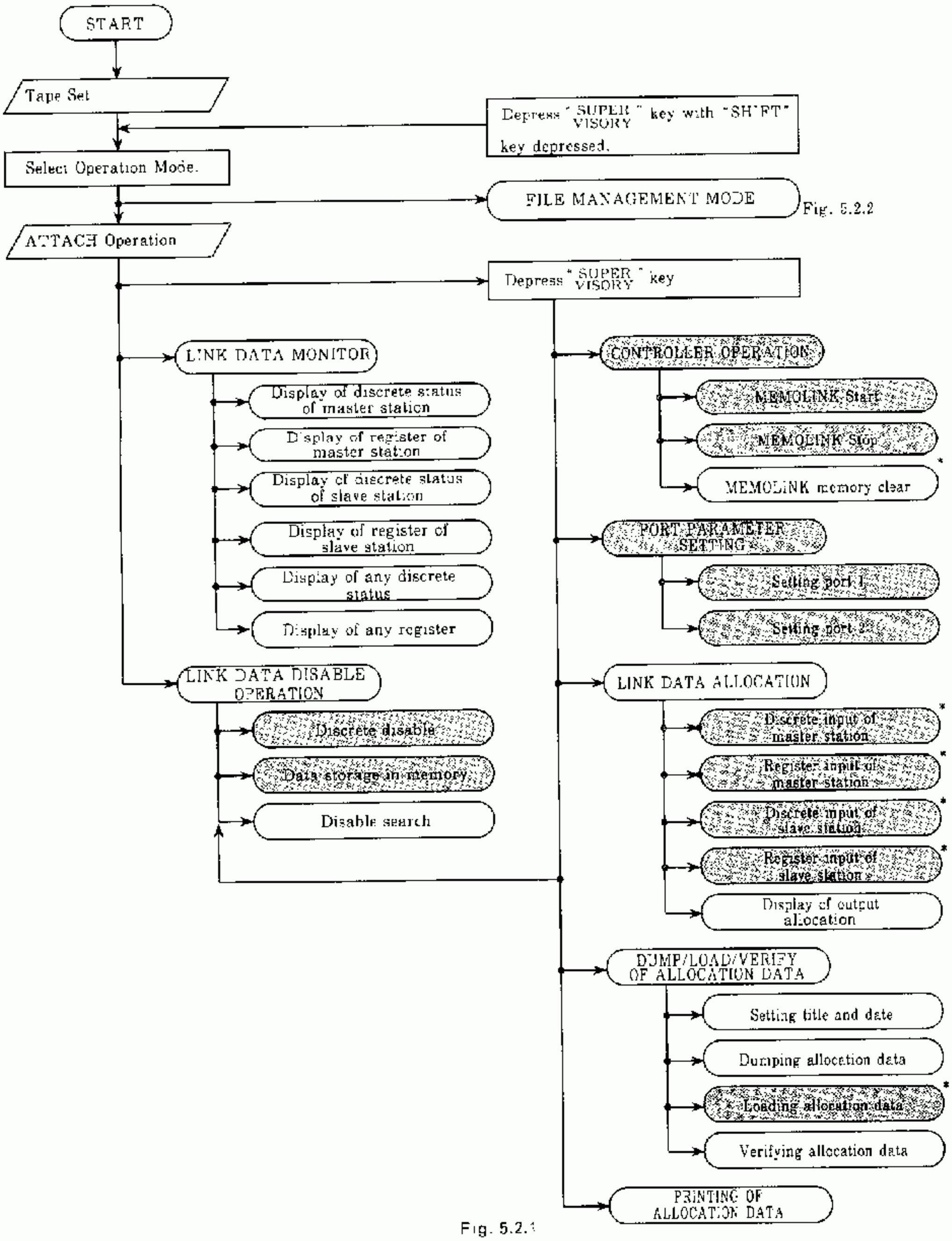


Fig. 5.2.2

Fig. 5.2.1

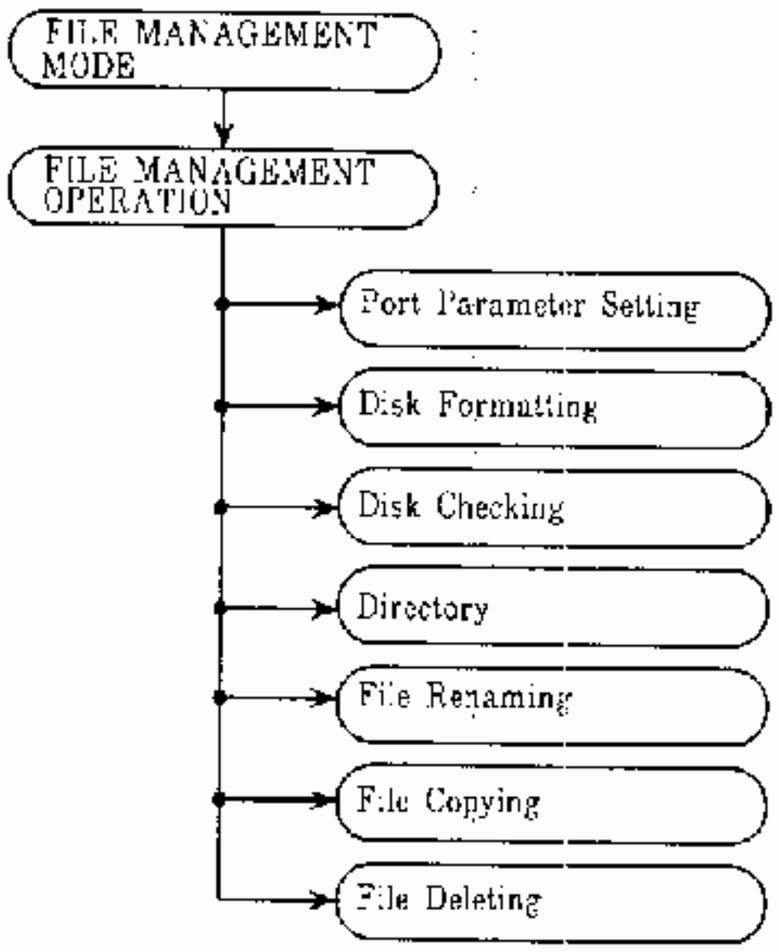


Fig. 5.2.2

NOTE

1. For normal operation, set the switches as shown below, to prevent errors.
   MEMOLINK master module memory protect switch : ON

2. In program mode, all operations are possible.
   When MEMOLINK is operating, however, the asterisked operations cannot be accomplished.

3. In monitor mode, the operations in [redacted] are not possible.

4. The keys are classified as follows:

   ( ) : Label keys

   [ ] : Function keys, such as numeric, fixed function, cursor control, and ASCII keys.

5. Eight labels displayed on the screen indicate the functions of the eight keys (label keys : F1 to F8) located at a top of the keyboard.

5.2.2 Preparation

Performing ATTACH operation makes data communication between the P150 and the MEMOLINK master module possible.

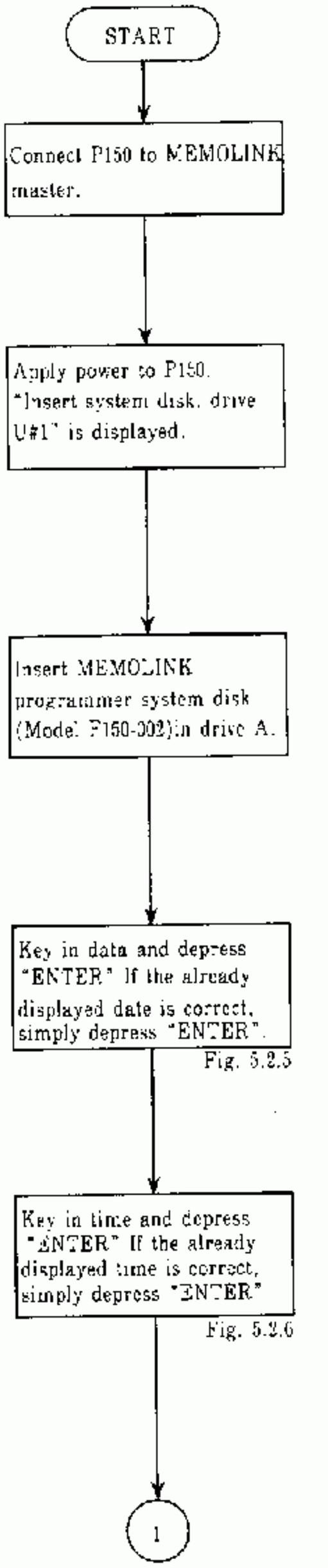


Fig. 5.2.3

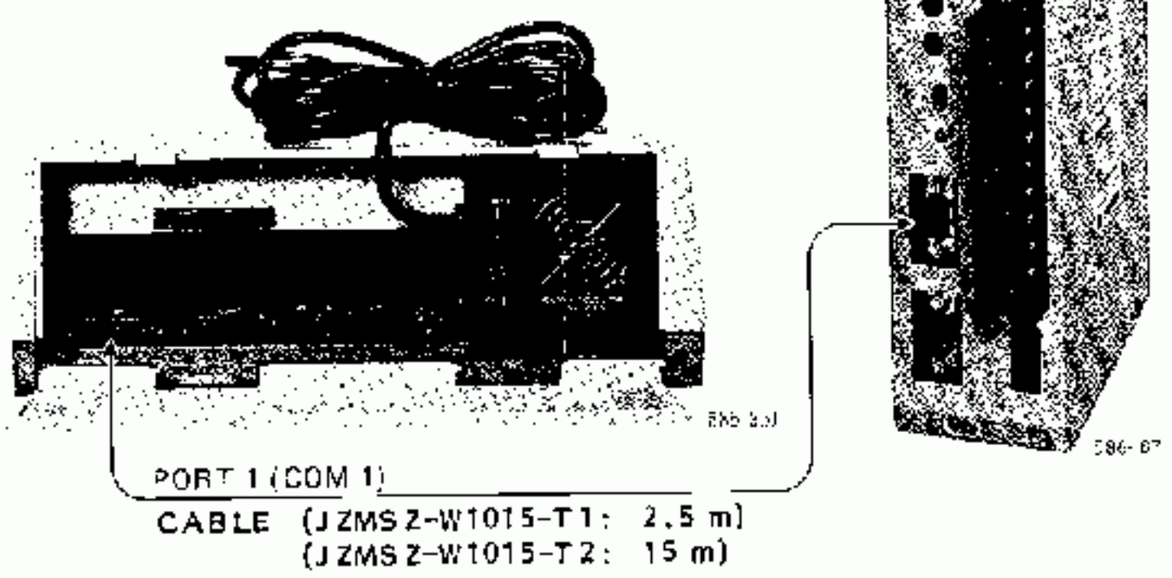


Fig. 5.2.3 Connection of P150 and MEMOLINK Master

```
Microsoft MS-DOS Version 2.11
Copyright 1981,82,83 Microsoft corp.

System Release A1.01
Command v. 2.11

A>echo off
---------- MEMOLINK_PROGRAMMER

Current date is Thu  7-17-1986
Enter new date:
```

Fig. 5.2.4

```
Microsoft MS-DOS Version 2.11
Copyright 1981,82,83 Microsoft corp.

System Release A1.01
Command v. 2.11

A>echo off
---------- MEMOLINK_PROGRAMMER

Current date is Thu  7-17-1986
Enter new date: 7-18-1986
Current time is 20:50:26.00
Enter new time:
```

Fig. 5.2.5

```
Microsoft MS-DOS Version 2.11
Copyright 1981,82,83 Microsoft corp.

System Release A1.01
Command v. 2.11

A>echo off
---------- MEMOLINK_PROGRAMMER

Current date is Thu  7-17-1986
Enter new date: 7-18-1986
Current time is 20:50:26.00
Enter new time: 20:55:00.00

---------- READING
```

Fig. 5.2.6

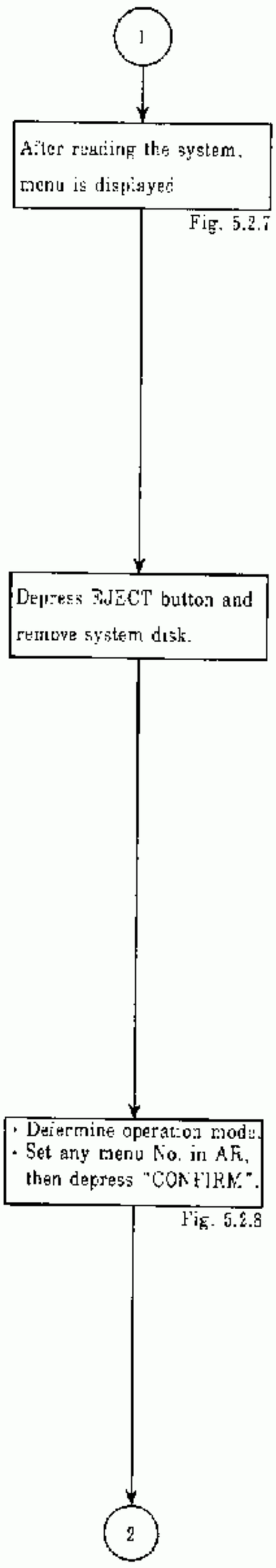


Fig. 5.2.7

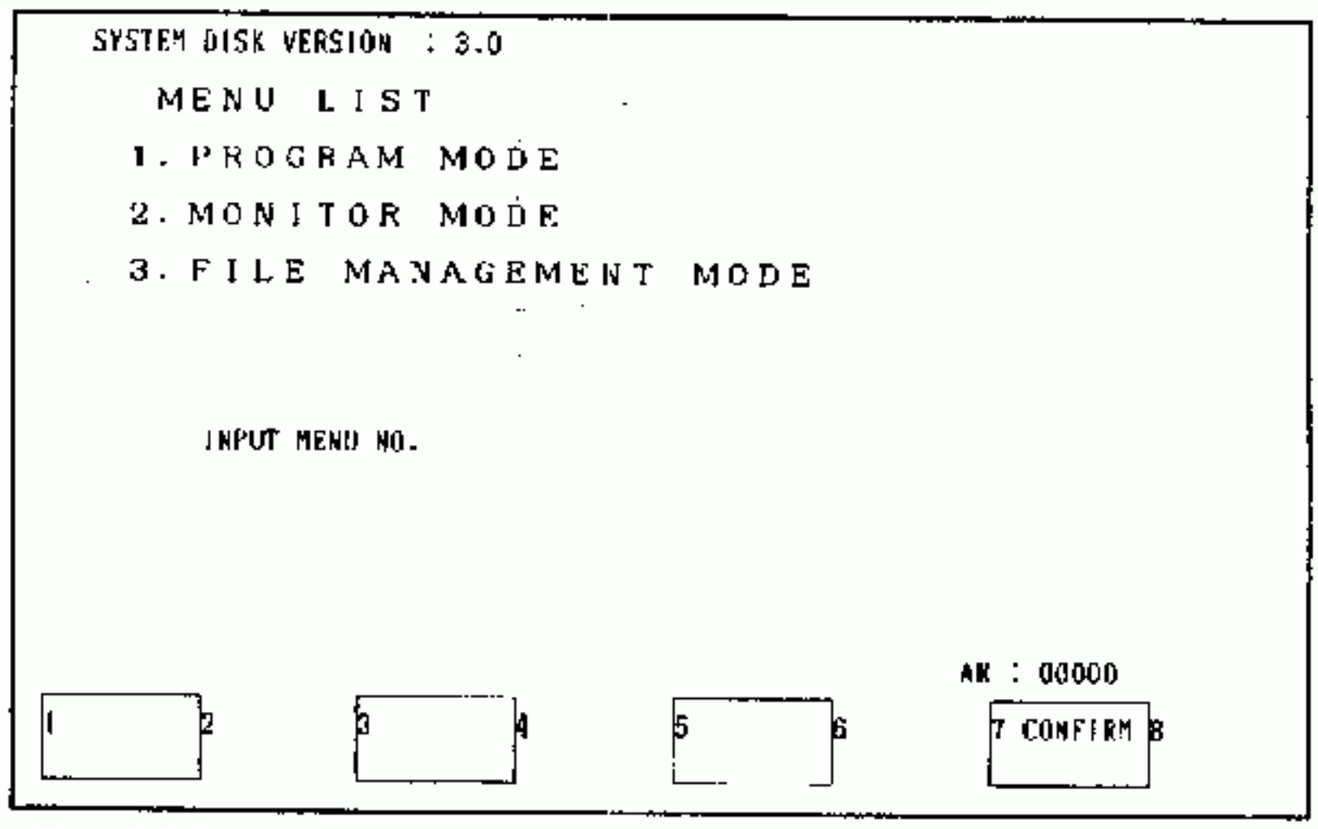


Fig. 5.2.7

PROGRAM MODE (On-line Program Writing) : All the program operations are possible.

MONITOR MODE (On-line Program Monitor) : Memory contents cannot be altered. (Accidental or erroneous memory destruction is prevented.)

FILE MANAGEMENT MODE (File Management) : This mode is selected to check the disk, display file names, delete files and set transmission conditions, ect. All the functions in this mode can be executed with a P150 alone.

Table 5.2.1 Setting of Memory Protect Switch of MEMOLINK

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

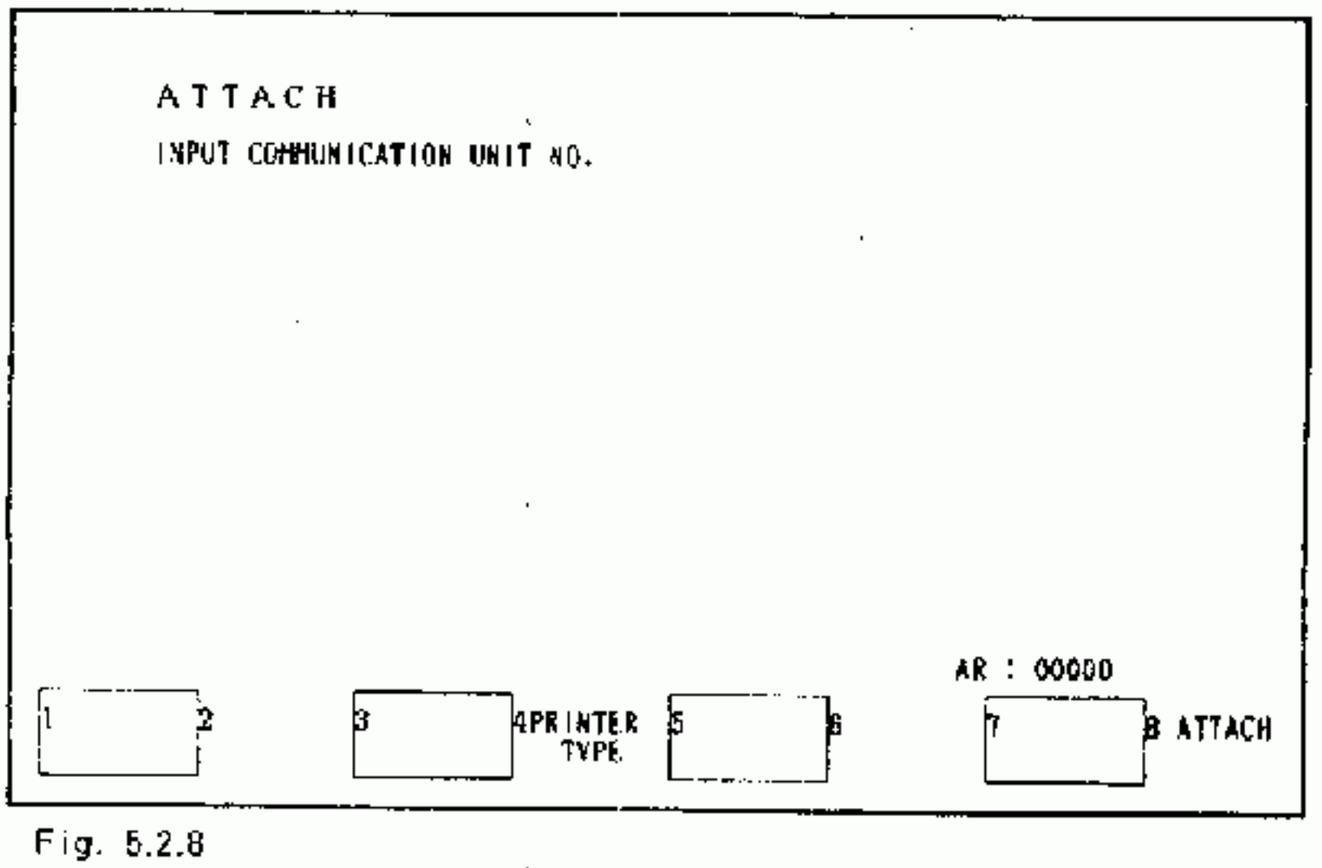


Fig. 5.2.8

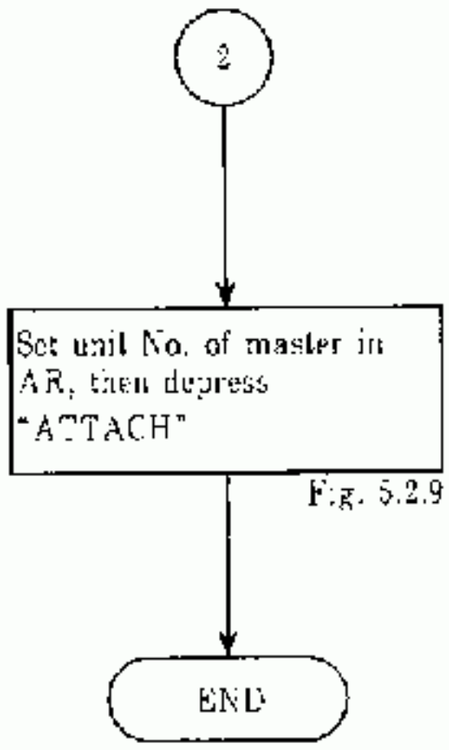


Fig. 5.2.9

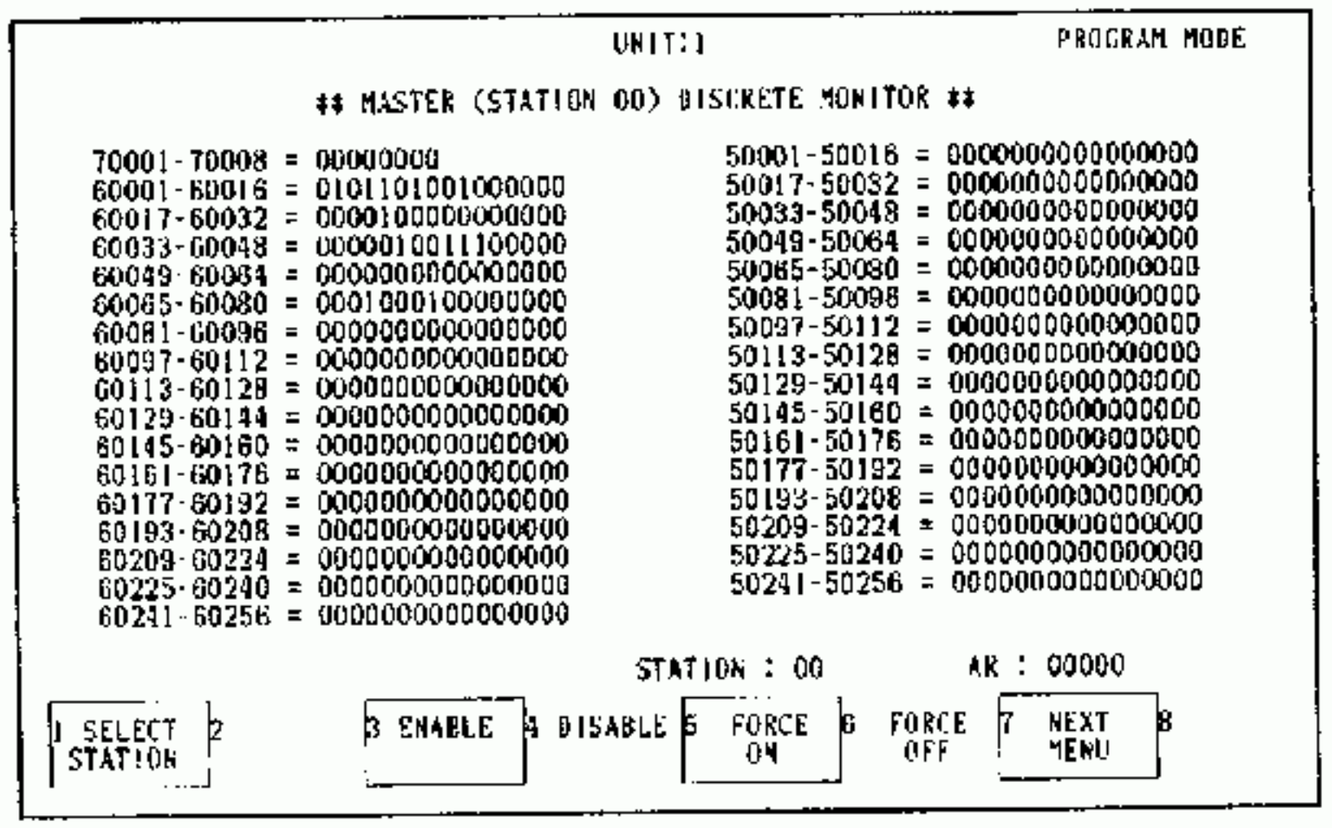


Fig. 5.2.9

NOTE

1. Before inserting a system disk, check that it is a MEMOLINK programmer.

2. To restart the system, start from the power supply ON/OFF operation.

3. Store the removed system disk in the specified area.

4. After ATTACH operation, depressing " SUPER VISORY " and "INITIAL DISPLAY", or "SHIFT" and " SUPER VISORY " may lead to the menu (initial) display.

PRECAUTIONS

1. Plug in the P150 power code into a properly grounded 100 VAC receptacle.

2. Connect the P150 and MEMOLINK master before connecting to power.

3. Turn off power to the P150 before disconnecting the P150 and MEMOLINK master.

5.2.3 Link Data Allocation

MEMOLINK allocation is carried out by loading connection information "Use 'A' PC output data as 'B' PC input data" into the master module.

POINT

When altering an allocation, stop MEMOLINK.

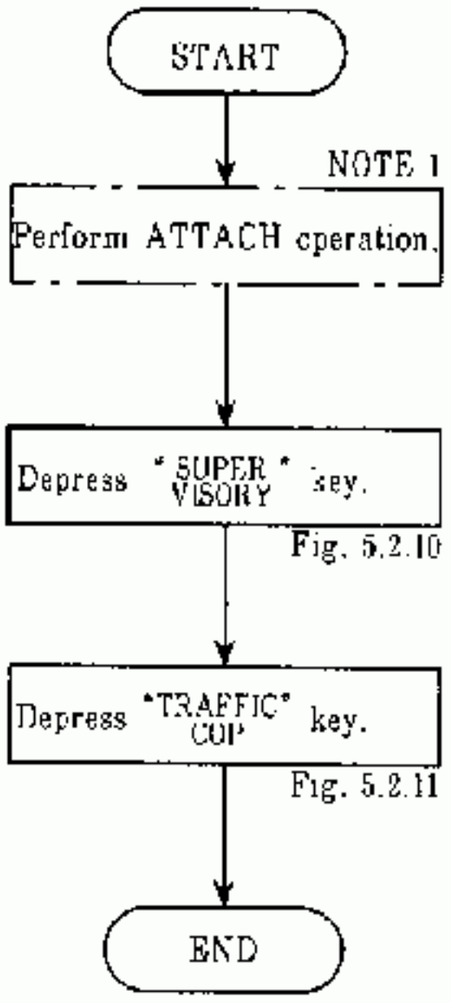


Fig. 5.2.10

Fig. 5.2.11

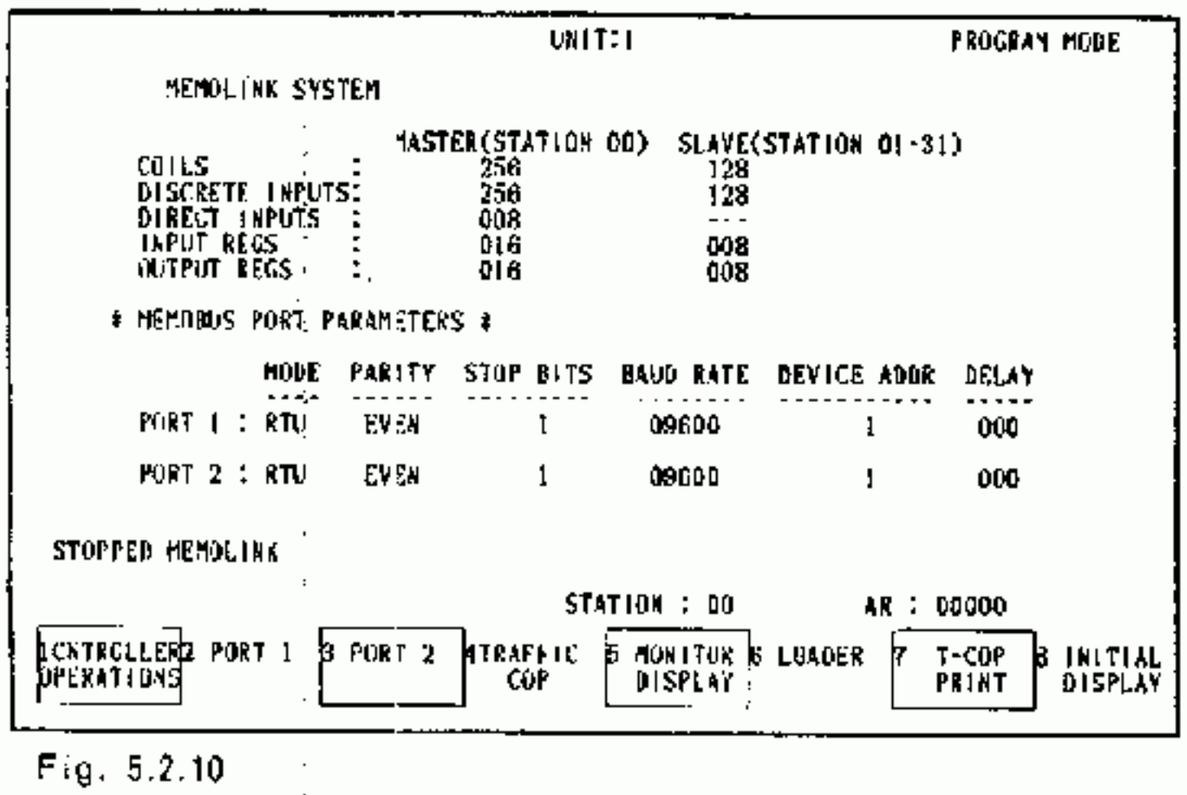


Fig. 5.2.10

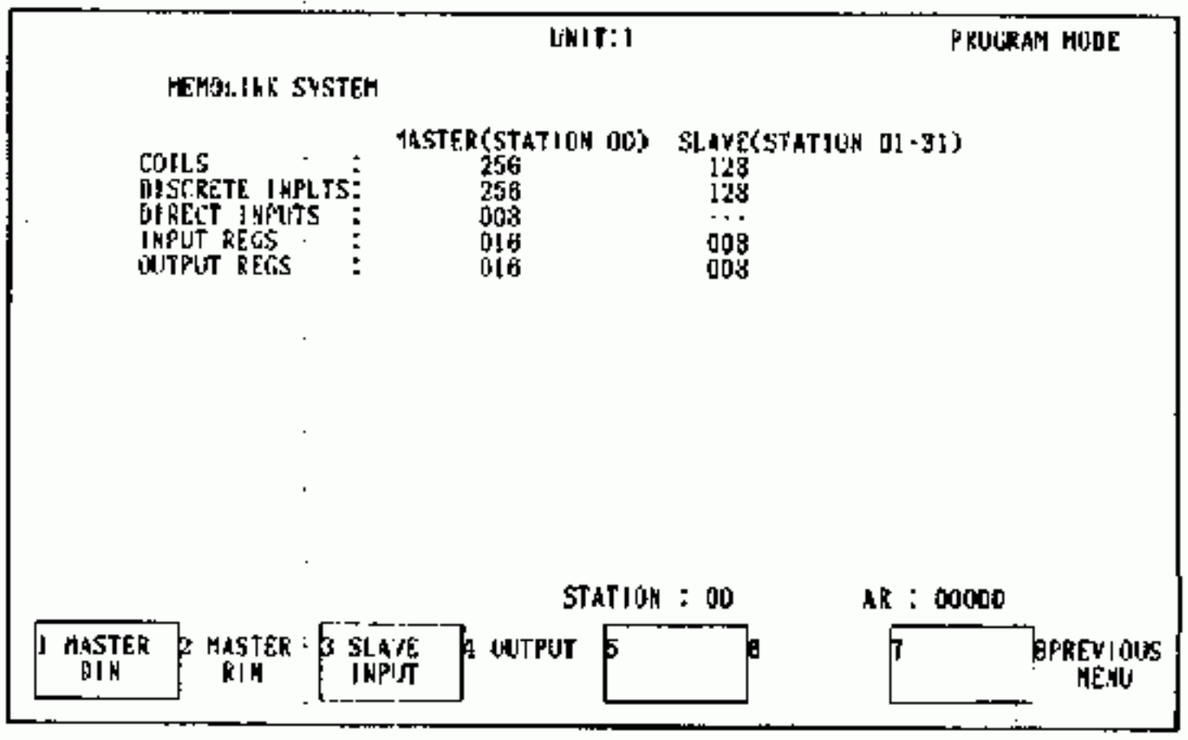


Fig. 5.2.11

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

2. When "PREVIOUS MENU" key is depressed, the state returns to the state as shown in Fig. 5.2.10.

3. See Section 4 for detailed allocation.

(1) Typical Allocation of Discrete Input in Master Station

Discrete data are allocated in increment of 8 points. Allocation is loaded by setting the station number to STATION and the last three digits (001 to 249) of the first reference numbers to AR and depressing "SET DISCRETE" key. It is not necessary to allcate interrupt signals (70001 to 70008).

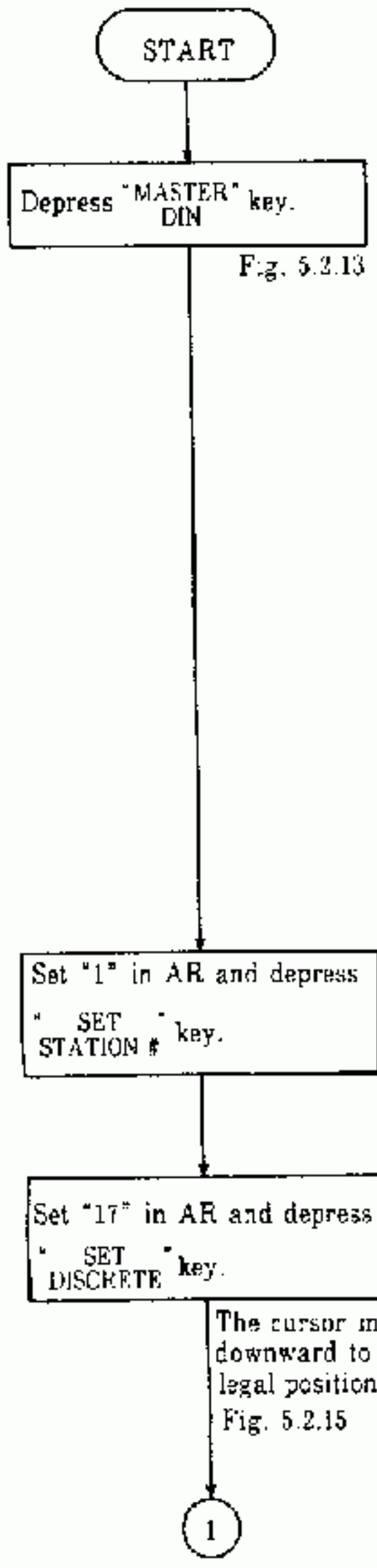


Fig. 5.2.13

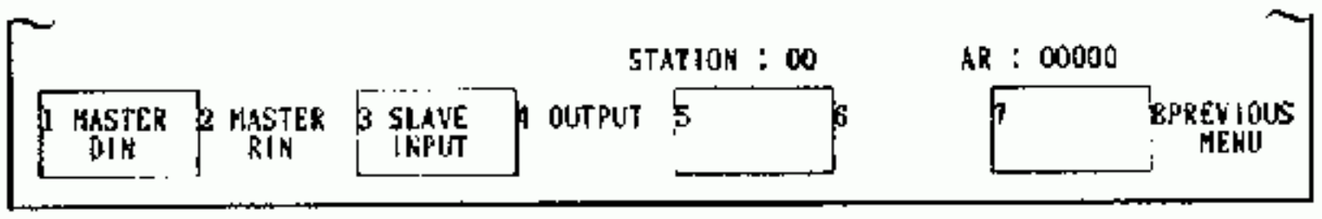


Fig. 5.2.12

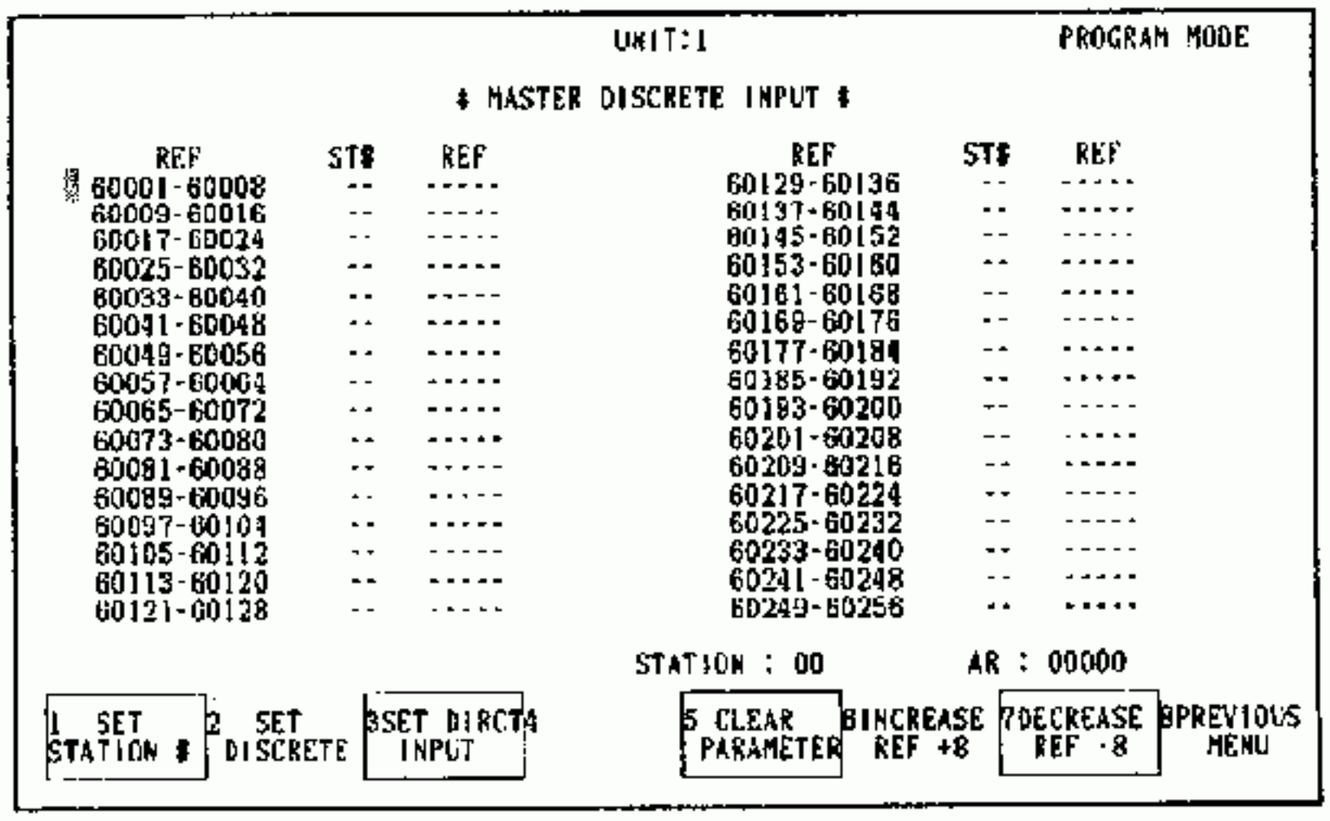


Fig. 5.2.13

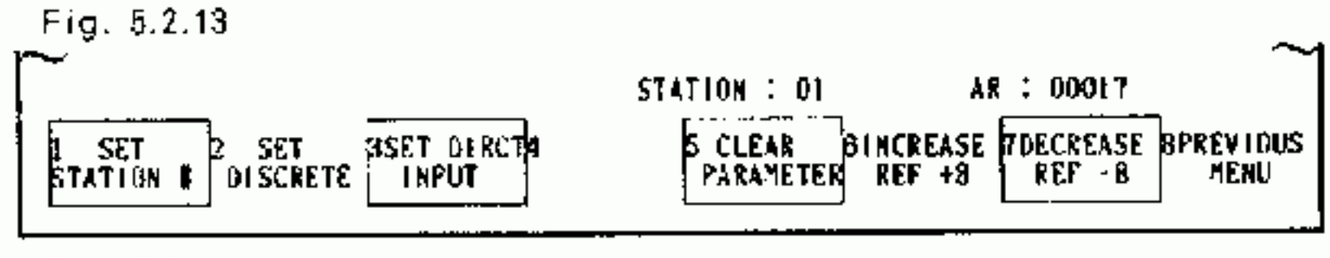


Fig. 5.2.14

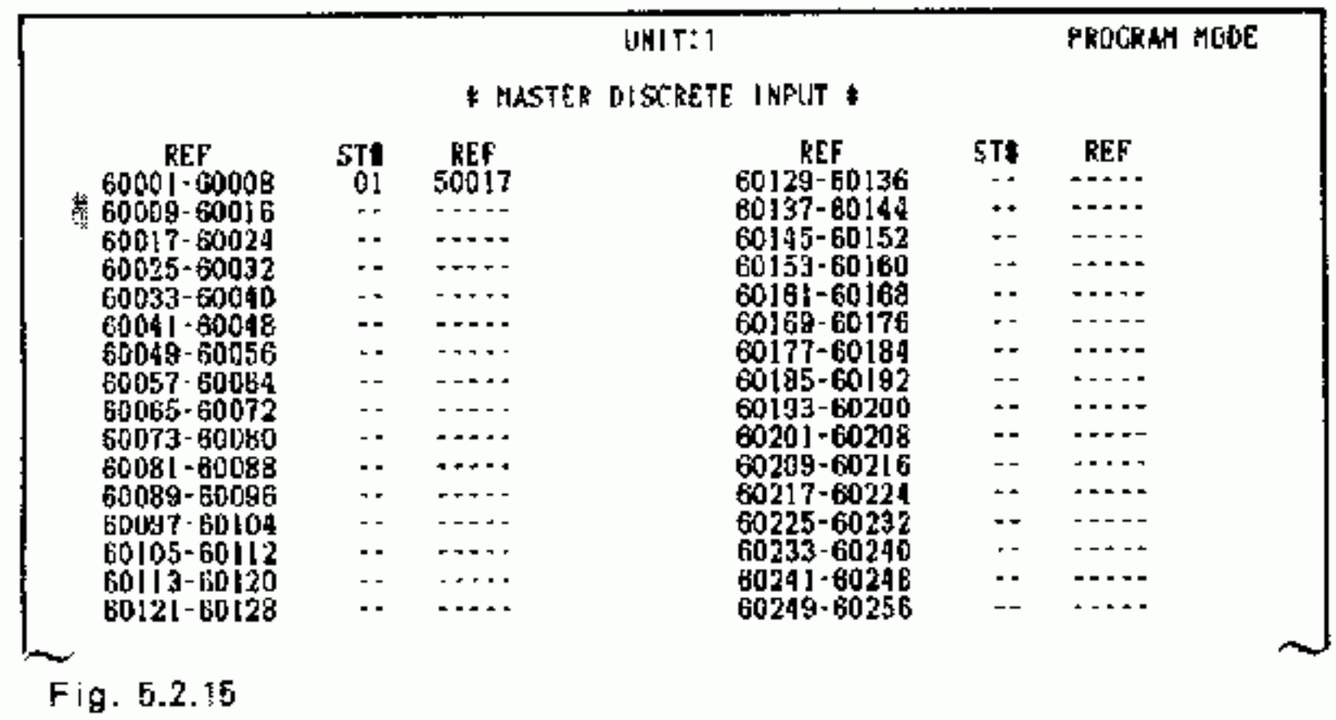


Fig. 5.2.15

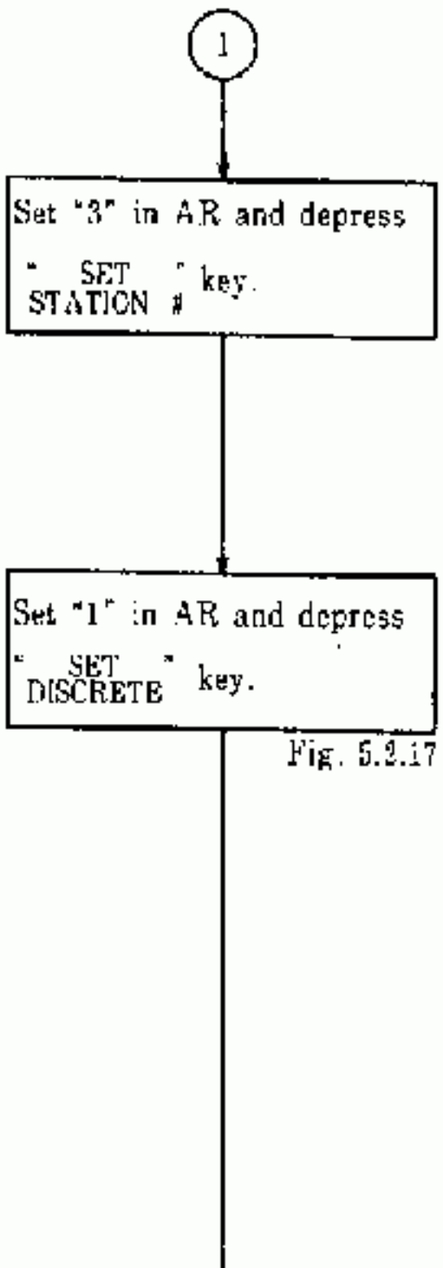


Fig. 5.2.17

Fig. 5.2.16

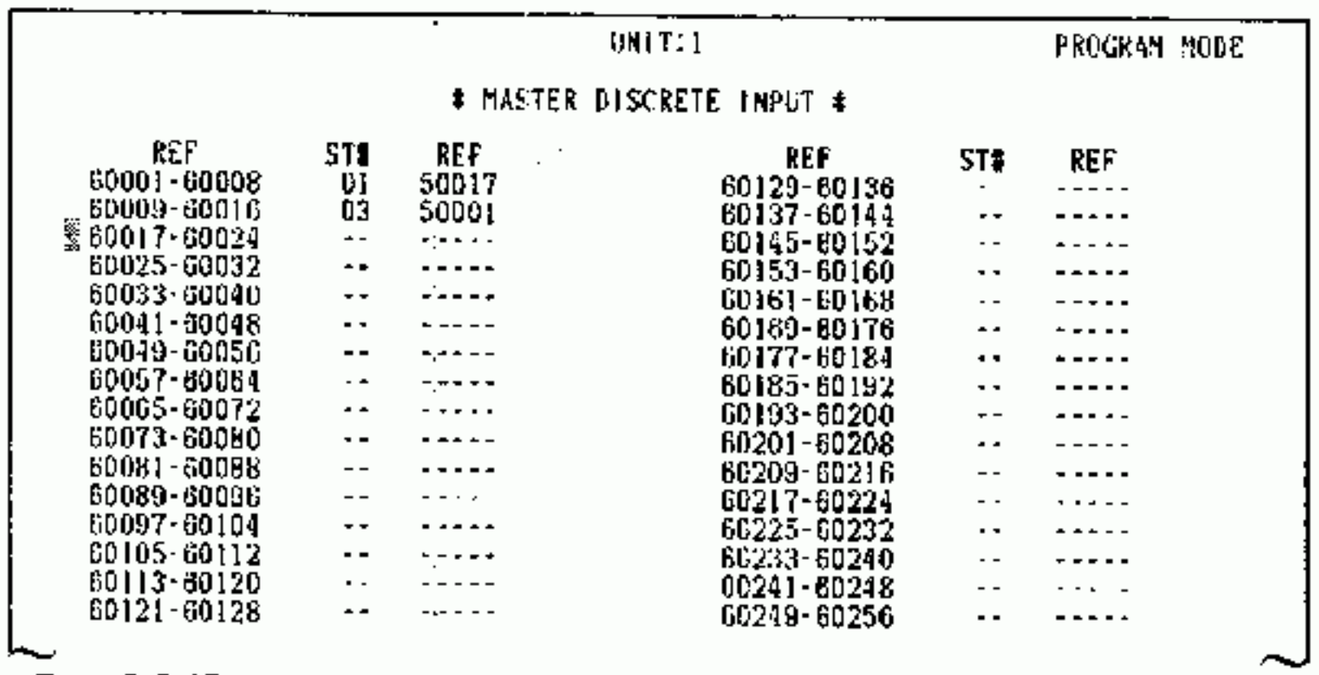


Fig. 5.2.17

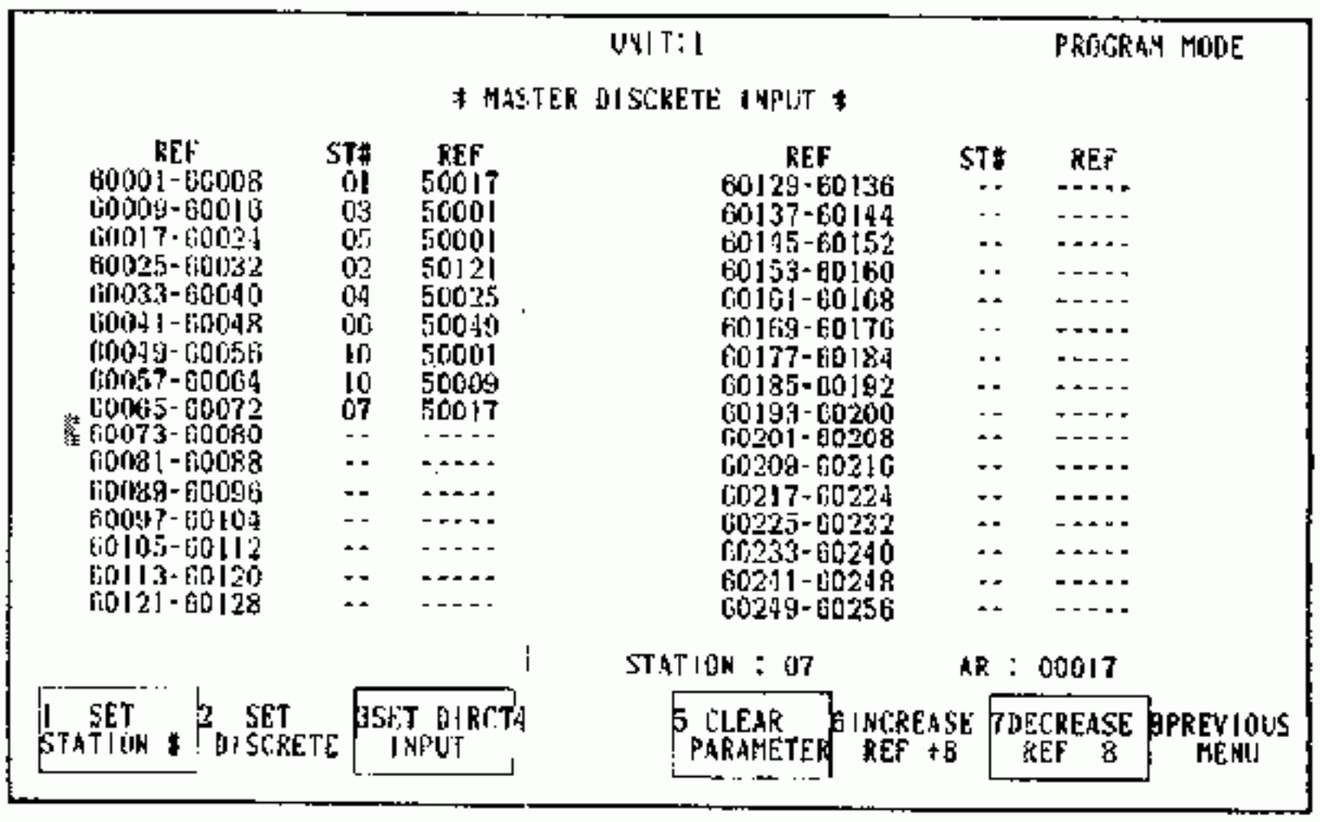
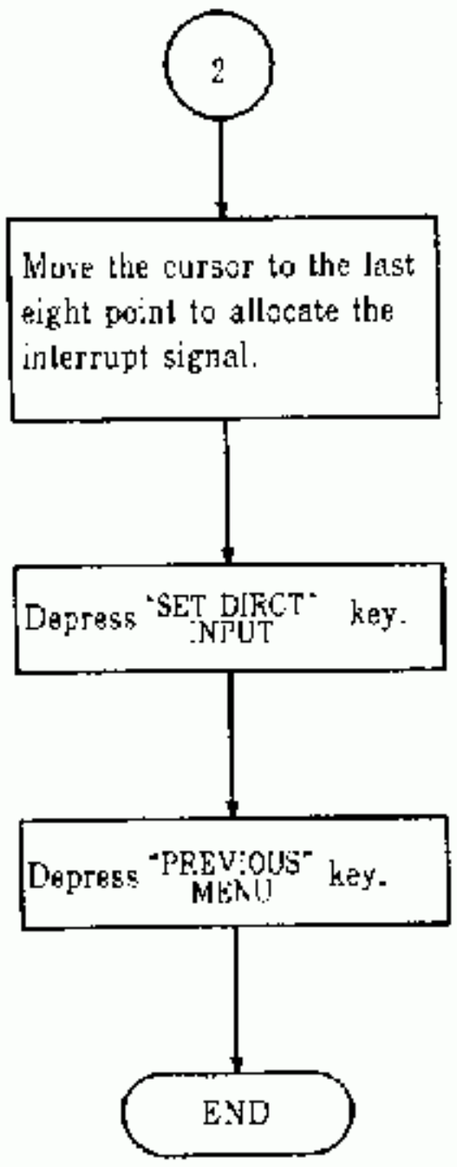


Fig. 5.2.18

(1) Typical Allocation of Discrete Input in Master Station (Cont'd)



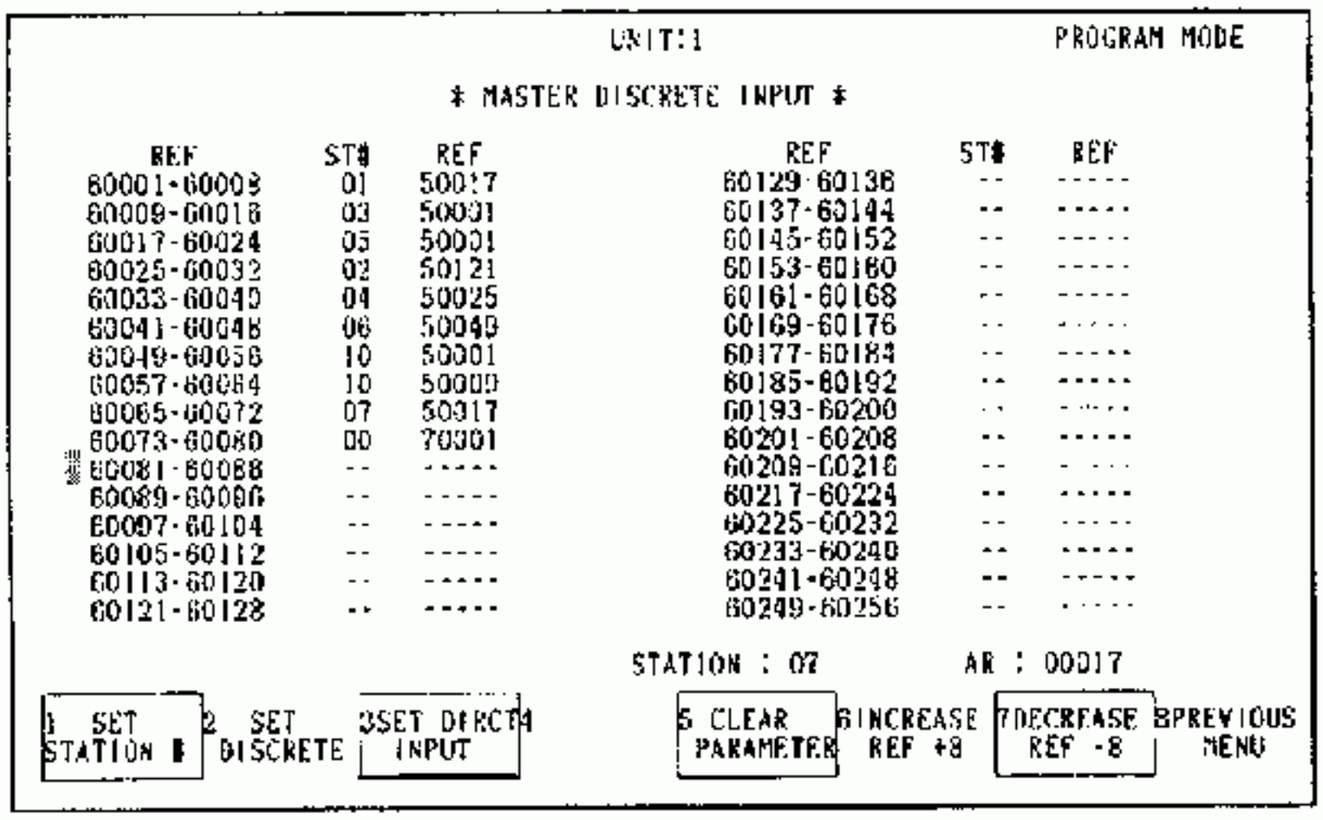


Fig. 5.2.19

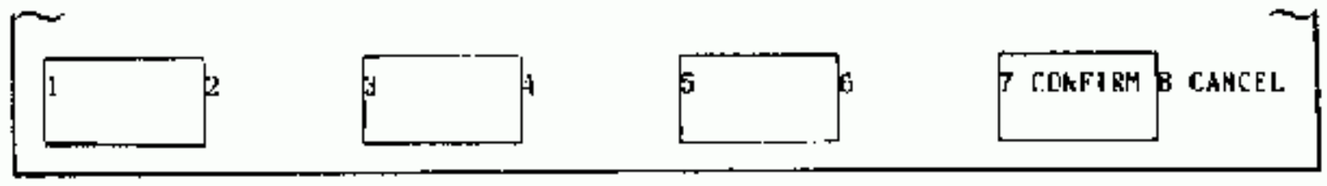


Fig. 5.2.20

NOTE

1. In monitor mode, only label "PREVIOUS MENU" appears.

2. When "INCREASE REF +8" is depressed, the AR content increases to become 8N + 1 (N = 0, 1, 2, ... 31) nearest the value set in AR.

3. When "DECREASE REF −8" is depressed, the AR content decreases to become 8N + 1 (N = 0, 1, 2, ... 31) nearest the value set in AR.

4. When "CLEAR PARAMETER" is depressed, the allocation at the cursor is cleared.

5. Once an interrupt signal is allocated, succeeding discrete data cannot be allocated.

6. As a reference number set in AR, any one of the last 3 digits (AR : 00001) or all 5 digits (AR : 50001) can be used.

7. If output in the same station is used as its input, "ERROR : CAUTION : THE OUTPUT IN THE SAME STATION" is displayed and label display shown in Fig. 5.2.20 appers. If the allocation is OK, depress "CONFIRM", and not OK, depress "CANCEL".

(2) Typical Allocation of Register Input in Master Station

Registers are input one by one. Allocation is loaded by setting the station number to STATION and the last two digits (01 to 16) of the reference numbers to AR and depressing " SET REGISTER ".

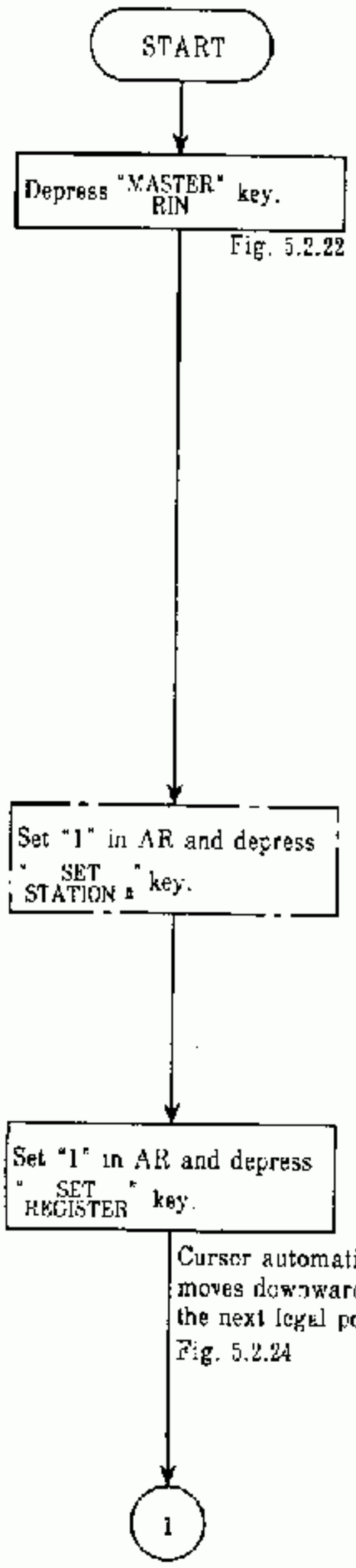
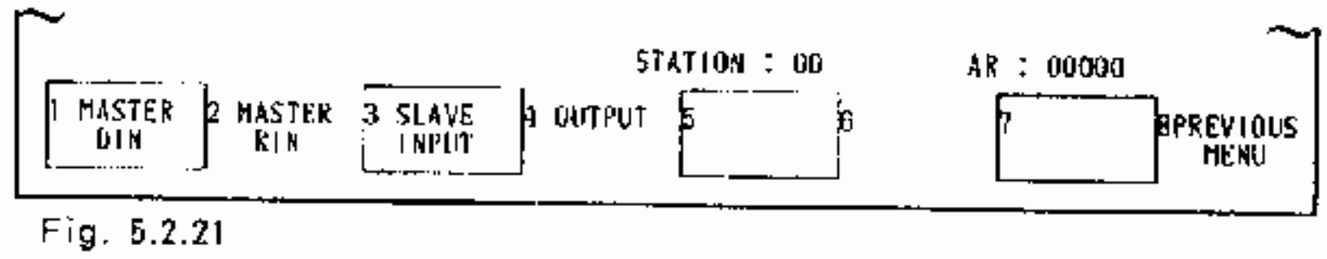


Fig. 5.2.22

Fig. 5.2.21



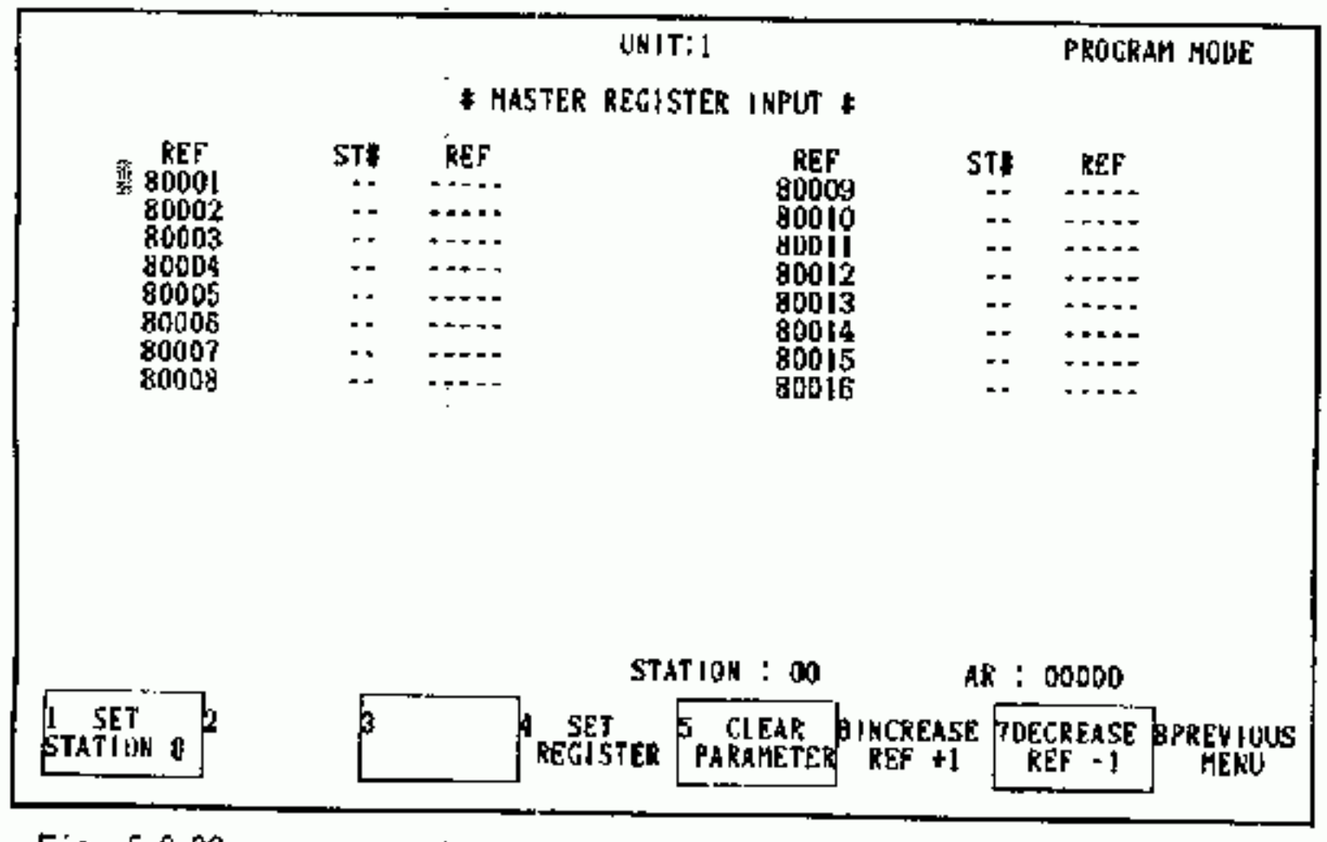


Fig. 5.2.22

Fig. 5.2.23

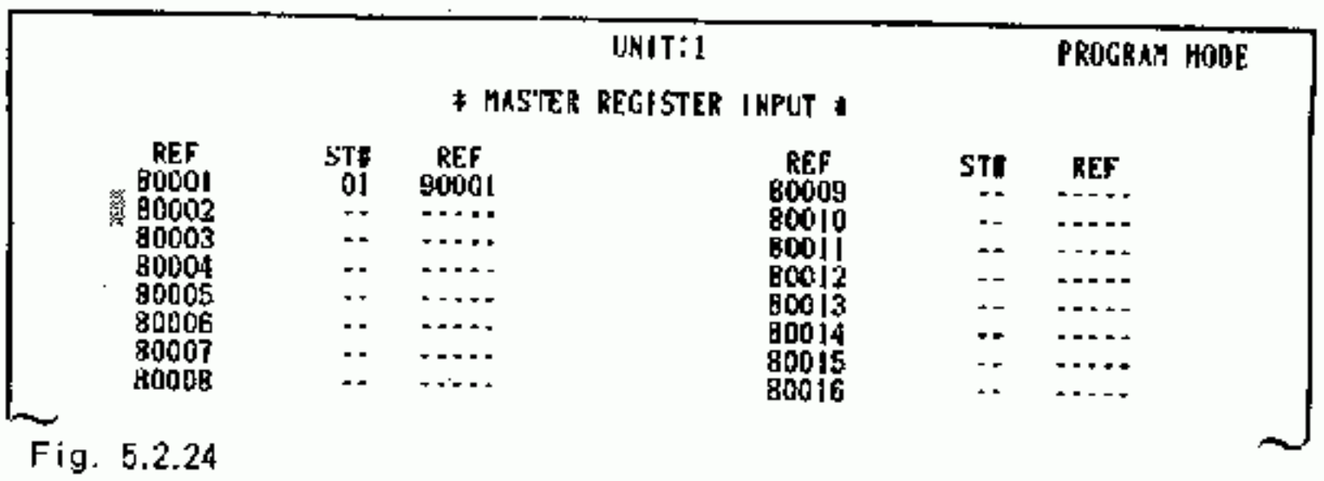


Fig. 5.2.24

(2) Typical Allocation of Register Input in Master Station (Cont'd)

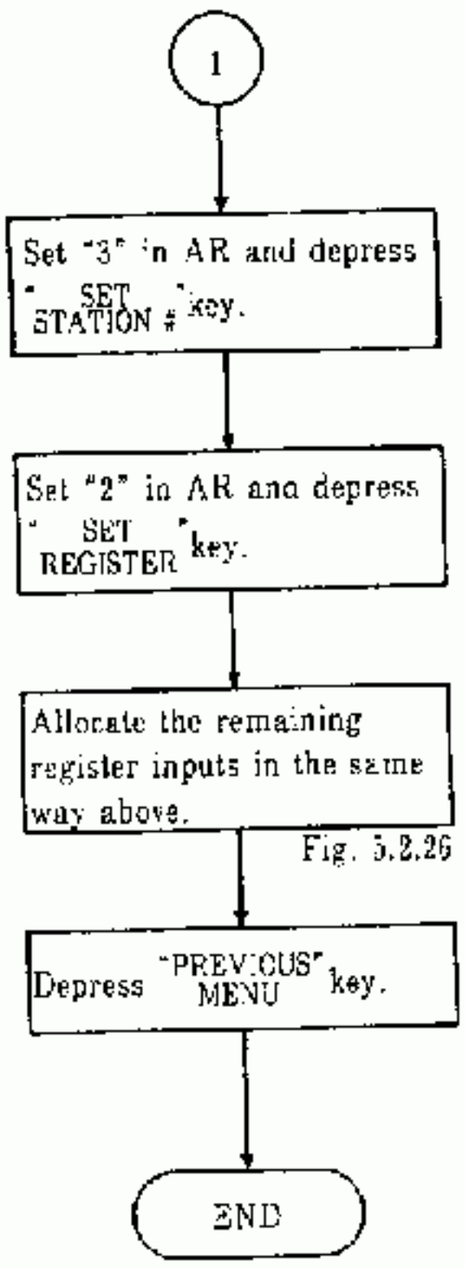


Fig. 5.2.25

Fig. 5.2.26

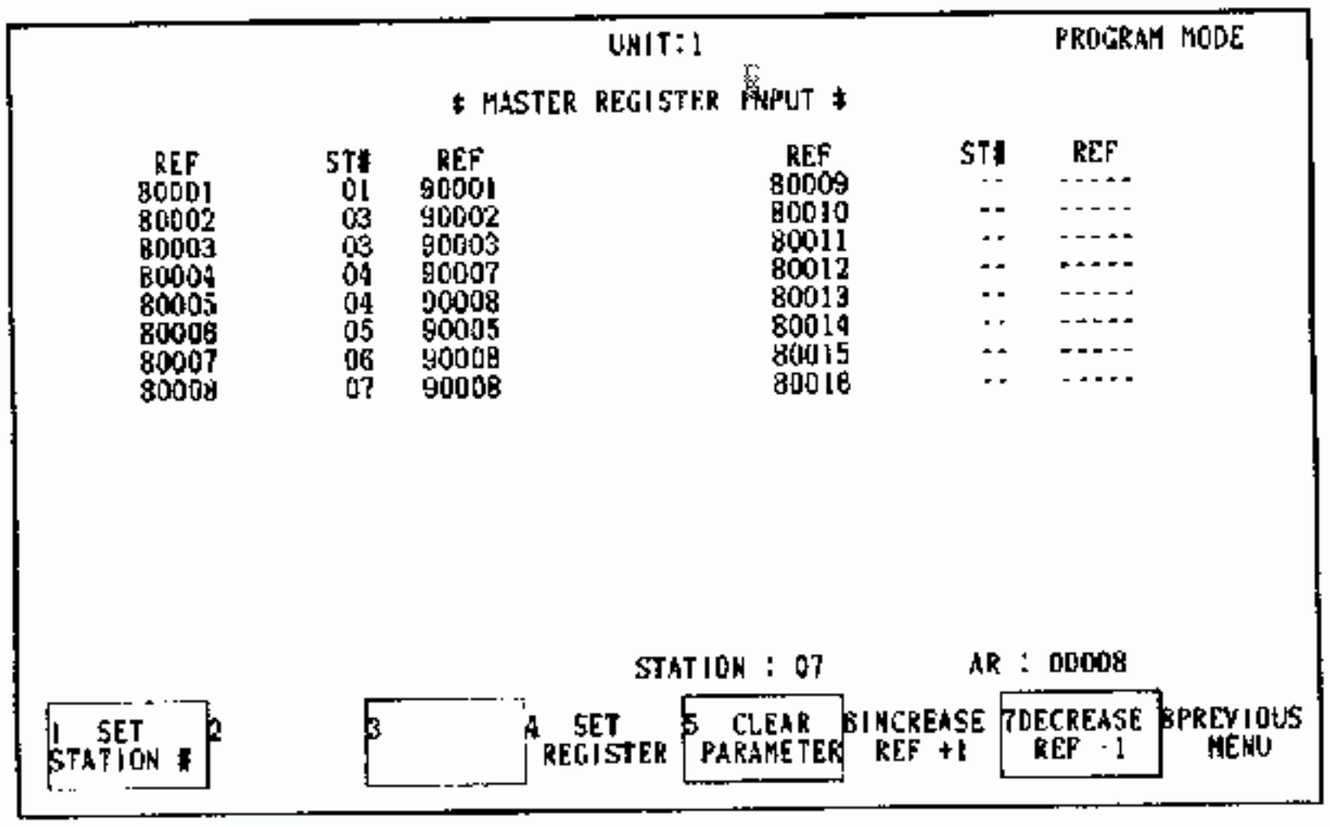


Fig. 5.2.26

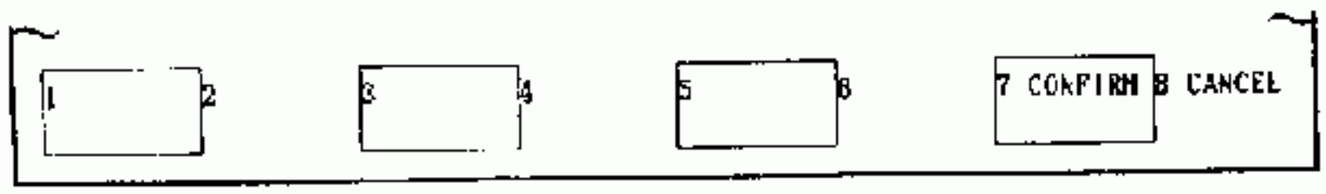


Fig. 5.2.27

NOTE

1. In monitor mode, only "PREVIOUS MENU" appears.

2. When "INCREASE REF +1" is depressed, the AR content increases by 1.

3. When "DECREASE REF −1" is depressed, the AR content decreases by 1.

4. When " CLEAR PARAMETER " is depressed, the allocation at the cursor is cleared.

5. As a reference number set in AR, any one of the last 3 digits (AR : 00001) or all 5 digits (AR : 90001) can be used.

6. If output in the same station is used as its input, "ERROR : CAUTION : THE OUTPUT IN THE SAME STATION" is displayed and label display shown in Fig. 5.2.27 appears. If the allocation is OK, depress "CONFIRM," and not OK, depress "CANCEL."

(3) Typical Allocation of Discrete Input in Slave Station

Discrete data are allocated in increment of 8 points. Allocation is loaded by setting the station number to STATION and the last three digits (001 to 249) of the first reference numbers to AR and depressing " SET DISCRETE ". It is not necessary to allocate interrup signals (70001 to 70008).

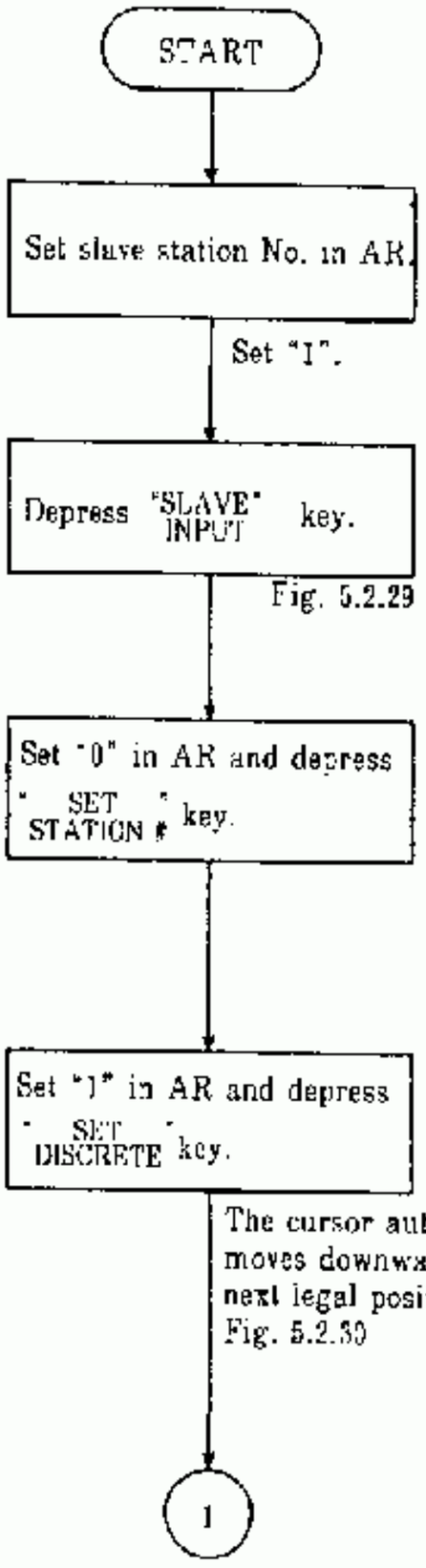


Fig. 5.2.28

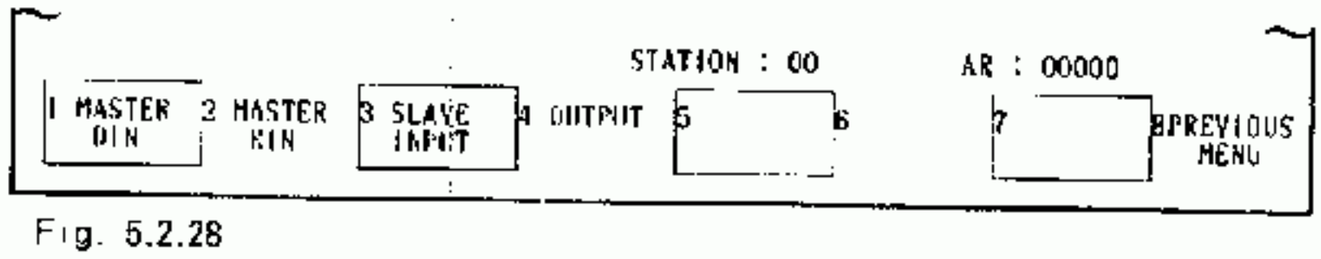


Fig. 5.2.29

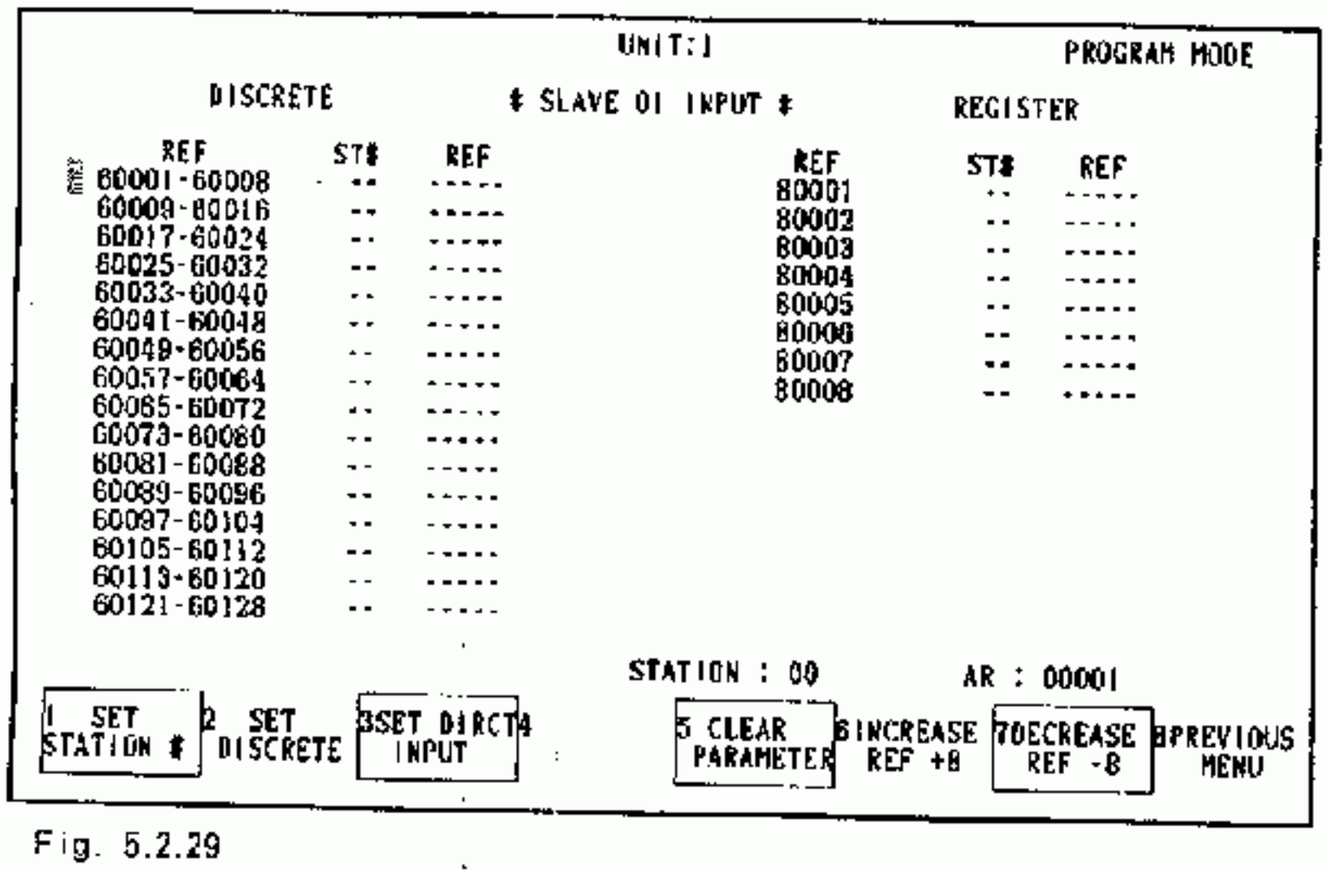


Fig. 5.2.29

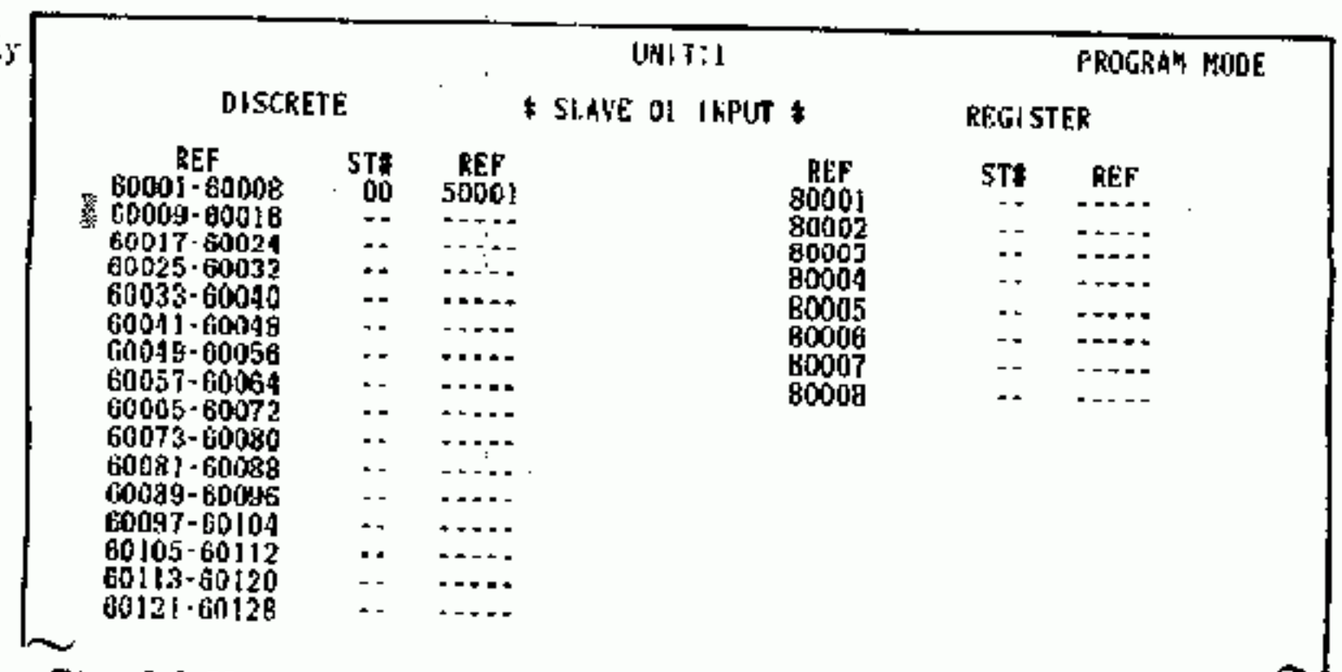


Fig. 6.2.30

(3) Typical Allocation of Discrete Input in Slave Station (Cont'd)

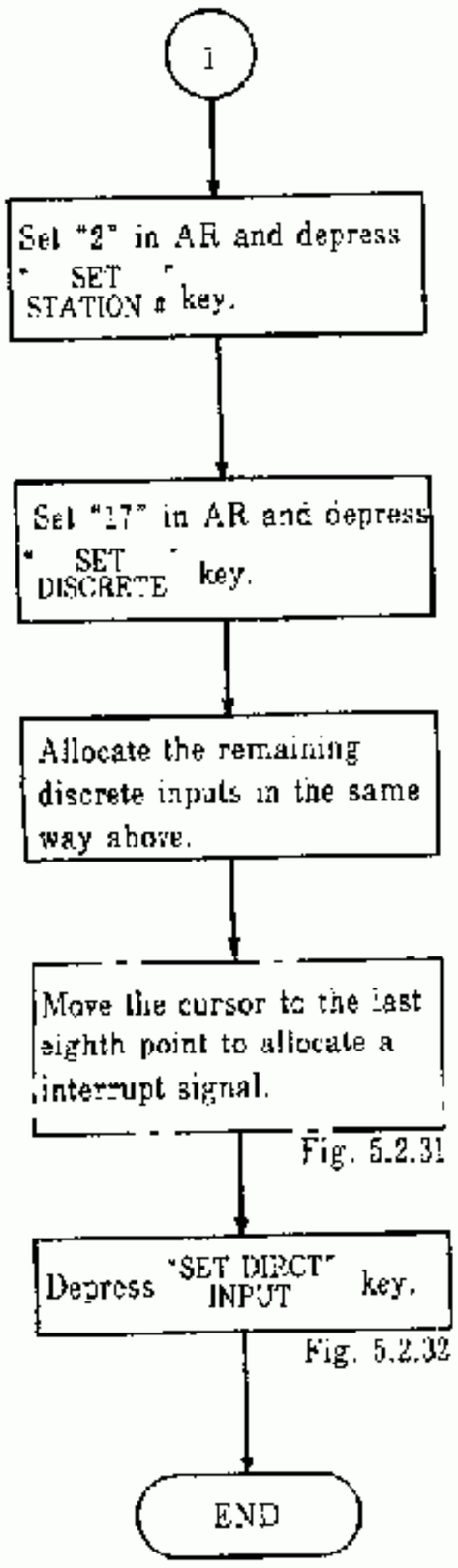


Fig. 5.2.31

Fig. 5.2.32

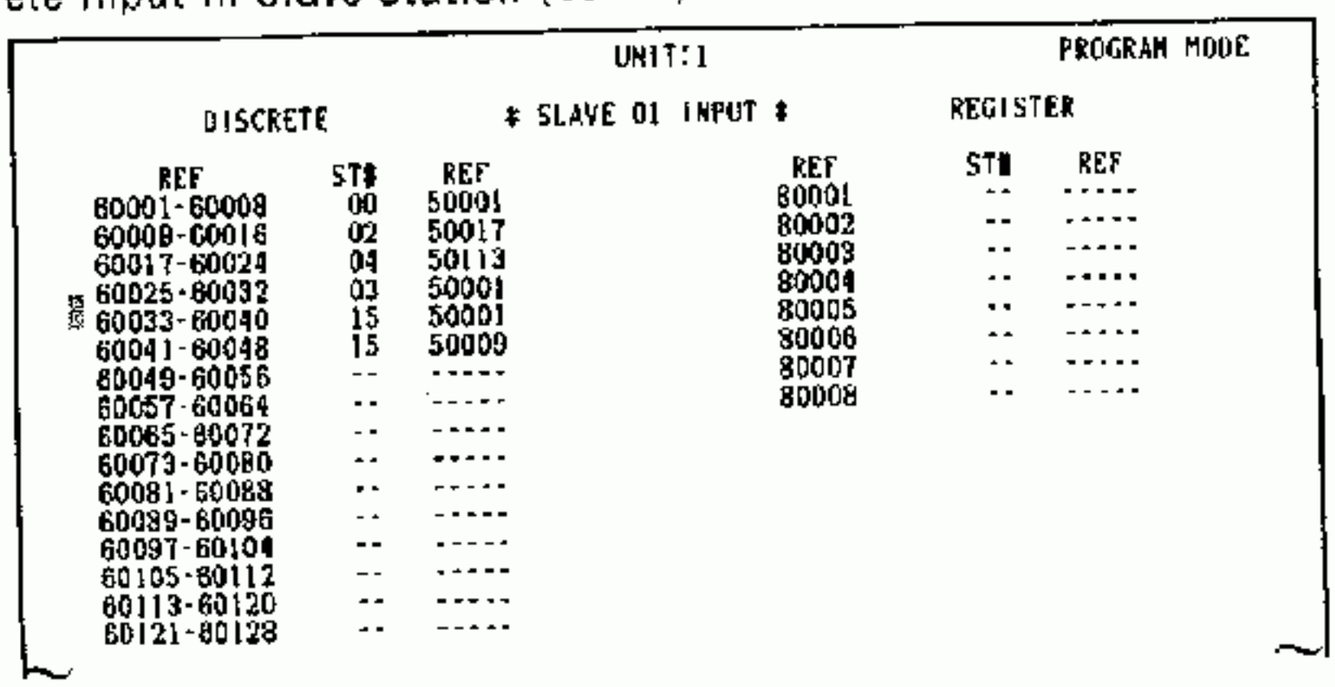


Fig. 5.2.33

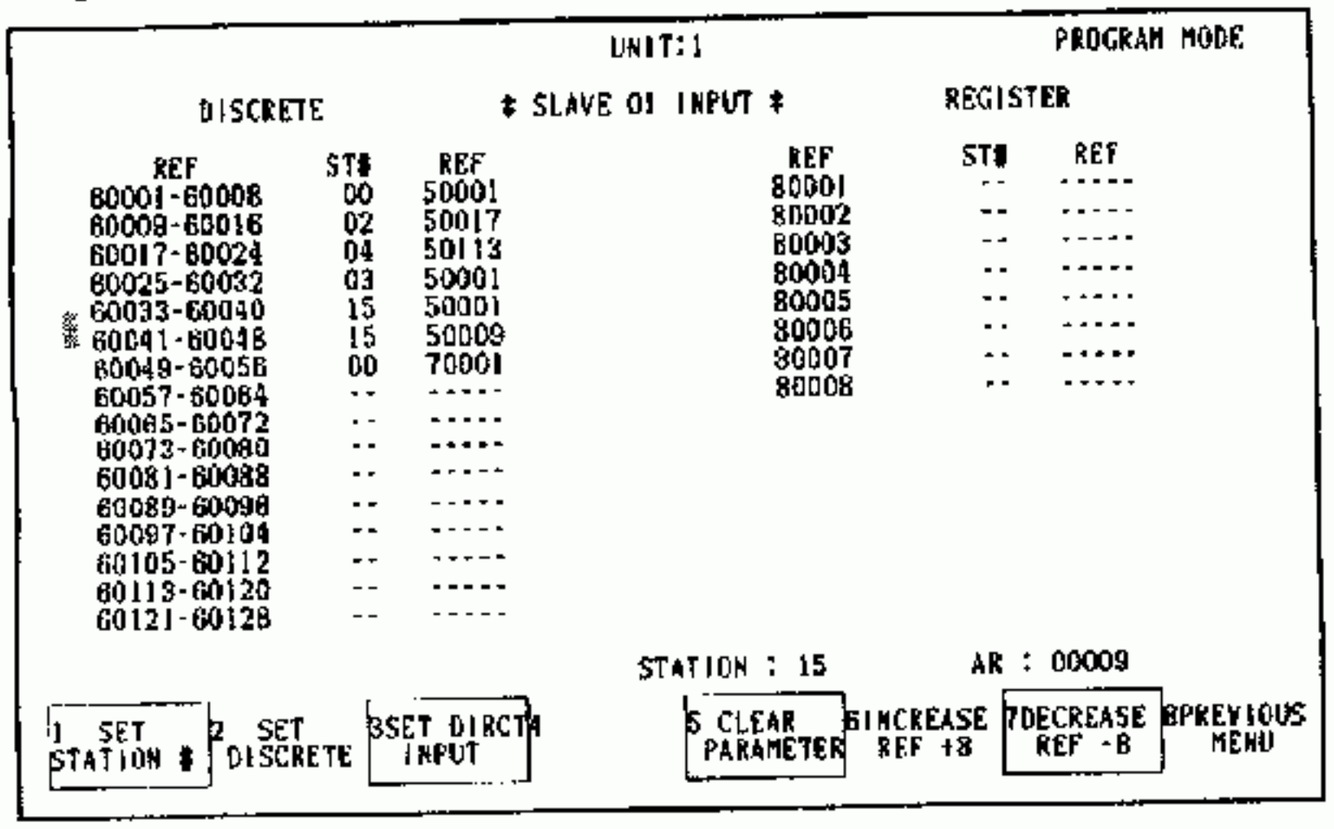


Fig. 5.2.34

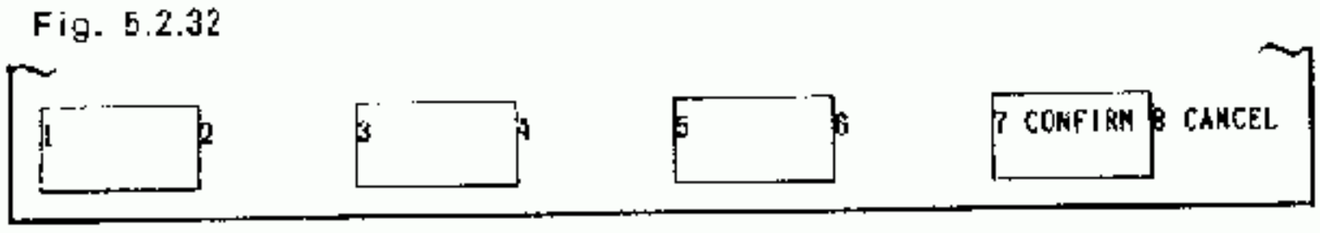


Fig. 5.2.33

NOTE

1. In monitor mode, only "PREVIOUS MENU" appears.

2. When "INCREASE REF −8" is depressed, the AR content increases to become 8N + 1 (N = 0, 1, 2, ... 31) nearest the value set in AR.

3. When "DECREASE REF −8" is depressed, the AR content decreases to become 8N + 1 (N = 0, 1, 2, ... 31) nearest the value set in AR.

4. When "CLEAR PARAMETER" is depressed, the allocation at the cursor is cleared.

5. Once an interrupt signal is allocated, succeeding discrete data cannot be allocated.

6. As a reference number set in AR, any one of the last 3 digits (AR : 00001) or all 5 digits (AR : 50001) can be used.

7. If output in the same station is used as its input, "ERROR : CAUTION : THE OUTPUT IN THE SAME STATION" is displayed and label display shown in Fig. 5.2.33 appears. If the allocation is OK, dispress "CONFIRM," and not OK depress "CANCEL".

(4) Typical Allocation of Register Input in Slave Station

Registers are input one by one. Allocation is loaded by setting the station number to STATION and the last two digits (01 to 16) of the reference number to AR and depressing "SET" REGISTER.

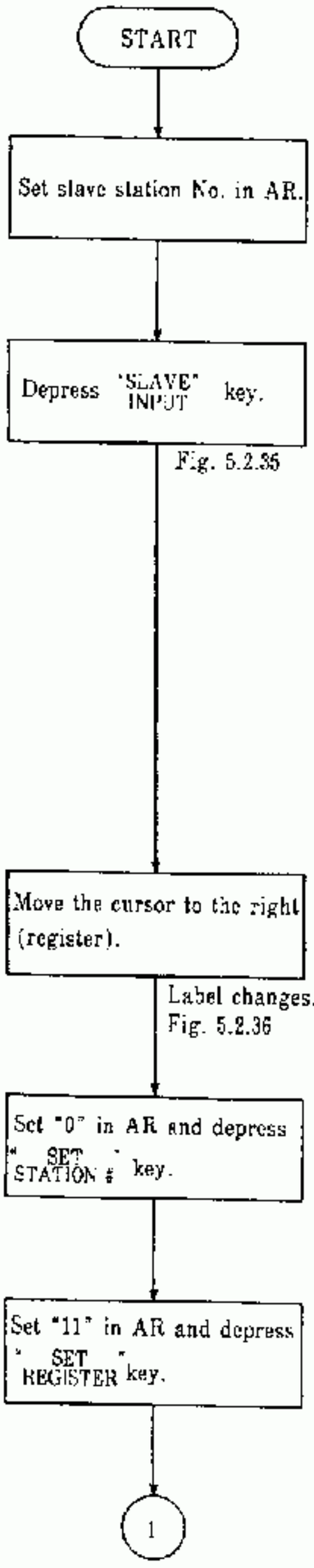


Fig. 5.2.34

Fig. 5.2.35

Fig. 5.2.36

Fig. 5.2.37

(4) Typical Allocation of Register Input in Slave Station (Cont'd)

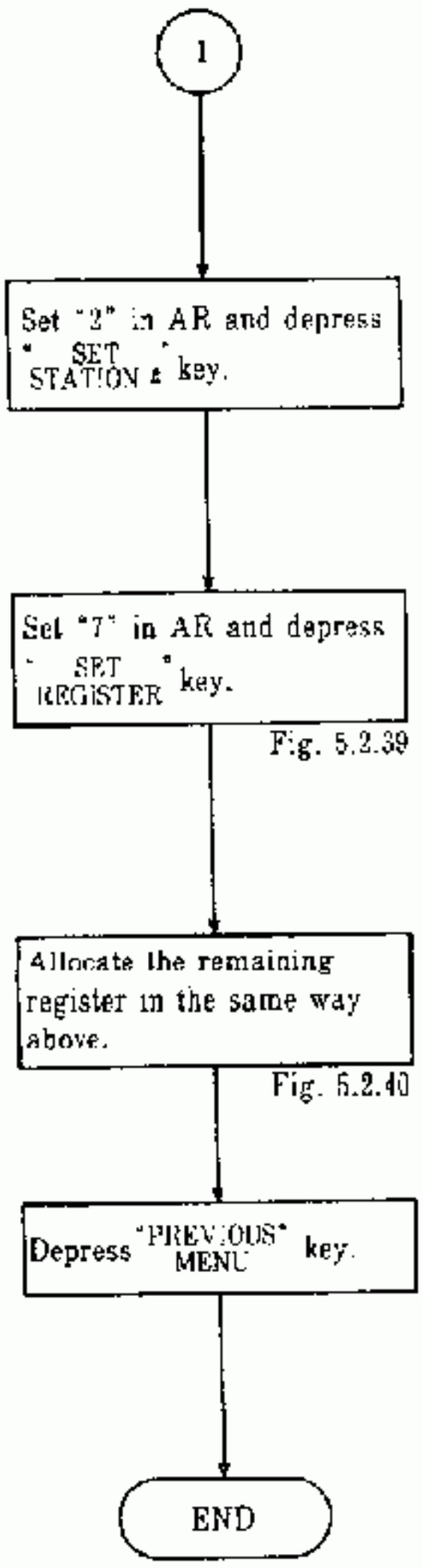


Fig. 5.2.39

Fig. 5.2.40

Fig. 5.2.38

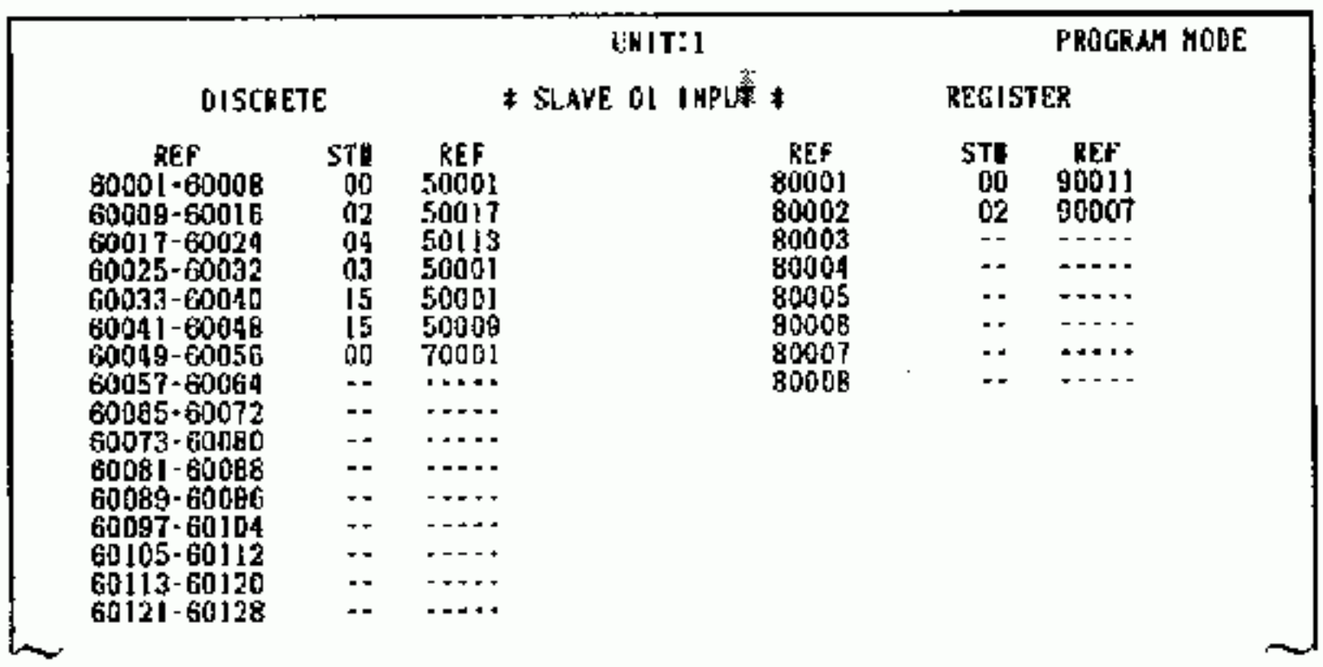


Fig. 5.2.39

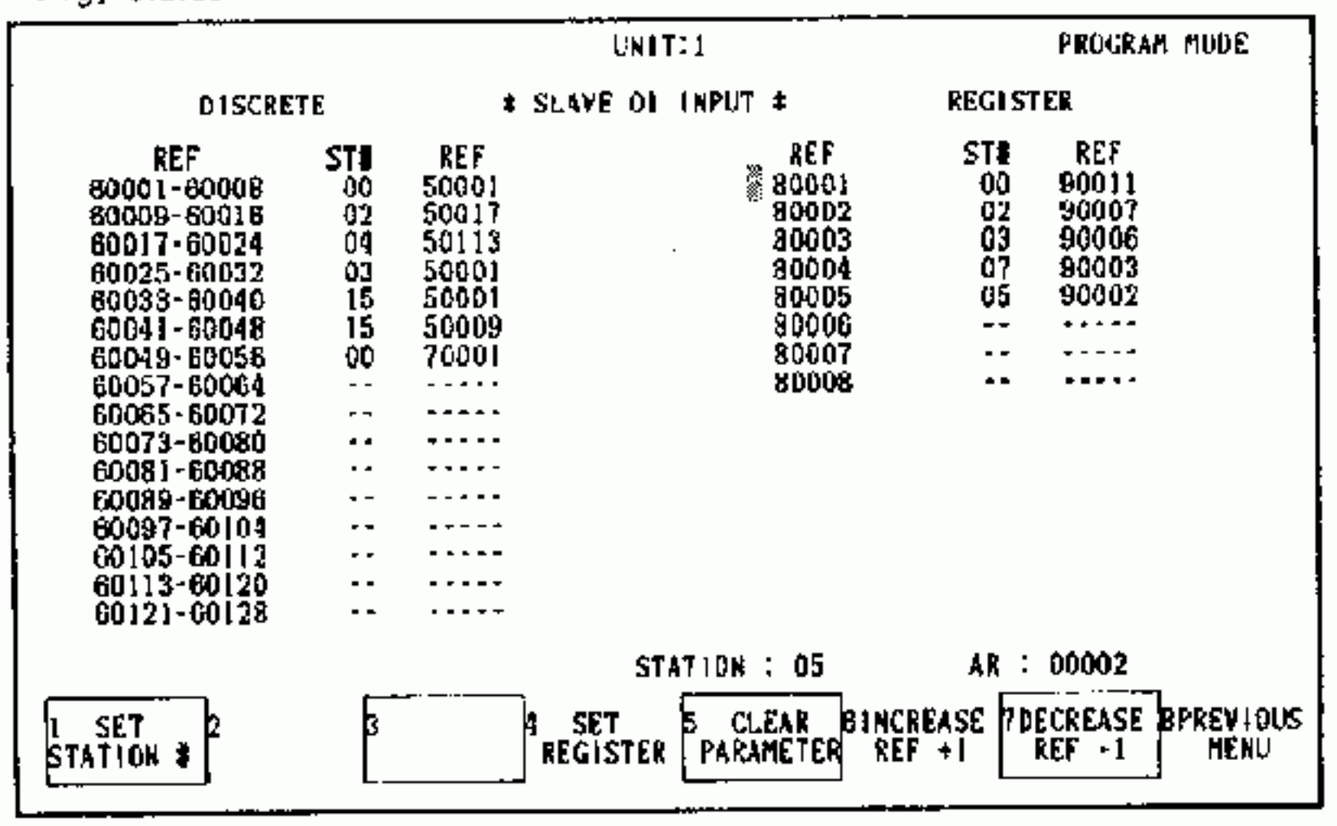


Fig. 5.2.40

NOTE

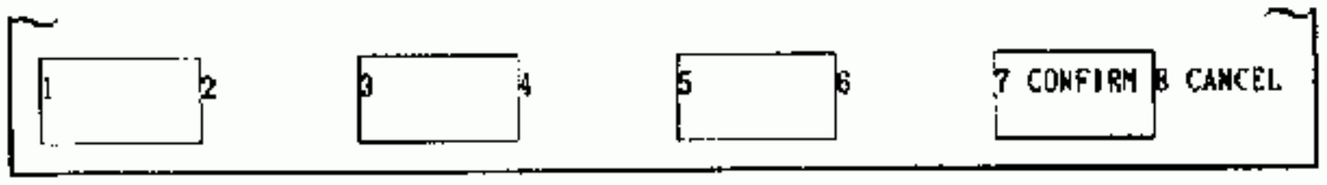


Fig. 5.2.41

1. In monitor mode, only "PREVIOUS MENU" appears.
2. When "INCREASE REF +1" is depressed, the AR content increases by 1.
3. When "DECREASE REF −1" is depressed, the AR content decreases by 1.
4. When "CLEAR PARAMETER" is depressed, the allocation at the cursor is cleared.
5. As a reference number set in AR, any one of the last 3 digits (AR : 00001) or all 5 digits (AR : 90001) can be used.
6. If output in the same station is used as its input, " ERROR : CAUTION : THE OUTPUT IN THE SAME STATION " is displayed and label display shown in Fig. 5.2.41 appears. If the allocation is OK, depress "CONFIRM," and not OK, depress "CANCEL."

(5) Output Allocation Display

Every station number output allocation is indicated.

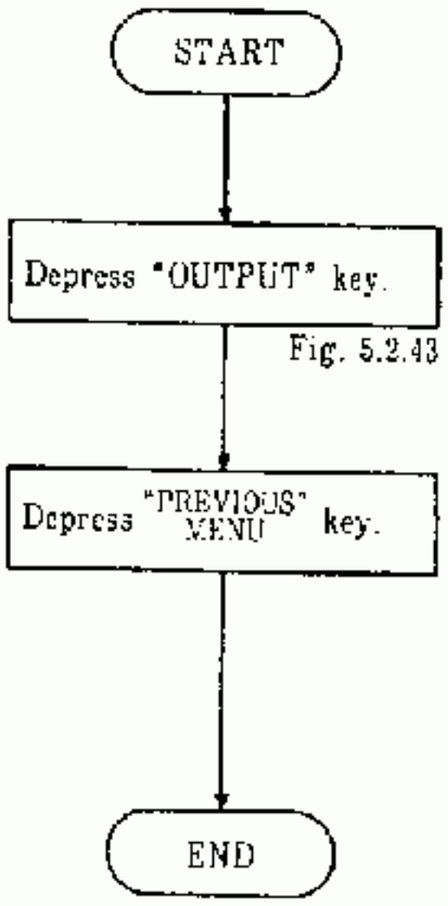


Fig. 5.2.43

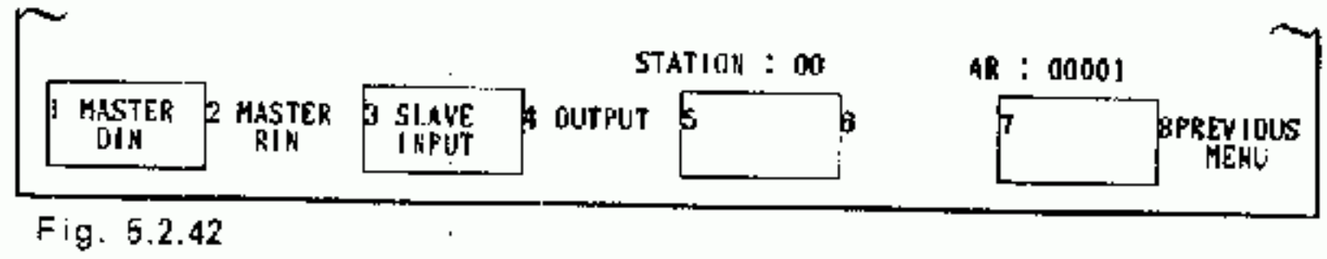


Fig. 5.2.42

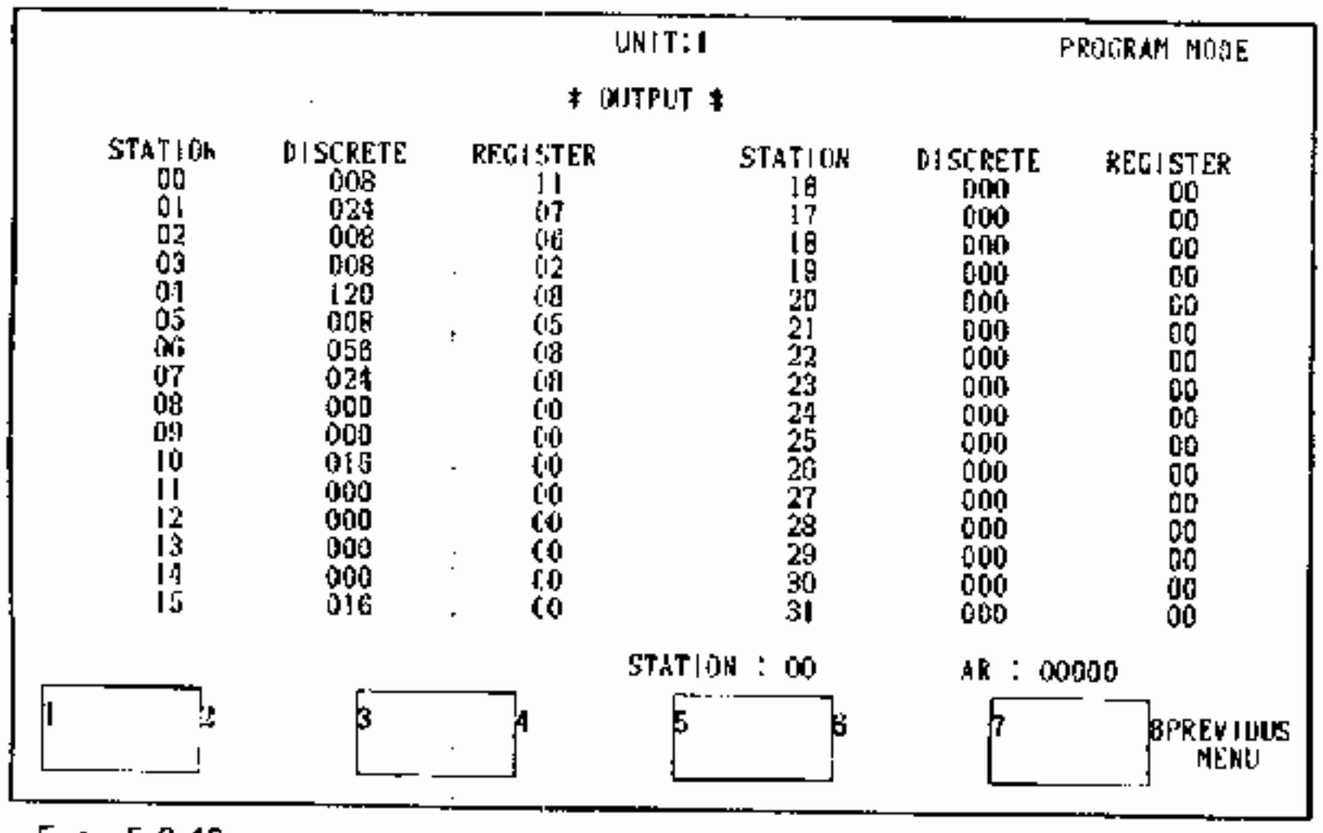


Fig. 5.2.43

NOTE

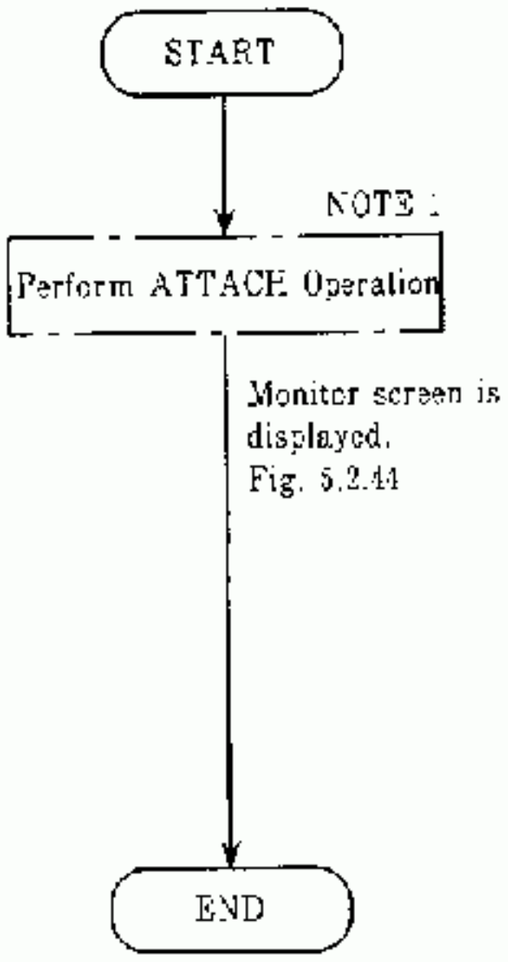
The output allocation display indicates the PC output capacity of each station, corresponding to the number of inputs of discrete data and registers allocated to each station.

5.2.4 Link Data Monitor

(1) Discrete Data Status Indication in Master Station

Discrete data appear in increment of 16 points, as shown below (1 indicates ON ; 0 indicates OFF). The underlined numerals are in disabled state. An interrupt signal appears in 8 points.

Example : 60001-60016 = 1000<u>1</u>1000<u>1</u>000010
↑ 60001 ↑ 60016



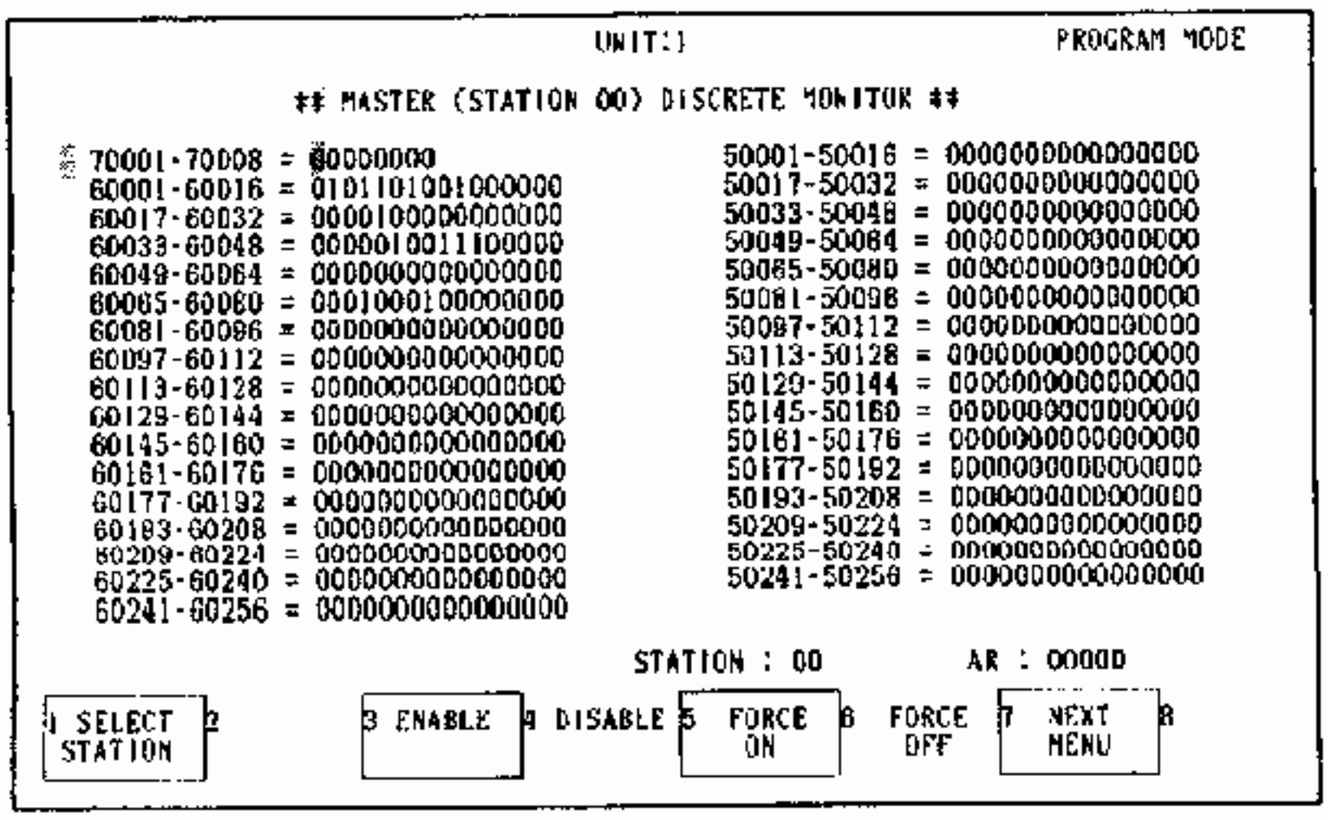


Fig. 5.2.44

NOTE

1. This step can be stepped, if ATTACH operation has already been completed.

2. In monitor mode, "ENABLE," "DISABLE," "FORCE ON," "FORCE OFF," and small cursor do not appear.

3. Even if "MONITOR DISPLAY" is depressed in Fig. 5.2.10, display shown in Fig. 5.2.44 comes up.

(2) Indication of Register Contents in Master Station

Initially, the register contents appear in decimal, but can appear in decimal, hexadecimal, binary, or ASCII.

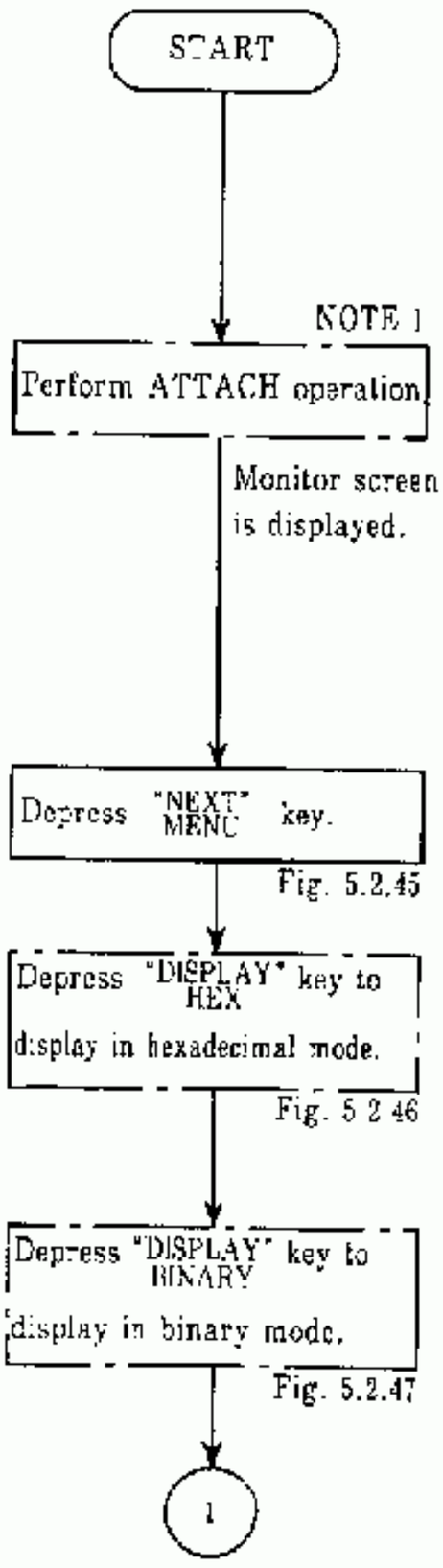


Fig. 5.2.45

Fig. 5.2.46

Fig. 5.2.47

(2) Indication of Register Contents in Master Station (Cont'd)

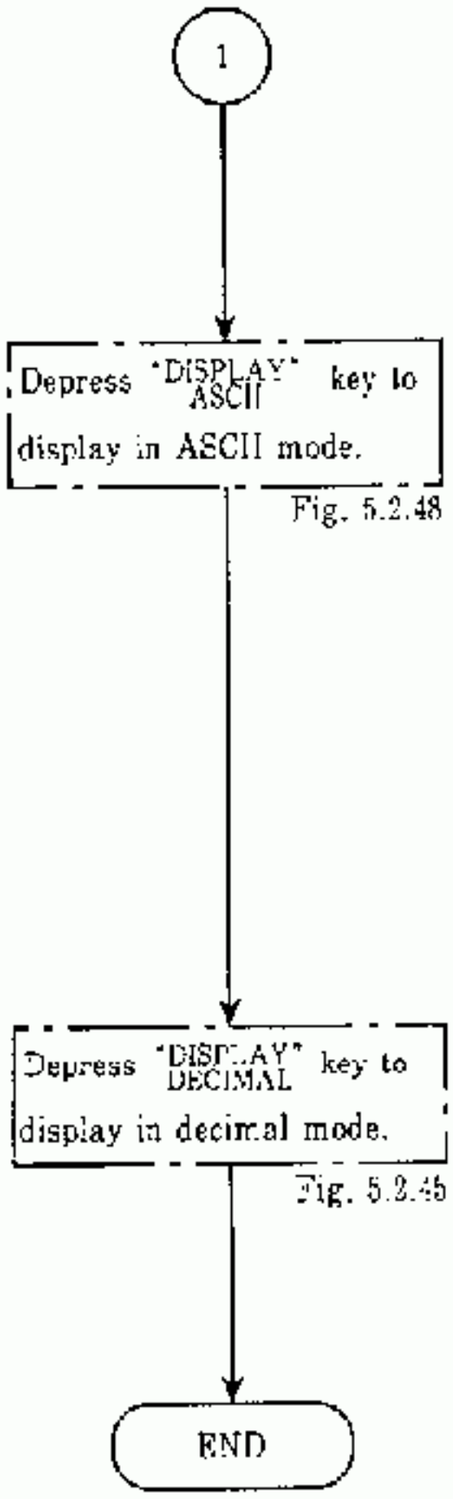


Fig. 5.2.46

Fig. 5.2.46

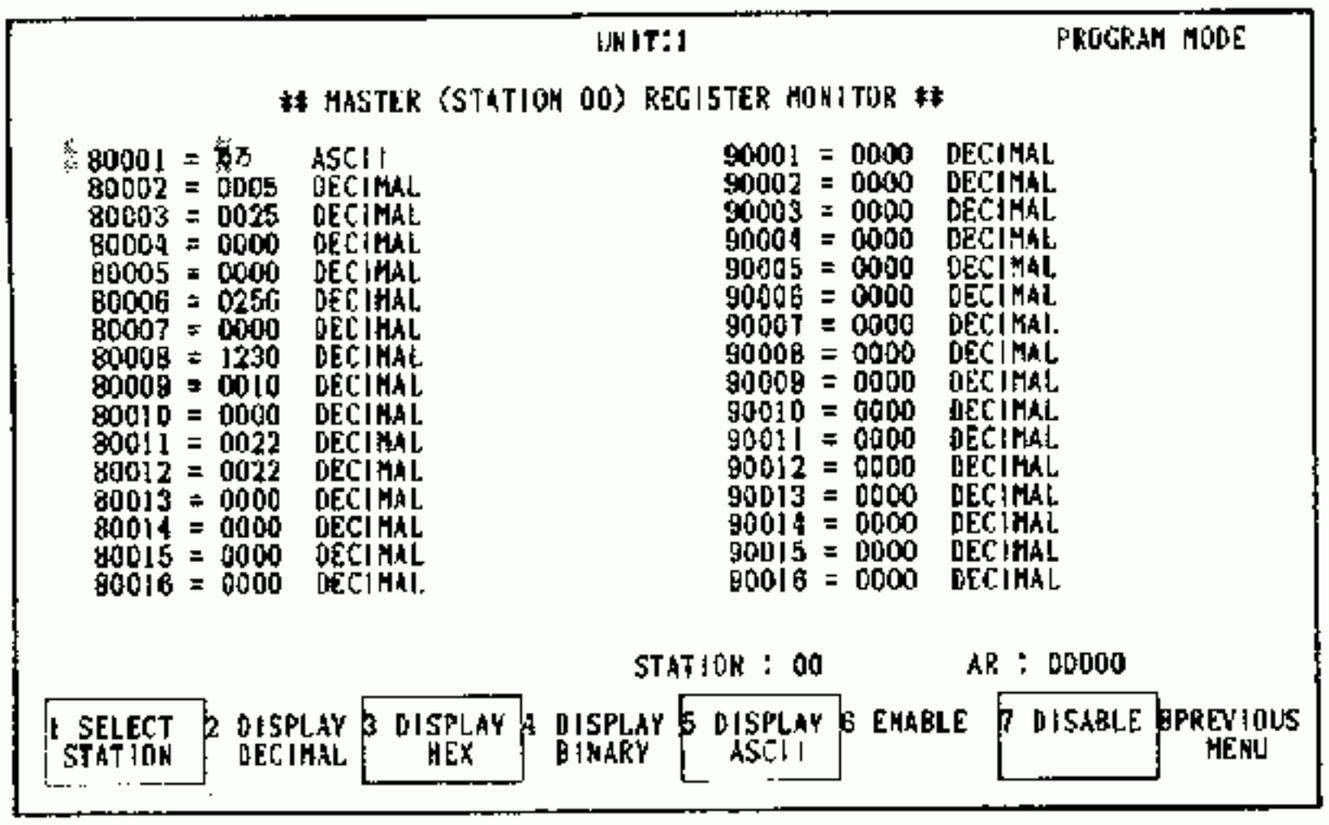


Fig. 5.2.48

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.
2. In monitor mode, "ENABLE" and "DISABLE" do not appear. Also, "NEXT MENU" (see Fig. 5.2.47) and small cursor do not appear.
3. When "PREVIOUS MENU" is depressed, the display returns to that shown in Fig. 5.2.44.

(3) Discrete Status Indication in Slave Station

As in the master module, discrete data appear in increment of 16 points. (1 indicates ON ; 0 indicates OFF.) The underlined numerals are in disabled state.

Example : 60001-60016 = 1000<u>1</u>1000<u>1</u>000010

60001 60016

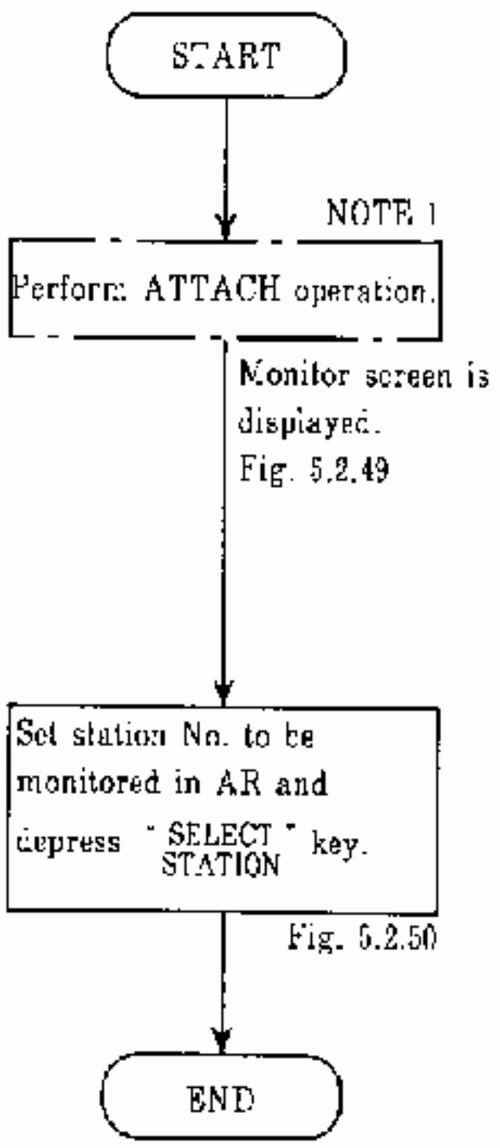


Fig. 5.2.49

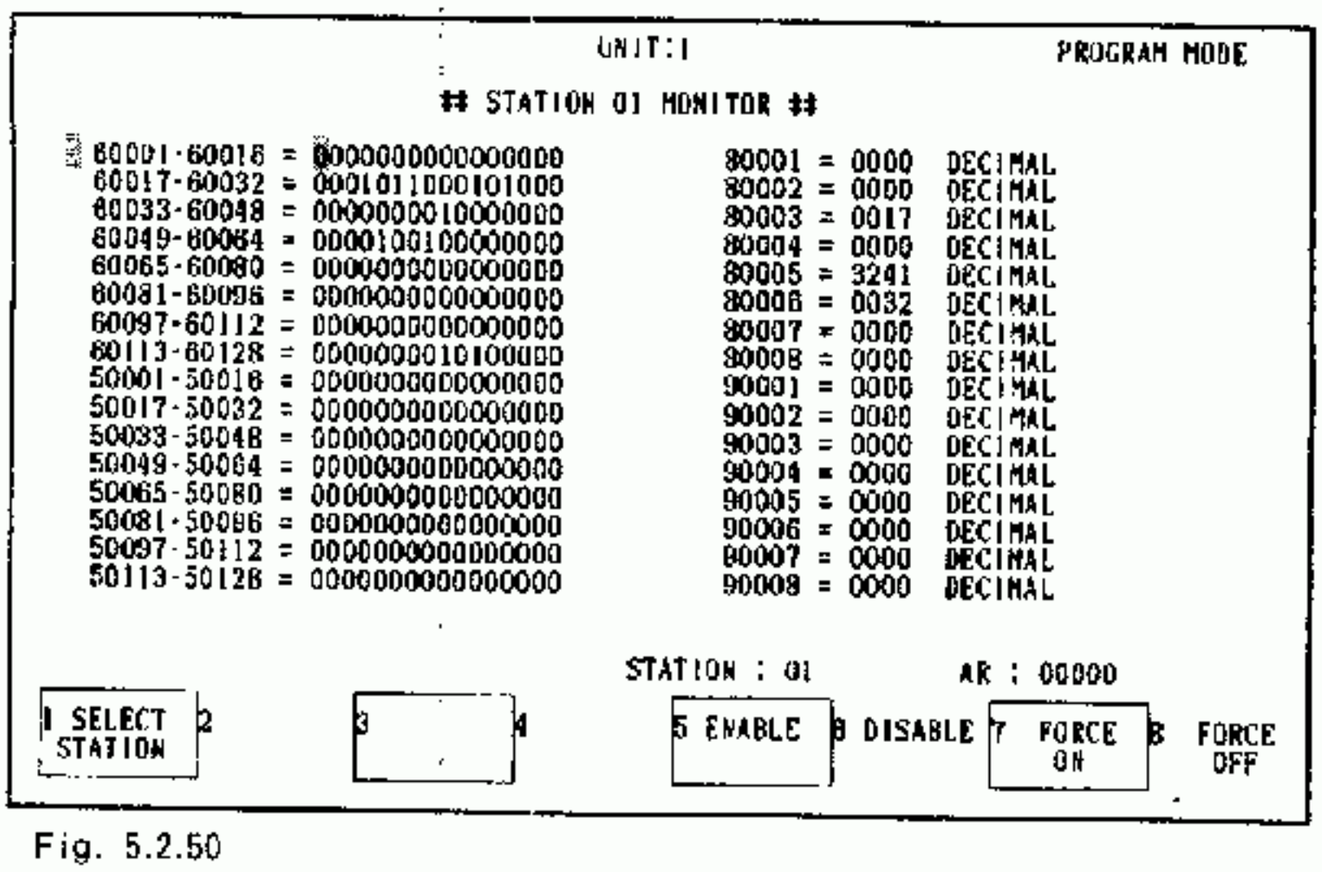


Fig. 5.2.50

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.
2. In monitor mode, "ENABLE," "DISABLE," "FORCE ON", "FORCE OFF", and small cursor do not appear.

(4) Indication of Register Contents in Slave Station

Initially, the register contents appear in decimal, but can appear in decimal, hexadecimal, binary, or ASCII.

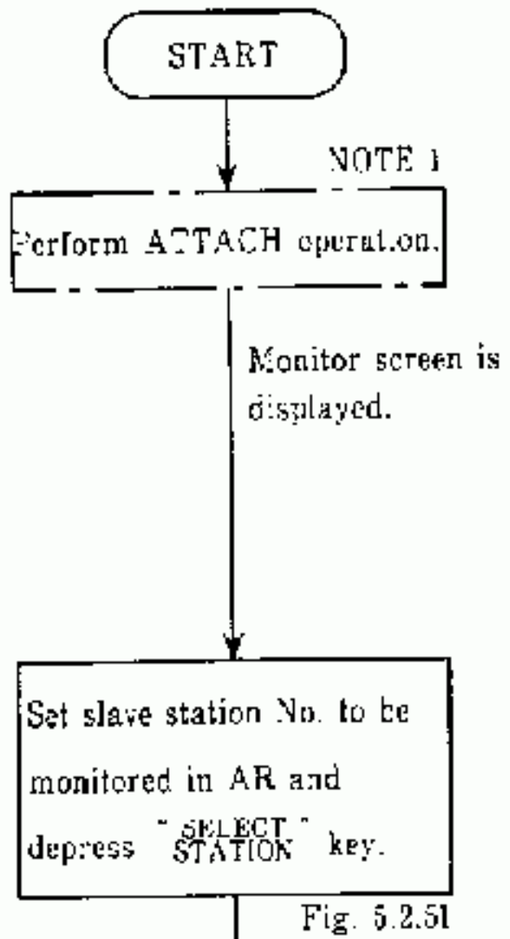


Fig. 5.2.51

Fig. 5.2.52

Fig. 5.2.53

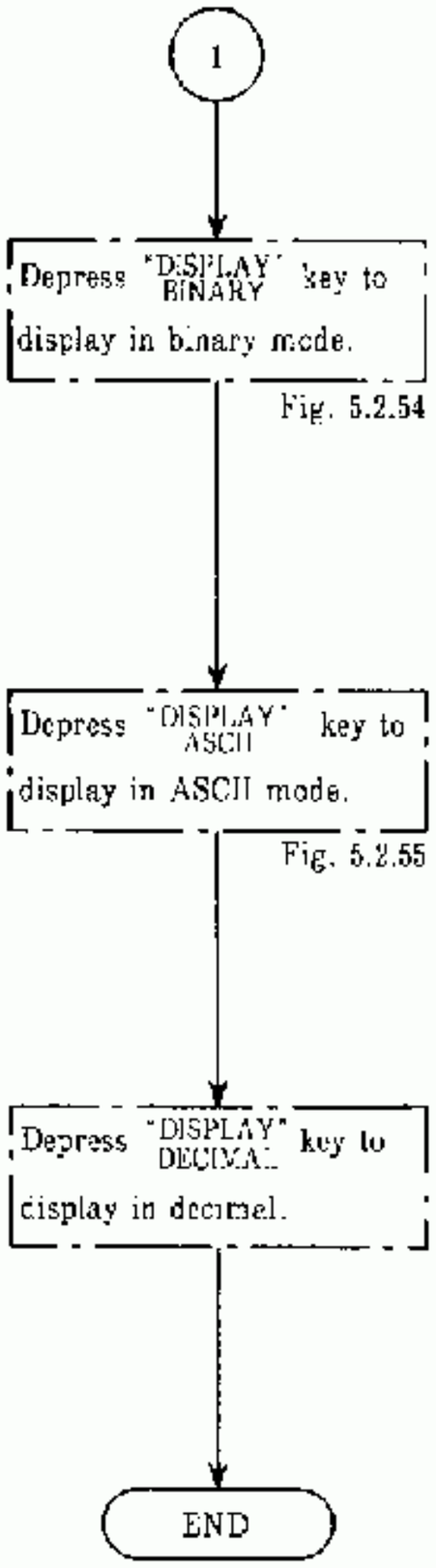
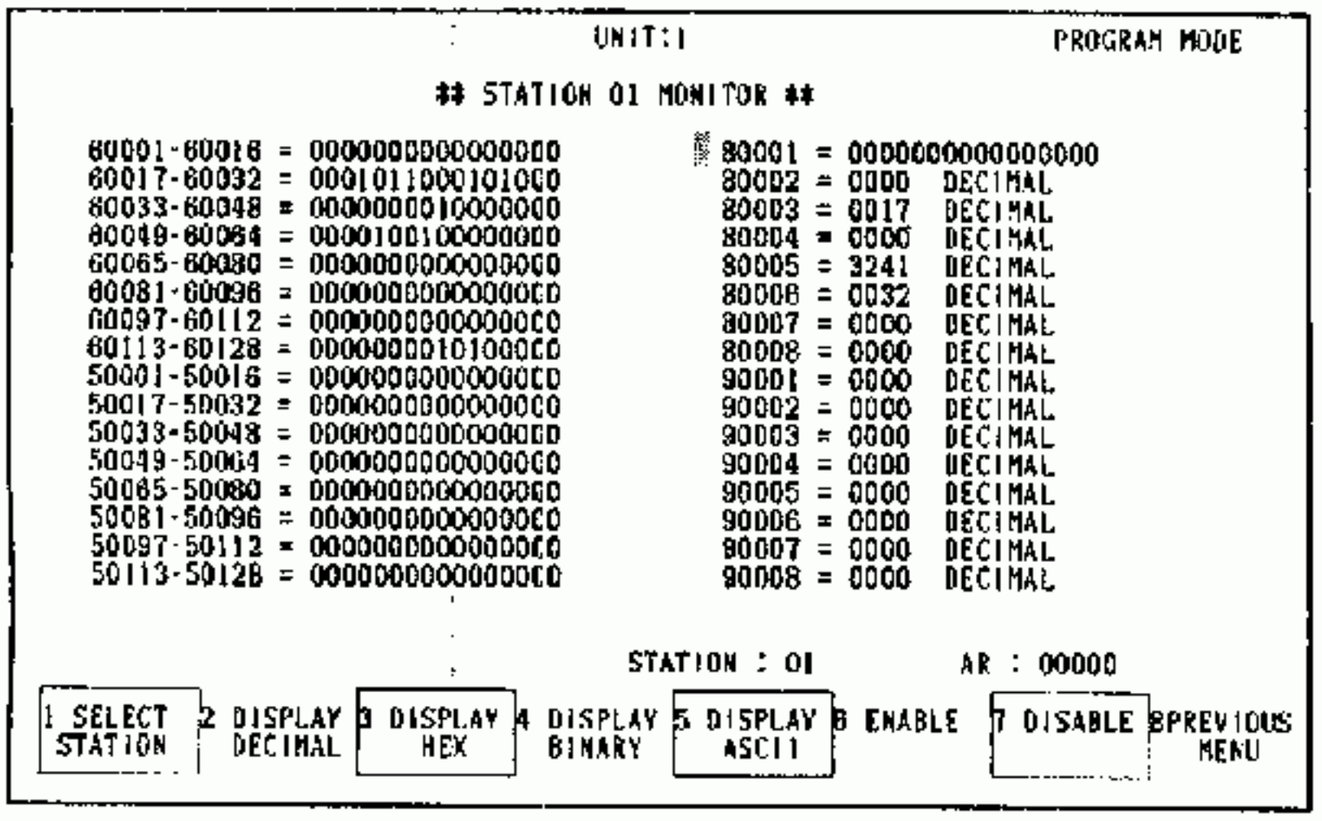
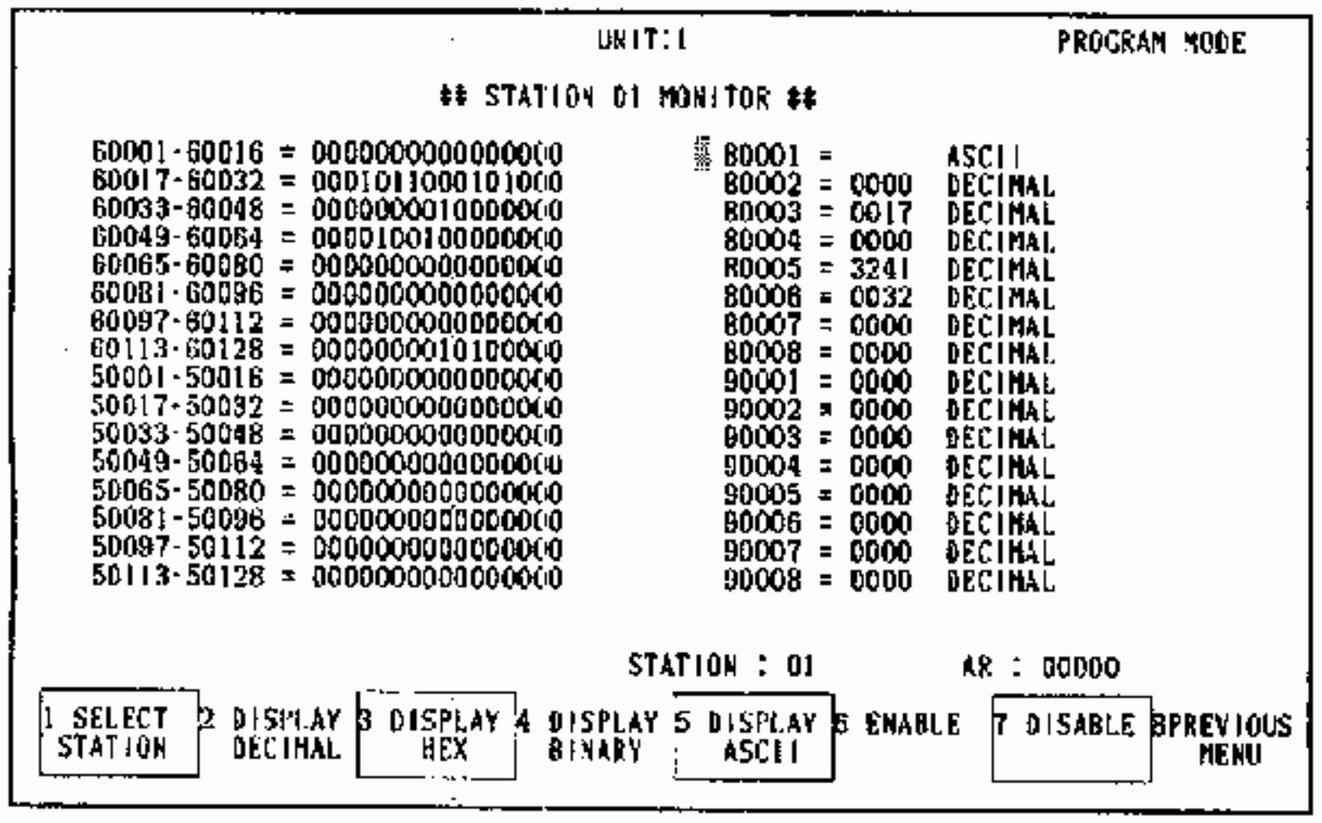


Fig. 5.2.54

Fig. 5.2.55





NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

2. In monitor mode, "ENABLE" and "DISABLE" do not appear.
   Also, "NEXT MENU" (Fig. 5.2.54) and small cursor do not appear.

3. If a register content that is more than 9999 is set to decimal indication, it appears as follows :
   Example : 90001 = > 9999 OVERFLOW

4. If the register content that cannot be indicated in ASCII is so set, it appears follows:
   Example : 90001 = ろ万 ASCII

(5) Indication of Any Discrete State

When "CHG SCREEN" is depressed while the monitor display appears, the expansion reference area appears as shown in Fig. 5.2.56, so that up to 36 desired discrete data can be indicated in columns of 18 lines each.

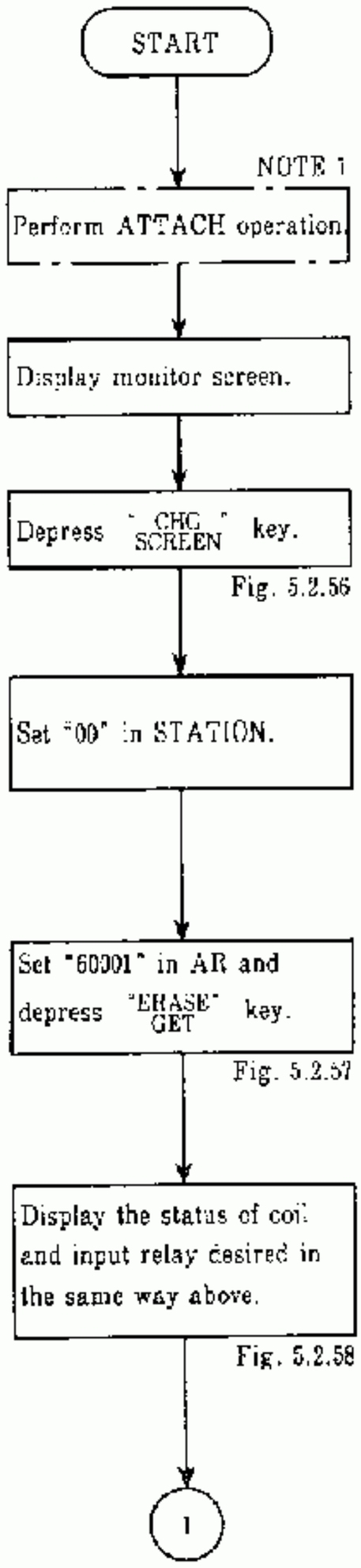


Fig. 5.2.56

Fig. 5.2.57

Fig. 5.2.58

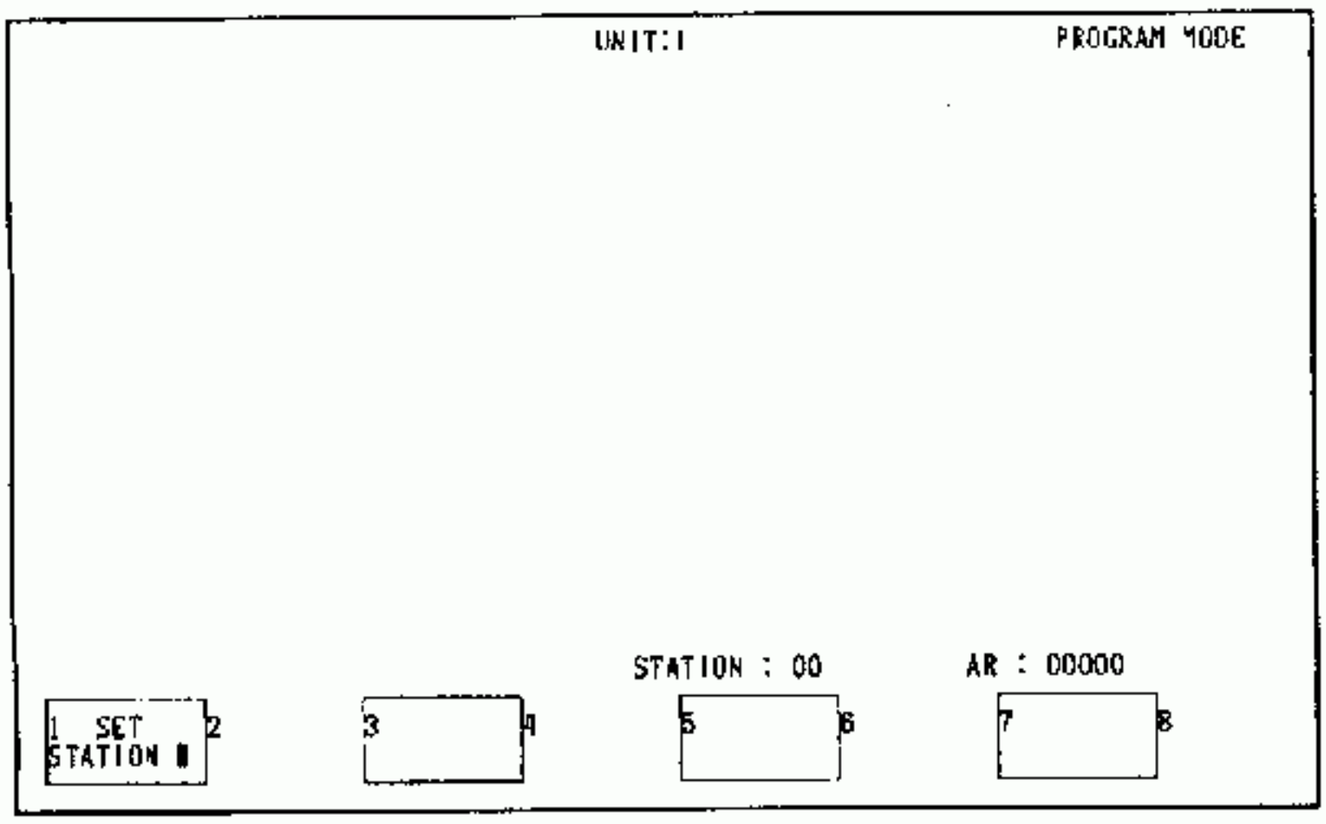


Fig. 5.2.56

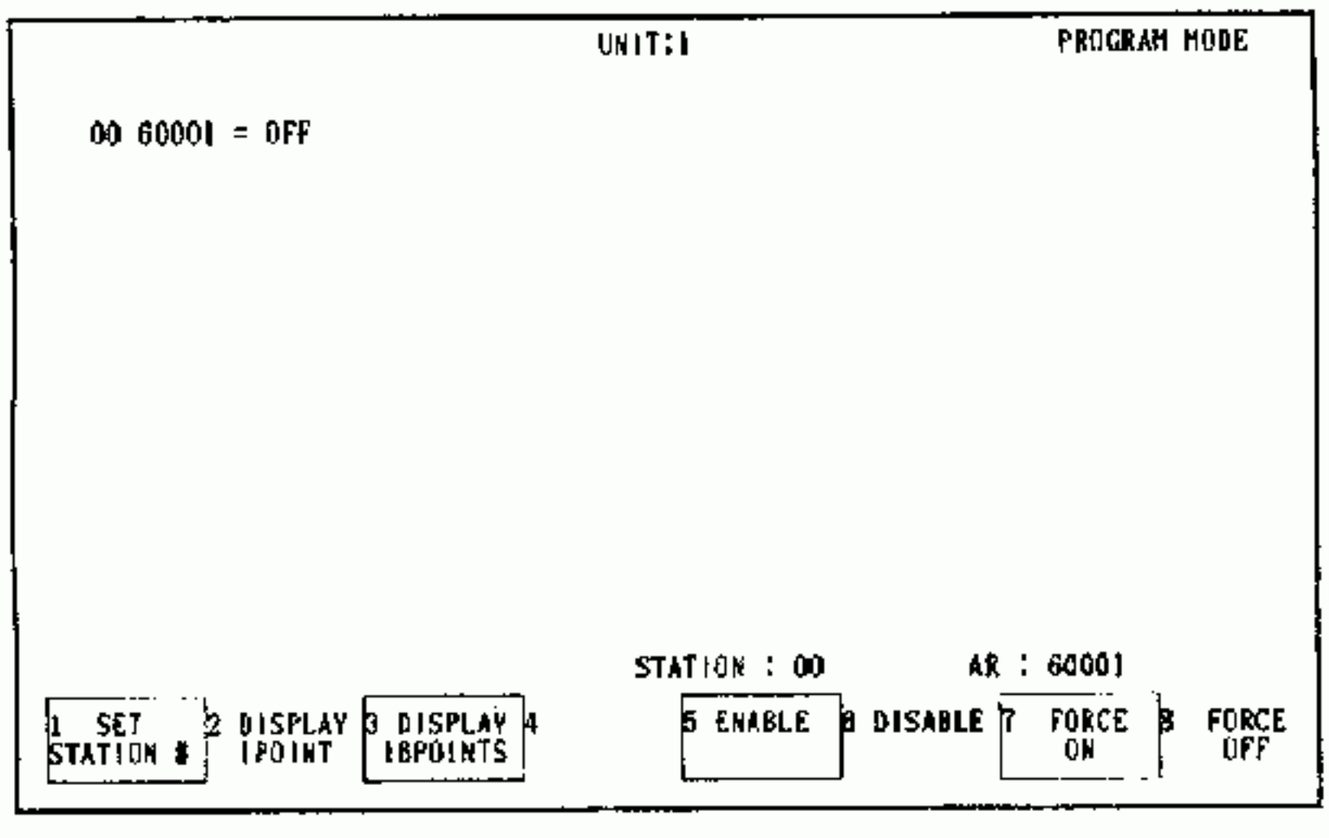


Fig. 5.2.57

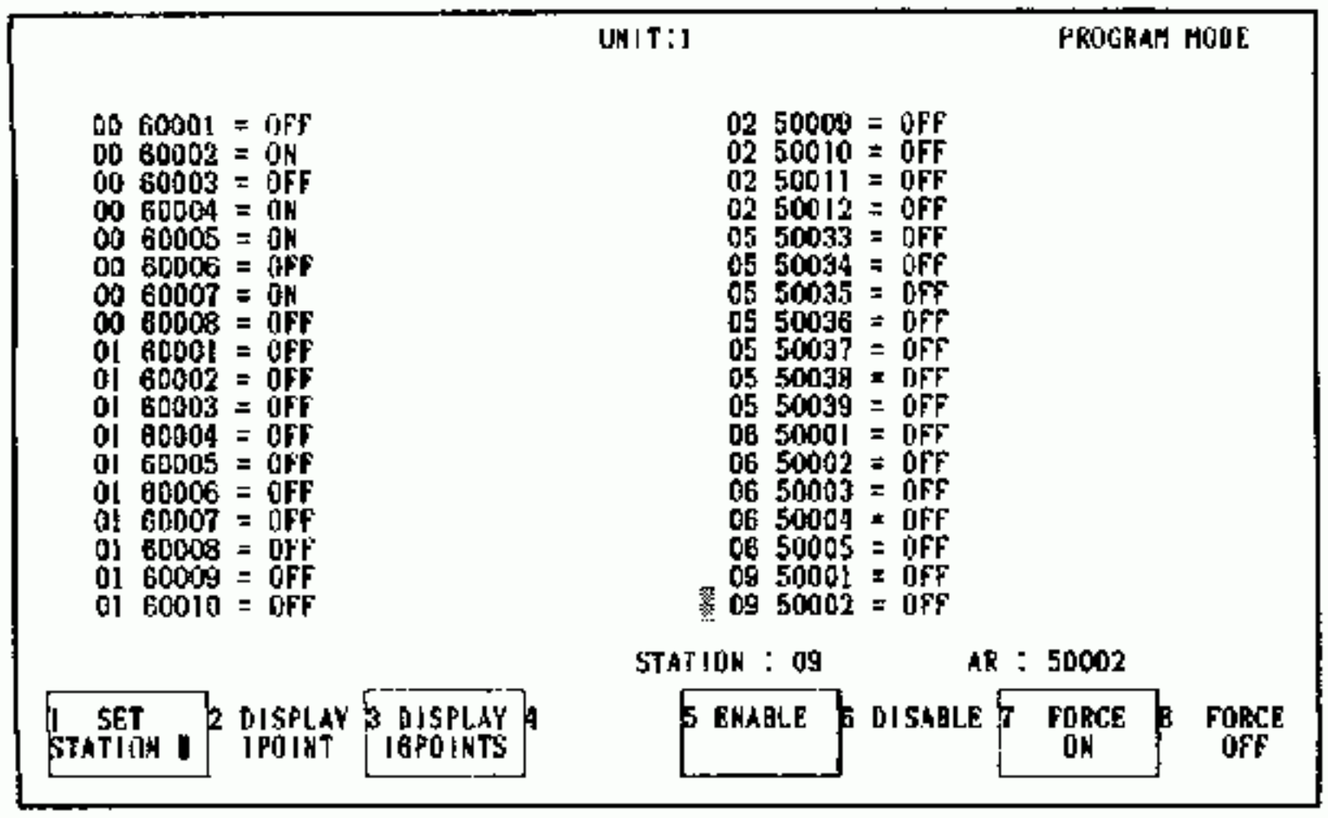
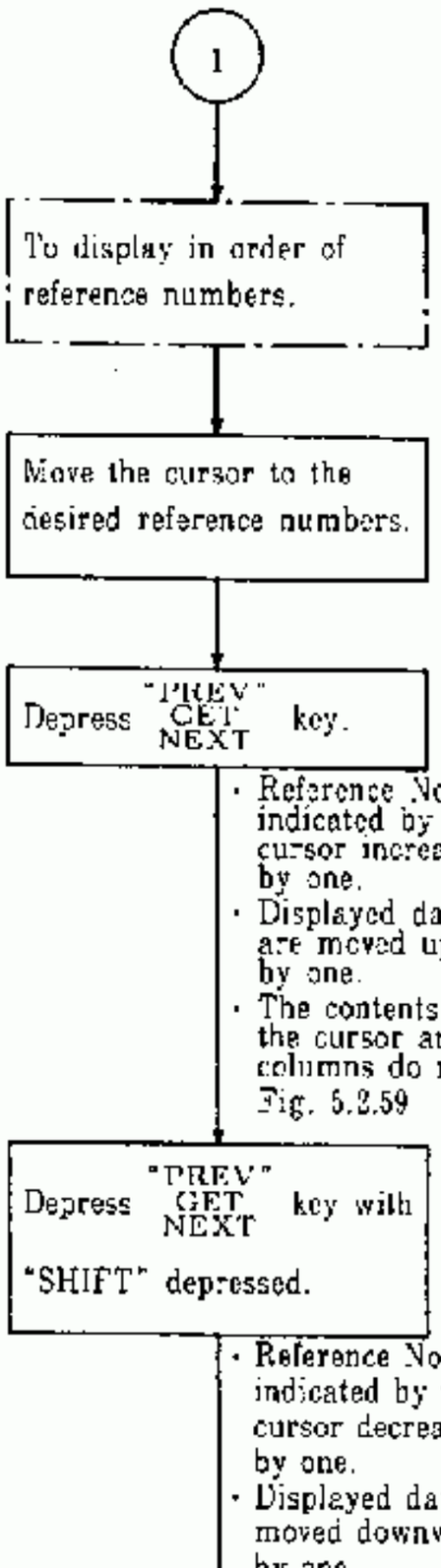


Fig. 5.2.58



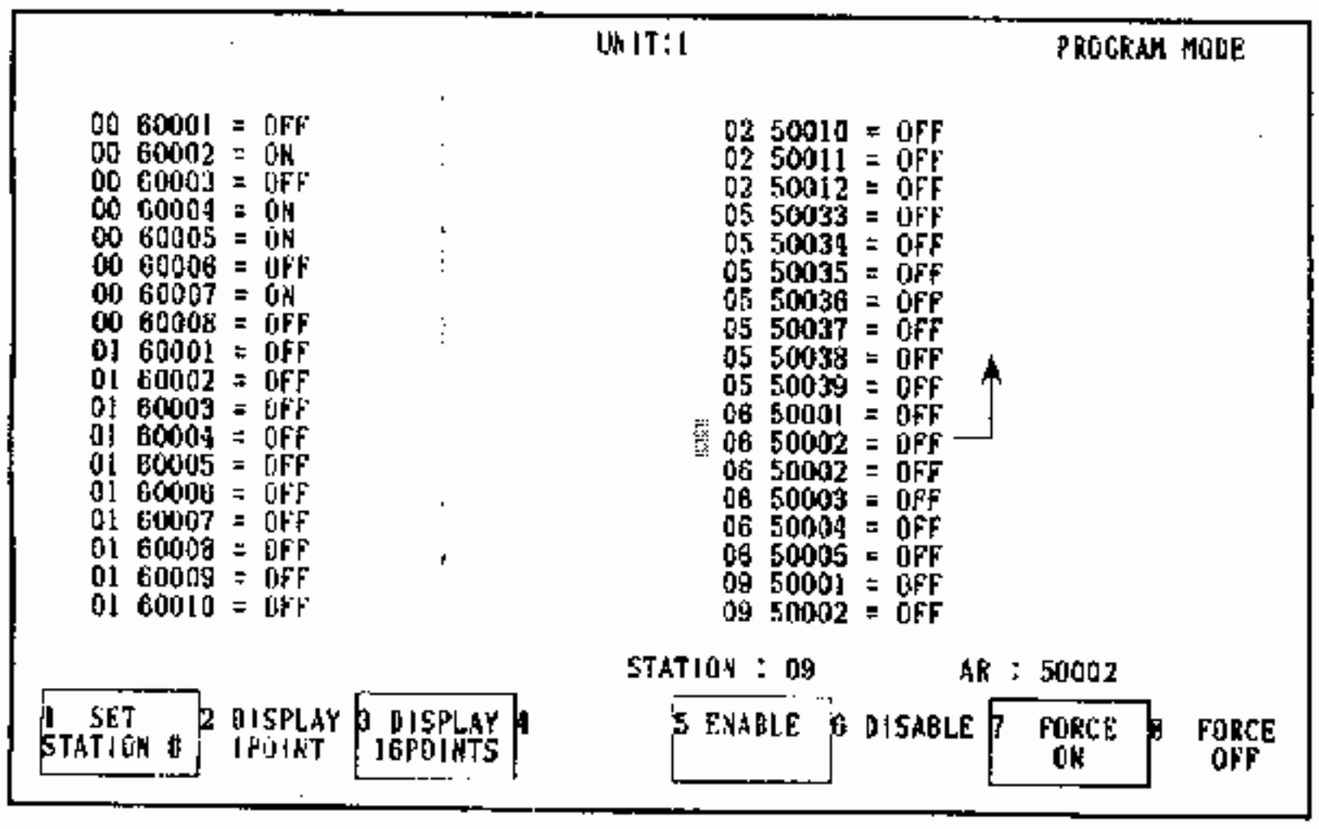


Fig. 5.2.59

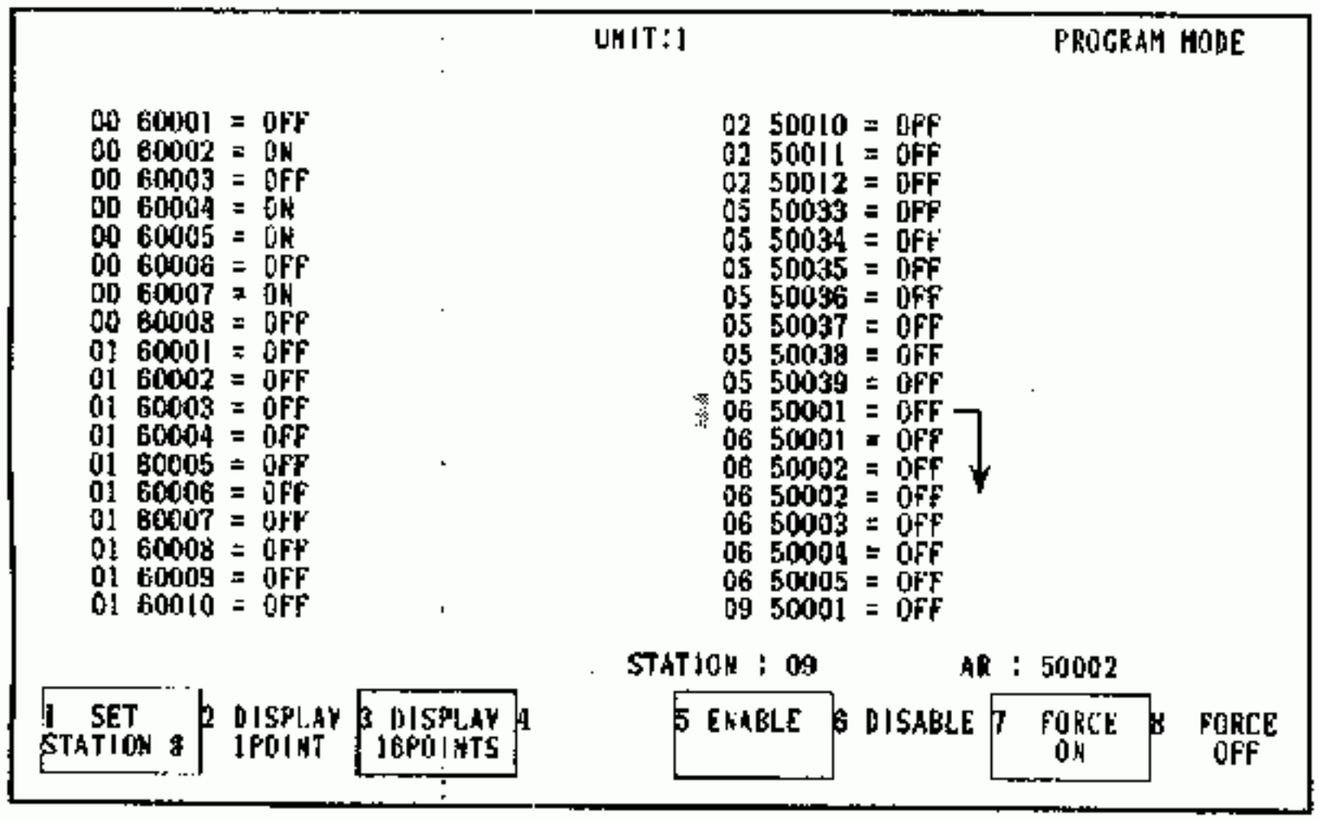


Fig. 5.2.60

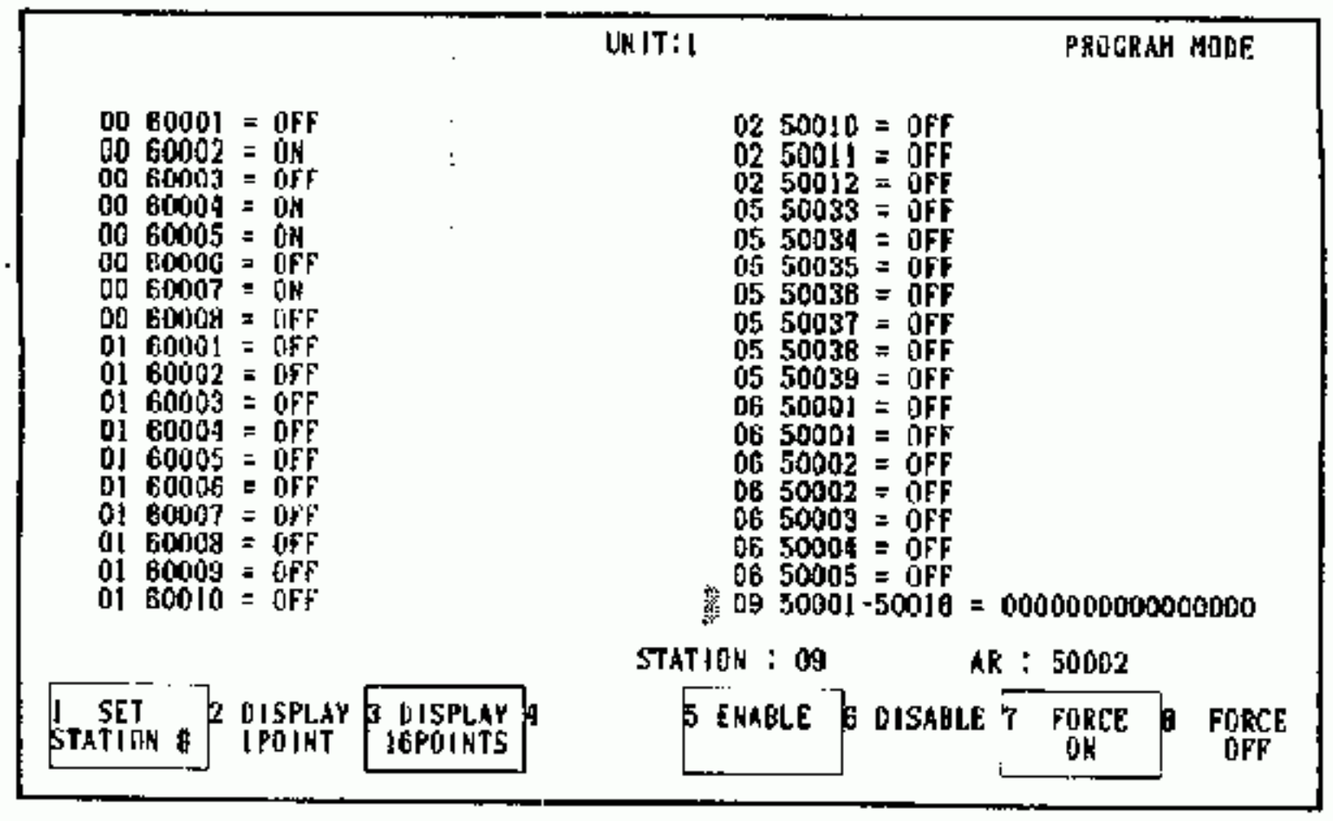
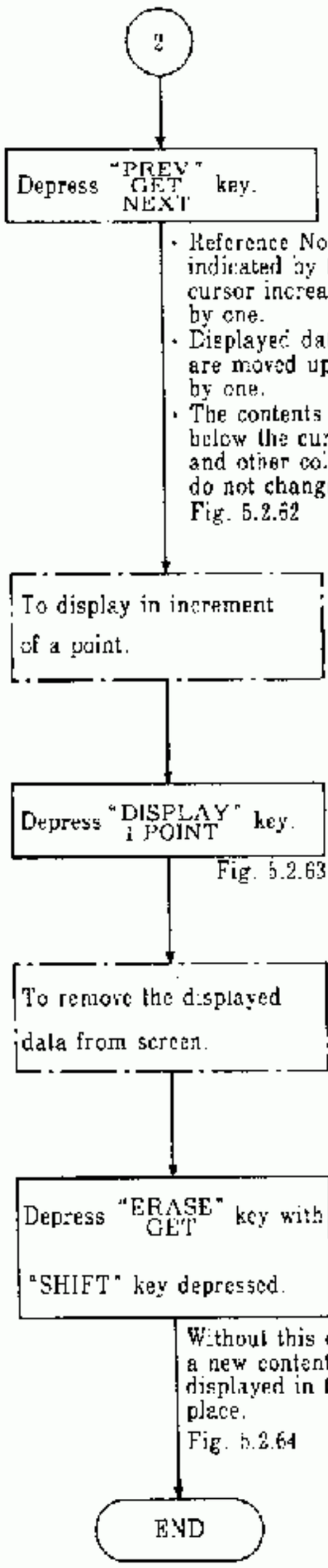


Fig. 5.2.61

(5) Indication of Any Discrete State (Cont'd)



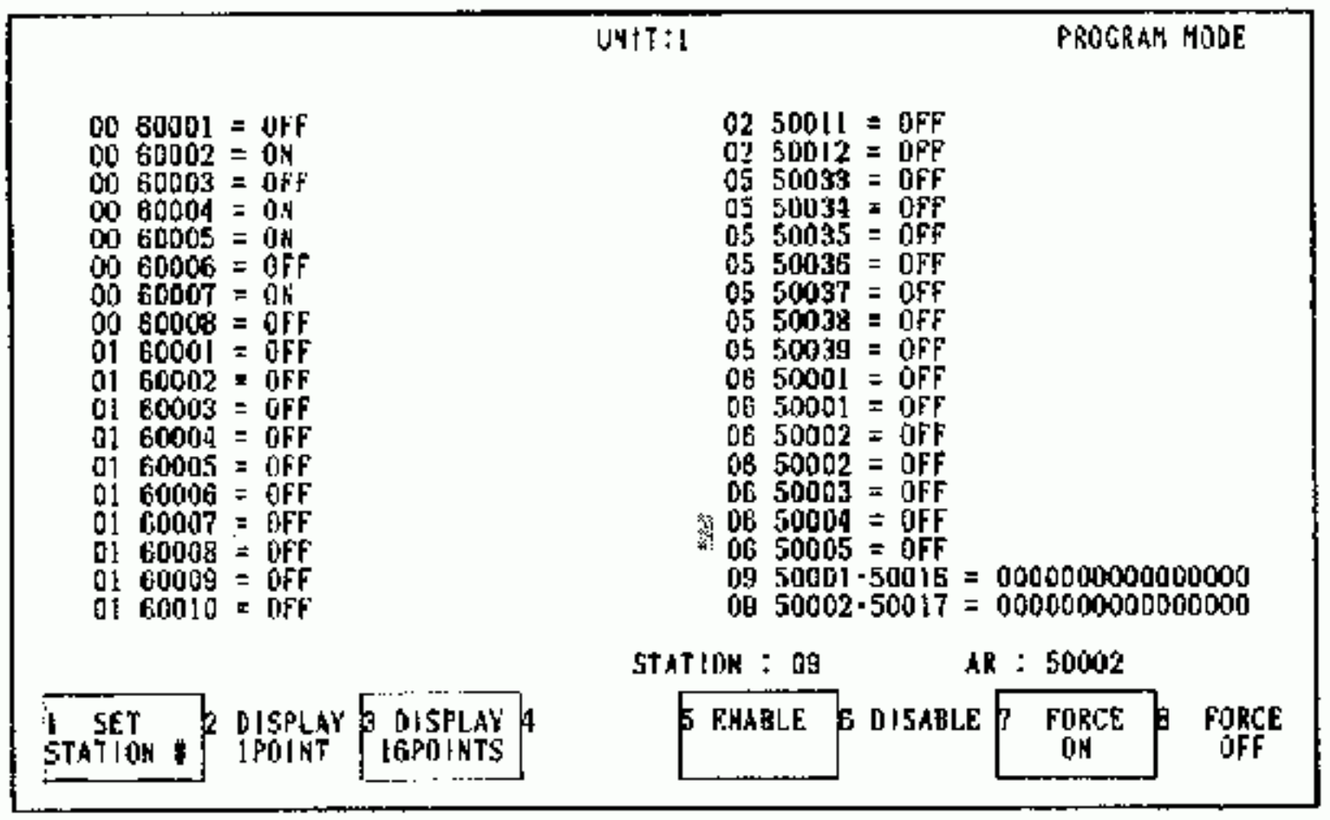


Fig. 5.2.62

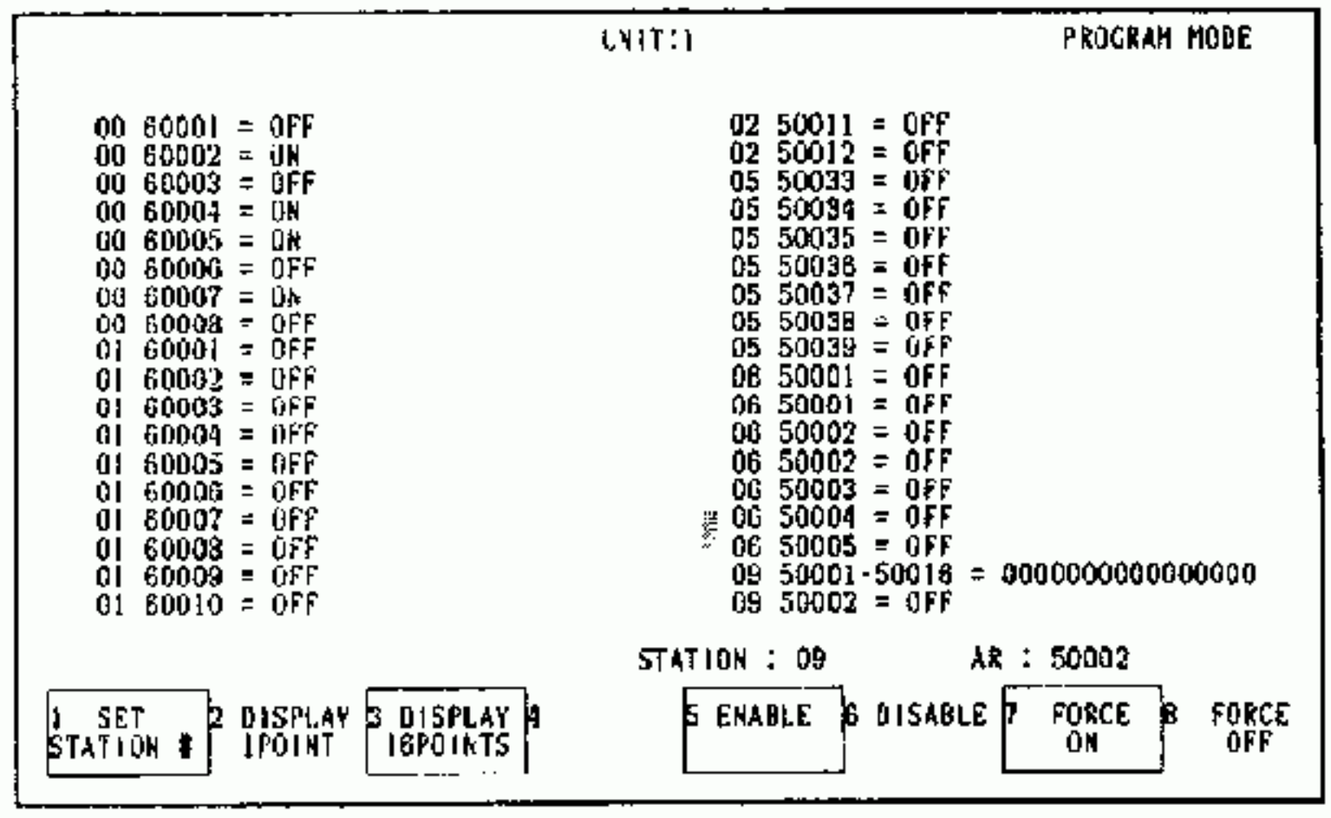


Fig. 5.2.63

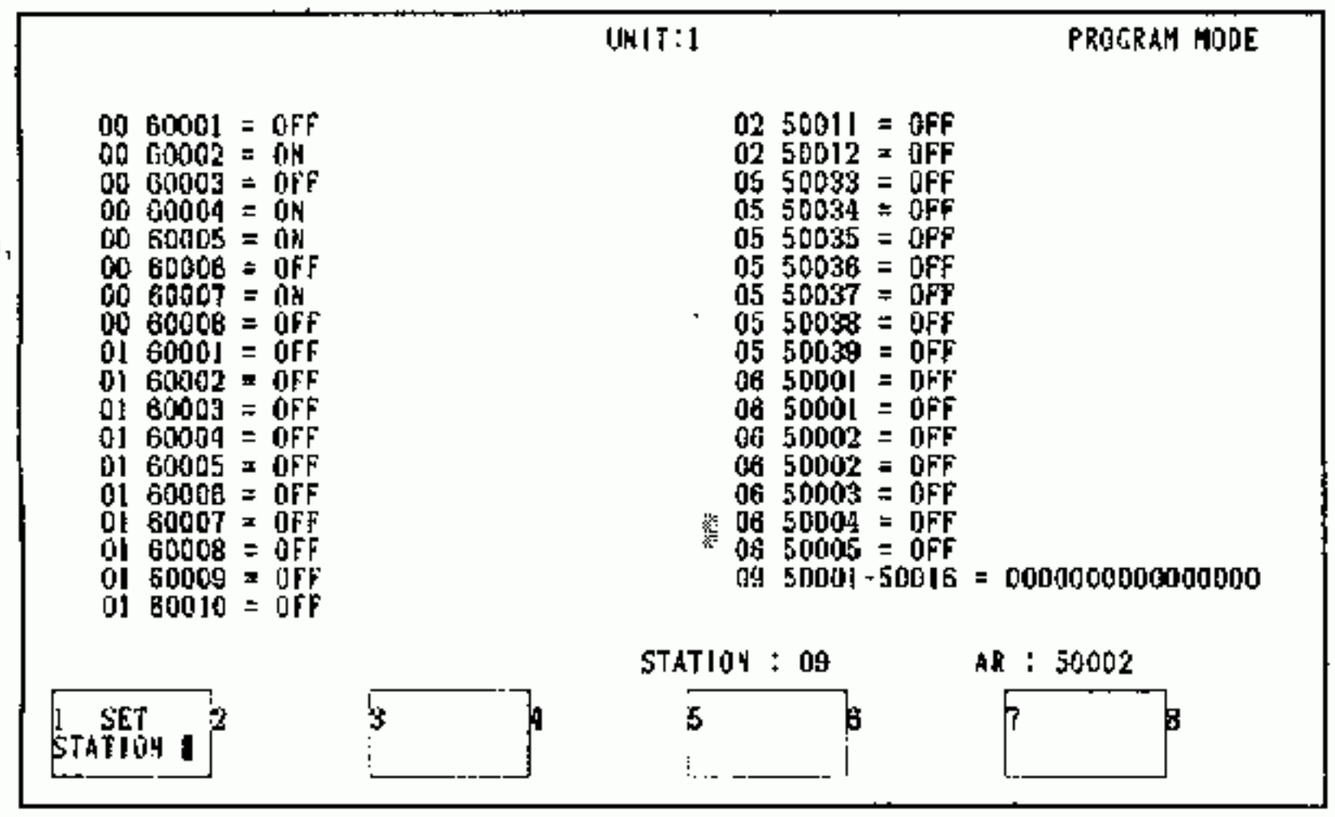


Fig. 5.2.64

NOTE

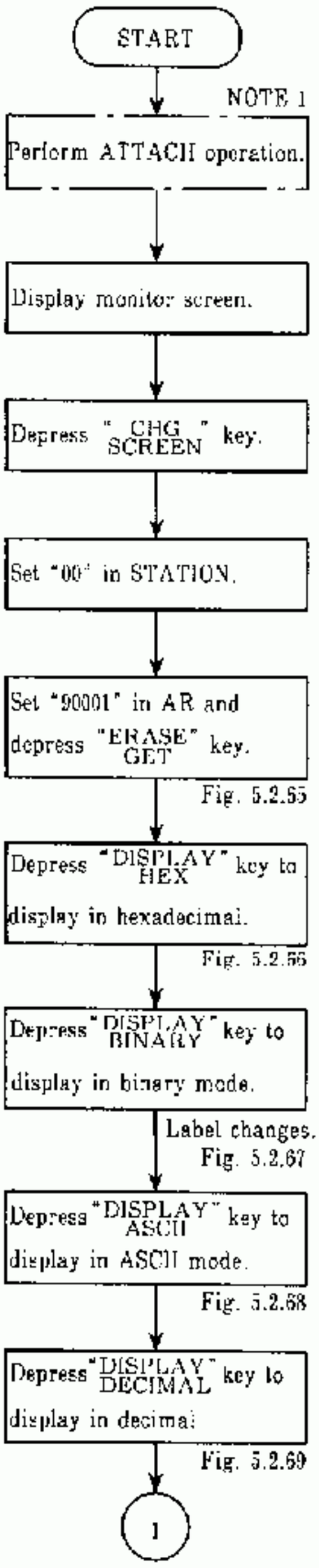
1. This step can be skipped, if ATTACH operation has already been completed.

2. When "CHG SCREEN" is depressed, an alternate operation occurs. (This does not clear the contents on the screen.)

3. In monitor mode, "ENABLE," "DISABLE," "FORCE ON," and "FORCE OFF" do not appear.

(6) Indication of Desired Register State

When "CHG SCREEN" is depressed while the monitor display appears, the expansion reference area appears as shown in Fig. 5.2.65, so that up to 36 desired registers can be indicated in 2 columns of 18 lines each.



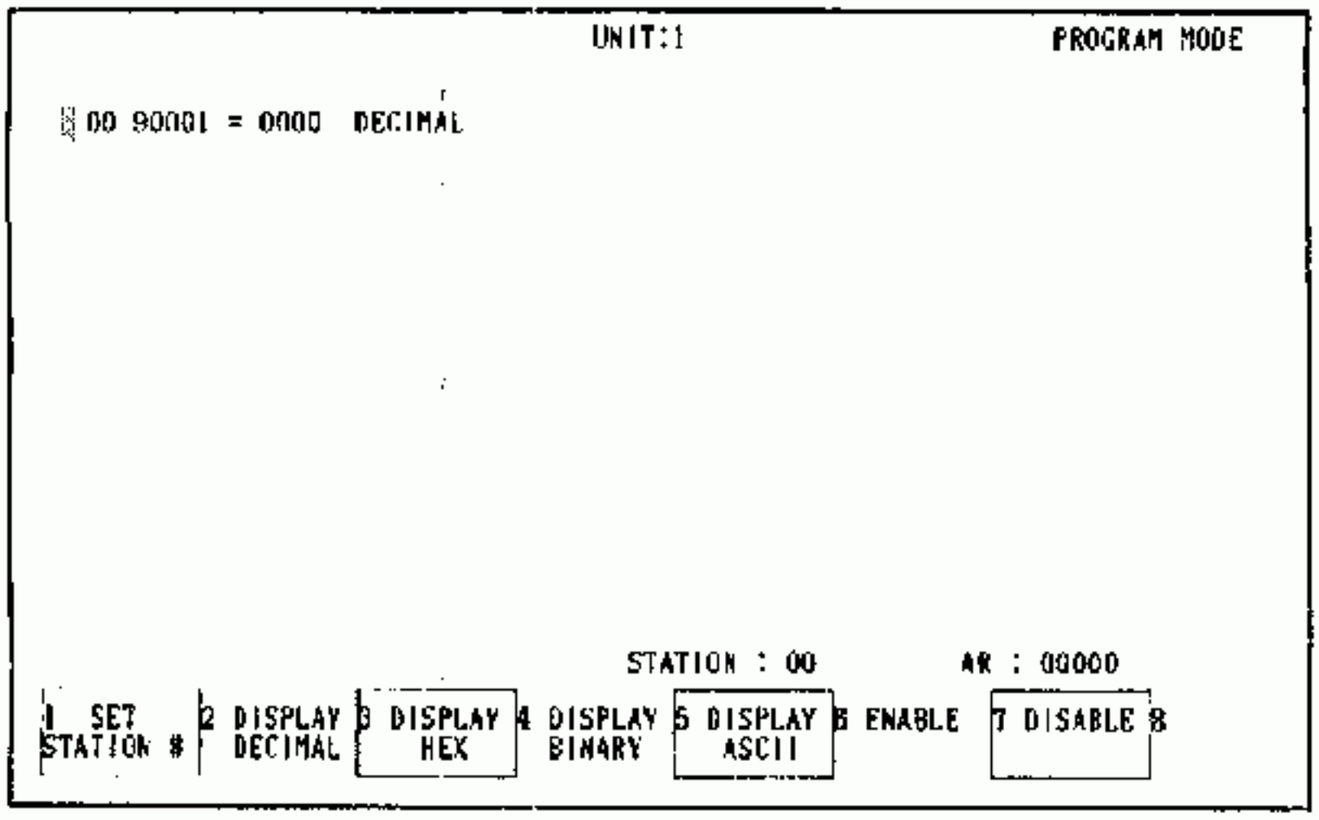


Fig. 5.2.65

Fig. 5.2.66

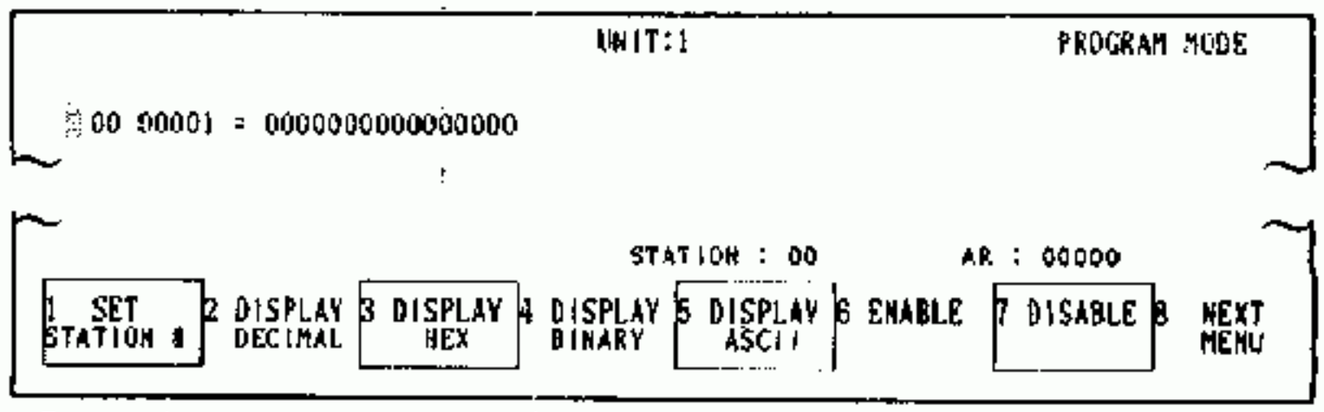


Fig. 5.2.67

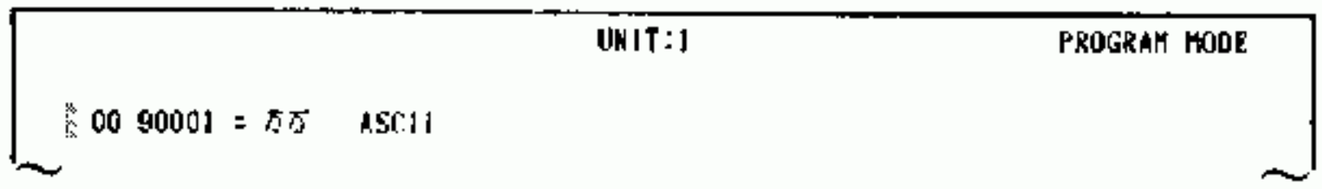
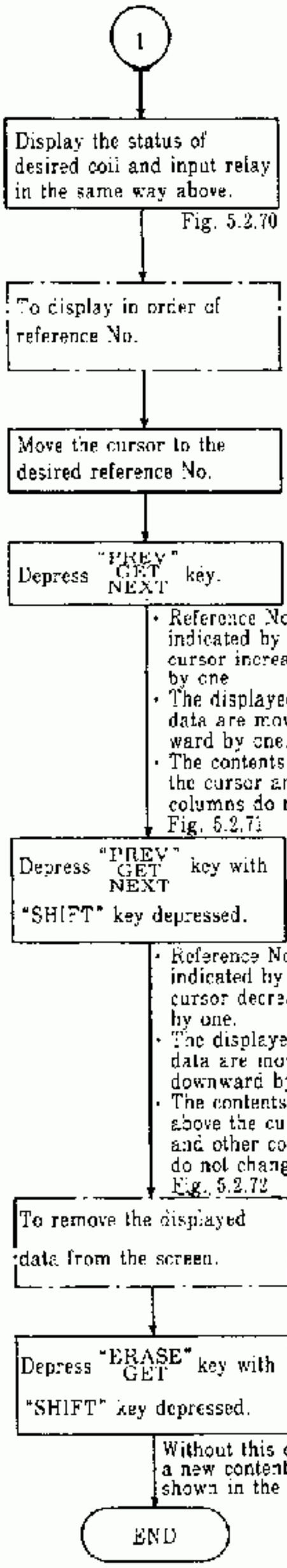


Fig. 5.2.68

Fig. 5.2.69

(6) Indication of Desired Register State (Cont'd)



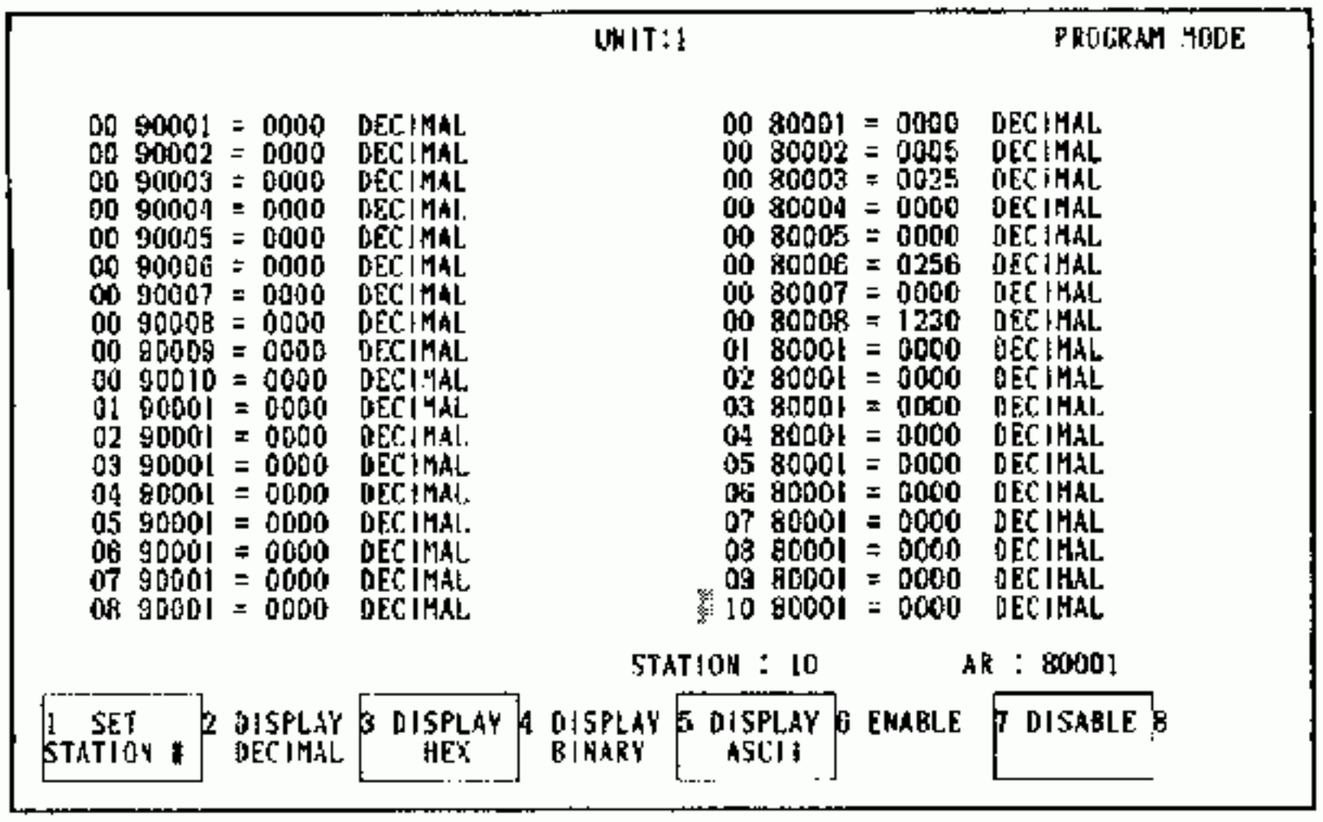


Fig. 5.2.70

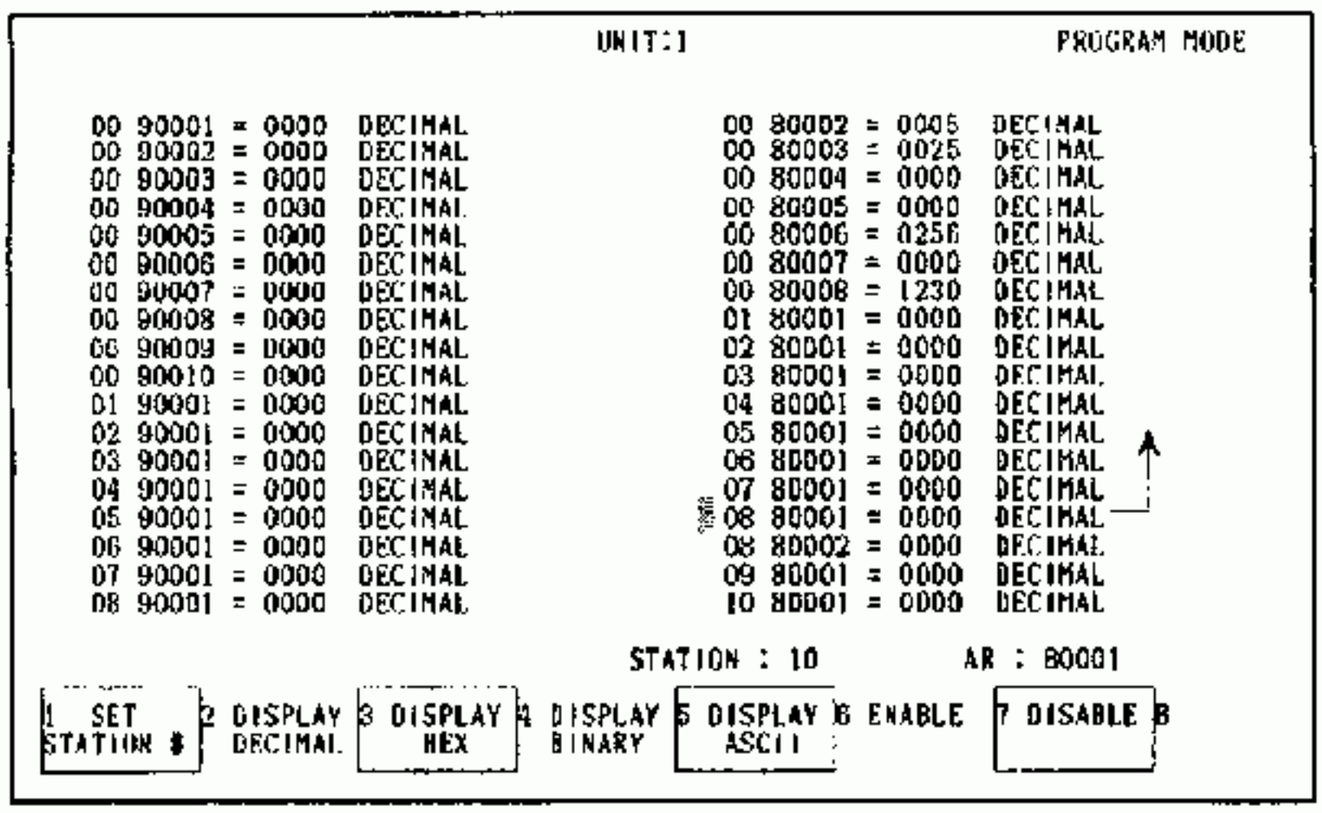


Fig. 5.2.71

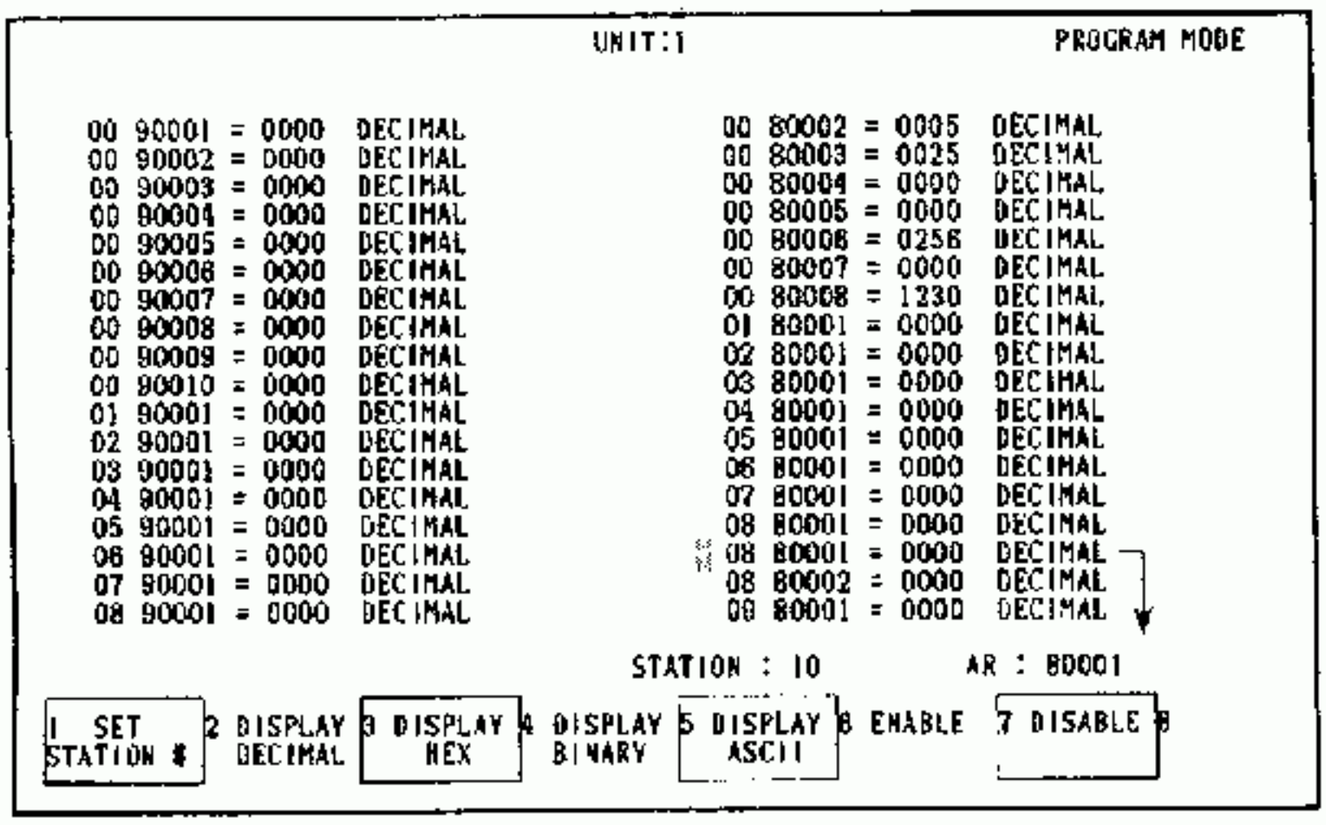


Fig. 5.2.72

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

2. When "CHG SCREEN" is depressed, an alternate operation occurs. (This does not clear the contents on the screen.)

3. In monitor mode, "ENABLE," "DISABLE," "NEXT MENU," and small cursor do not appear.

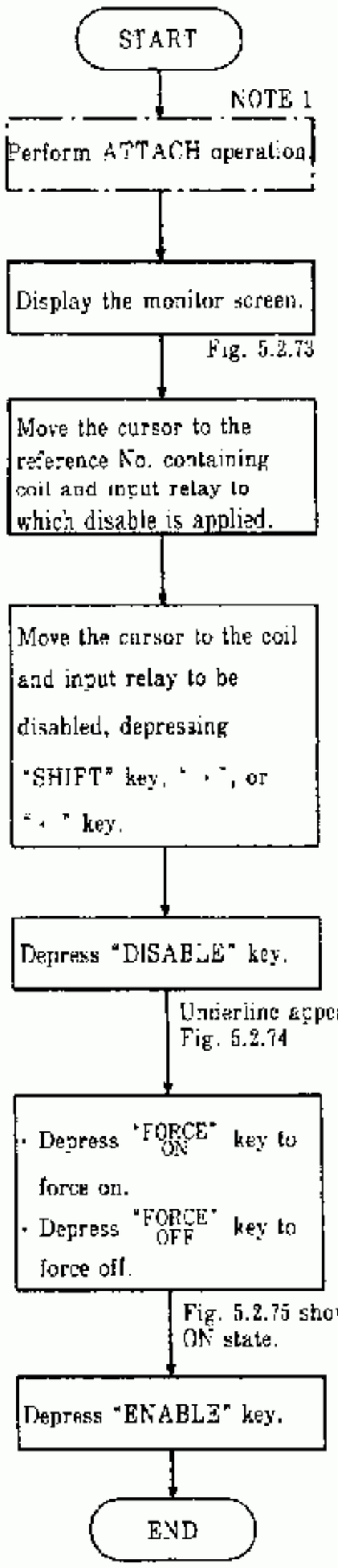
4. If a register content that is more than 9999 is set to decimal indication, it appears as follows :
   Example : 90001=>9999 OVERFLOW

5. If the register content that cannot be indicated in ASCII is so set, it appears as follows :
   Example : 90001 = 万万 ASCII

5.2.5 Link Data Disable Operation

(1) Disabling Coils and Input Relays

While the monitor display or expansion reference area appears, a disable operation (forced ON and OFF operations) can be carried out by specifying disable to the desired coil or input relay.




```
                                   UNIT:1                          PROGRAM MODE

              ** MASTER (STATION 00) DISCRETE MONITOR **

 70001-70008 = 00000000
 60001-60016 = 0101101001000000          50001-50016 = 0000000000000000
 60017-60032 = 0000100000000000          50017-50032 = 0000000000000000
 60033-60048 = 0000010011100000          50033-50048 = 0000000000000000
 60049-60064 = 0000000000000000          50049-50064 = 0000000000000000
 60065-60080 = 0001000100000000          50065-50080 = 0000000000000000
 60081-60096 = 0000000000000000          50081-50096 = 0000000000000000
 60097-60112 = 0000000000000000          50097-50112 = 0000000000000000
 60113-60128 = 0000000000000000          50113-50128 = 0000000000000000
 60129-60144 = 0000000000000000          50129-50144 = 0000000000000000
 60145-60160 = 0000000000000000          50145-50160 = 0000000000000000
 60161-60176 = 0000000000000000          50161-50176 = 0000000000000000
 60177-60192 = 0000000000000000          50177-50192 = 0000000000000000
 60193-60208 = 0000000000000000          50193-50208 = 0000000000000000
 60209-60224 = 0000000000000000          50209-50224 = 0000000000000000
 60225-60240 = 0000000000000000          50225-50240 = 0000000000000000
 60241-60256 = 0000000000000000          50241-50256 = 0000000000000000

                                   STATION : 00          AR : 00000

 1 SELECT STATION  2   3 ENABLE  4 DISABLE  5 FORCE ON  6 FORCE OFF  7 NEXT MENU  8
```

Fig. 5.2.73

```
 60081-60096 = 0000000000000000          50097-50112 = 0000000000000000
```

Fig. 5.2.74

```
 60081-60096 = 0000000000000000          50097-50112 = 0000000000000000
```

Fig. 5.2.75

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

2. When the discrete data is indicated as a one-point increment, a disable operation indicates the following:
   00 60001 = OFF DISABLED

3. In the monitor mode, no disable operation can be applied.

4. Disabled coil or input coil must be returned to enable state, when it is not necessary.

(2) Storing Data in Register

While the monitor display or expansion reference area appears, the desired numerics can be stored in a register. This is possible only when the register is disabled.

Data types that can be stored

Decimal : 0000 to 9999
Hexadecimal : 0000 to FFFF
Binary : Any 16-bit pattern
ASCII : Any 2 ASCII characters

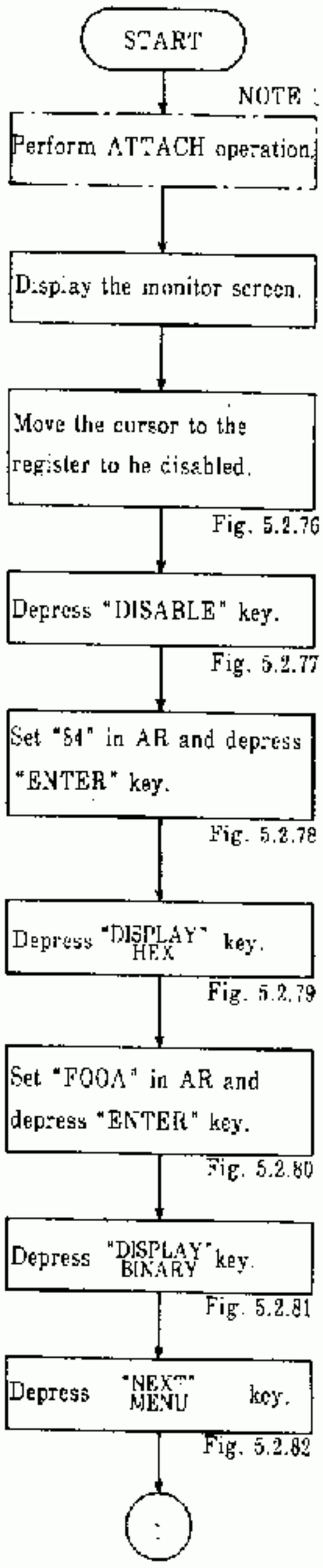


Fig. 5.2.76

Fig. 5.2.77

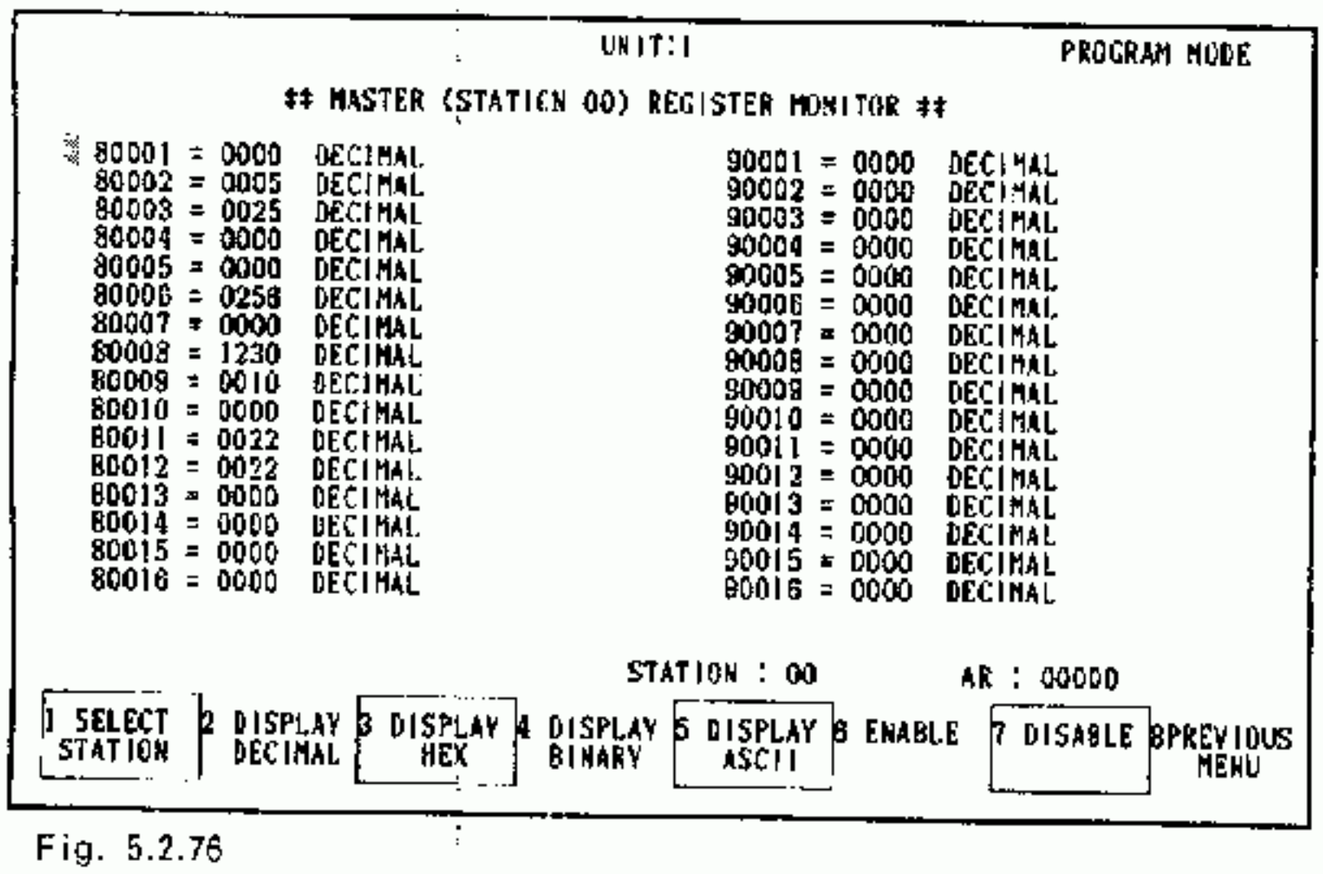
Fig. 5.2.78

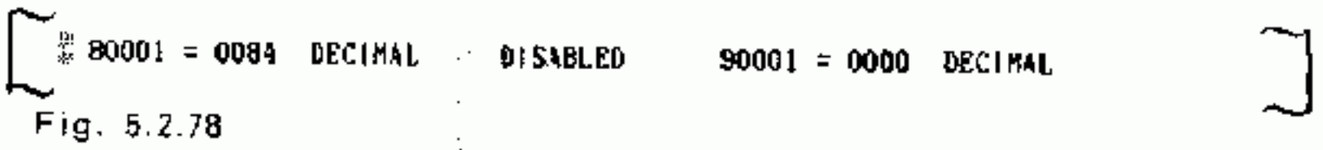
Fig. 5.2.79

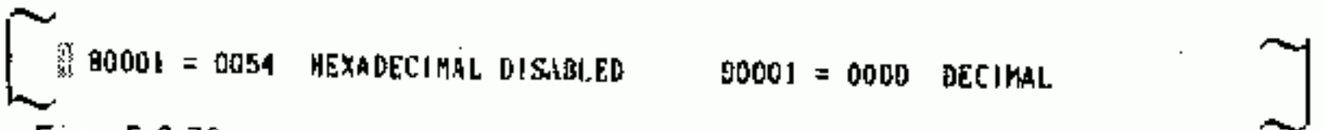
Fig. 5.2.80

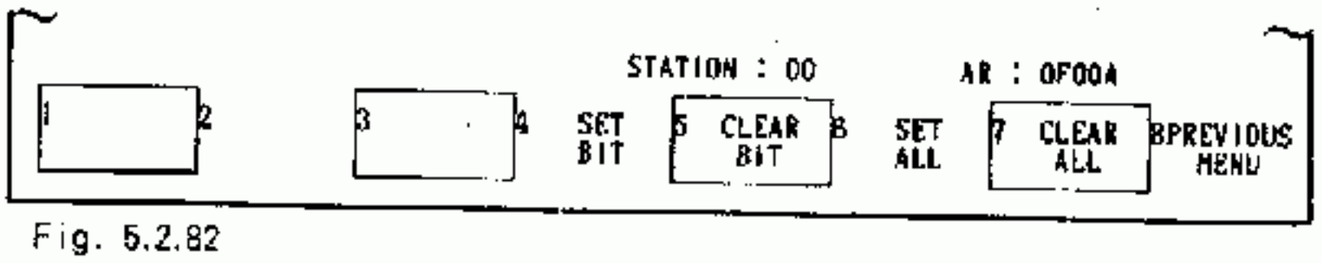
Fig. 5.2.81

Fig. 5.2.82

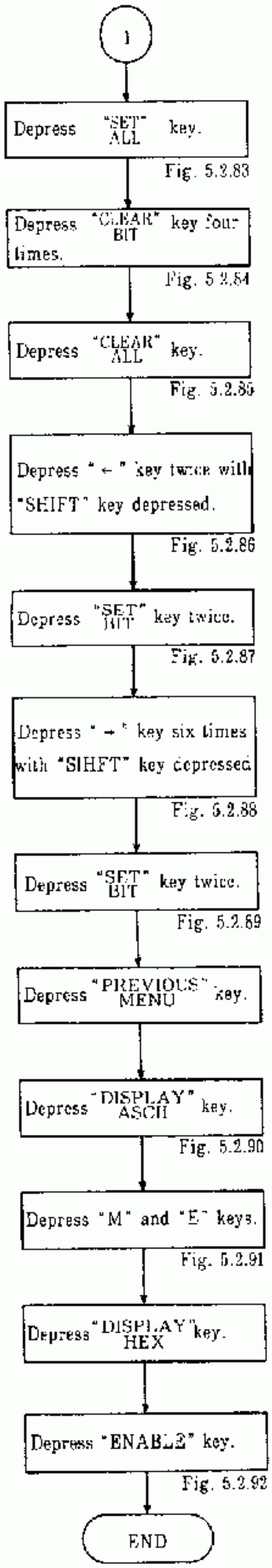








(2) Storing Data Register (Cont'd)




```
80001 = 1111111111111111  DISABLED      90001 = 0000  DECIMAL
```
Fig. 5.2.83

```
80001 = 0000111111111111  DISABLED      90001 = 0000  DECIMAL
```
Fig. 5.2.84

```
80001 = 0000000000000000  DISABLED      90001 = 0000  DECIMAL
```
Fig. 5.2.85

```
80001 = 0000000000000000  DISABLED      90001 = 0000  DECIMAL
```
Fig. 5.2.86

```
80001 = 0011000000000000  DISABLED      90001 = 0000  DECIMAL
```
Fig. 5.2.87

```
80001 = 0011000000000000  DISABLED      90001 = 0000  DECIMAL
```
Fig. 5.2.88

```
80001 = 0011000000110000  DISABLED      90001 = 0000  DECIMAL
```
Fig. 5.2.89

```
80001 = 00    ASCII       DISABLED      90001 = 0000  DECIMAL
```
Fig. 5.2.90

```
80001 = ME    ASCII       DISABLED      90001 = 0000  DECIMAL
```
Fig. 5.2.91

```
80001 = 0000  DECIMAL                   90001 = 0000  DECIMAL
```
Fig. 5.2.92

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

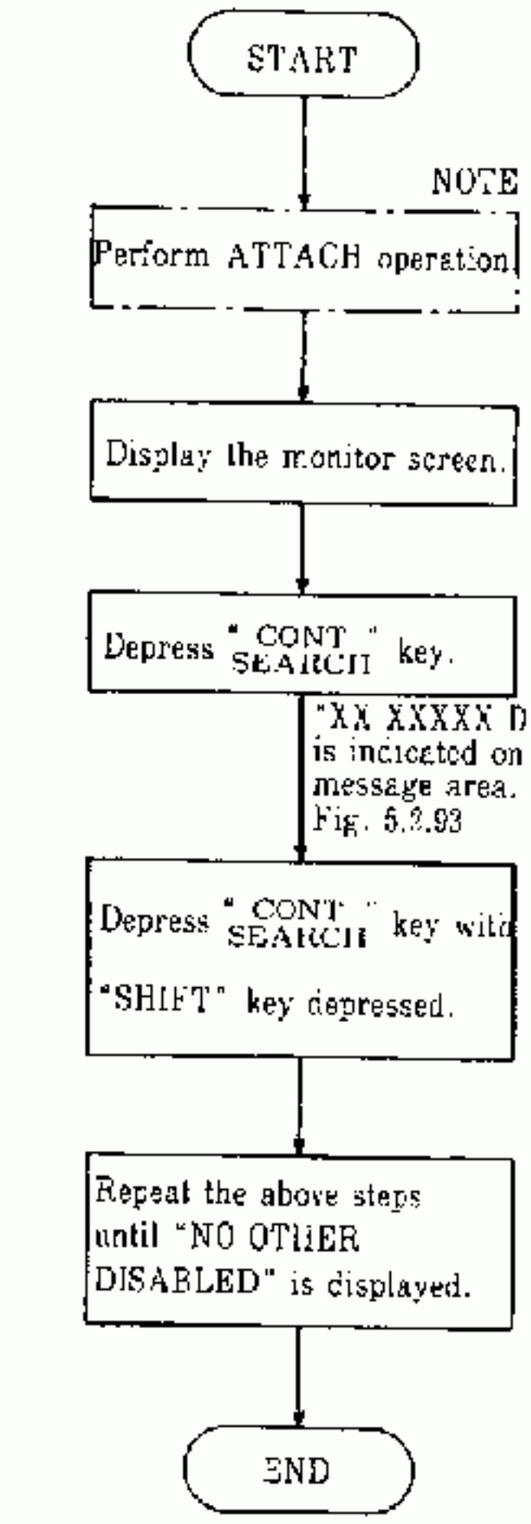
2. If a register content that is more than 9999 is set to decimal indication, it appears as follows :
   Example : 900001 -> 9999 OVERFLOW

3. If the register content that cannot be indicated in ASCII is so set, it appears as follows :
   Example : 90001= ぐあ ASCII

4. In the monitor mode, no numerics can be stored.

(3) Searching for Disabled Items

Disabled coils, input relays and registers can be searched for. This is used when disabled states have not been released.



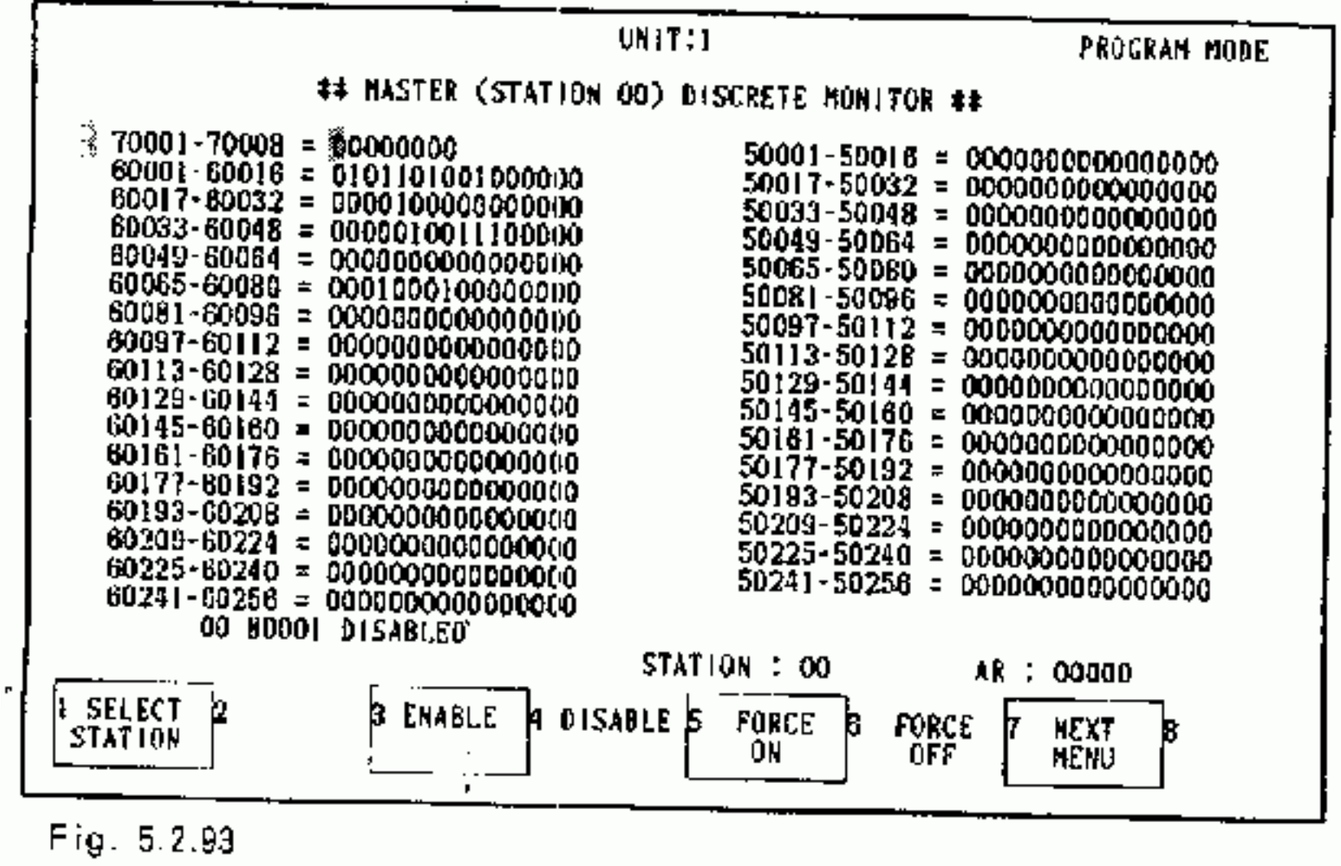


Fig. 5.2.93

NOTE

This step can be skipped, if ATTACH operation has already been completed.

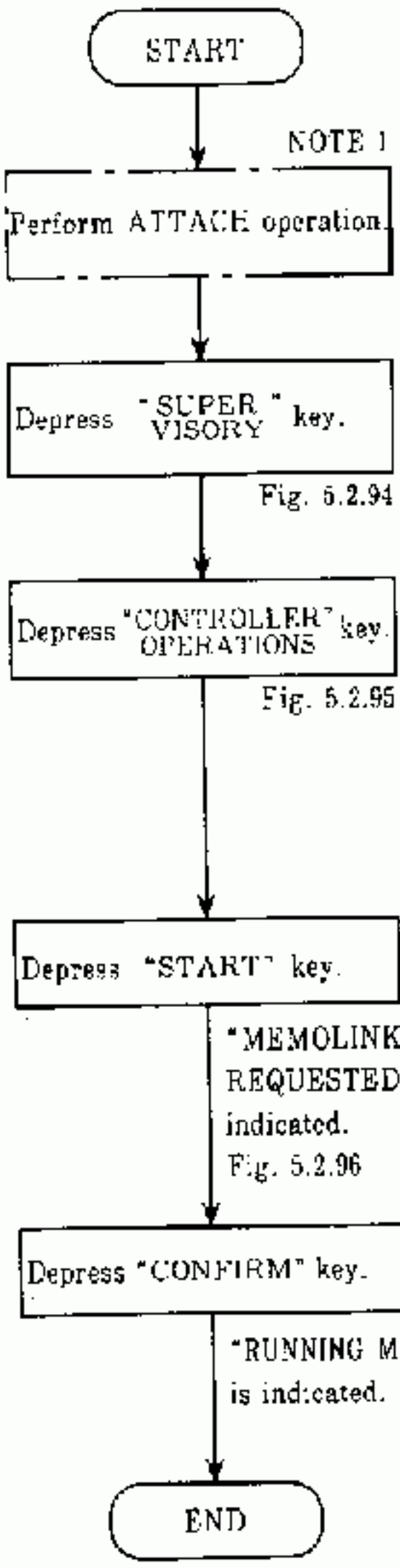
5.2.6 Controller Operation

(1) Start

This operation restarts MEMOLINK that is in the process of stopping.

POINT

Port parameter setting and disable operations can be carried out whether MEMOLINK is running or stopping. Clearing memory, allocation, and load operations can be done only when MEMOLINK is stopping.



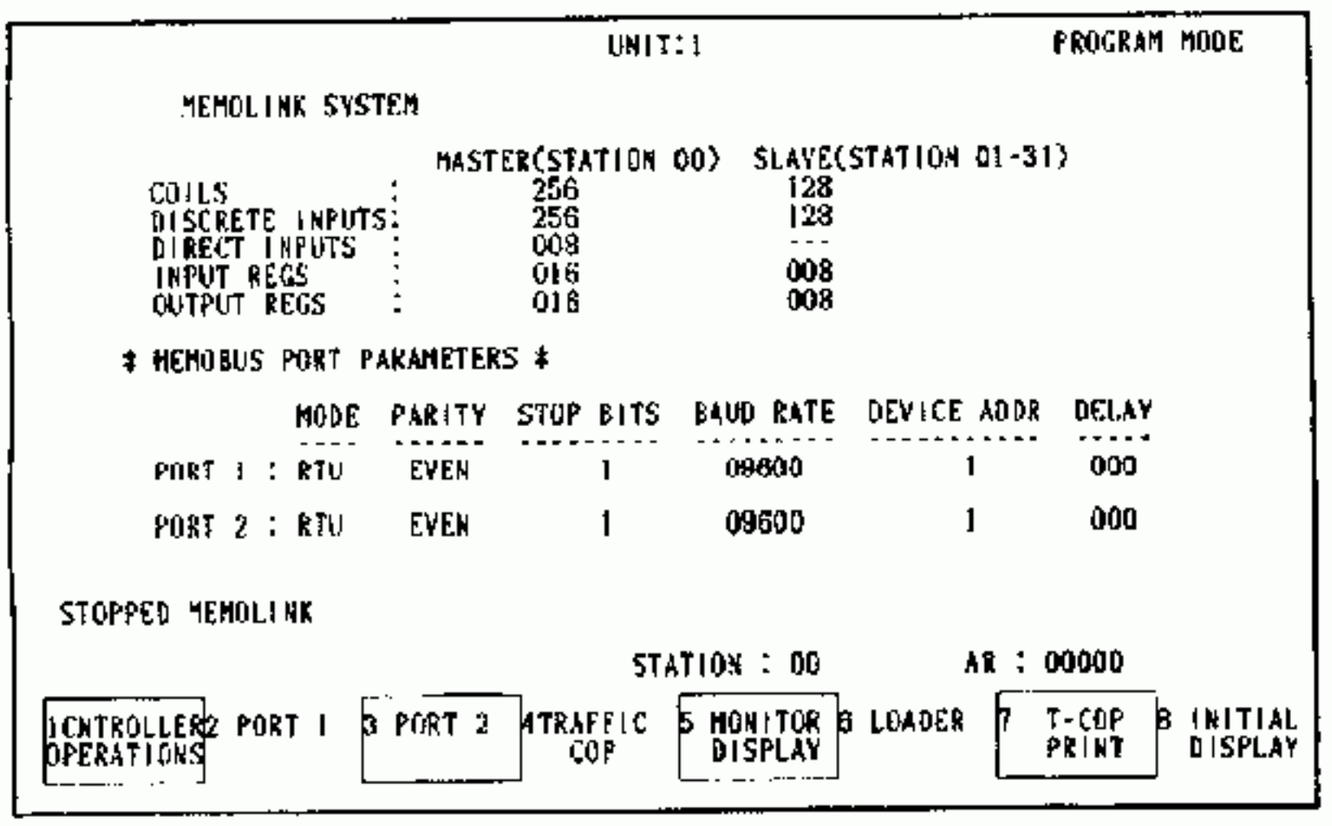


Fig. 5.2.94

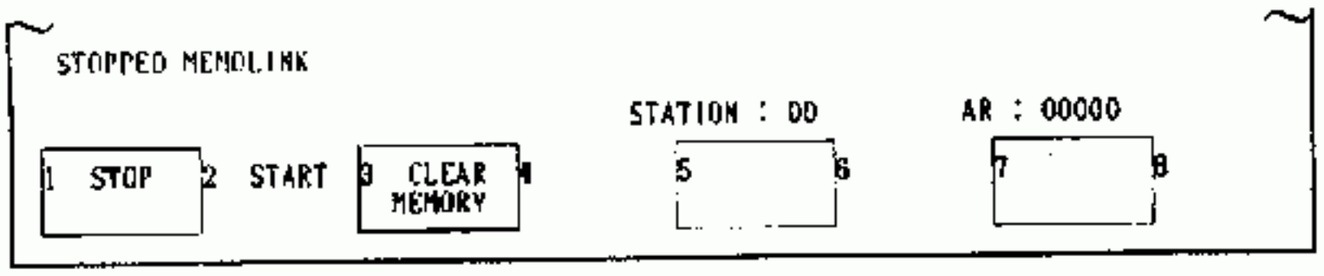


Fig. 5.2.95

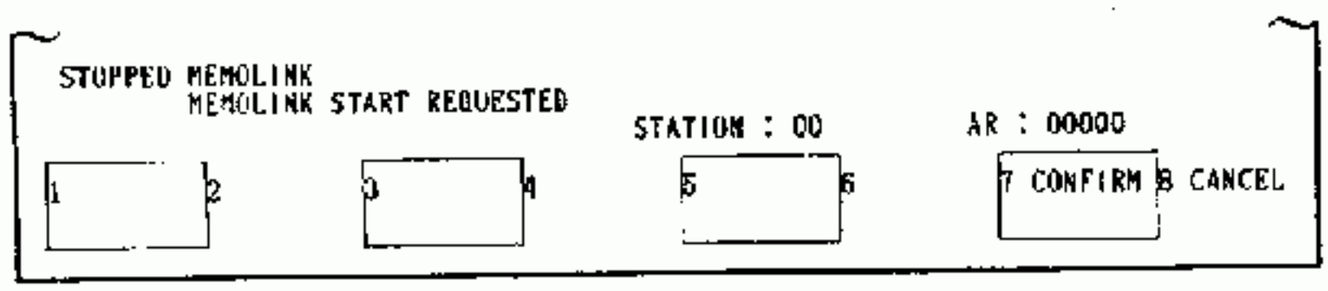


Fig. 5.2.96

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

2. If "CANCEL" is depressed instead of "CONFIRM," nothing happens, and the display returns to that shown in Fig. 5.2.95.

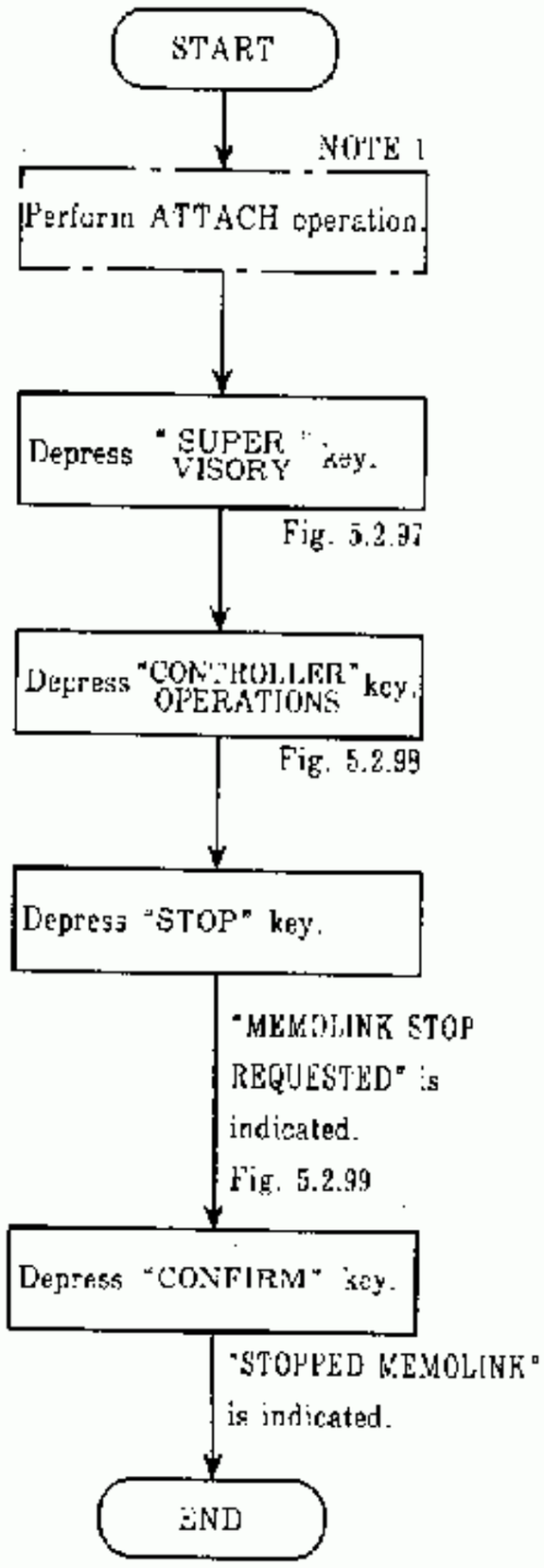
3. If "SUPER VISORY" is depressed in Fig. 5.2.95, the display returns to that shown in Fig. 5.2.94.

(2) Stop

This operation stops MEMOLINK that is running.

POINT

All operations are possible when MEMOLINK is stopping. Note that clearing memory, allocation, and load operations can be done only when MEMOLINK is stopping.



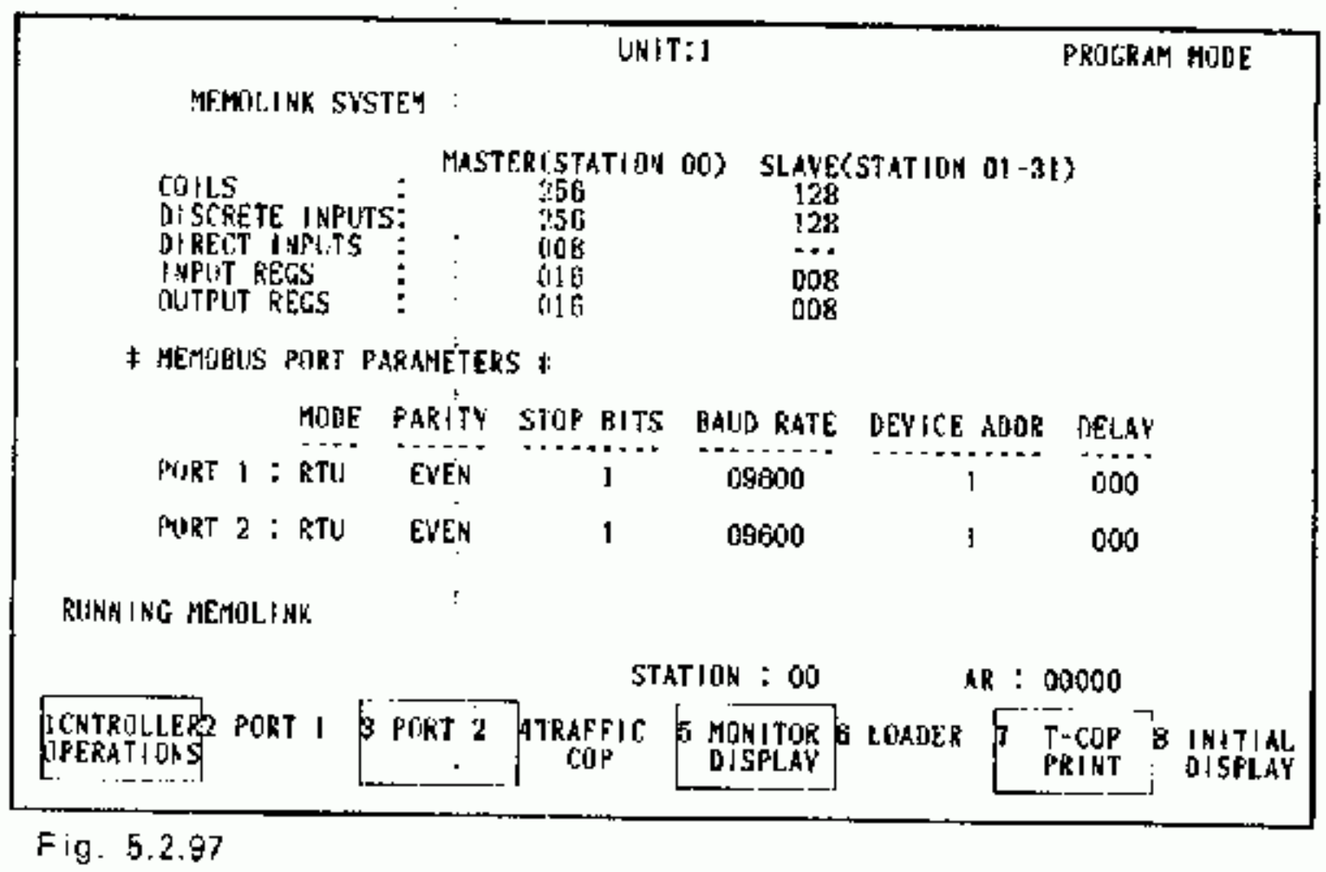


Fig. 5.2.97

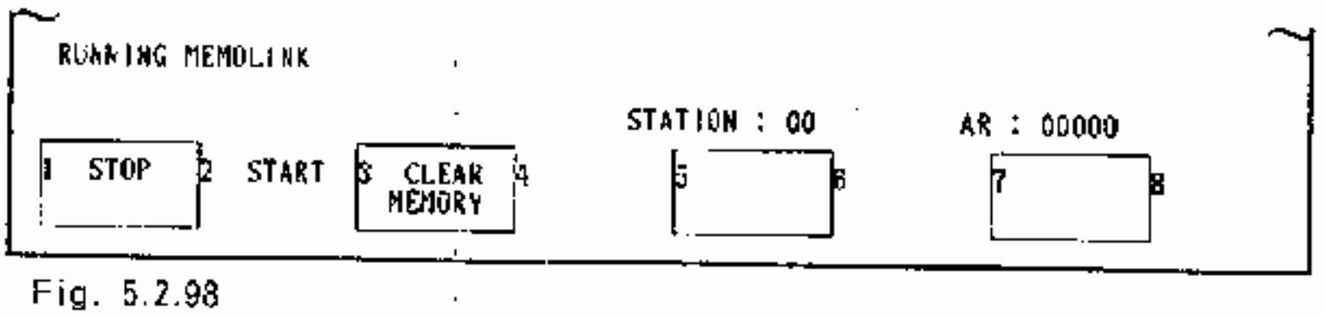


Fig. 5.2.98

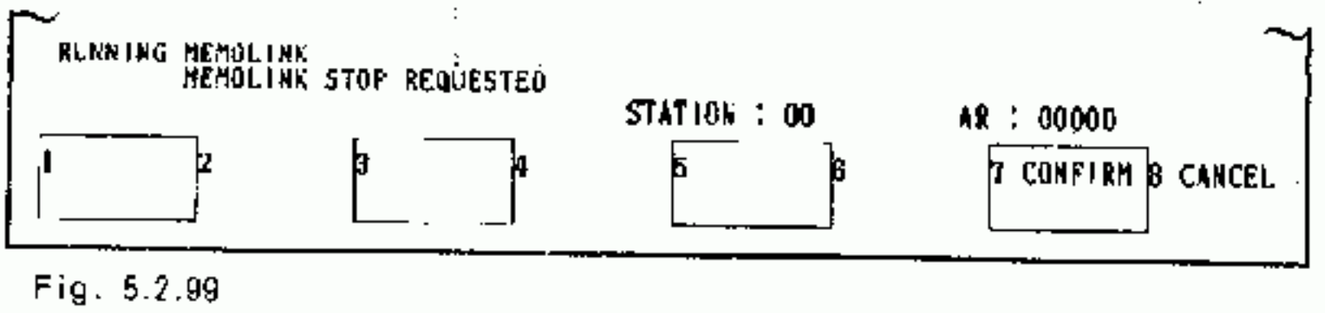


Fig. 5.2.99

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

2. If "CANCEL" is depressed instead of "CONFIRM," nothing happens, and the display treturns o that shown in Fig. 5.2.98.

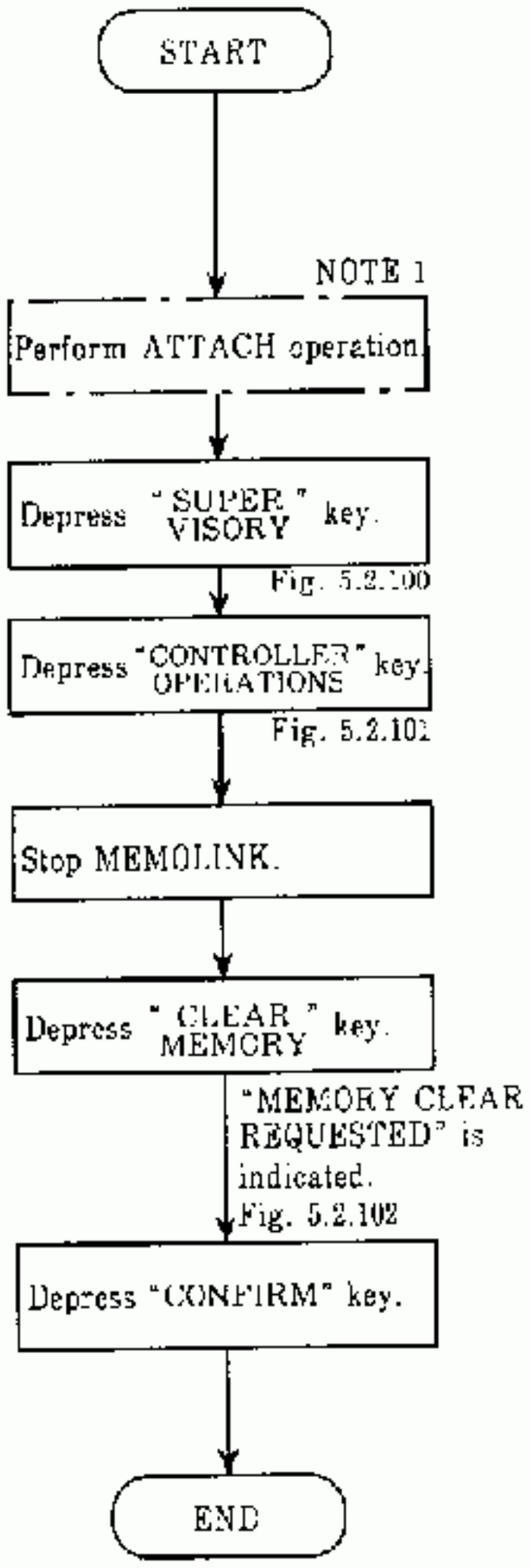
3. If "SUPER VISORY" is depressed in Fig. 5. 2.98, the display returns to that shown in Fig. 5.2.97.

(3) Clearing Memory

This operation clears the contents of I/O allocation table, disable table, and status table.

POINT

MEMOLINK must be stopped.




```
                                    UNIT:1                          PROGRAM MODE

  MEMOLINK SYSTEM

                          MASTER(STATION 00)  SLAVE(STATION 01-31)
  COILS            :           256                 128
  DISCRETE INPUTS  :           256                 128
  DIRECT INPUTS    :           008                 ---
  INPUT REGS       :           016                 008
  OUTPUT REGS      :           016                 008

  * MEMOBUS PORT PARAMETERS *

            MODE   PARITY   STOP BITS   BAUD RATE   DEVICE ADDR   DELAY
  PORT 1 : RTU     EVEN         1       09600           1         000
  PORT 2 : RTU     EVEN         1       09600           1         000

  STOPPED MEMOLINK

                                        STATION : 00        AR : 00000

  1CONTROLLER OPERATIONS 2 PORT 1  3 PORT 2  4TRAFFIC COP  5 MONITOR DISPLAY  6 LOADER  7 T-COP PRINT  8 INITIAL DISPLAY
```

Fig. 5.2.100

```
  STOPPED MEMOLINK

                                        STATION : 00        AR : 00000

  1 STOP  2 START  3 CLEAR MEMORY  4        5        6        7        8
```

Fig. 5.2.101

```
  STOPPED MEMOLINK
  MEMOLINK TRAFFIC COP MEMORY CLEAR REQUESTED
                                        STATION : 00        AR : 00000

  1        2        3        4        5        6  7 CONFIRM  8 CANCEL
```

Fig. 5.2.102

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

2. If "CANCEL" is depressed instead of "CONFIRM," nothing happens and the display returns to that shown in Fig. 5.2.101.

3. If "SUPER VISORY" is depressed in Fig. 5. 2.101, the display returns to that shown in Fig. 5.2.100.

5.2.7 Save/Load/Verify of Allocation Data

This operation is for loading, (write-in), saving (read out) and verifying programs with the MEMORINK. Prepare data disk.

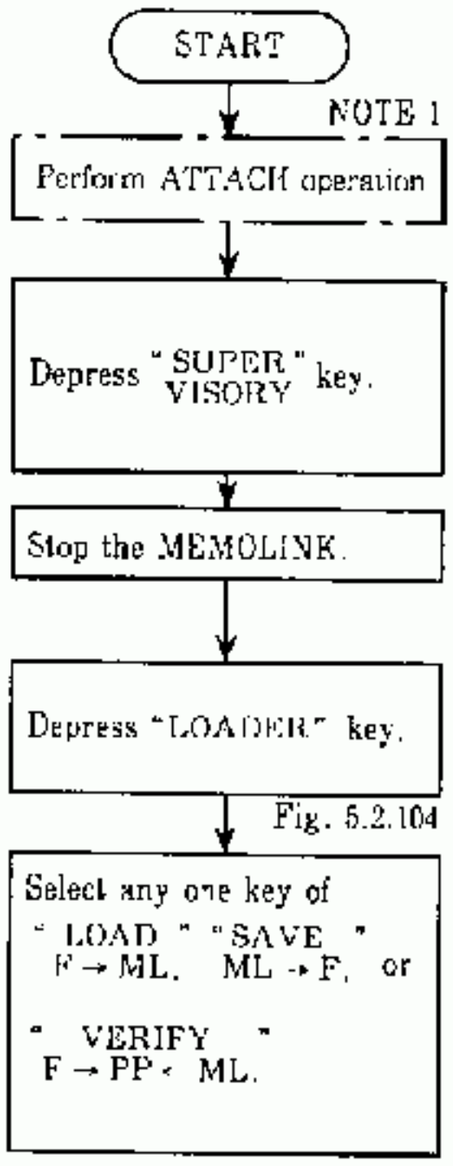


Fig. 5.2.103

Fig. 5.2.104

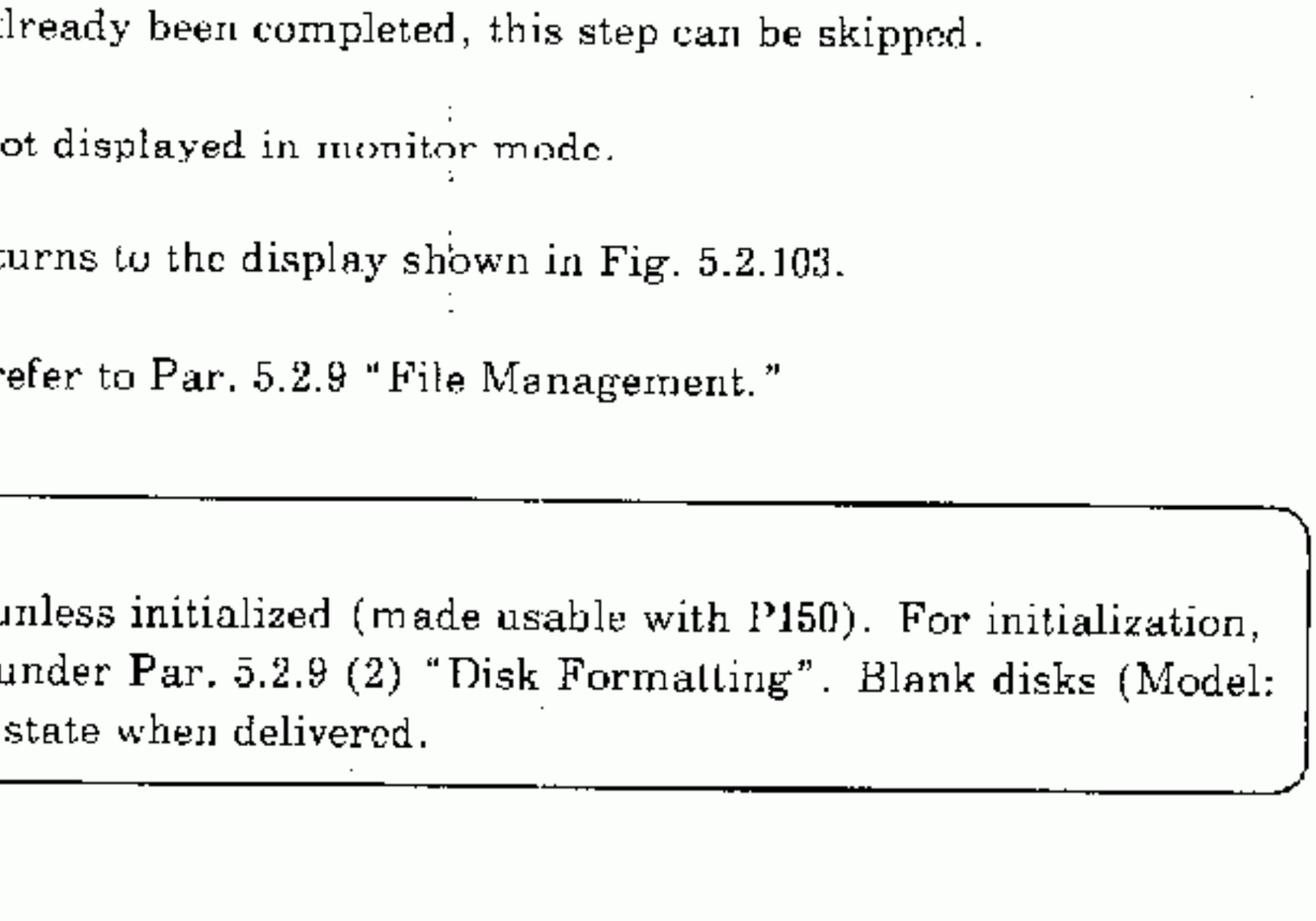


Fig. 5.2.104

NOTE

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

2. Label for "LOAD / F → ML" key is not displayed in monitor mode.

3. Depressing "PREVIOUS MENU" returns to the display shown in Fig. 5.2.103.

4. For operation of disk files, refer to Par. 5.2.9 "File Management."

IMPORTANT

The data disk cannot be used unless initialized (made usable with P150). For initialization, refer to the disk initialization under Par. 5.2.9 (2) "Disk Formatting". Blank disks (Model: P150-000) are in the initialized state when delivered.

(1) Saving Allocation Data

The memory contents of MEMOLINK master module can be saved on a data disk by the following operation. After saving , check the contents and store the disk. If the programs are destroyed, this disk can be used to restore them by loading.

POINT

Make the data disk ready for writing.

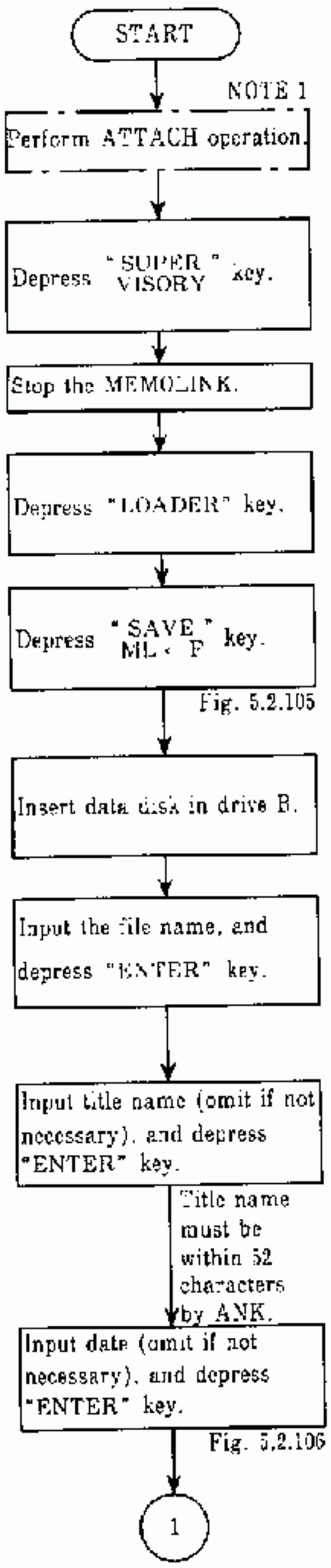


Fig. 5.2.106

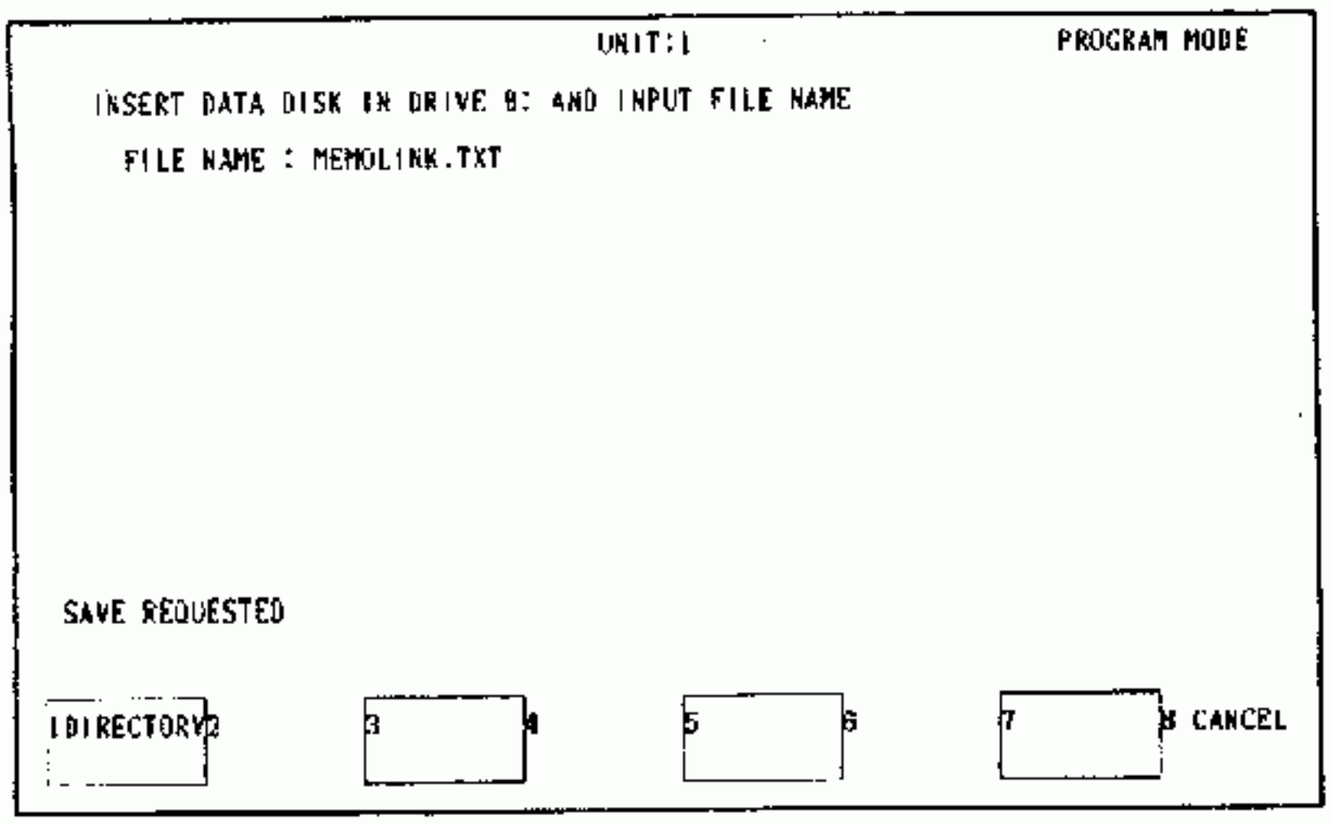


Fig. 5.2.105

POINT

File name is within 8 characters by ANK.
Escape character is within 3 characters.
Refer to Par. 5.2.9 (4).

$$\underbrace{\text{TESTLDR1}}_{\text{FILE NAME}} \bullet \underbrace{\text{U84}}_{\text{ESCAPE CHARACTER}}$$

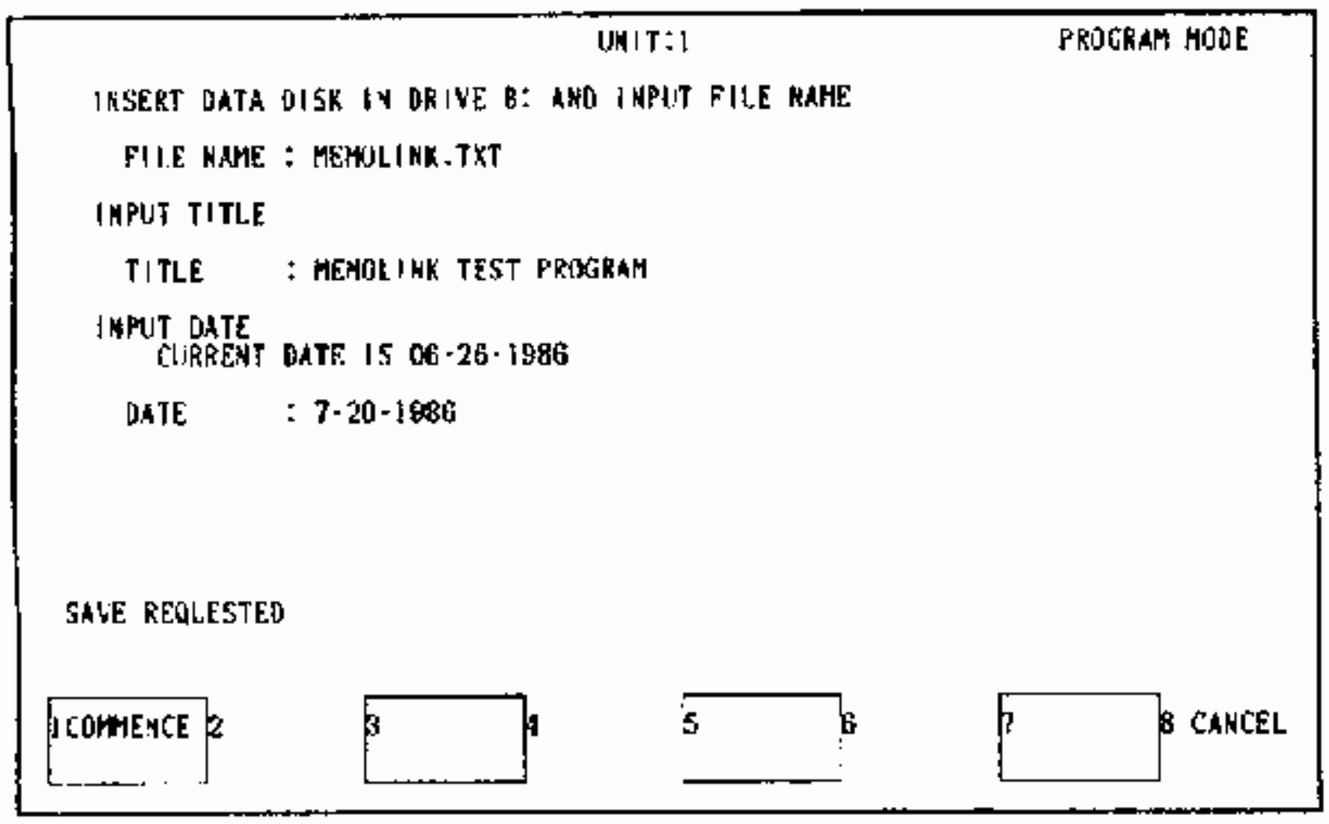


Fig. 5.2.106

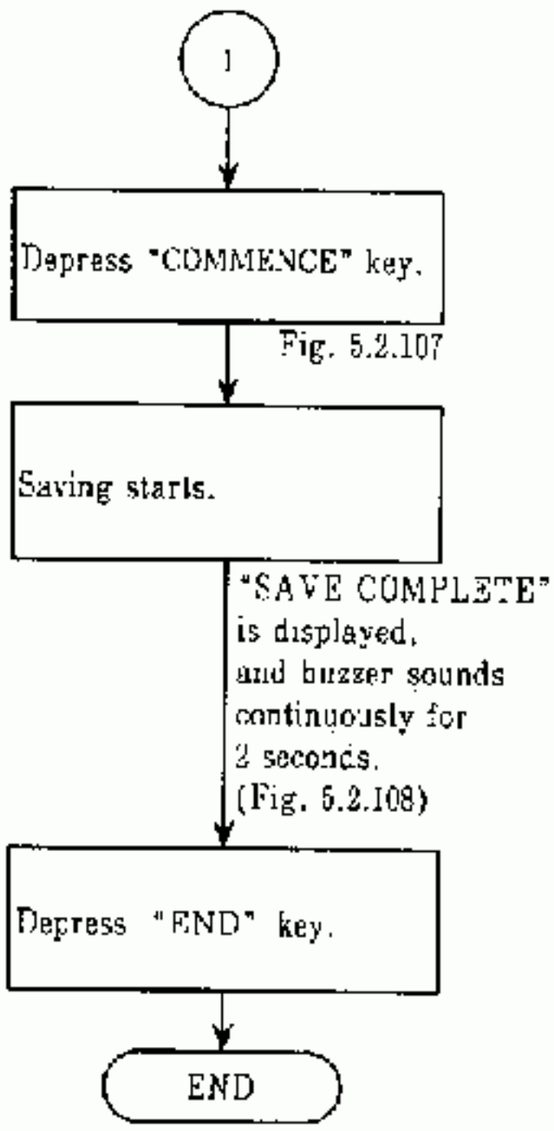


Fig. 5.2.107

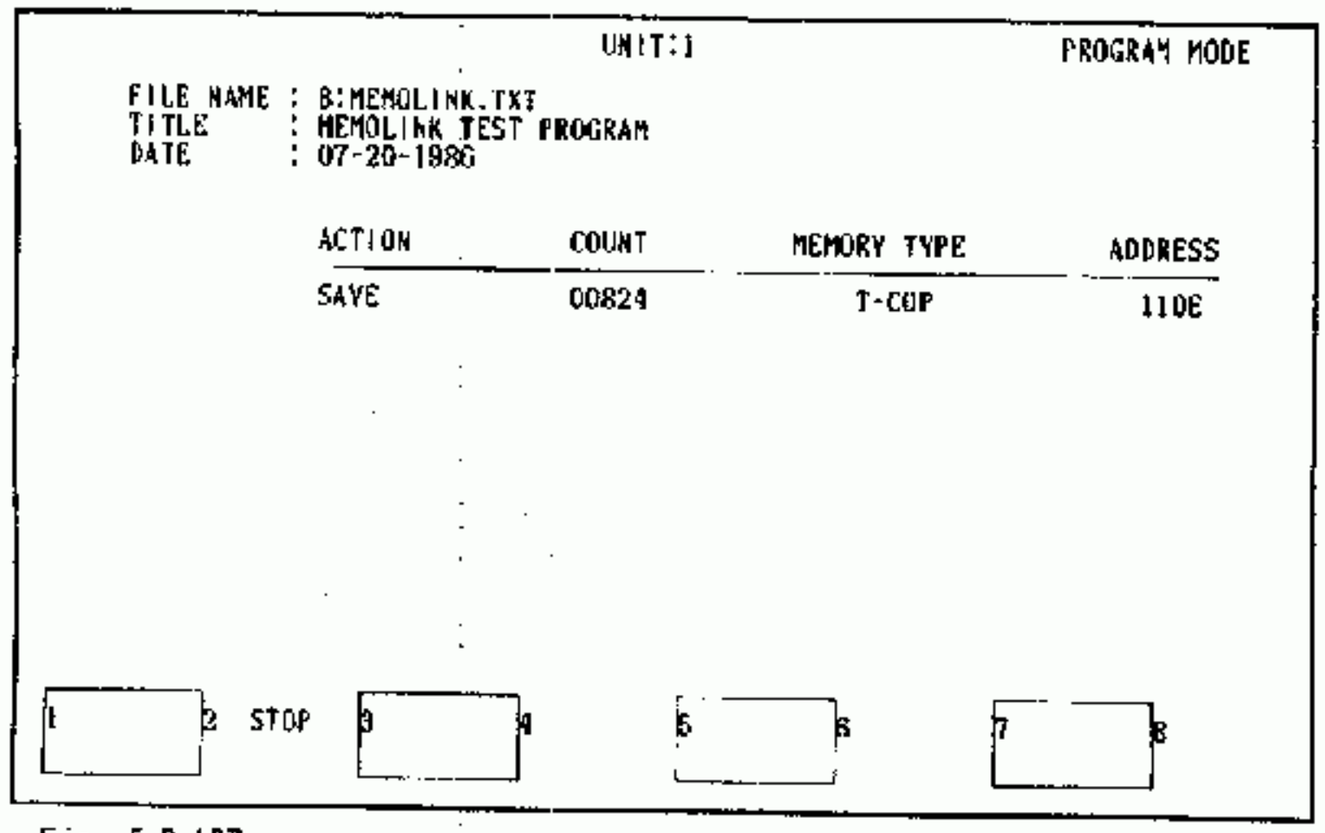


Fig. 5.2.107

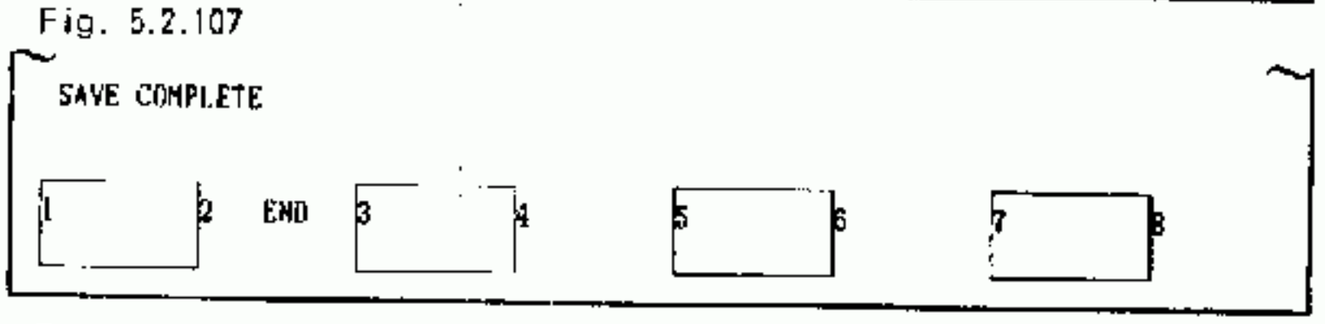


Fig. 5.2.108

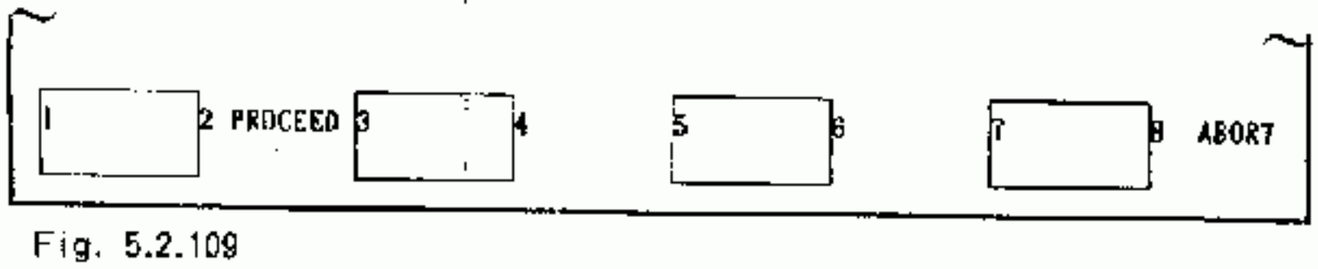


Fig. 5.2.109

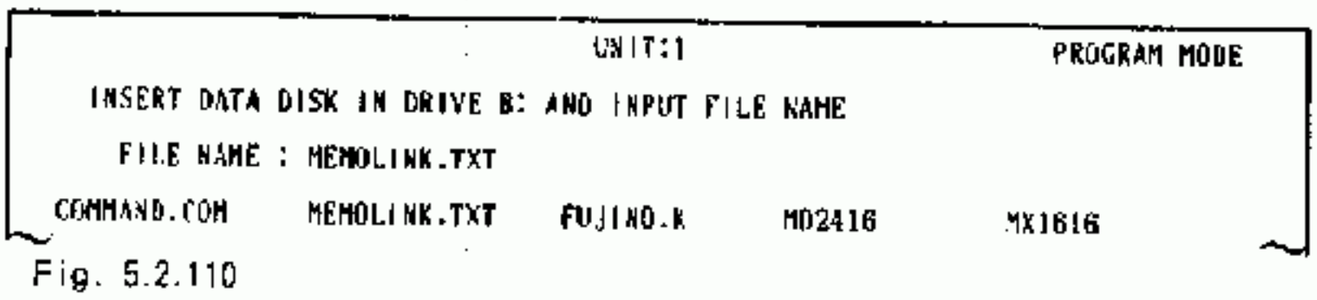


Fig. 5.2.110

NOTE

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

2. Depressing "DIRECTORY" key displays the file names. (Fig. 5.2.110).

3. Depressing "CANCEL" key restores the state as shown in Fig. 5.2.104.

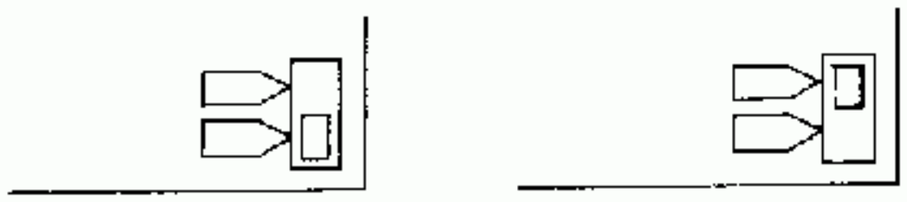
4. To stop the save process during save execution, depress "STOP" key (Fig. 5.2.107). The labels shown in Fig. 5.2.109 are displayed. Depressing "PROCEED" key causes the saving process to resume, and depressing "ABORT" key returns to the display as shown in Fig. 5.2.104.

5. Date can be input in the form "7-20-86" or "7/20/86" in addition to the example shown in Fig. 5.2.106.

6. Save operation can be executed also while MEMOLINK is running. However, execution of verify operation causes a mismatch.

IMPORTANT

Make the data disk ready for write-in beforehand.



(a) Write-in Disable

(b) Write-in Enable

(2) Loading Allocation Data

Data saved on disks can be written into MEMOLINK master module. After loading, check the contents and store the disk.

POINT

Stop the MEMOLINK before starting this operation.

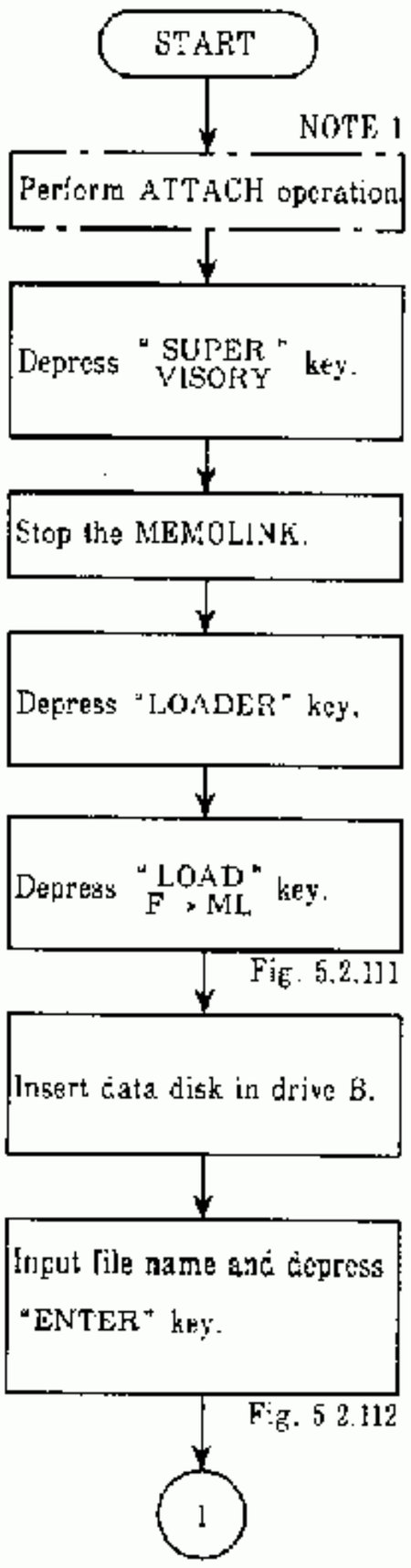


Fig. 5.2.111

Fig. 5.2.112

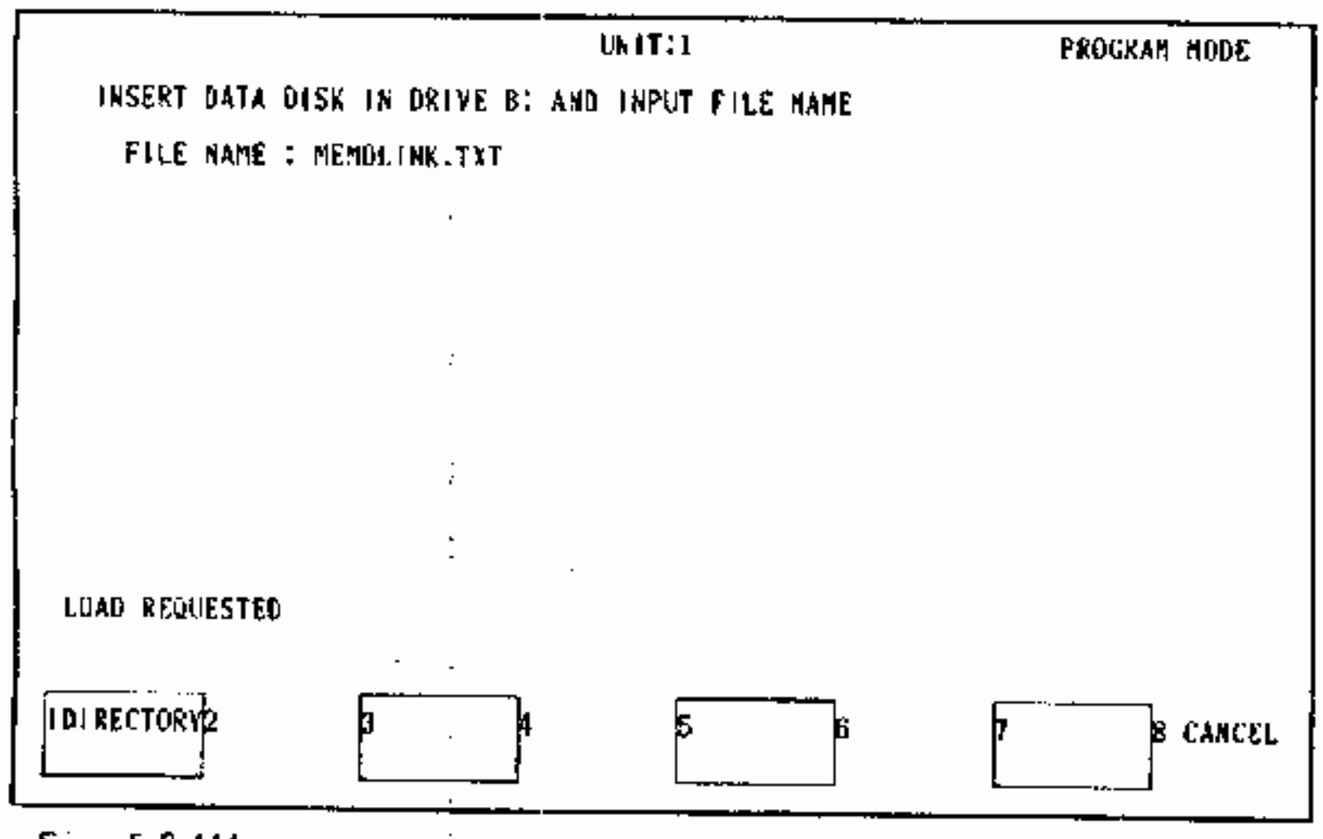


Fig. 5.2.111

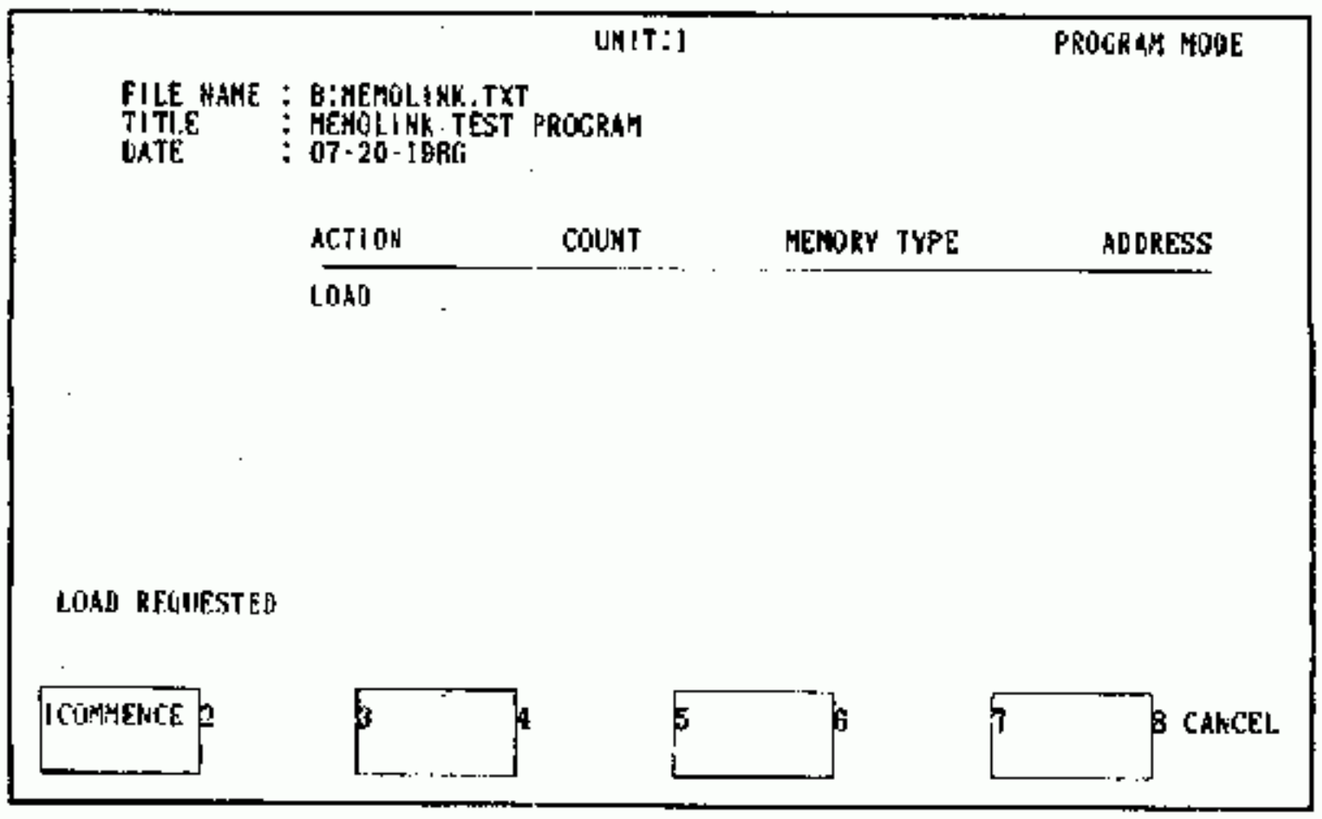
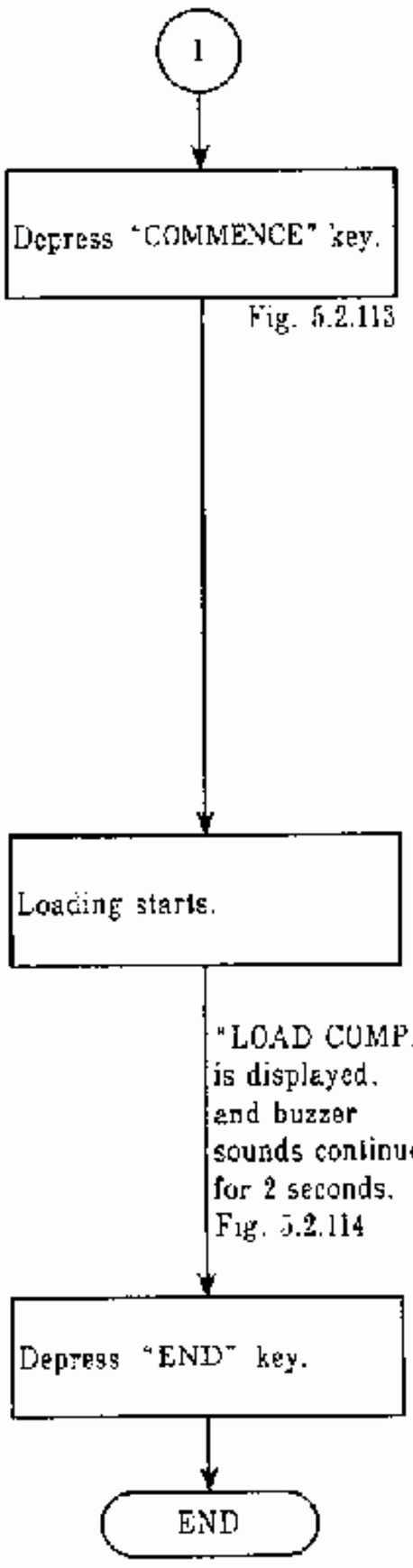


Fig. 5.2.112

(2) Loading Allocation Data (Cont'd)



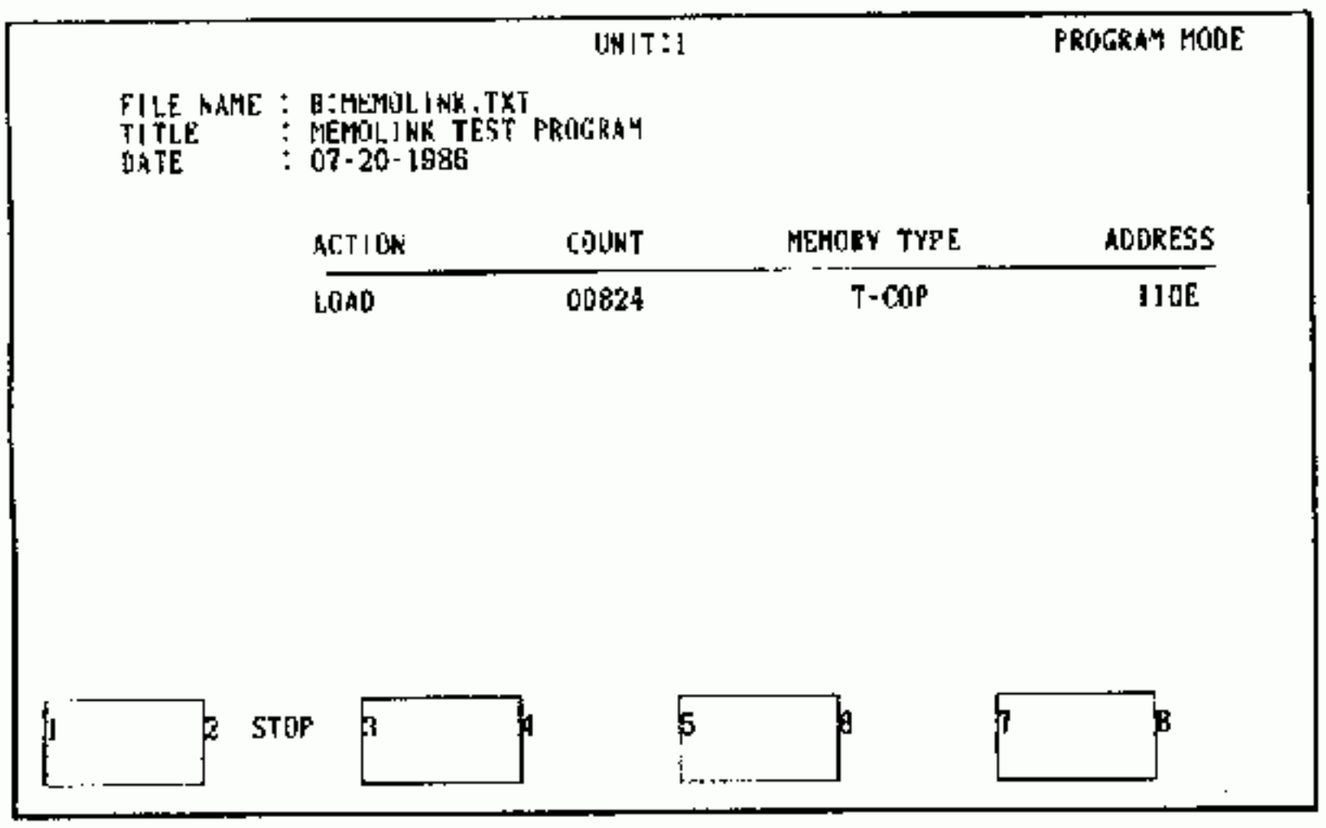


Fig. 5.2.113

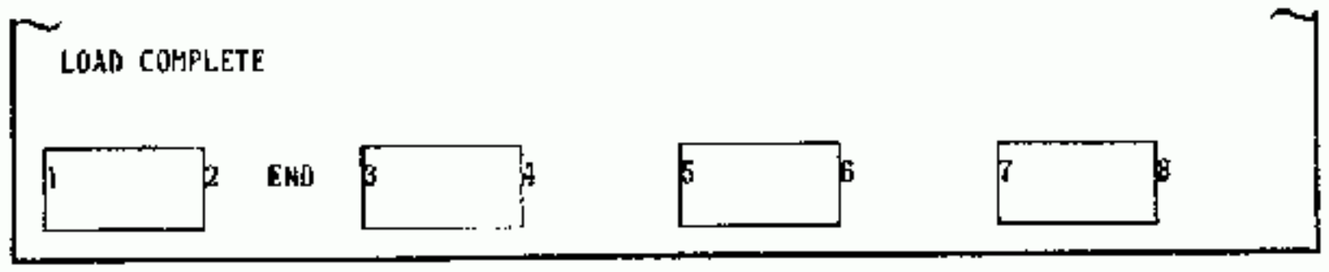


Fig. 5.2.114

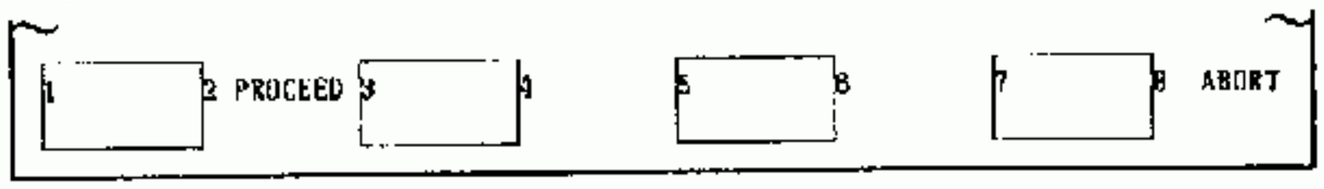


Fig. 5.2.115

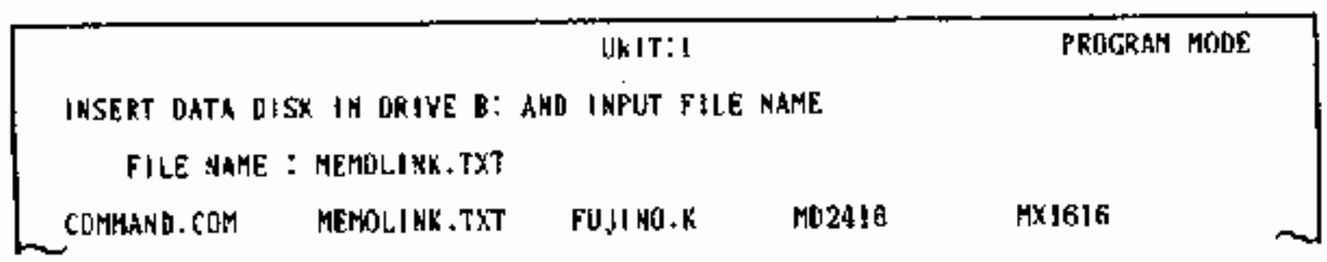


Fig. 5.2.116

NOTE

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

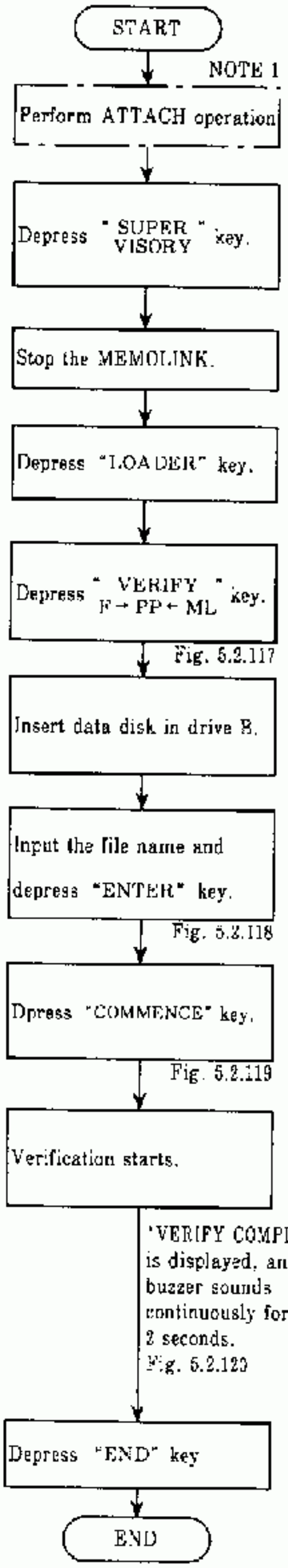
2. Depressing "DIRECTORY" key displays the file names (Fig. 5.2.116).

3. Depressing "CANCEL" key restors the state as shown in Fig. 5.2.104.

4. To stop the loading during execution, depress "STOP" key (Fig. 5.2.113). The labels shown in Fig. 5.2.115 are displayed. Depressing "PROCEED" key causes the loading to resume, and depressing "ABORT" key returns to the display as shown in Fig. 5.2.104.

(3) Verifying Allocation Data

This operation is used for verification of floppy disk contents and MEMOLINK master module memory contents.



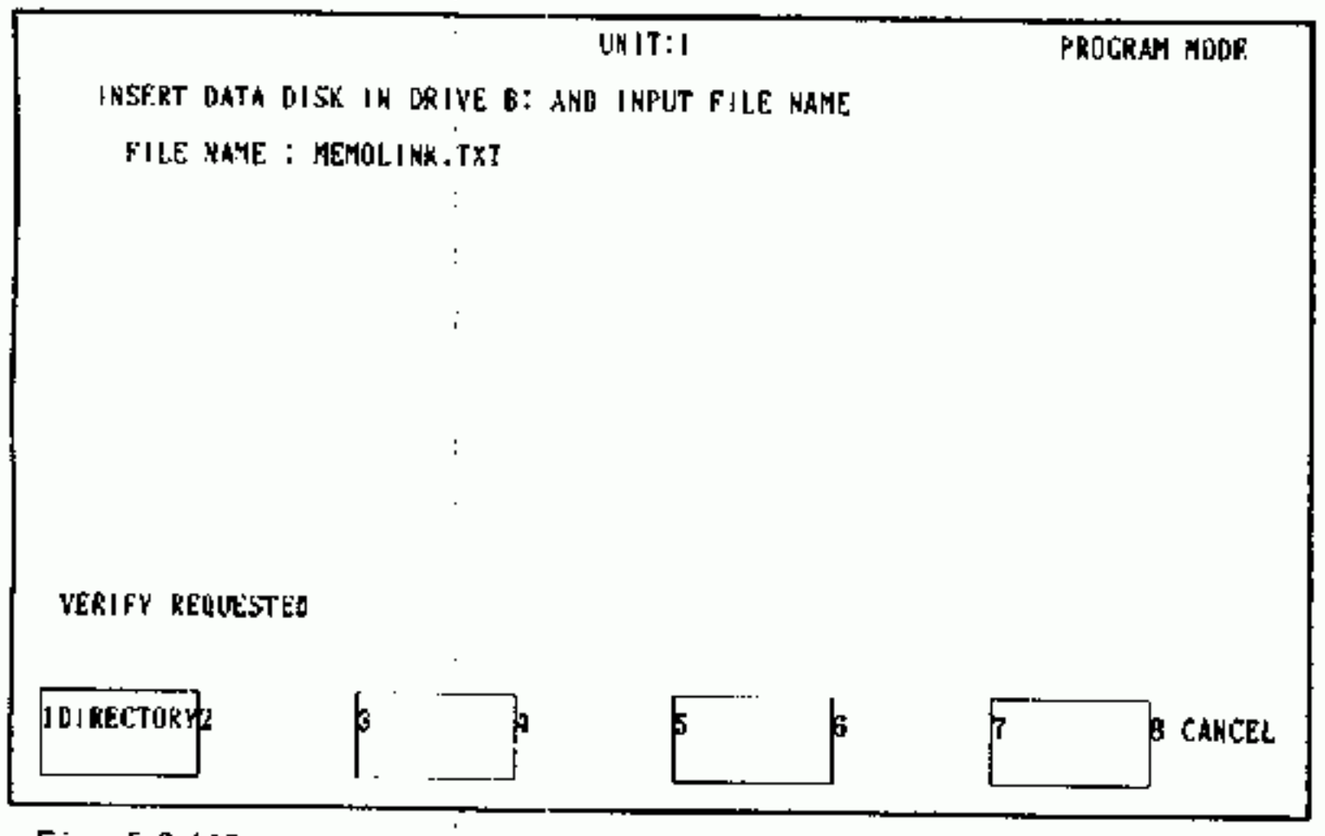


Fig. 5.2.117

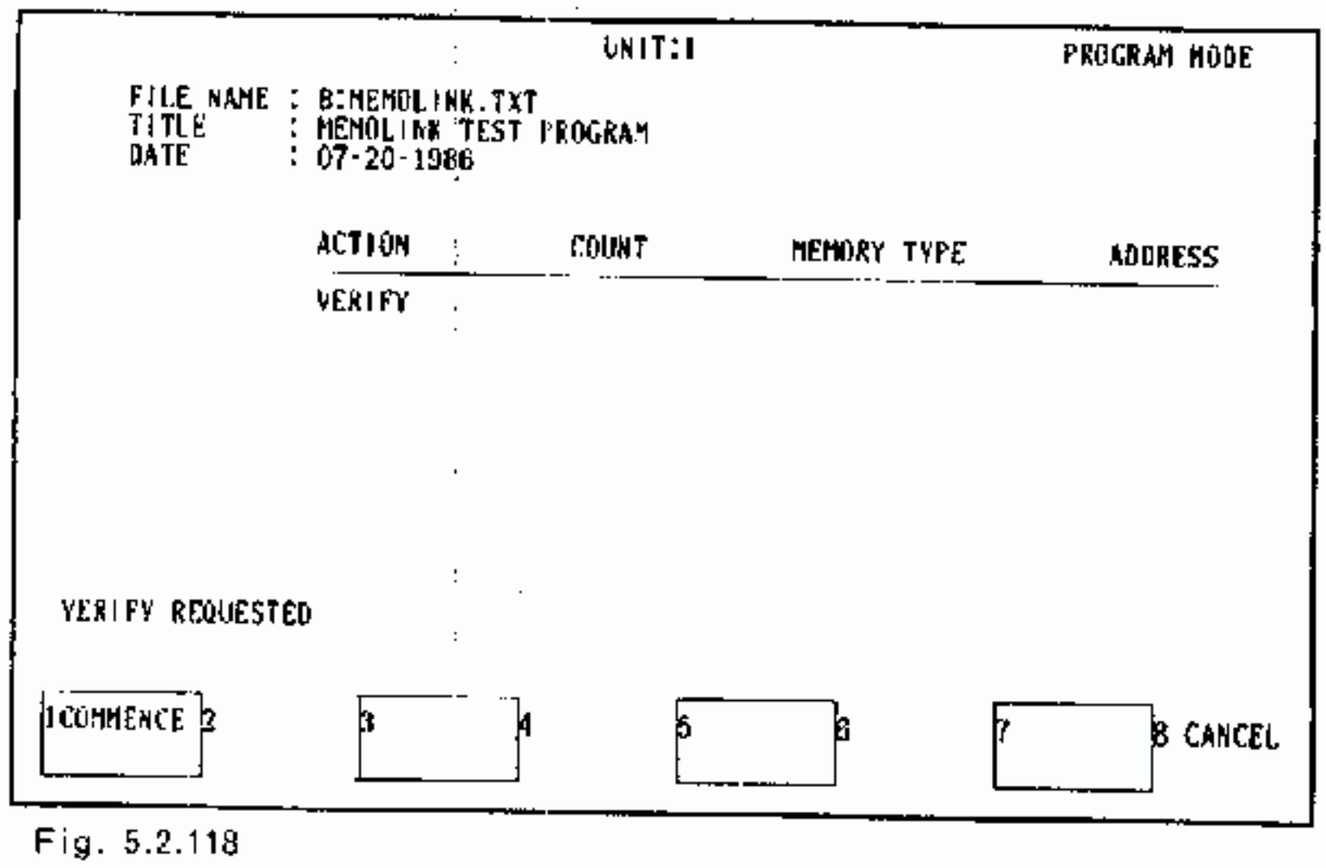


Fig. 5.2.118

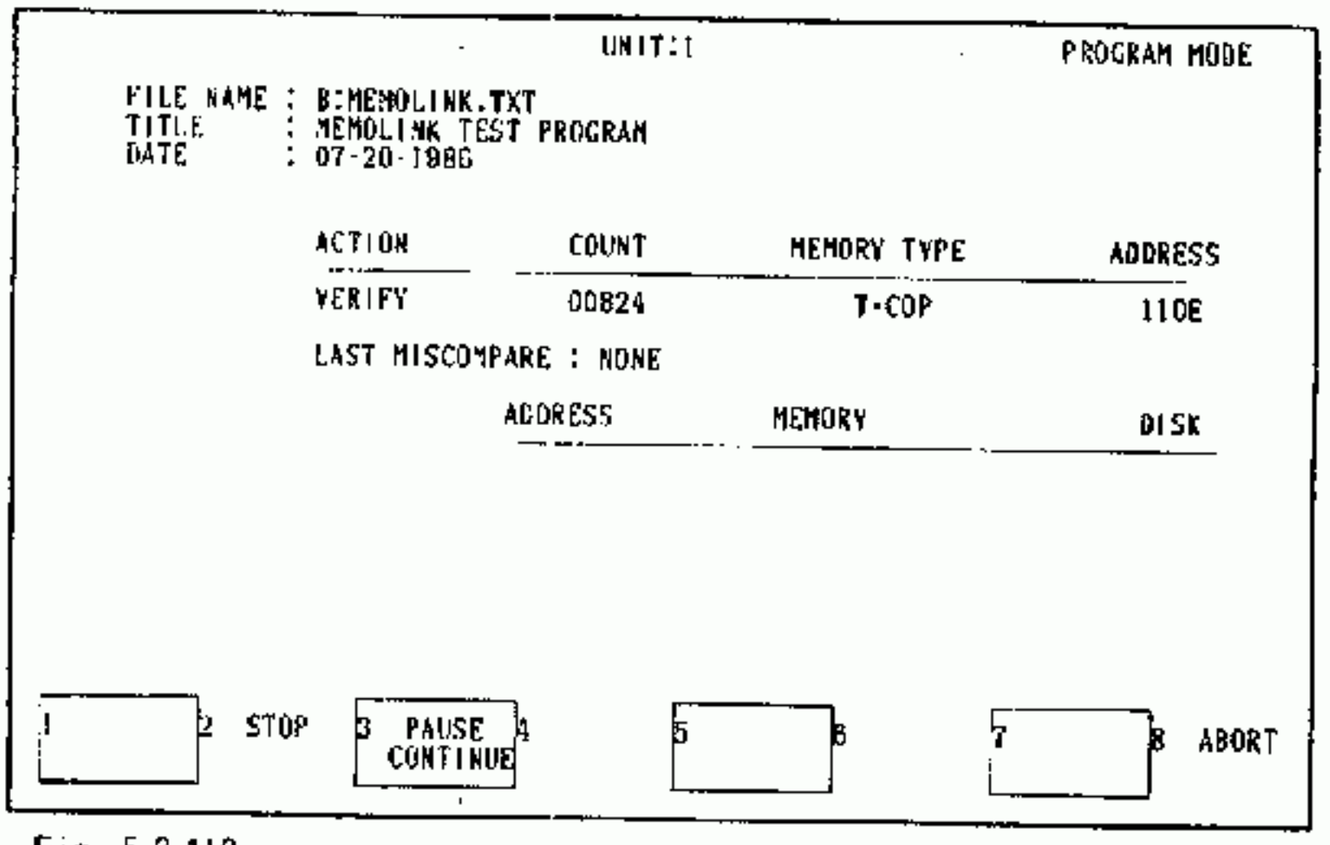


Fig. 5.2.119

(3) Verifying Allocation Data (Cont'd)

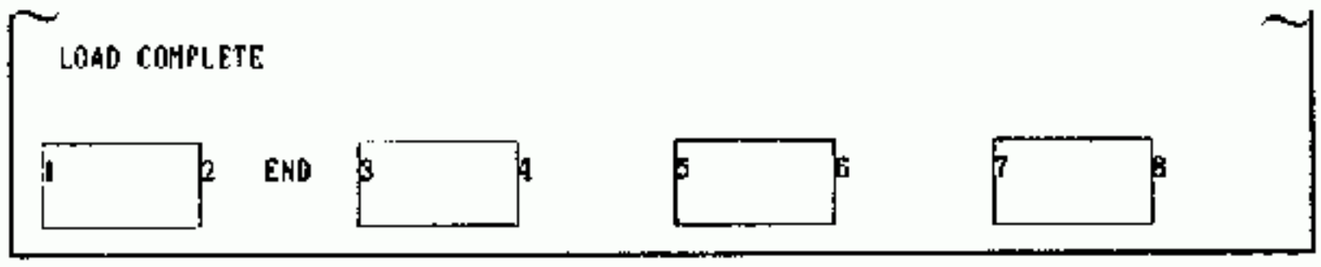


Fig. 5.2.120

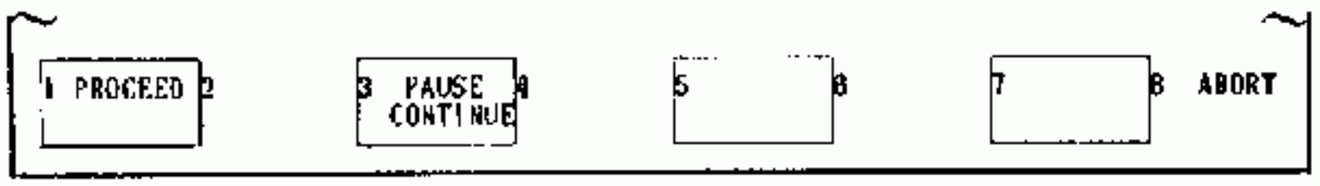


Fig. 5.2.121

```
                                UNIT:1                          PROGRAM MODE
 INSERT DATA DISK IN DRIVE 8: AND INPUT FILE NAME
     FILE NAME : MEMOLINK.TXT
 COMMAND.COM     MEMOLINK.TXT    FUJIND.K      MD241G        MX161G
```

Fig. 5.2.122

NOTE

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

2. Depressing "DIRECTORY" key displays the file names (Fig. 5.2.122).

3. Depressing "CANCEL" key restores the state as shown in Fig. 5.2.104.

4. If any miscomparison is found, labels shown in Fig. 5.2.121 are displayed. Depressing "PROCEED" key continues the VERIFY operation but "ABORT" key returns to the display shown in Fig. 5.2.104.

5. When label "↑ PAUSE ↓ / CONTINUE" is toggled to "PAUSE / ↓ CONTINUE ↑" by depressing "↑ PAUSE ↑ / CONTINUE" key, the VERIFY operation is continued even if an error exists. For example, "0023 ERRORS: VERIFY COMPLETE" is displayed in the message area.

5.2.8 Setting Port Parameters

This operation sets transmission conditions for communications when a high-level computer or P150 is connected. The initial condition is preset before shipment so that P150 can be connected unconditionally and the port parameters need not be changed. Always check that the setting is correct.

(1) Typical Setting of Port 1

Usually, port 1 is connected to P150 (using cable type JZMSZ-W1015-T or -T2). Note that only delay count* can be set.

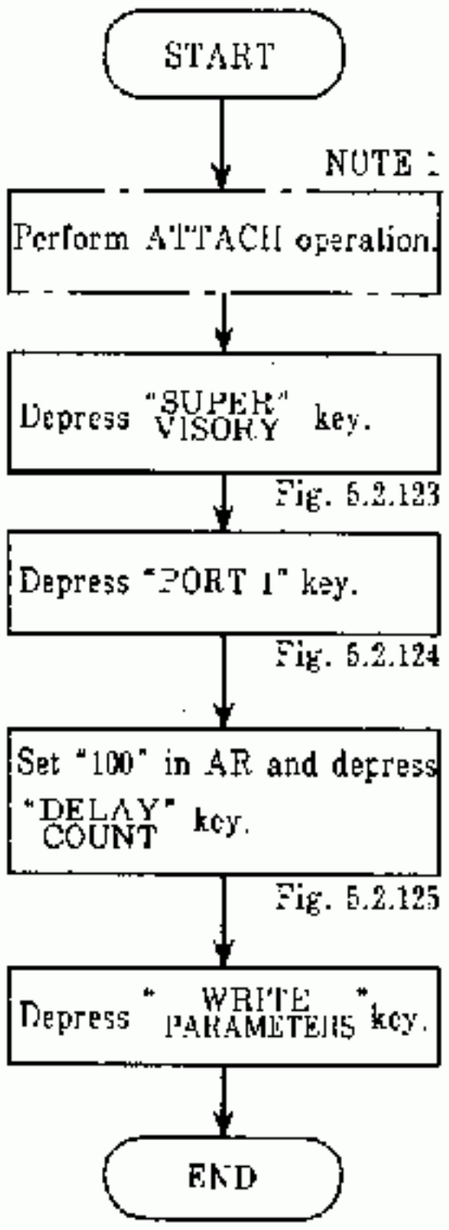


Fig. 5.2.123

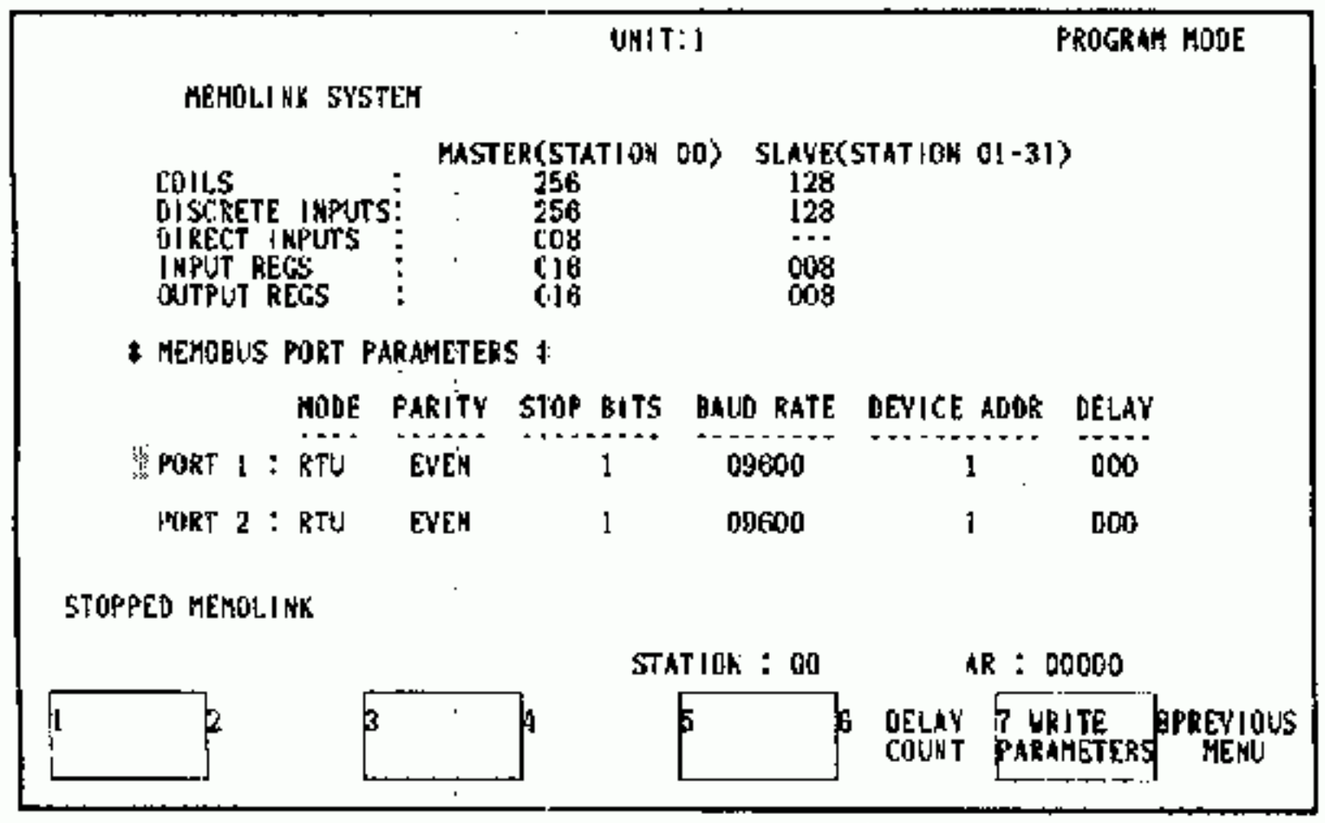


Fig. 5.2.124

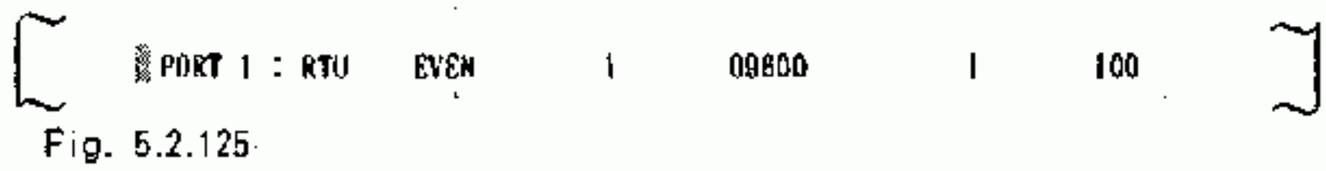


Fig. 5.2.125

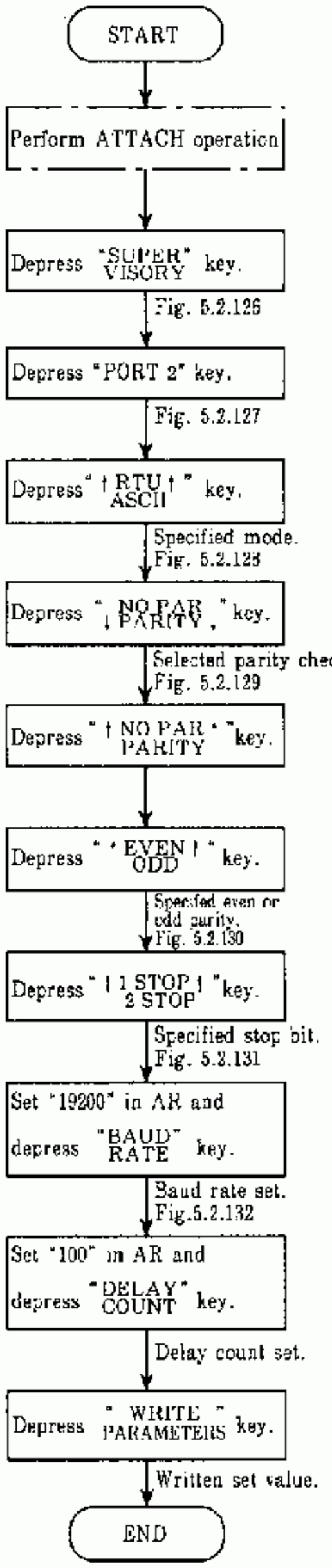
NOTE

1. This step can be skipped, if ATTACH operation has already been completed.
2. Set delay count in a range of 0 to 255.
3. When "PREVIOUS MENU" is depressed (Fig. 5.2.124), the set data is not written, and the display returns to that shown in Fig. 5.2.123.

* Delay count is a function to give the specified delay time to the period from the MEMOLINK receiving the port parameter to the start of an answer and sending the data. This can usually be set to 0.

(2) Typical Setting of Port 2

Usually, port 2 is connected to a high-level computer. Set the port parameter to the proper value.




```
                                        STATION : 00        AR : 00000
|CONTROLLER OPERATIONS| 2 PORT 1 | 3 PORT 2 | 4 TRAFFIC COP | 5 MONITOR DISPLAY | 6 LOADER | 7 T-COP PRINT | 8 INITIAL DISPLAY
```

Fig. 5.2.126

```
          MODE   PARITY   STOP BITS   BAUD RATE   DEVICE ADDR   DELAY
PORT 1 : RTU     EVEN         1         09600          1         000
PORT 2 : RTU     EVEN         1         09600          1         000

STOPPED MEHOLINK

                                        STATION : 00        AR : 00000
| 1 RTU ASCII | 2 NO PAR PARITY | 3 EVEN ODD | 4 1 STOP 2 STOP | 5 BAUD RATE | 6 DELAY COUNT | 7 WRITE PARAMETERS | 8 PREVIOUS MENU
```

Fig. 5.2.127

```
PORT 2 : ASCII   EVEN         1         09600          1         000
```

Fig. 5.2.128

```
PORT 2 : ASCII   NONE         1         09600          1         000
```

Fig. 5.2.129

```
PORT 2 : ASCII   ODD          1         09600          1         000
```

Fig. 5.2.130

```
PORT 2 : ASCII   ODD          2         09600          1         000
```

Fig. 5.2.131

```
PORT 2 : ASCII   ODD          2         19200          1         000
```

Fig. 5.2.132

```
PORT 2 : ASCII   ODD          2         19200          1         100
```

Fig. 5.2.133

NOTE

1. This step can be skipped, if ATTACH operation has already been completed.

2. Set the baud rate to 150, 300, 600, 1200, 2400, 4800, 9600, or 19200.

3. Set delay count in a range of 0 to 255.

4. When "PREVIOUS MENU" is depressed (Fig. 5.2.127), the set data is not written, and the display returns to that shown in Fig. 5.2.126.

5.2.9 File Management Operation

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

FILE MANAGEMENT

- Directory: File names are displayed.
- Delete: Unnecessary files are deleted.
- Rename: File names are altered.
- Format: New disks are formulated (initialized).
- Chek Disk: Disk status is checked.
- Copy: From the disk inserted in drive B, specified files or all the files are copied onto the disk inserted in drive A.
- Set Port Parameter: 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.

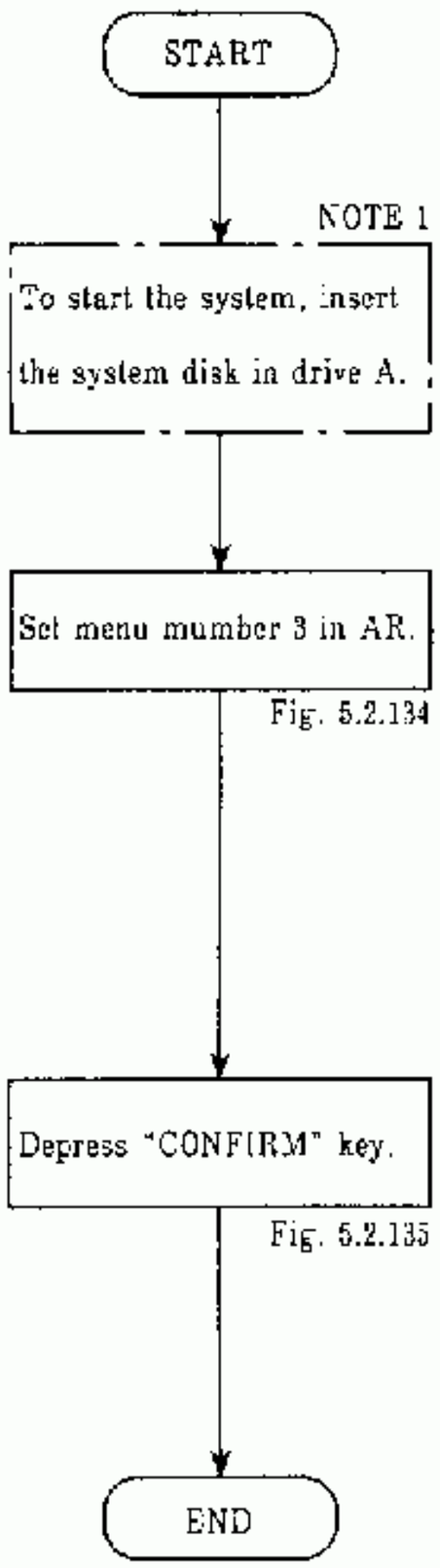


Fig. 5.2.134

Fig. 5.2.135

Fig. 5.2.134

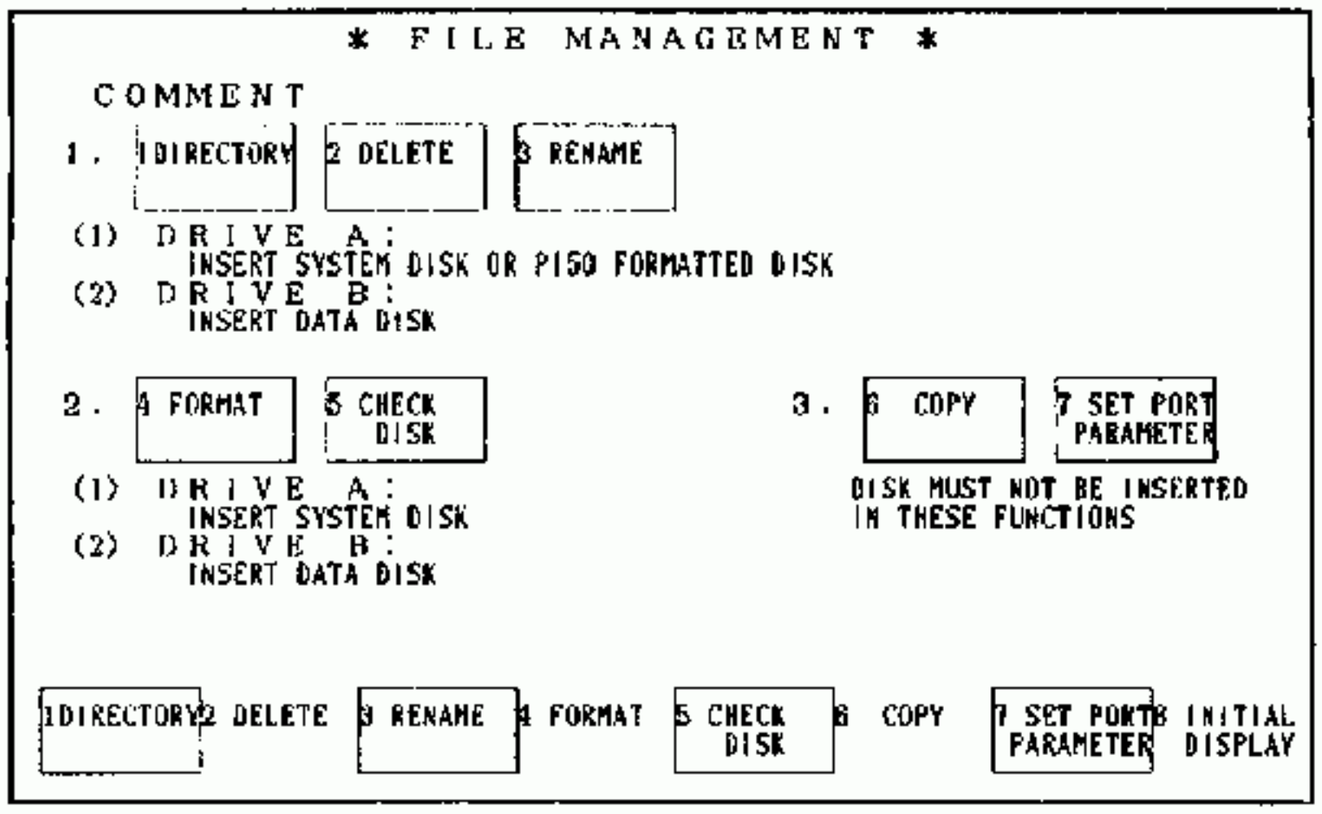


Fig. 5.2.135

NOTE

1. If ATTACH operation has already been completed, depress "SUPER VISORY" and then "INITIAL DISPLAY" key, or depress "SHIFT" and "SUPER VISORY" keys simultaneously to call up the operation menu display.

2. Depressing "INITIAL DISPLAY" key as shown in Fig. 5.2.135 also calls up the operation menu display.

(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 MEMOLINK by the following steps.

1. Select port (1 or 2) to connect MEMOLINK .
2. Set port parameters to the selected port.
3. Connect MEMOLINK to the port.
4. Use the other port for serial printer (for future use).

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

POINT

- If MEMOLINK 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.

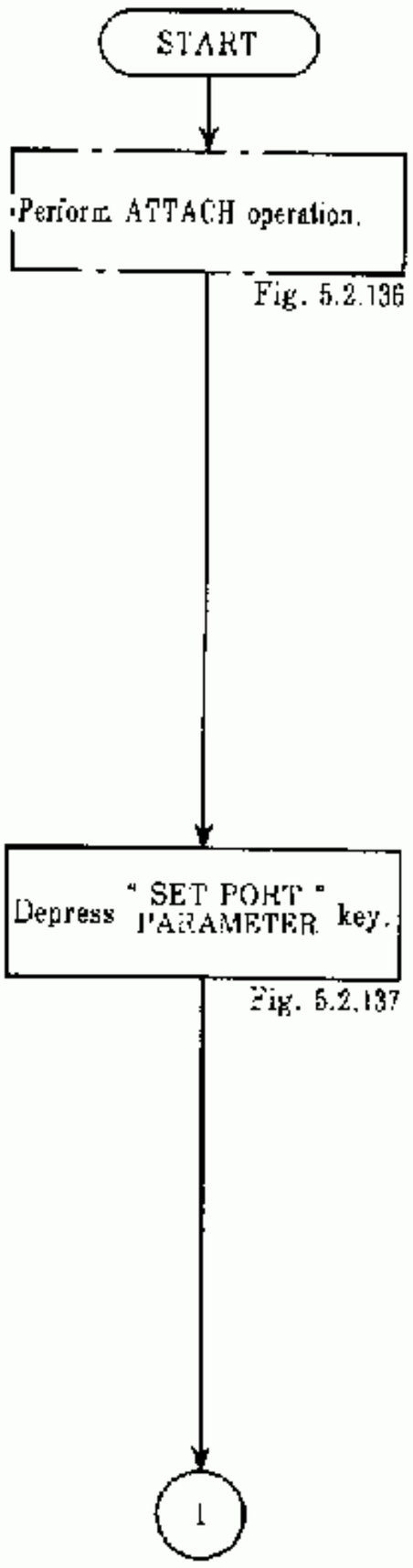


Fig. 5.2.136

Fig. 5.2.137

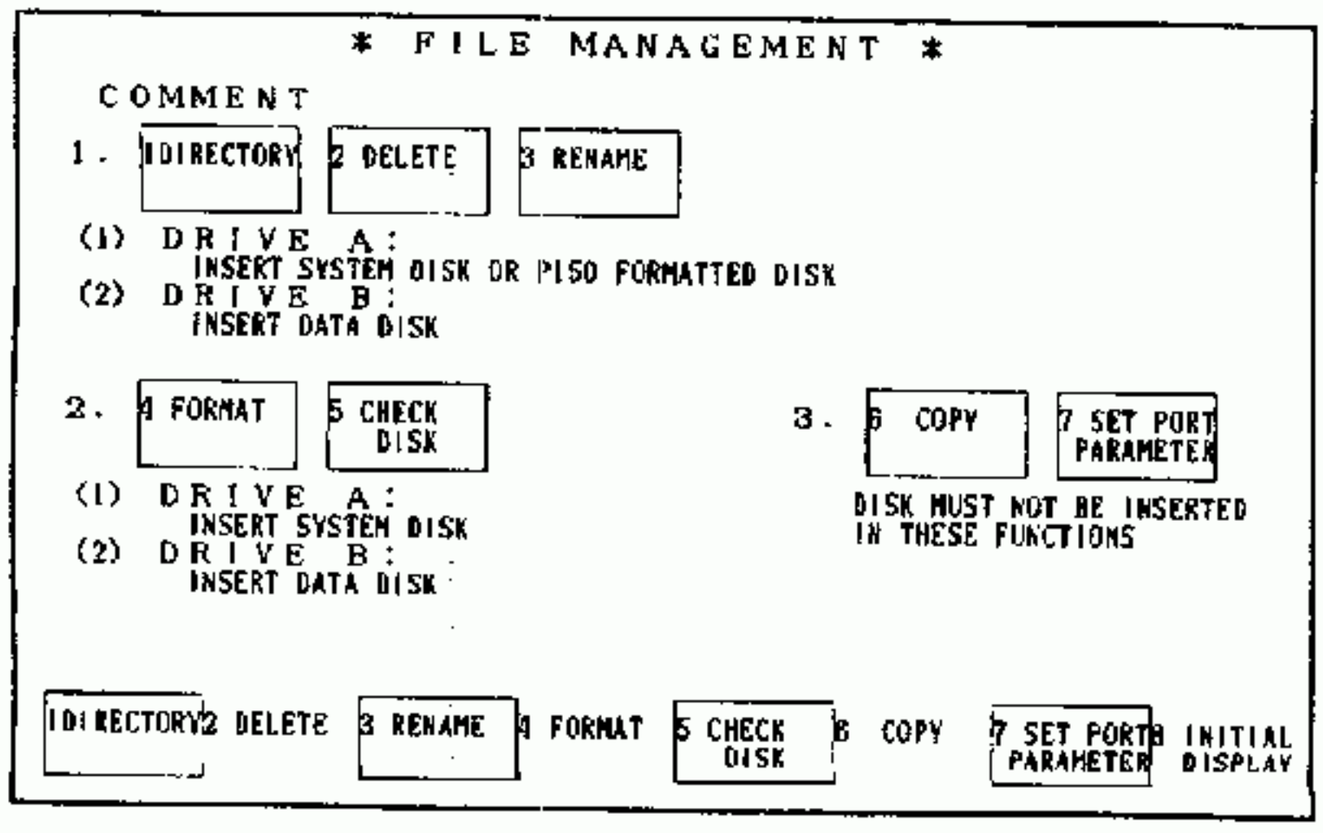
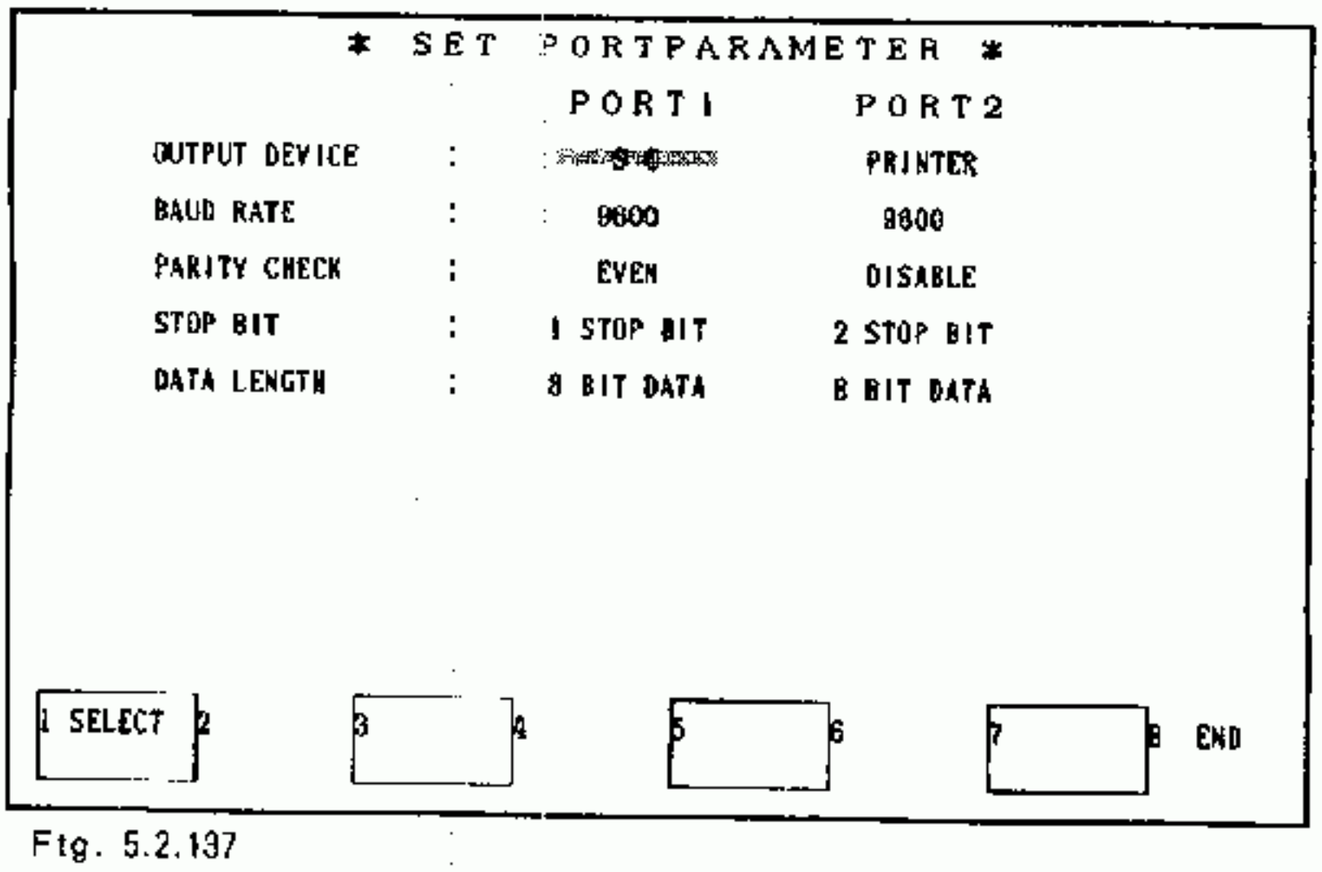


Fig. 5.2.136



Ftg. 5.2.137

(1) Port Parameter Setting (Cont'd)

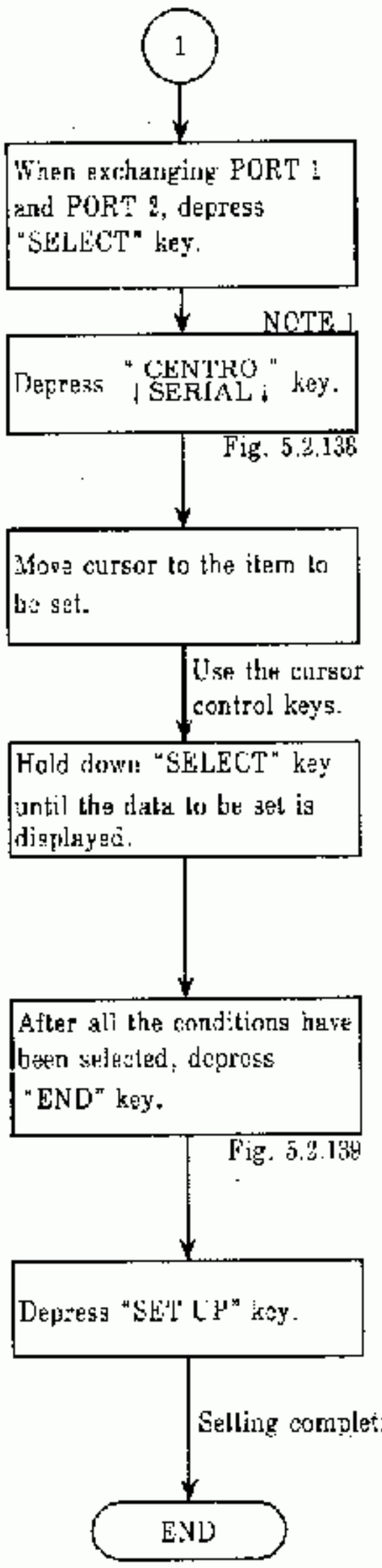


Fig. 5.2.136

Fig. 5.2.137

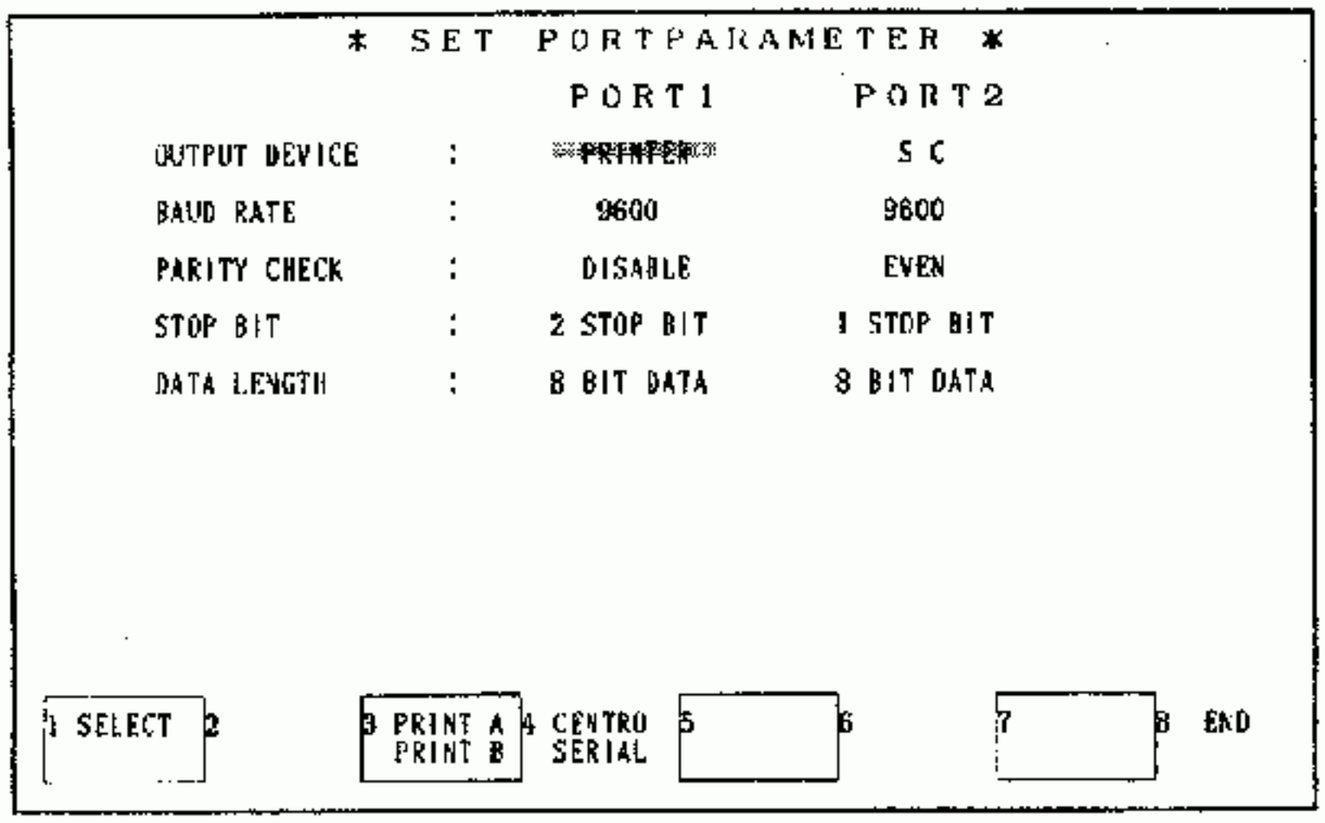


Fig. 5.2.138

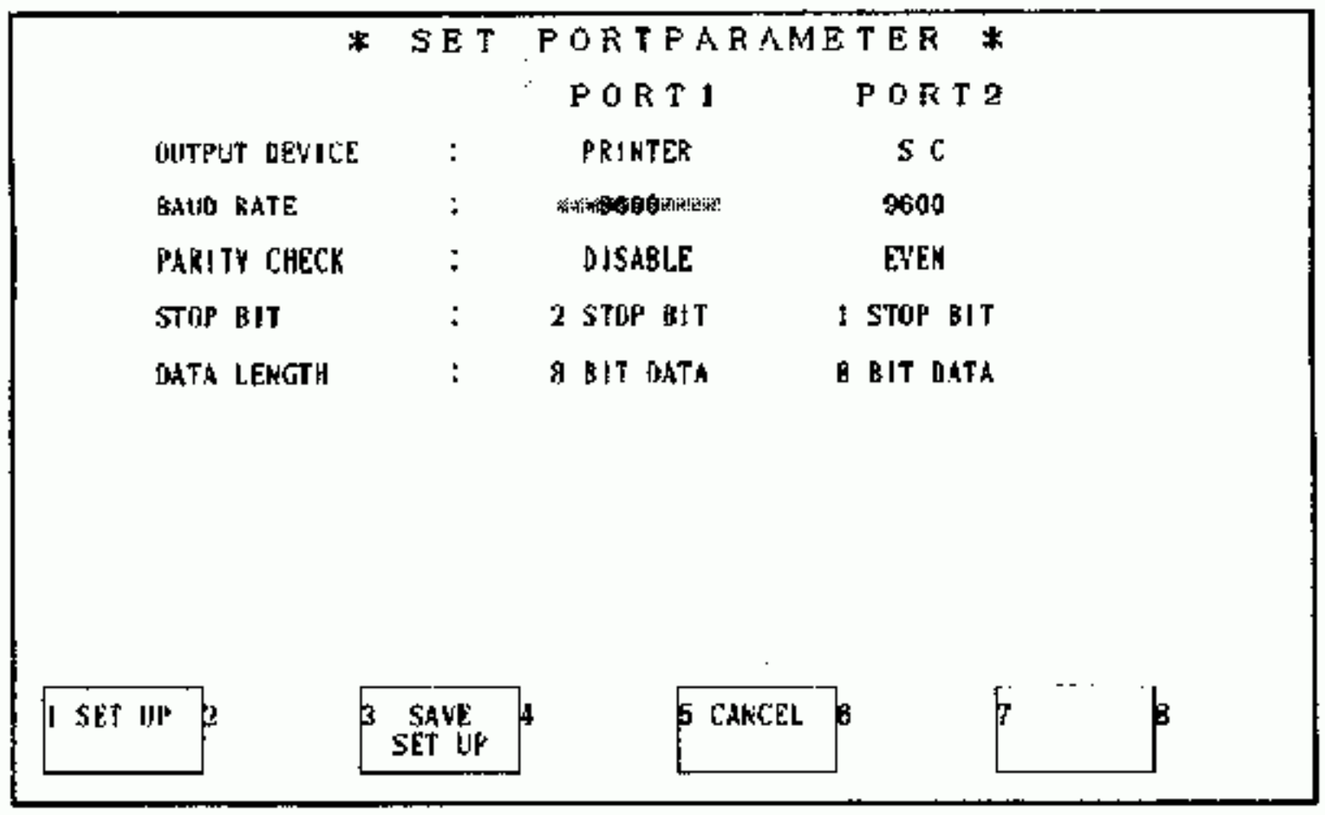


Fig. 5.2.139

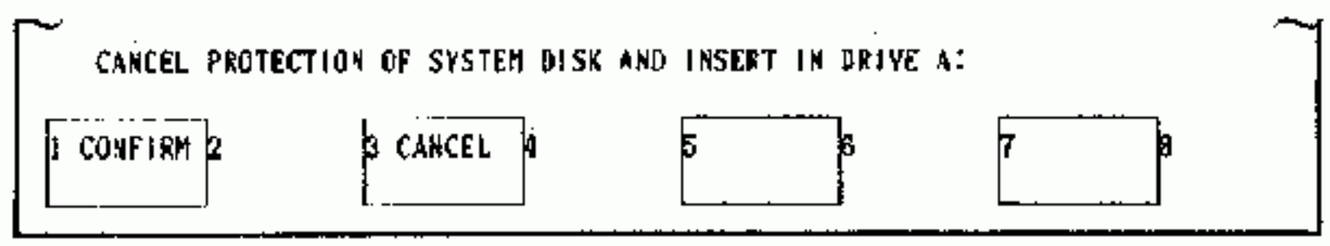


Fig. 5.2.140

NOTE

1. If " CENTRO / SERIAL " label is displayed, this label key should not be depressed.

2. P150 has a communication parameter file in the system disk, the default values (initial values) are shown in Fig. 5.2.137. By copying all modifications of these initial values on the system disk, altering the communication parameters is not required at system starting. Depress " SAVE / SET UP " key instead of "SET UP" key (Fig. 5.2.139). After the display shown in Fig 5.2.140 appears, insert the system disk, with writable state, in drive A, and depress "CONFIRM" key.

IMPORTANT

Be sure to bring the system disk to the write disable state after executing "SAVE" SET UP.

Table 5.2.2 Change of Setting Value at "SELECT" Key Depression

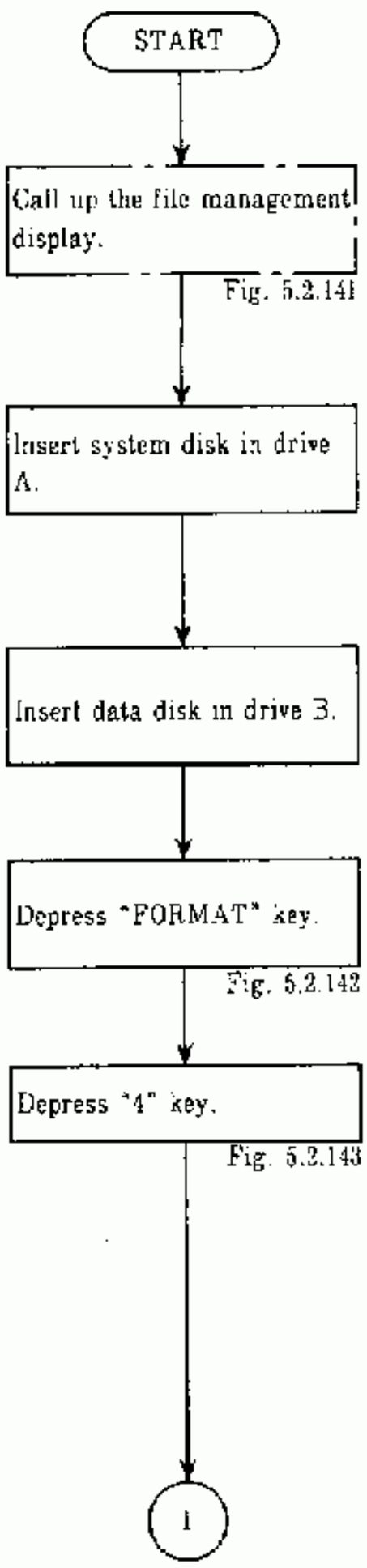
Item	Setting Value
OUTPUT DEVICE	→ SC → PRINTER →
BAUD RATE	→ 75 → 110 → 150 → 300 → 600 → 1200 → 2400 → 4800 → 9600 → 19200 →
PARITY CHECK	→ DISABLE → ODD → EVEN →
STOP BIT	→ 1 STOP BIT → 2 STOP BIT →
DATA LENGTH	→ 7 BIT DATA → 8 BIT DATA →

(2) 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.



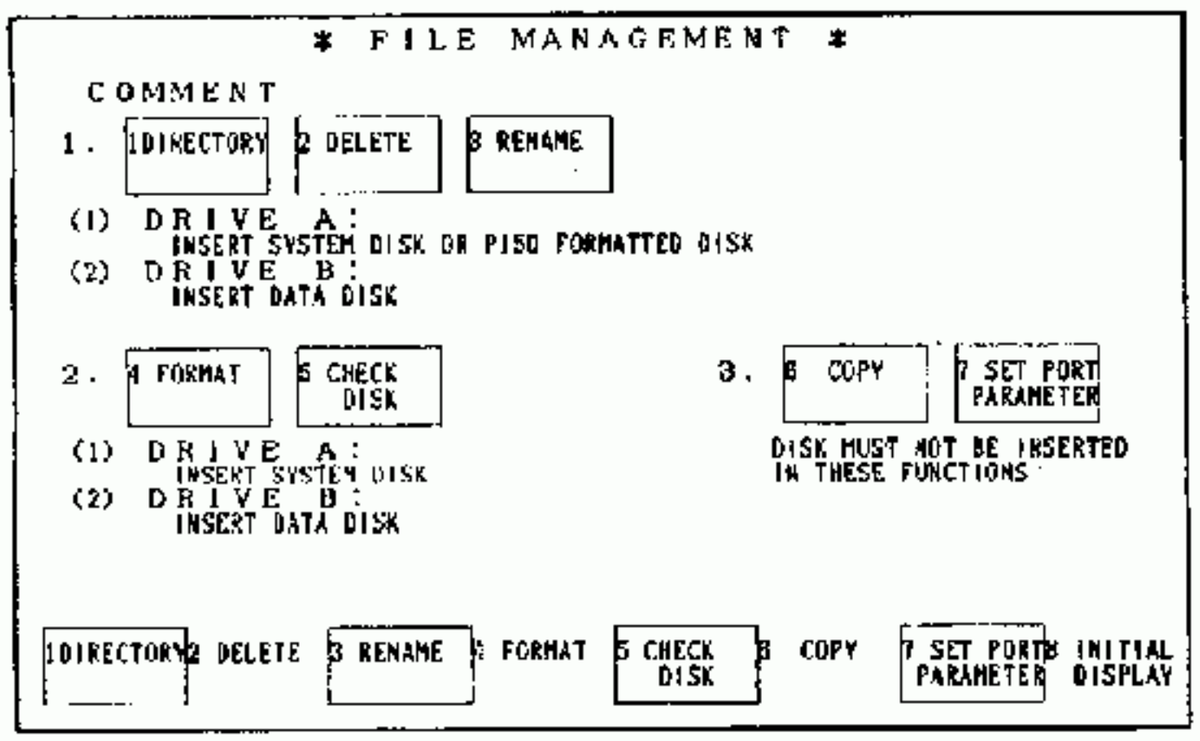


Fig. 5.2.141

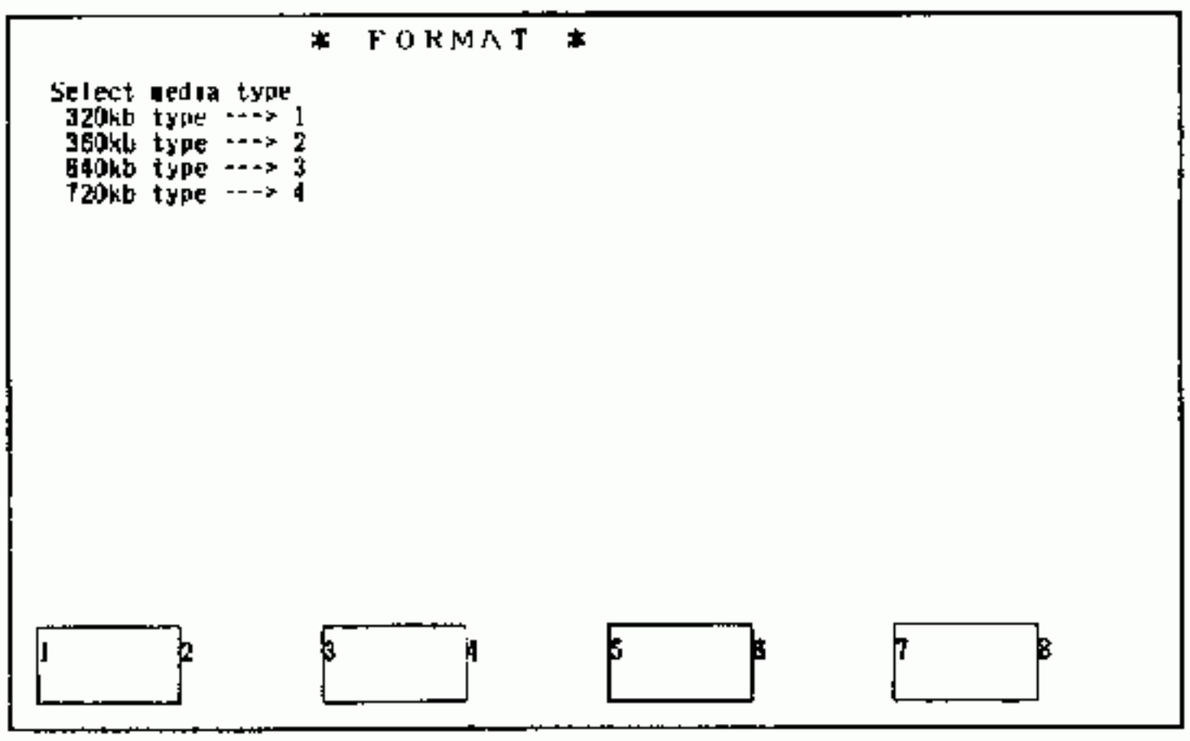


Fig. 5.2.142

POINT

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

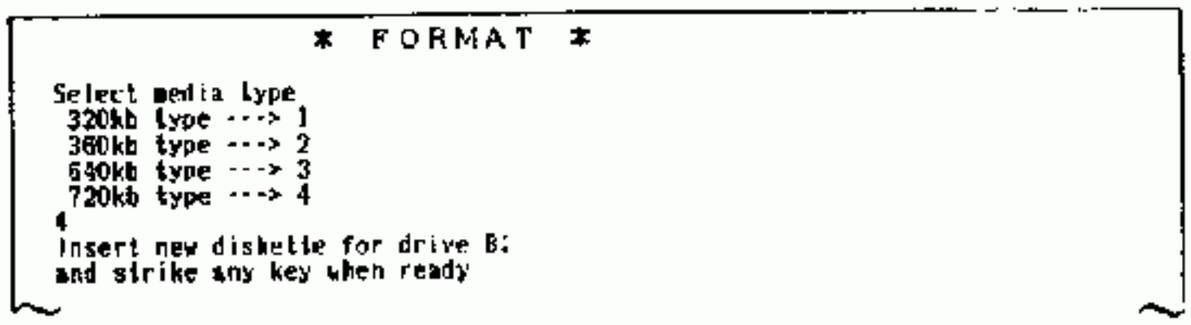


Fig. 5.2.143

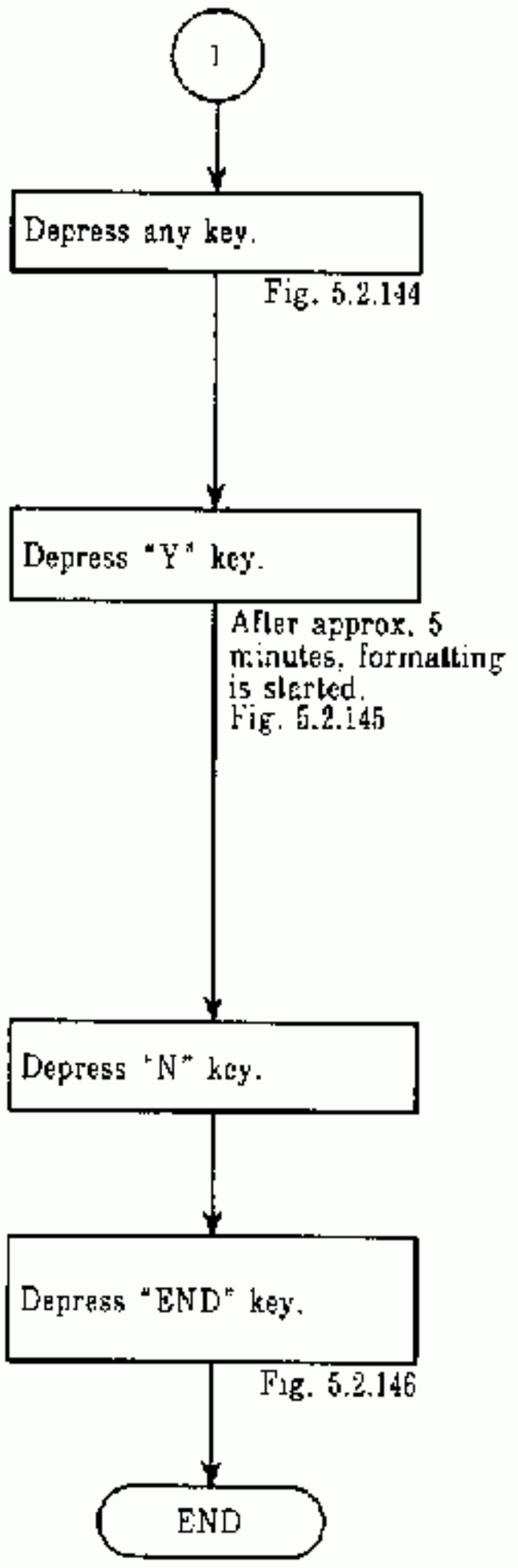


Fig. 5.2.144

```
                    *  FORMAT  *

Select media type
 320kb type ---> 1
 360kb type ---> 2
 640kb type ---> 3
 720kb type ---> 4
q
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. 5.2.145

```
                    *  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. 5.2.146

```
                    *  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
```

1 2 3 4 5 6 7 8 END

NOTE

1. Depressing "N" key in the display of Fig. 5.2.144 displays "END."
   Depressing "END" key returns to the display shown in Fig. 5.2.141.

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 data on the disk are deleted. To empty formatted disks, use the file deletion function.

(3) 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.

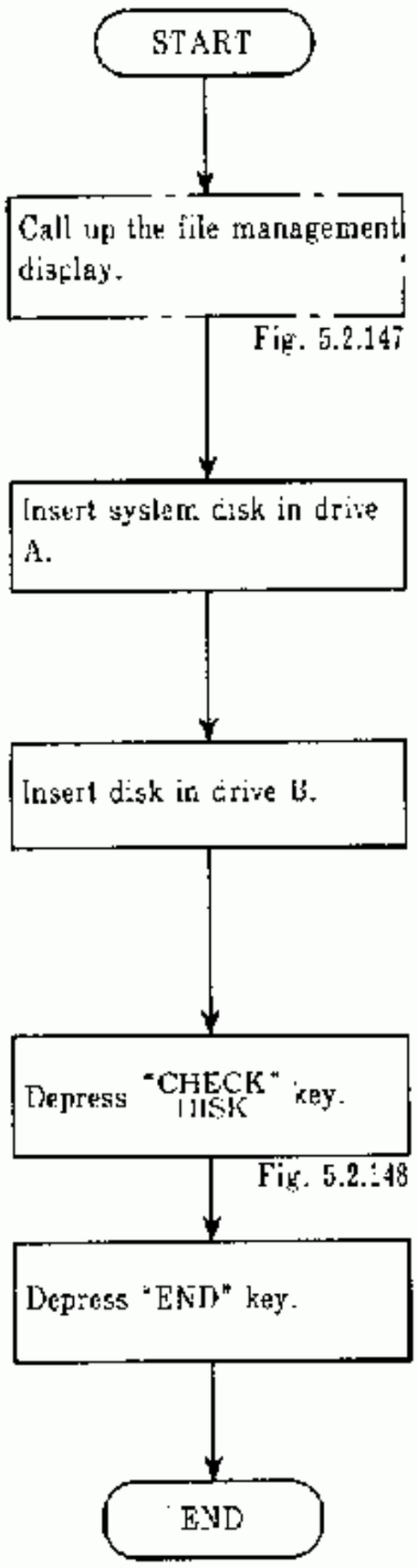


Fig. 5.2.147

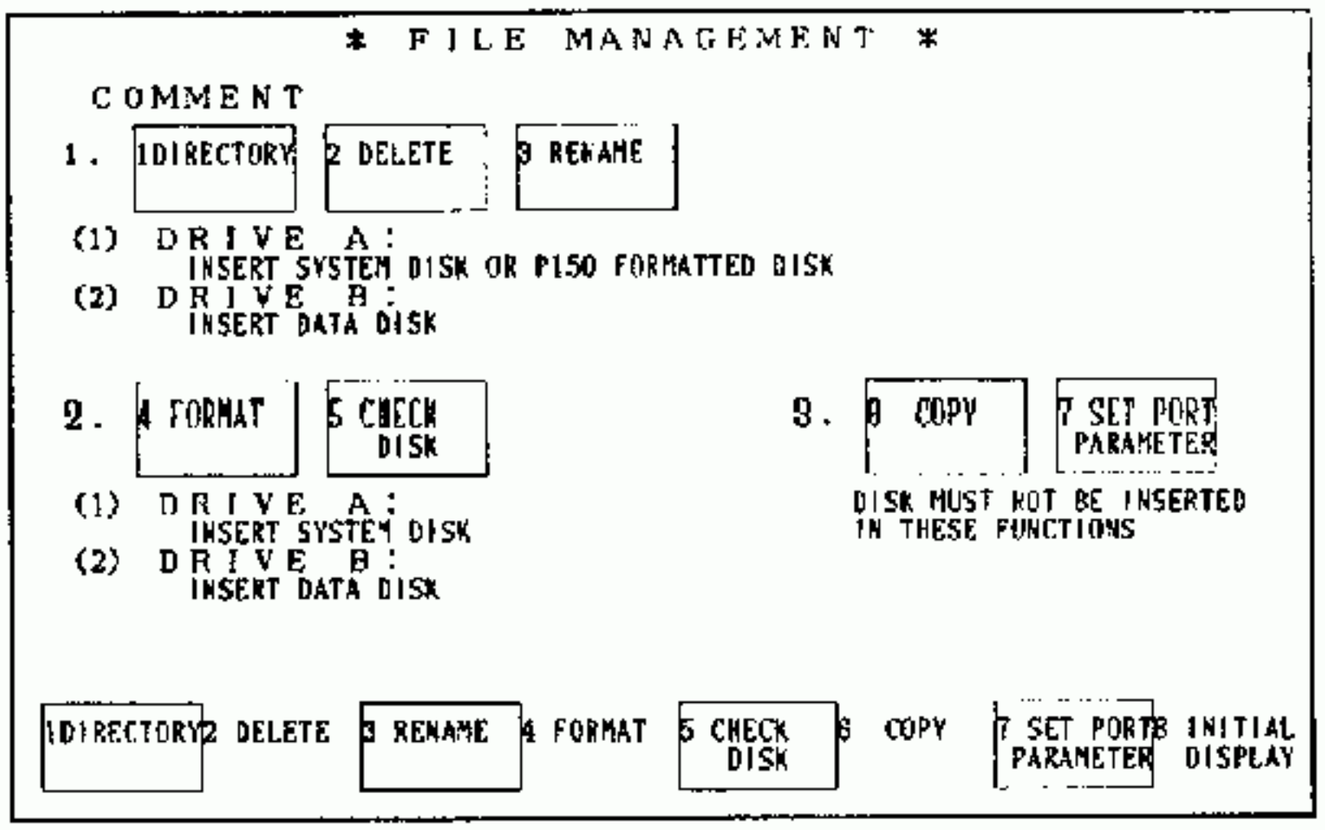


Fig. 5.2.147

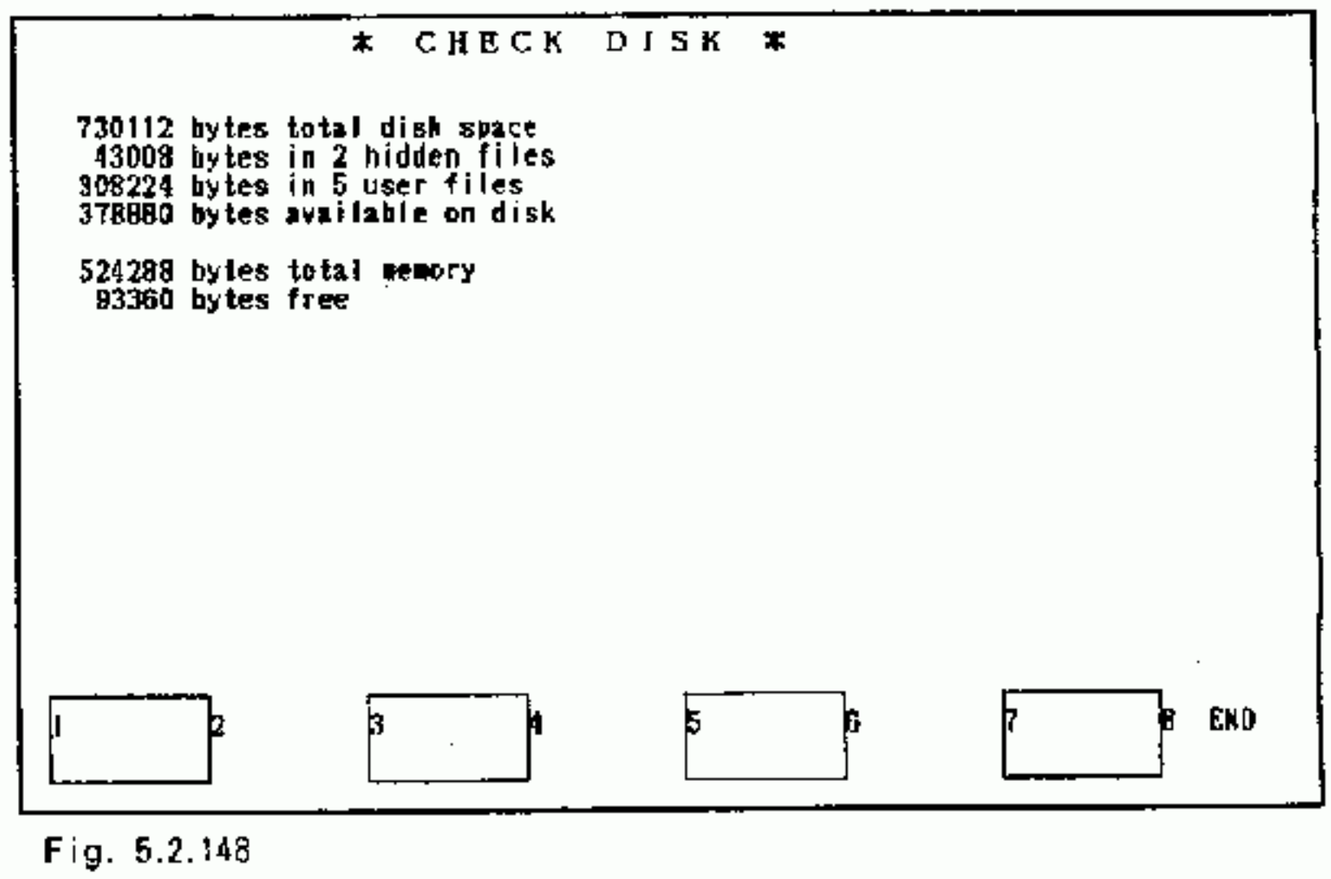


Fig. 5.2.148

(4) Directory

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

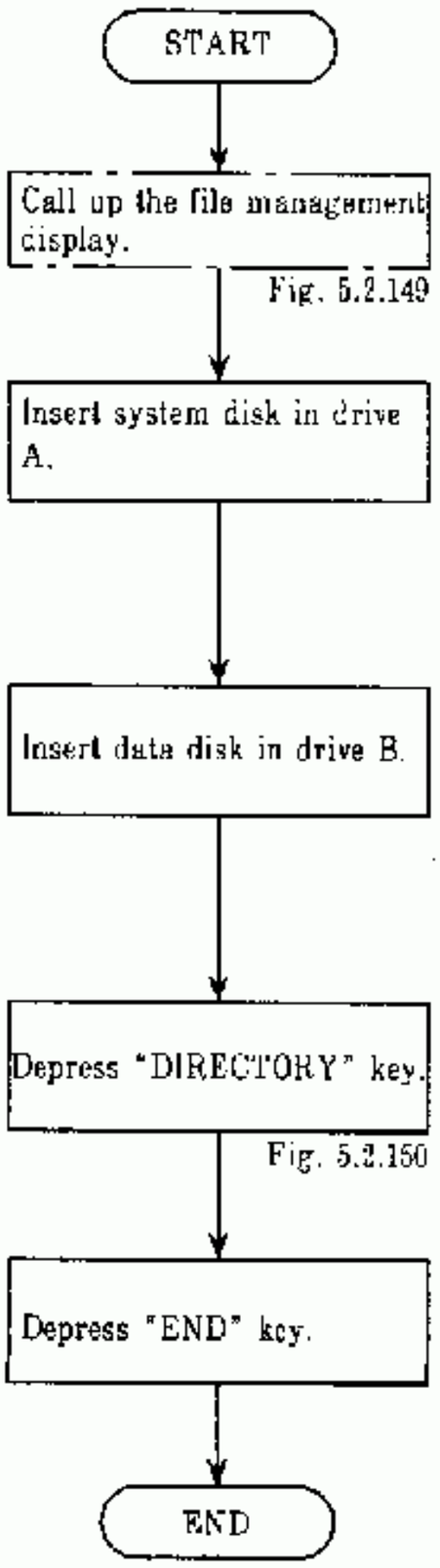


Fig. 5.2.149

Fig. 5.2.150

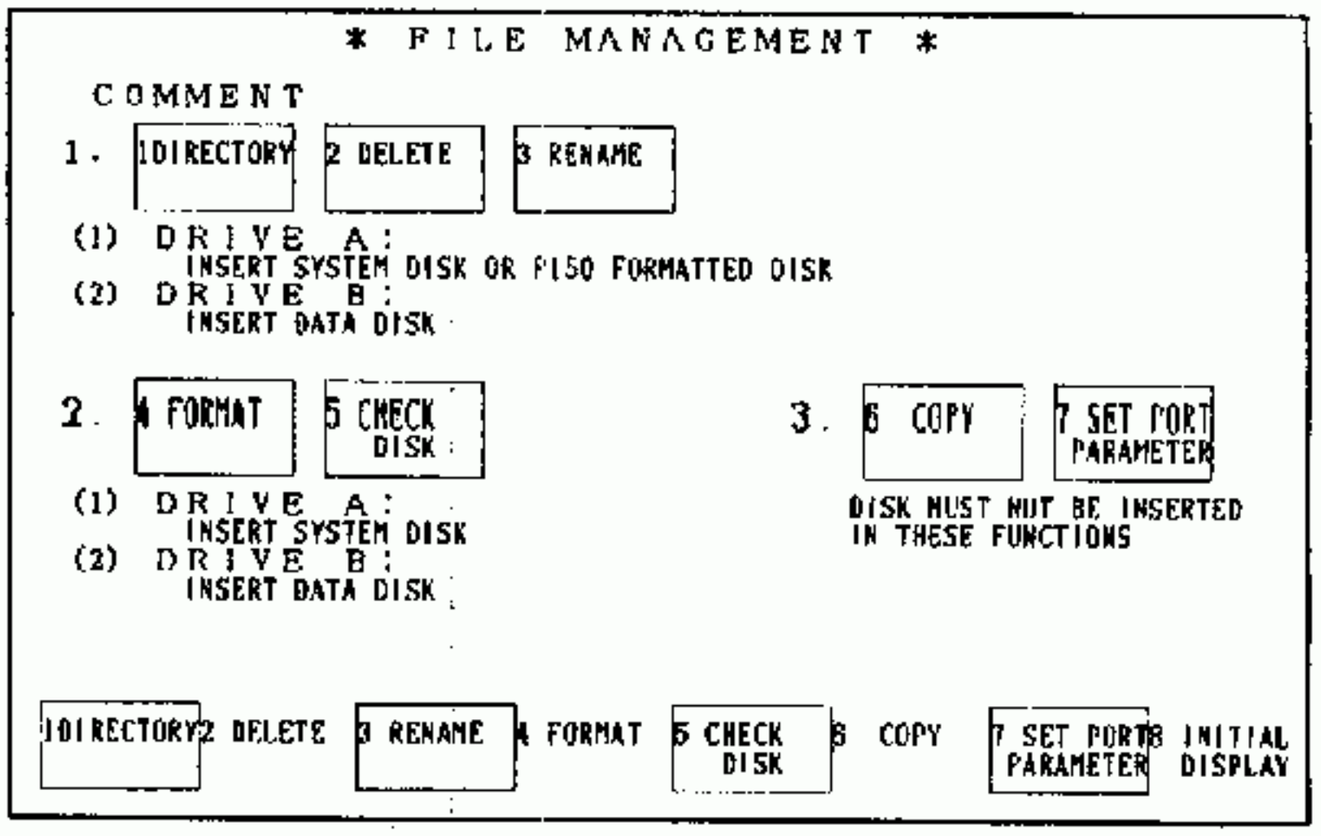


Fig. 5.2.149

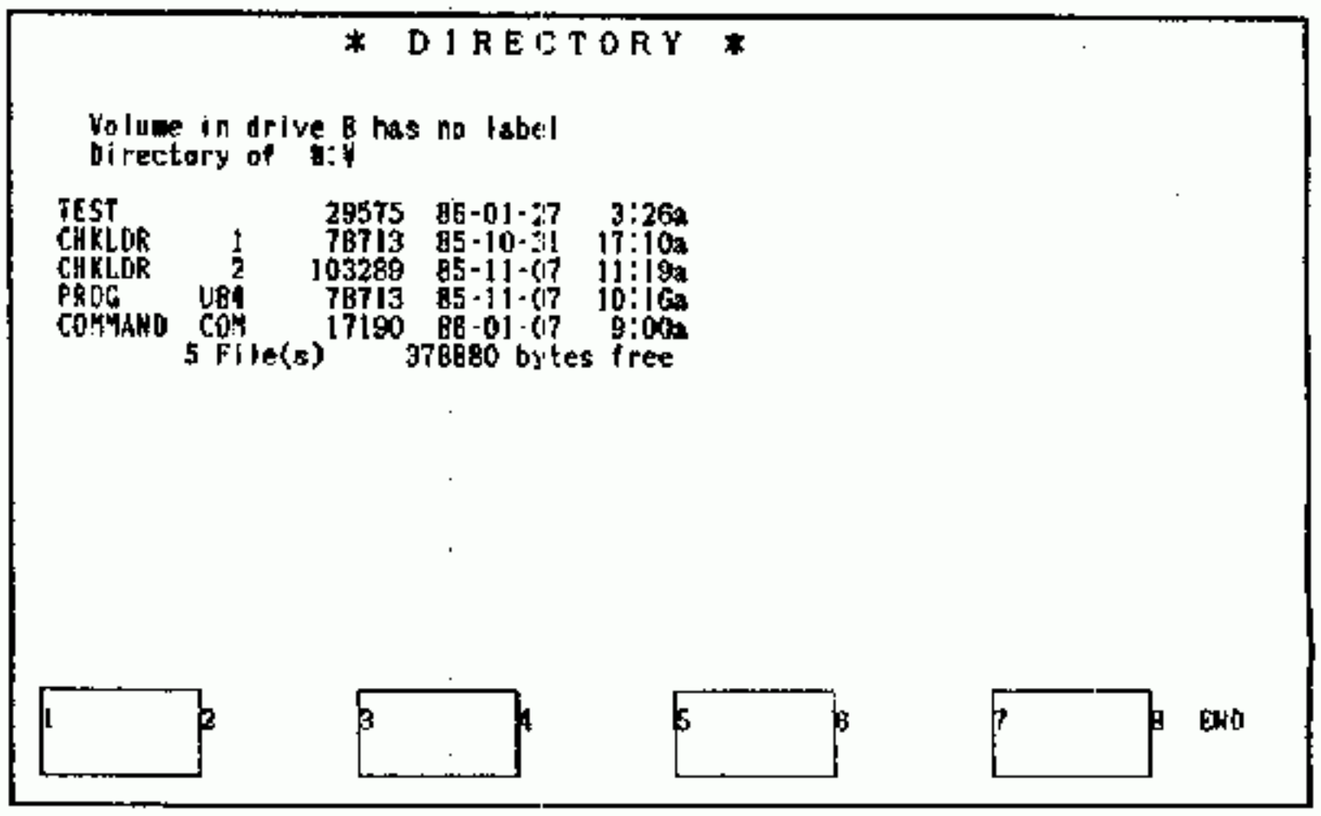


Fig. 5.2.150

NOTE

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

2. The file name is made by using 8 characters max for file name and 3 characters max for escape character. The escape character may be omitted. If it is used, a period "." must be put before it. For file names and escape characters, the following characters are usable:

```
A-Z     0-9     $     &     #
%     ″       (     )     –     @     _
`     {     }     ~     !
```

Although file names are written in both capital letters and small letters, P150 converts all characters into capital letters. However, the following file names cannot be used because they are used in the system.

AUX
CON
LST
PRN
NUL
IO. SYS
MSDOS. SYS
COMMAND. COM

(5) File Renaming

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

POINT

Make the data disk writable in advance.

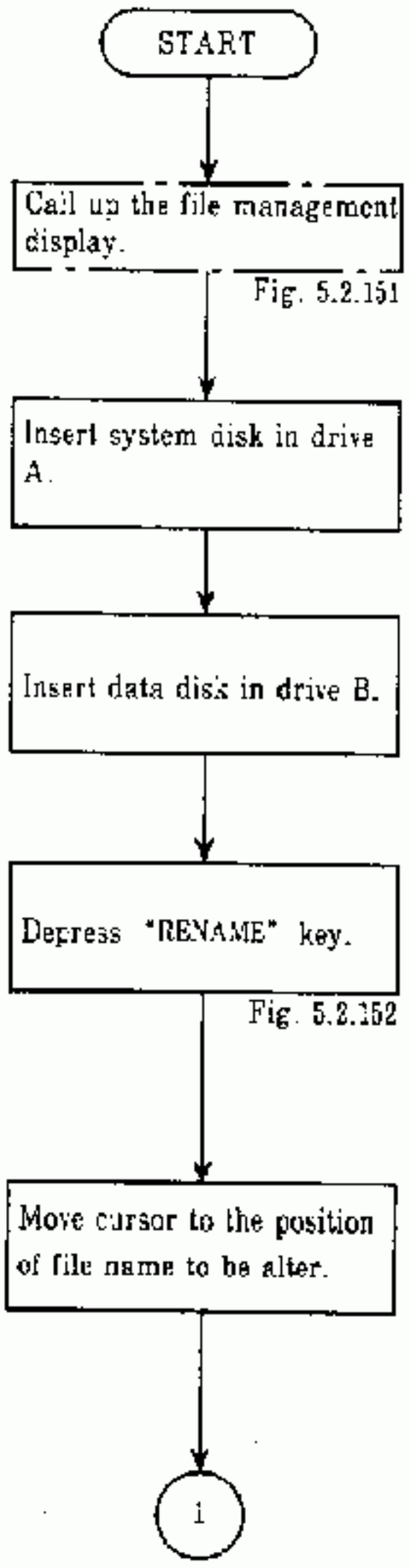
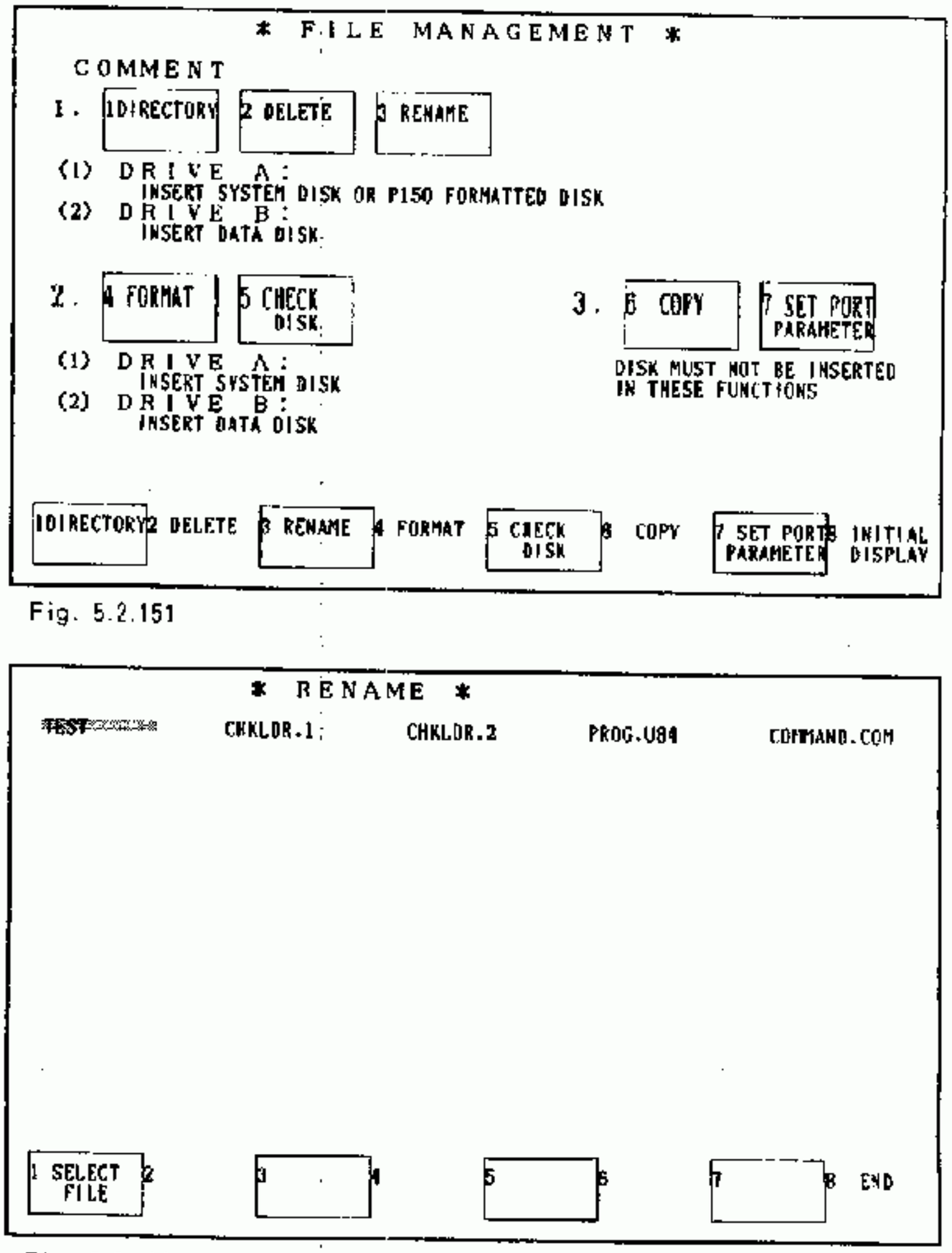
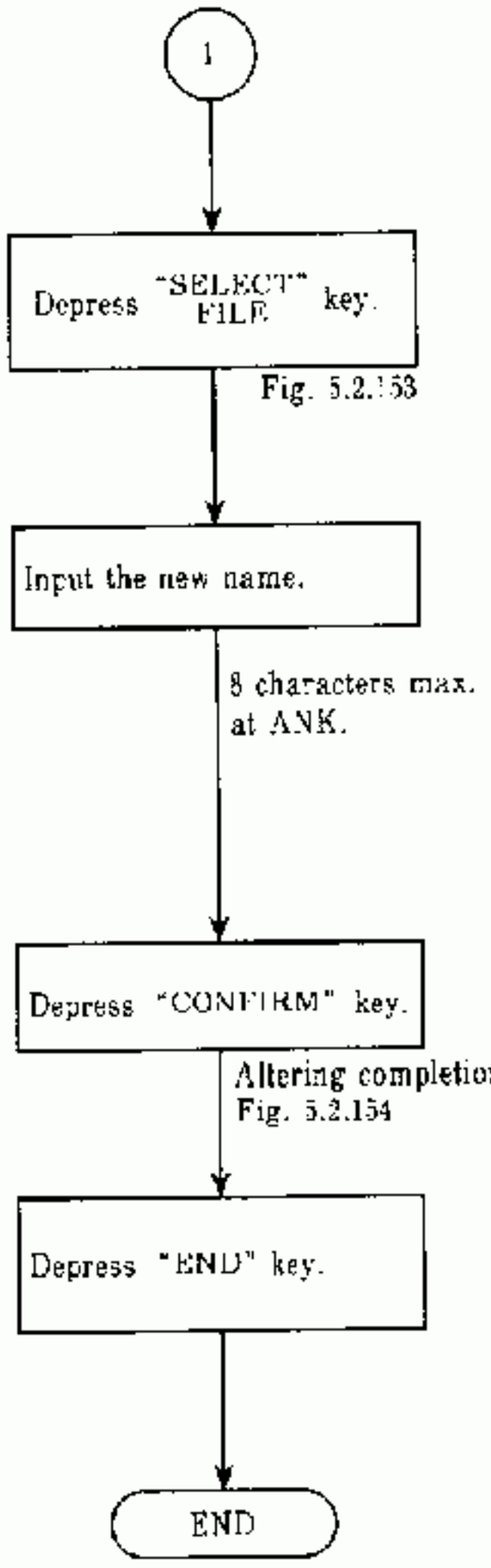


Fig. 5.2.151

Fig. 5.2.152



(5) File Renaming (Cont'd)



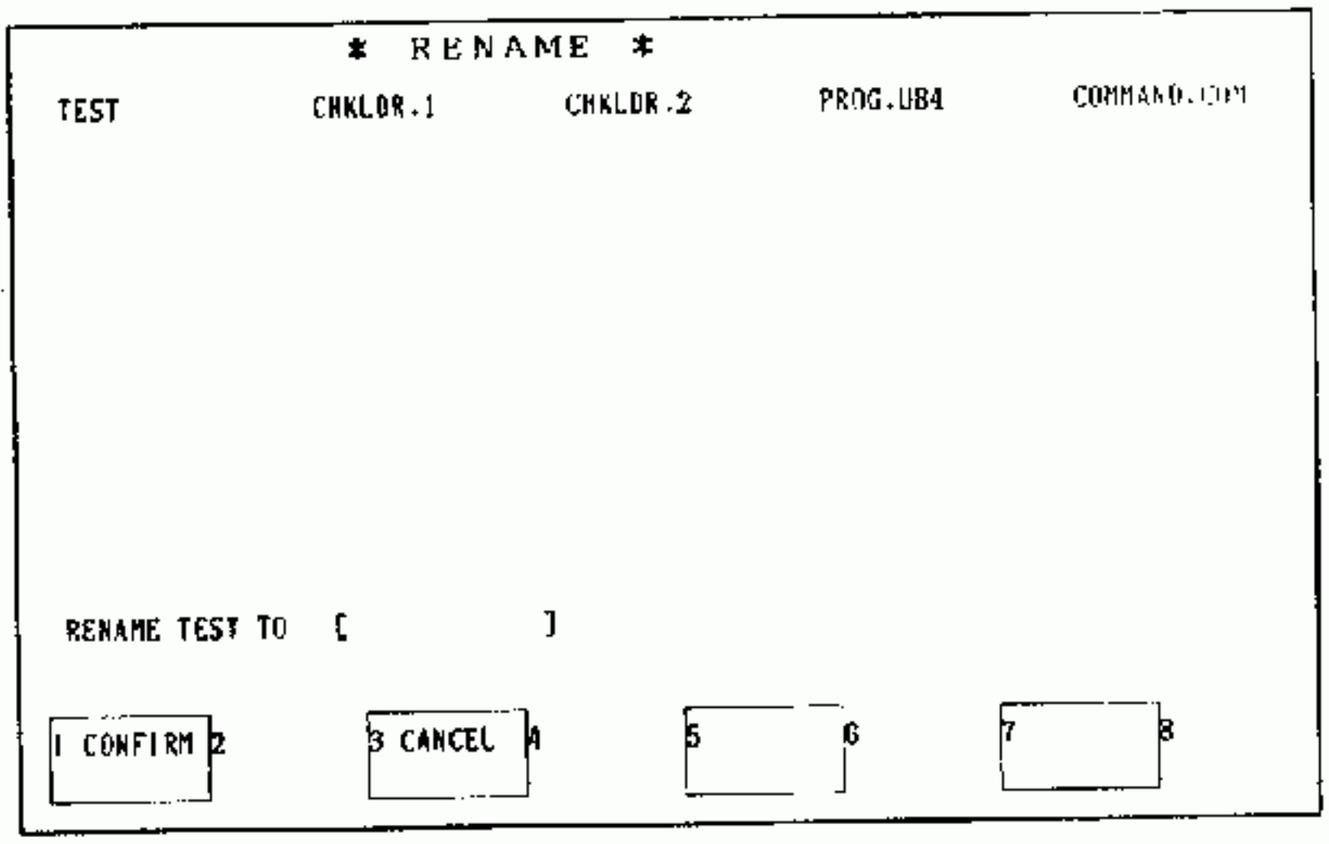


Fig. 5.2.153

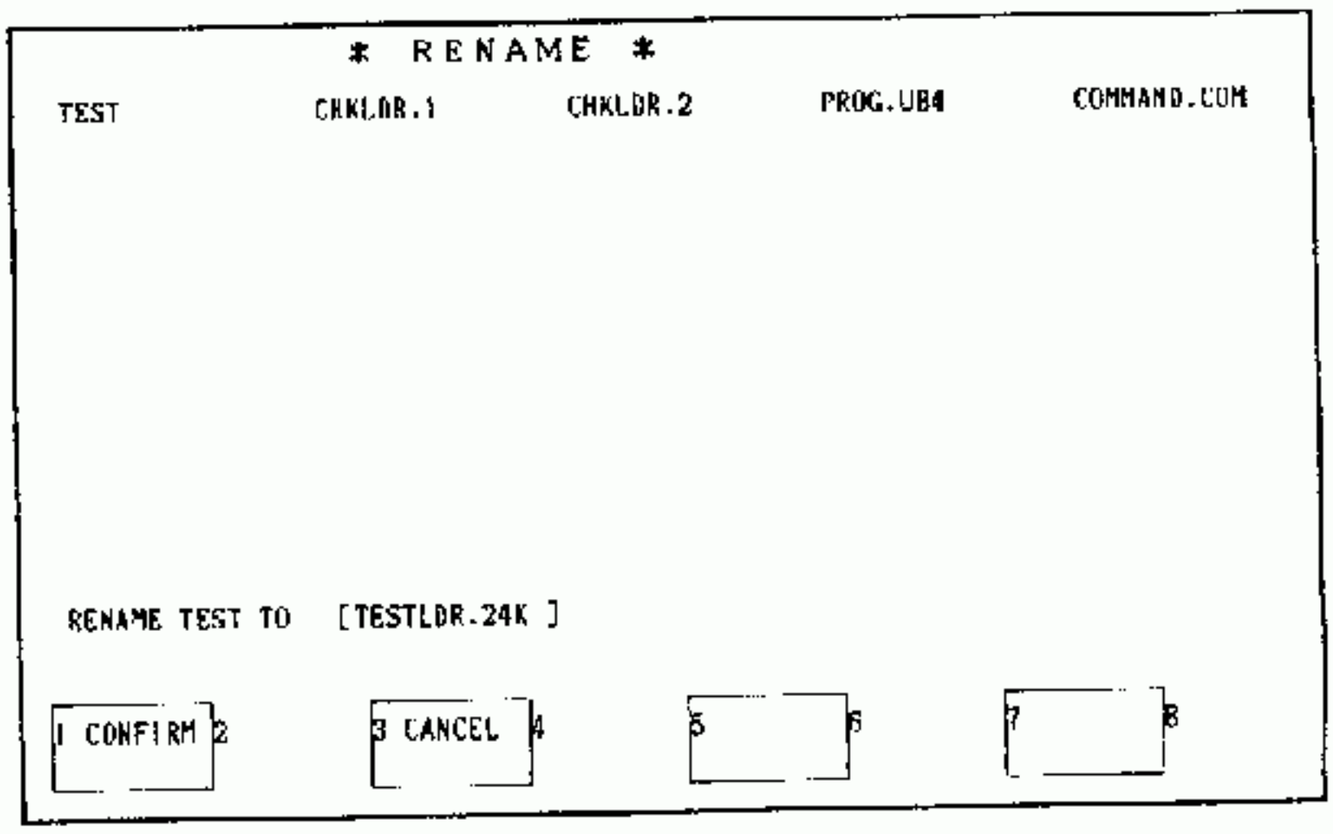


Fig. 5.2.154

NOTE

1. Depressing "CANCEL" key in the display of Fig. 5.2.154 returns to the display shown in Fig. 5.2.152.

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

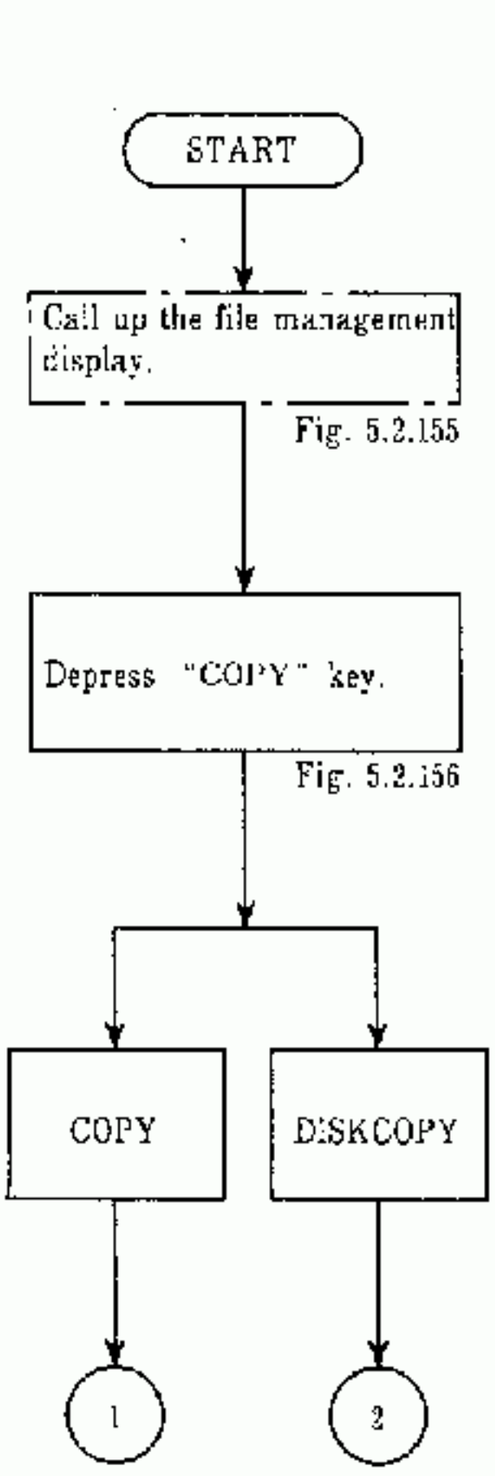
(6) File Copying

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.



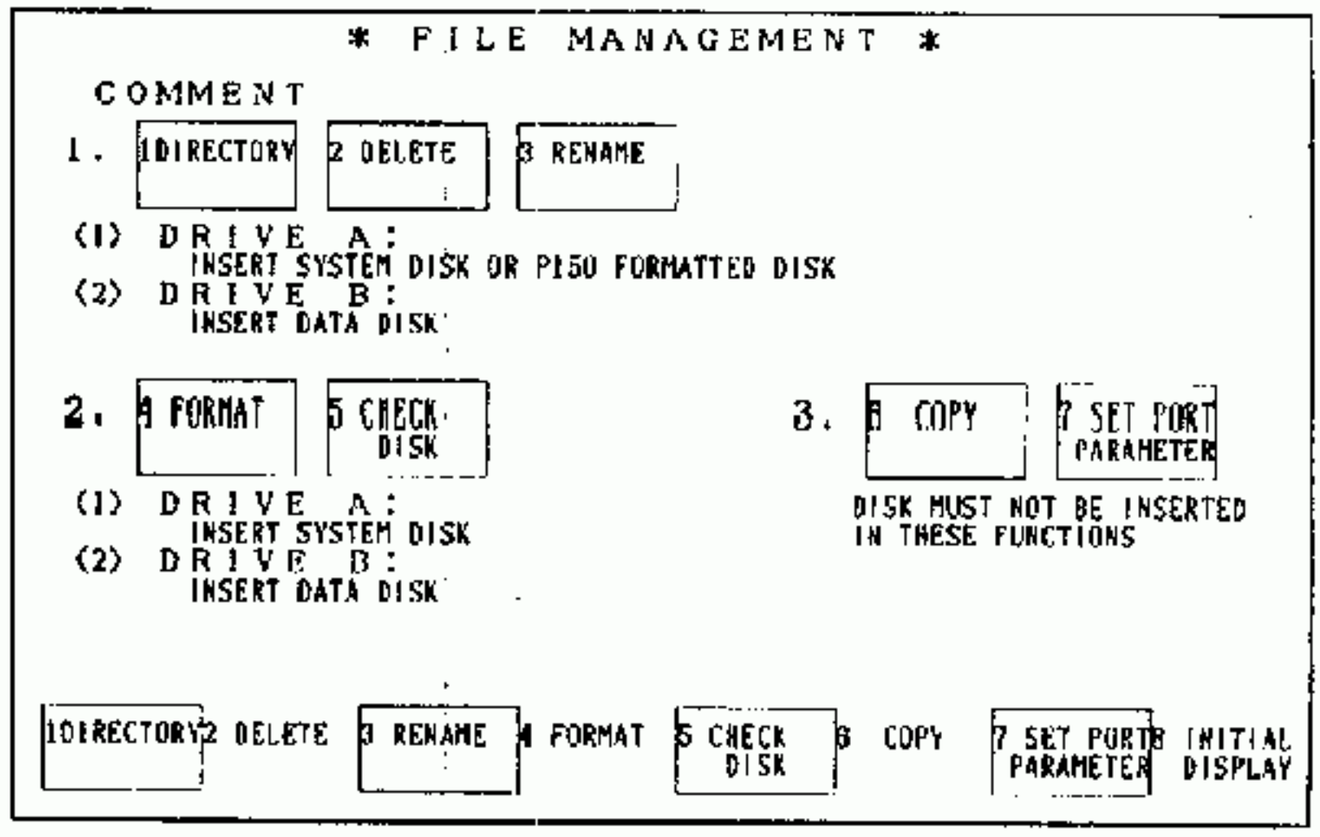


Fig. 5.2.155

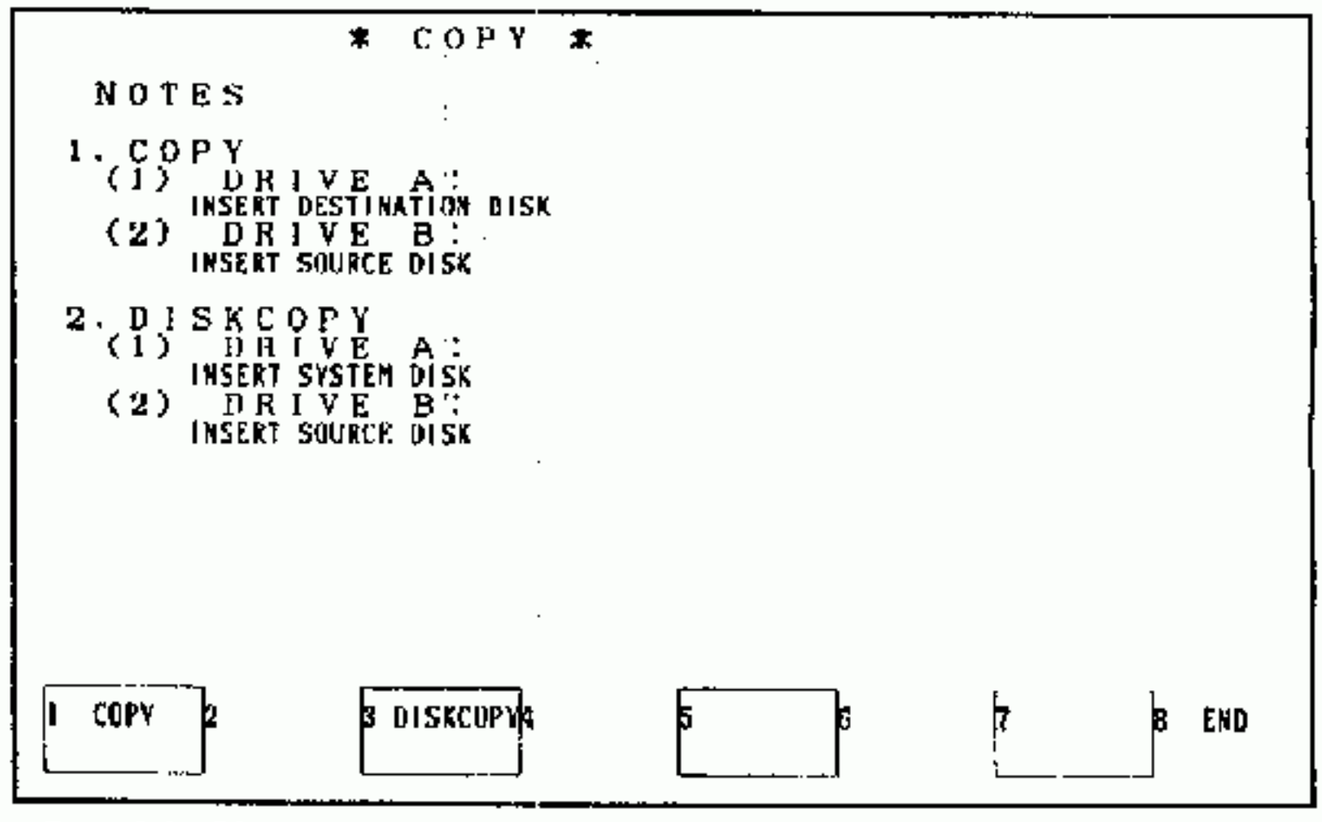


Fig. 5.2.156

NOTE

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

FILE COPY

The specified file contents, from the disk in drive B to the disk in drive A, are copied.

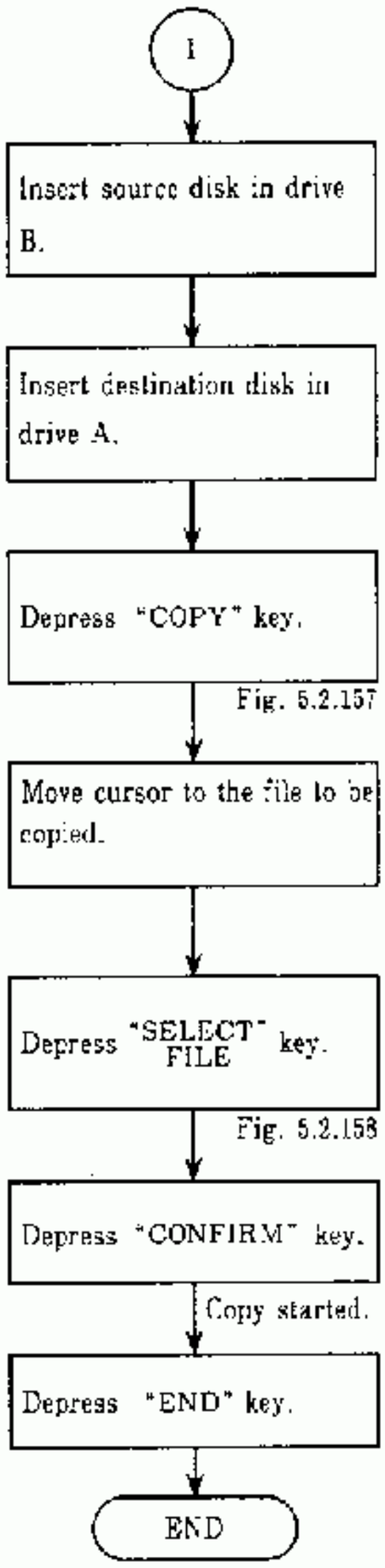


Fig. 5.2.157

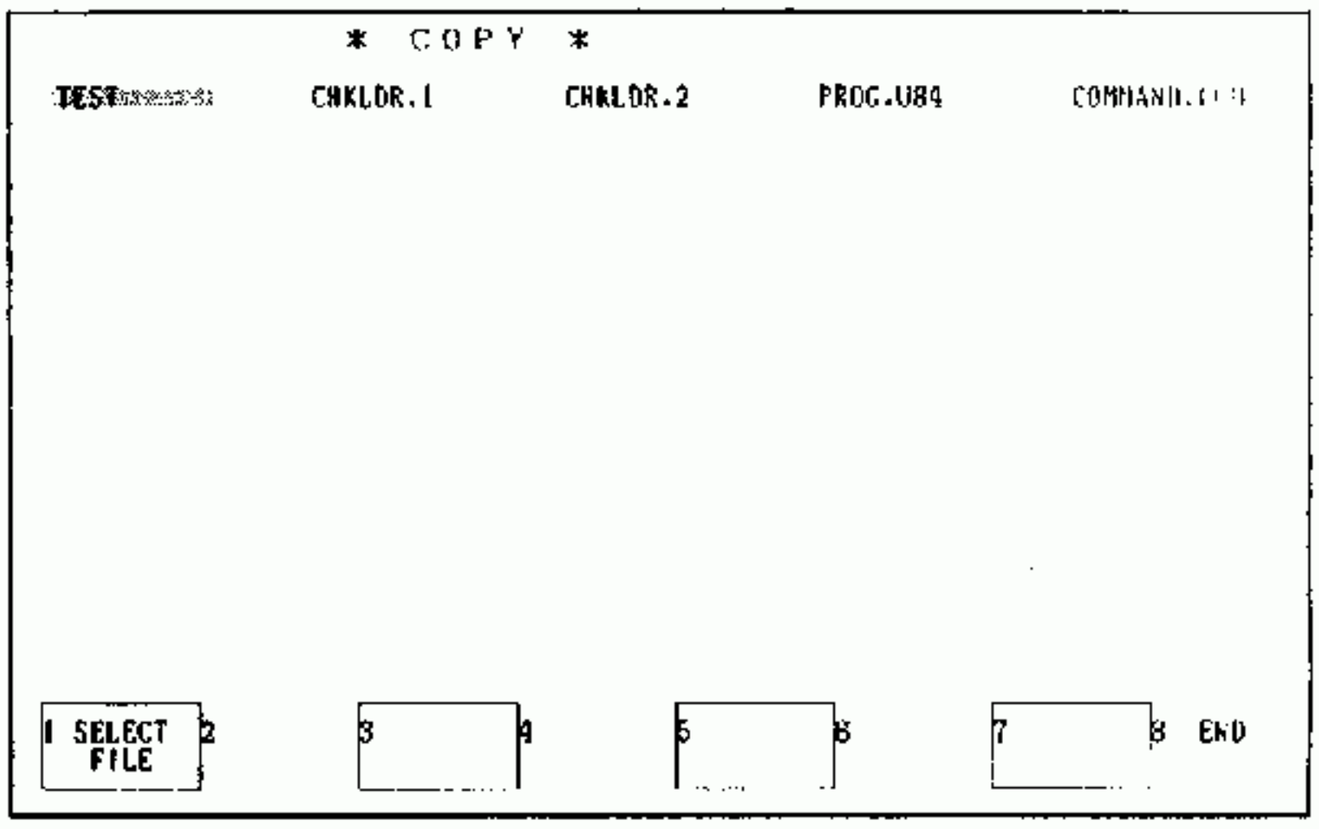


Fig. 5.2.157

Fig. 5.2.158

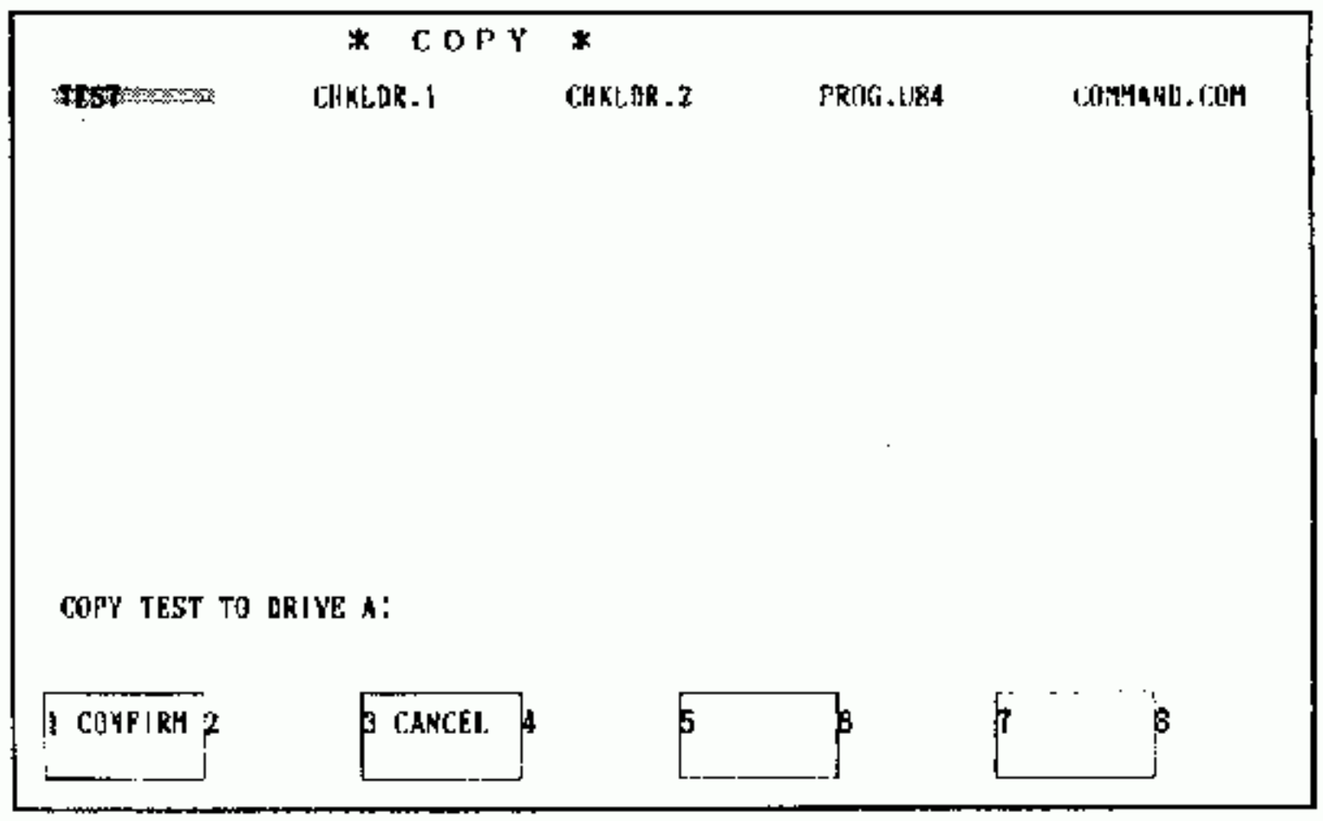


Fig. 5.2.158

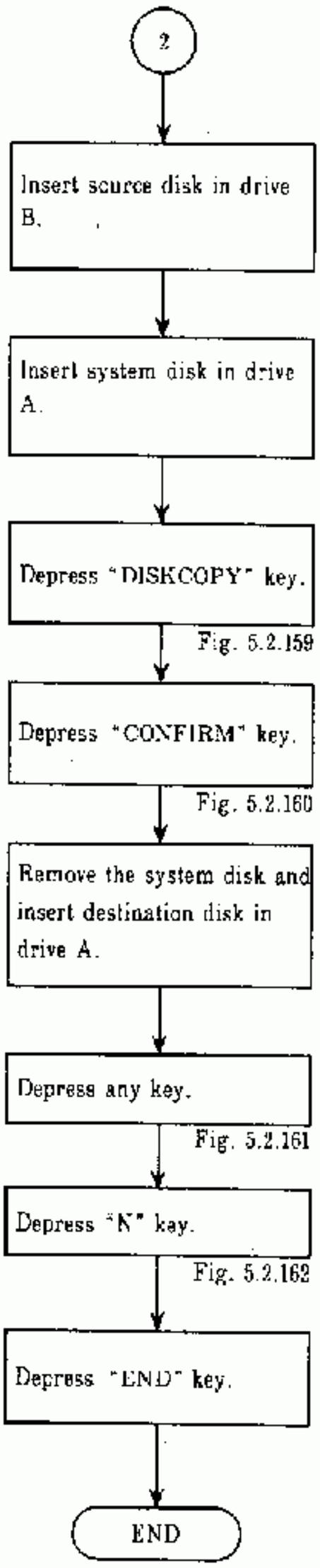
NOTE

1. Make the destination disk writable in advance.

2. Depressing "CANCEL" key (Fig. 5.2.158) returns to the display shown in Fig. 5.2.156.

DISK COPY

The entire contents of the disk in drive B are copied onto the disk in drive A.



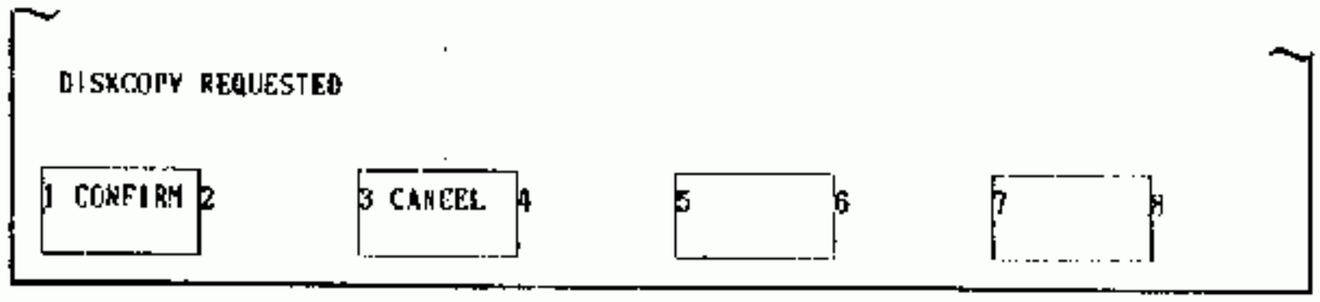


Fig. 5.2.159

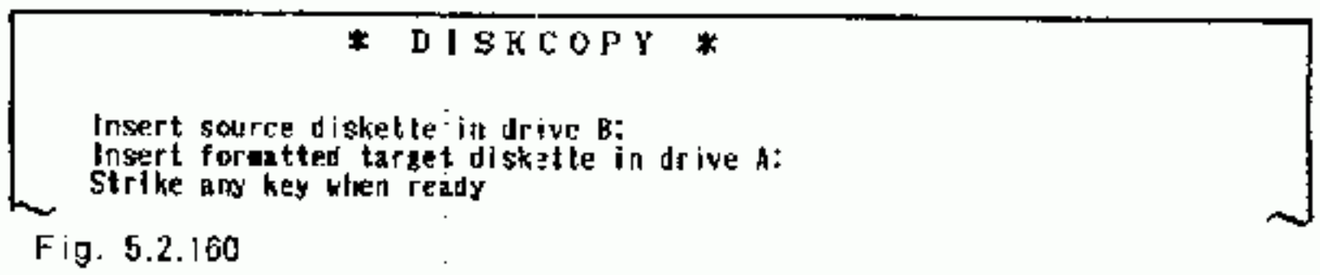


Fig. 5.2.160

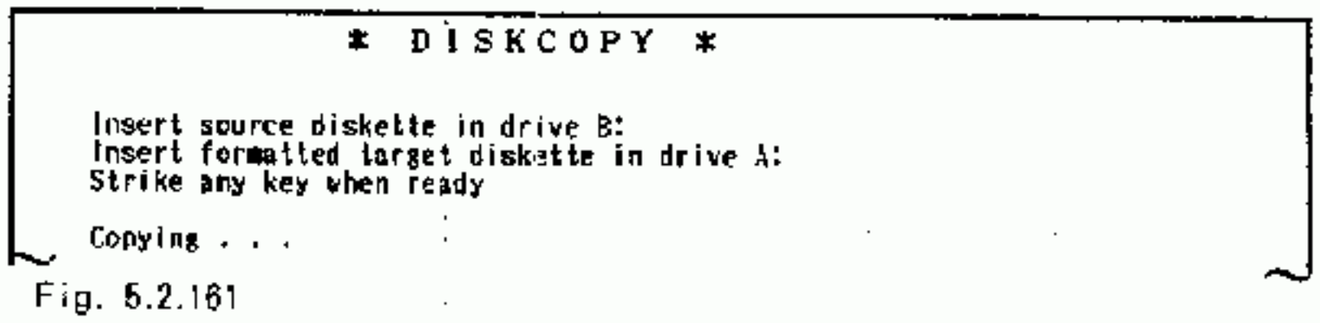


Fig. 5.2.161

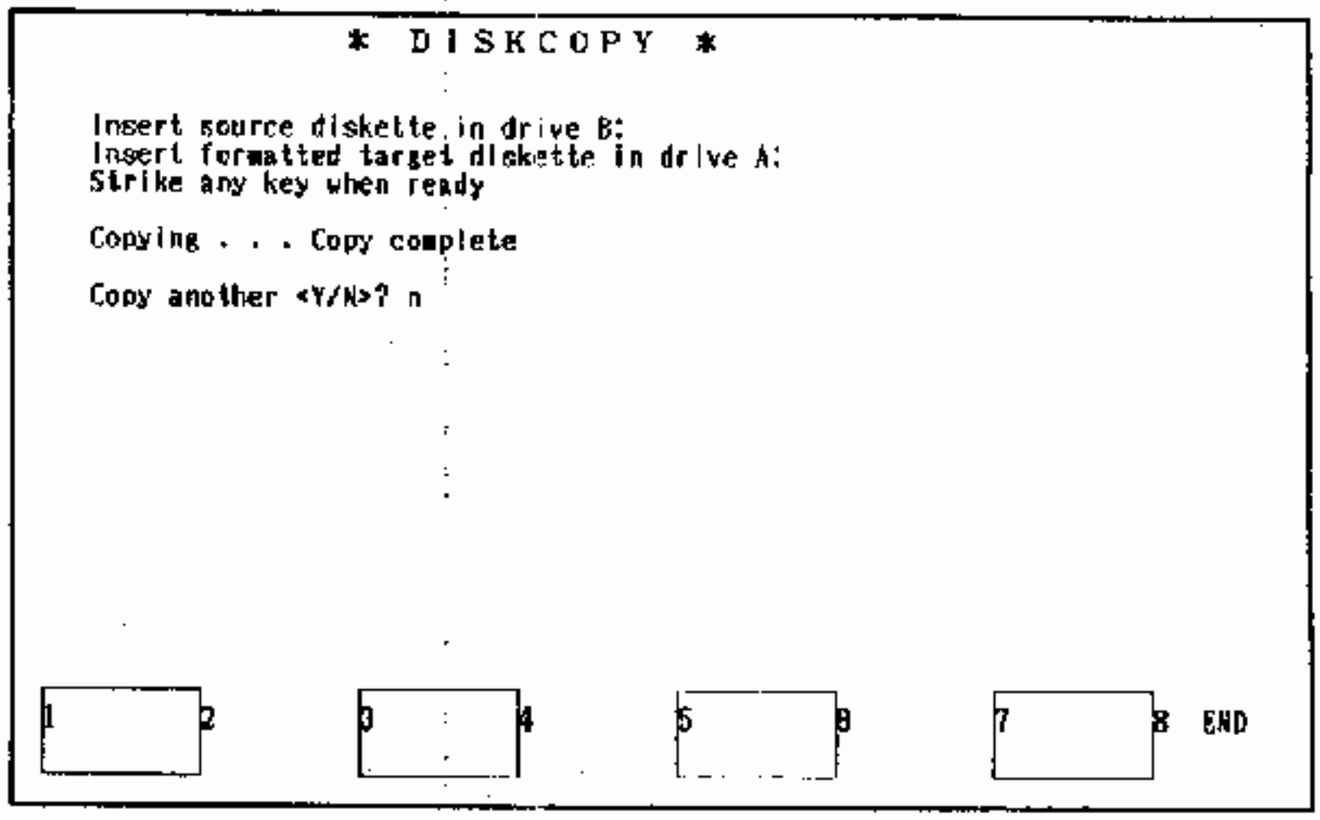


Fig. 5.2.162

NOTE

1. Make the destination disk writable in advance.

2. Depressing "CANCEL" key (Fig. 5.2.159) returns to the display shown in Fig. 5.2.156.

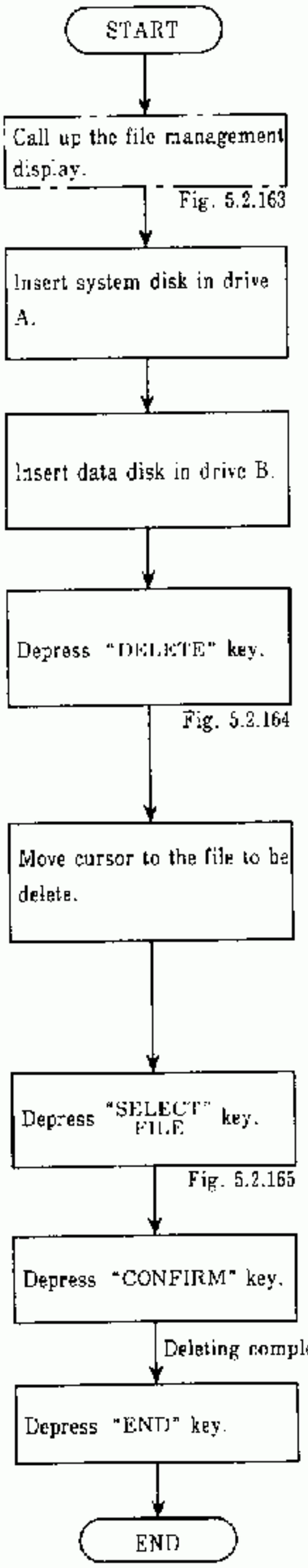
3. To copy other disks in Fig. 5.2.162, first depress "Y" key, and then make the same operations as shown above.

(7) File Deleting

This function is used to delete unnecessary files in the data disk.

POINT

Make the data disk writable in advance.



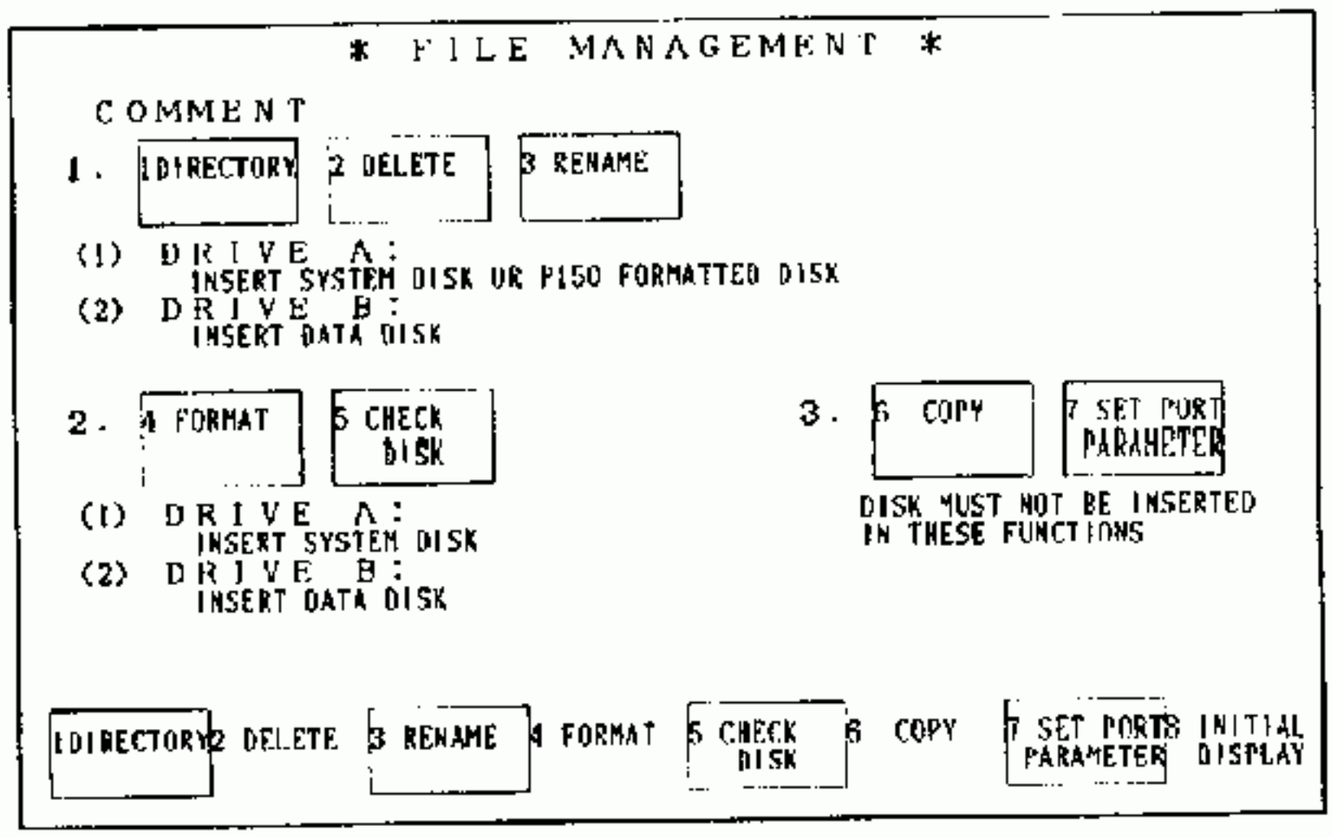


Fig. 5.2.163

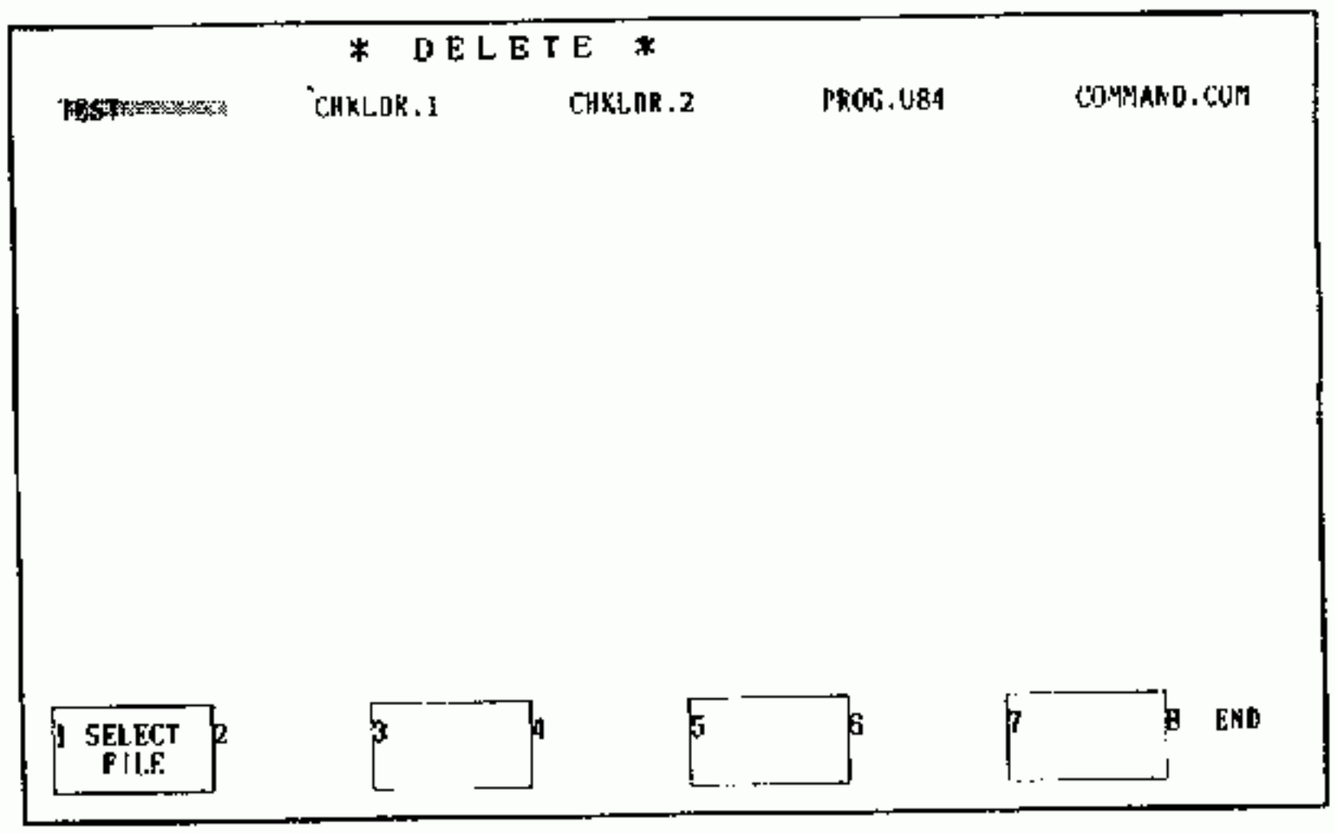


Fig. 5.2.164

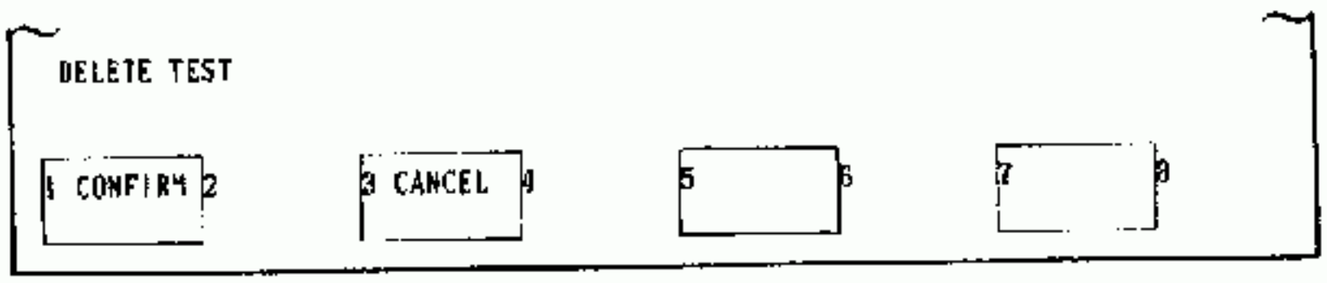


Fig. 5.2.165

NOTE

1. Depressing "CANCEL" key (Fig. 5.2.165) returns to the display shown in Fig. 5.2.164

2. A disk formatted by P150 (containing "COMMAND. COM" file) can be used in place of the system disk.

IMPORTANT

Be sure to put important disks in write disable state.

5.2.10 Printing

(1) Allocation Data Printing

Only allocation data are printed out by depressing "T-COP" PRINT after connecting a printer to P150 parallel port (Centronics).

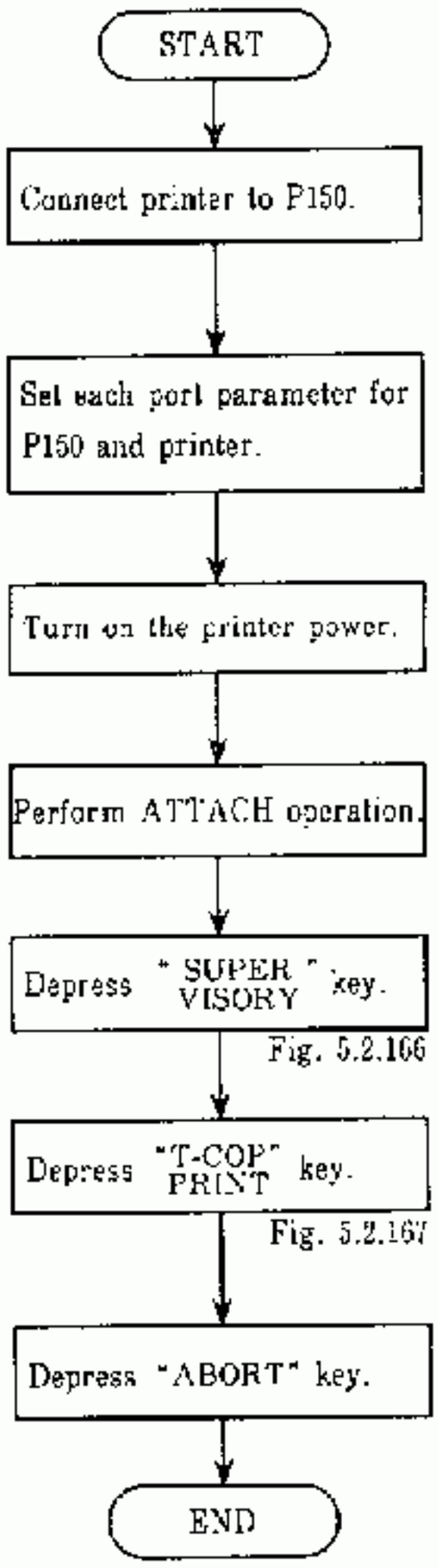


Fig. 5.2.166

Fig. 5.2.167

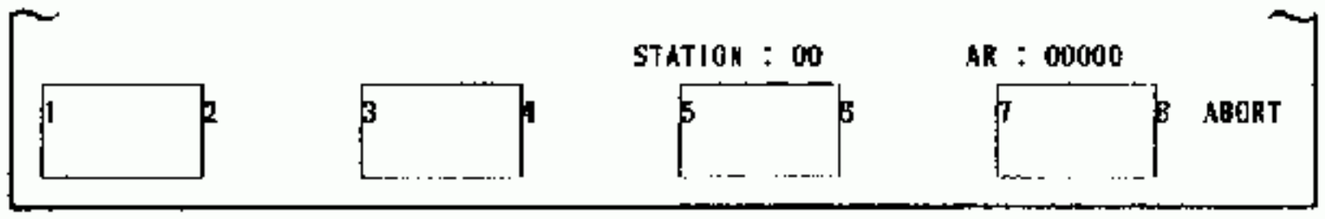


Fig. 5.2.168

*** MASTER DISCRETE INPUT ***

UNIT NO : 1

REFERENCE	STATION	REFERENCE	REFERENCE	STATION	REFERENCE
60001-60008	01	50001	60129-60136	--	-----
60009-60016	01	50009	60137-60144	--	-----
60017-60024	01	50017	60145-60152	--	-----
60025-60032	01	50025	60153-60160	--	-----
60033-60040	01	50033	60161-60168	--	-----
60041-60048	01	50041	60169-60176	--	-----
60049-60056	01	50049	60177-60184	--	-----
60057-60064	01	50057	60185-60192	--	-----
60065-60072	00	70001	60193-60200	--	-----
60073-60080	--	-----	60201-60208	--	-----
60081-60088	--	-----	60209-60216	--	-----
60089-60096	--	-----	60217-60224	--	-----
60097-60104	--	-----	60225-60232	--	-----
60105-60112	--	-----	60233-60240	--	-----
60113-60120	--	-----	60241-60248	--	-----
60121-60128	--	-----	60249-60256	--	-----

*** MASTER REGISTER INPUT ***

UNIT NO : 1

REFERENCE	STATION	REFERENCE	REFERENCE	STATION	REFERENCE
80001	--	-----	80009	--	-----
80002	--	-----	80010	--	-----
80003	--	-----	80011	--	-----
80004	--	-----	80012	--	-----
80005	--	-----	80013	--	-----
80006	--	-----	80014	--	-----
80007	--	-----	80015	--	-----
80008	--	-----	80016	--	-----

Fig. 5.2.168 Printing Example

NOTE

For printer setting, refer to the next page.

(2) Hard Copy

Using a printer available on the market, connected to the parallel port of P150, then depressing "SHIFT" and "PRINT" CHC NODE keys simultaneously produces a hard copy of the display.

Use of Parallel Port

(a) Applicable printer

- PC-PR201 F (made by NEC Corp.)
- PC-PR101 F (made by NEC Corp.)

(b) Accessories

The following accessories are required in addition to MEMOLINK, P150, and their connecting cables (JZMSZ-W1015):

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
Printing Paper	10" × 11"	1 set	

Note: Cable and Printer above are made by NEC Corp.

(c) Setting communication parameter

Set DIP switches of PC-PR201F or PC-PR101F as follows:

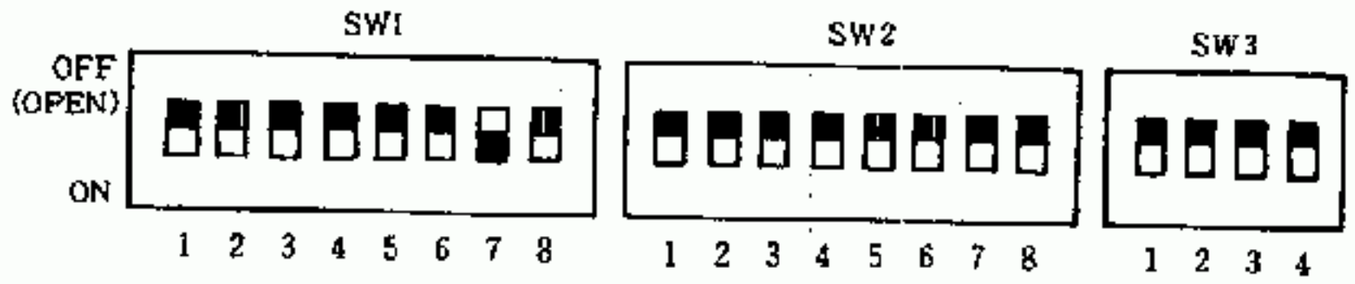


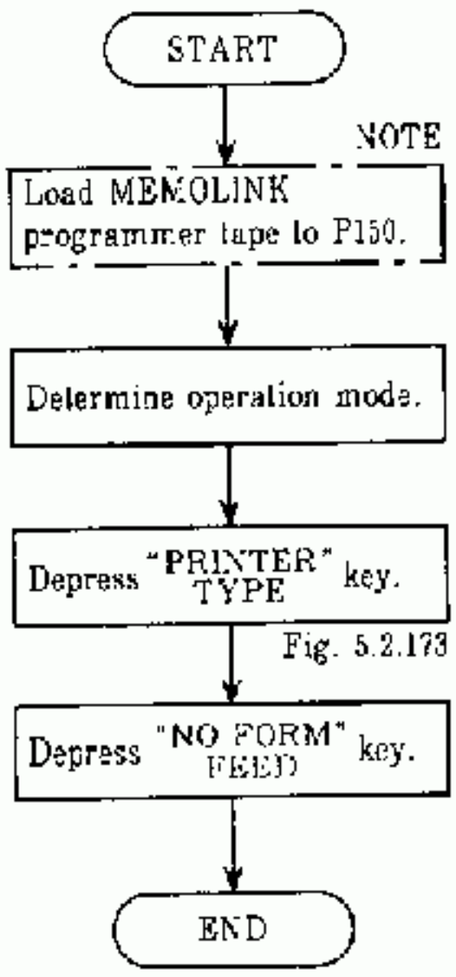
Fig. 5.2.169

POINT

For detailed information of switches, refer to user's manual attached to printer.

(3) Printer Type Setting

Select "NO FORM FEED", when using printer which cannot accept a form feed code.



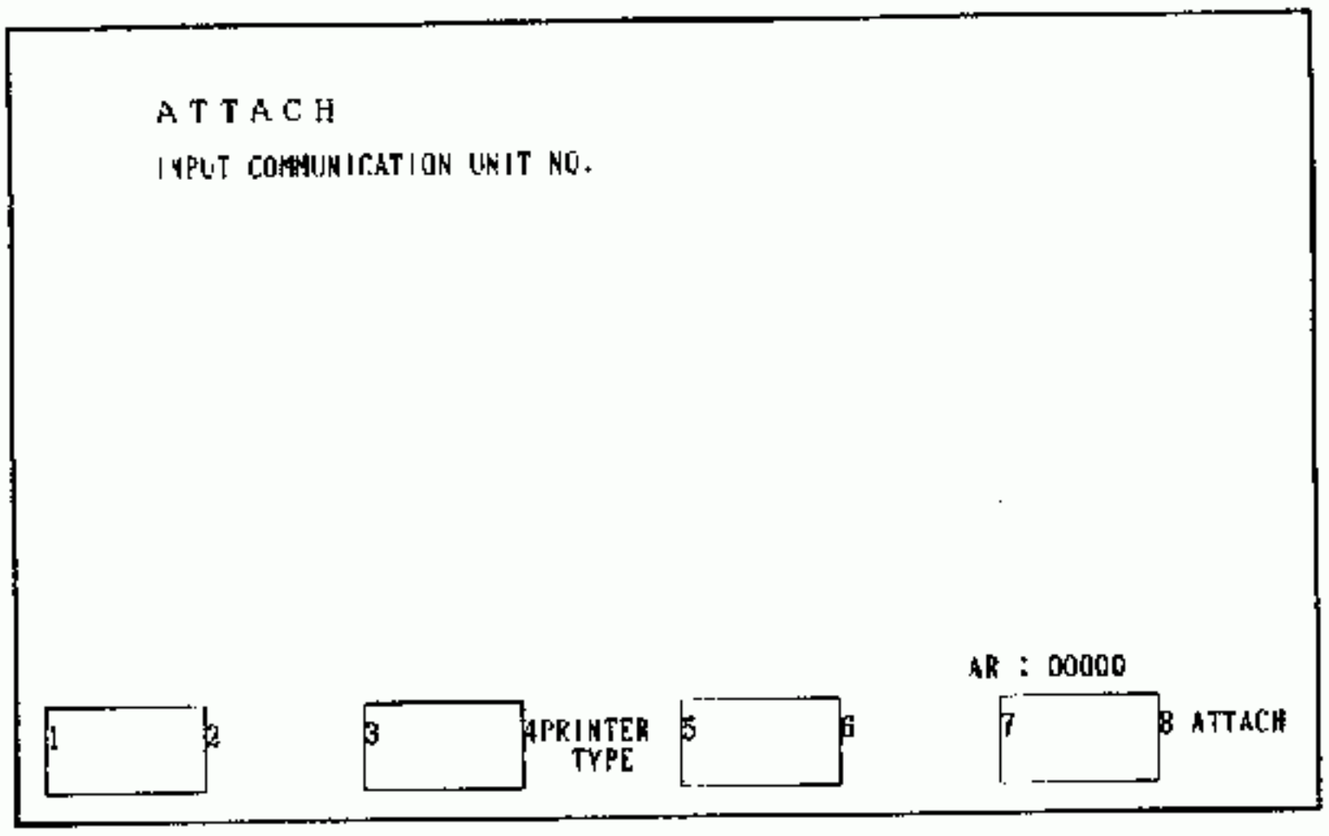


Fig. 5.2.170

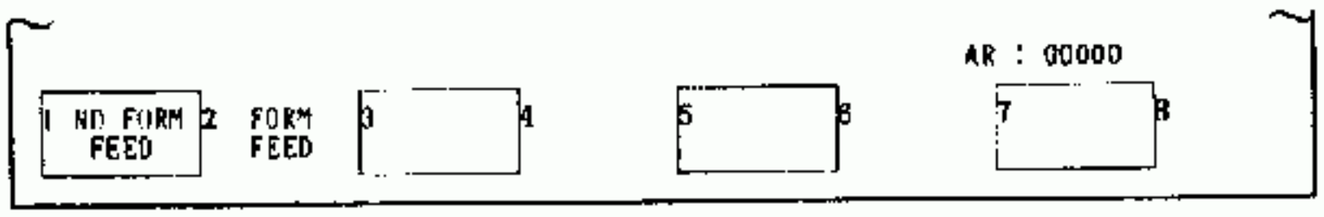


Fig. 5.2.171

NOTE

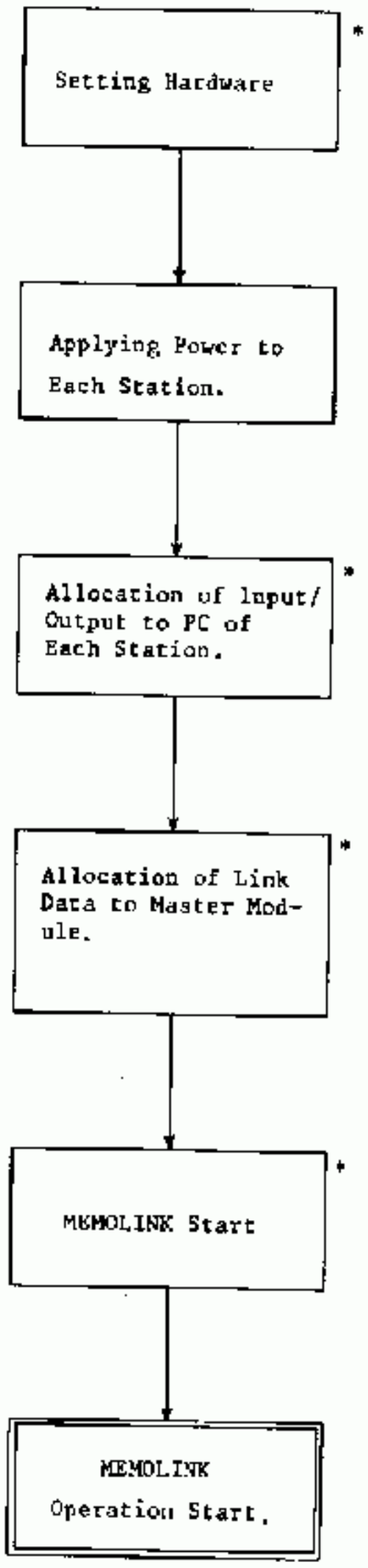
If ATTACH operation has already been completed, perform either the following two operations:

- Depress "SHIFT" and " SUPER VISORY " keys.
- Depress " INITIAL DISPLAY " in status shown in Fig. 5.2.10.

6. OPERATIONAL PROCEDURES

6.1 OPERATION START

Start operation in accordance with the following flow:



Set the MEMOLINK station No. in the slave stations and MEMOBUS station No. in the master station.

Turn on power to the optical fiber connectors of the slave stations. "READY" indicator on the MEMOLINK module lights.

Match the allocation size.

Dump link data allocation on a tape or a floppy disk.

Set PCs of the stations to the RUN status.

RXD, TXD, I/F ACTIVE, MASTER OK, and SLAVE OK indicators light,

* Operation needed only at initial system start.

Note: Power may be turned on randomly irrespective of station numbers.

6.2 OPERATION STOP

Stop operation after considering all operating factors of the system.

6.2.1 MEMOLINK Operation Stop

MEMOLINK operation (communications) can be stopped by stopping the master module through the programming panel. If the MEMOLINK is not operating, all data from the modules to the PCs of the stations turn OFF (input rleay) or go to 0 (input register). The module is disconnected from the PCs.

By starting the master module, MEMOLINK operation (communications) is restarted. The module also restarts data exchange with the PCs.

6.2.2 PC Stop

By stopping the PCs, data exchanges betwen the PCs of that station and module will stop because I/O service stops. In this case, link data of that station turn OFF or go to 0, but operation (communications) will continue.

By starting PCs, the I/O service is restarted, and data exchanges with the module is also performed. Link data of that station become the normal state.

6.2.3 Power OFF

(1) Master PC power OFF

By turning off power to the master PC, the MEMOLINK stops oepration (communications). At this time, all the slave stations become MEMOLINK communication errors and the "COMM ERR" indicator lights. The stations stop exchanging data with the PCs, and input data from the mdule to the PCs turn OFF (input relay) or go to 0 (input register).

By turning on power to the master PC again, operation (communications) with the MEMOLINK restarts, and the data exchanges between the PCs of the stations and module is also performed.

(2) Slave PC power OFF

By turning off powr to the slave PCs, link data of this station turn OFF or go to 0. Only this station is disconnected from the MEMOLINK. MEMOLINK operation (communications) still continues. The master module displays the station No. of the separated slave station. If there are several trouble stations, the smallest station No. is displayed.

By turning on power again, the slave station is connected to the MEMOLINK automatically again.

(3) Optical connector power OFF

By turning off power to the optical fiber connector of one slave station, this station and the stations in the down-stream can no longer have communications with the MEMOLINK and are separated. The link data of the separated stations turn OFF or go to 0. MEMOLINK communications with the other stations continue normally. The master module displays the smallest No. of the separated stations this time. The stations to be disconnected relate only to physical positions.

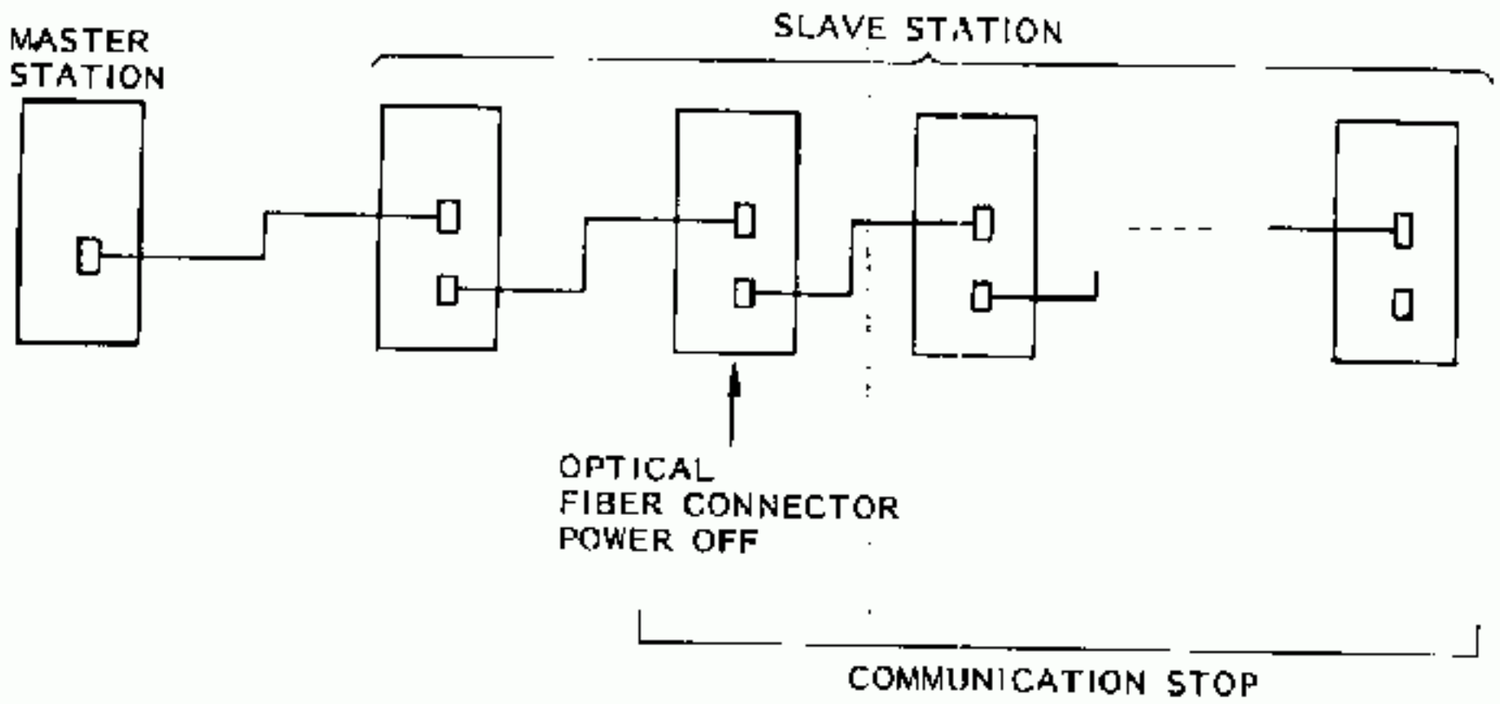


Fig. 6.1 Optical Fiber Connector Power OFF

By turning on power again, all the disconnected stations are connected. Table 6.1 summarizes the foregoing.

Table 6.1 Operation Status

Condition	MEMOLINK Communication	Date Exchange between PC and Module
MEMOLINK Operation Stop (by programming panel)	Stop	No (OFF or 0)
PC Stop	Continued (Data in PC stop station; OFF or 0)	Yes (except for PC stop station)
Master PC Power OFF	Stop	No (OFF or 0)
Slave PC Power OFF	Continued (Data in power OFF station: OFF or 0)	Yes (except for power OFF station)
Optical Fiber Connector Power OFF	Communication interrupted after power OFF station. Operation continuation of upstream station (Data of disconnected station is OFF or 0.)	No disconnected station No upstream station

6.3 TROUBLESHOOTING

6.3.1 Master Module Checking

The MEMOLINK system status can be checked through the master-module numerical indicators and module status indicators .

Table 6.2 Troubles and Causes

No.	Light ON/OFF	Cause	Remarks
1	Error code display and module status shown by blinking	Self-diagnosis error. ①	Refer to Tables 3.3 and 6.3.
2	"COMM ERR" ON (SLAVE OK OFF)	MEMOLINK communication error. ②	–
3	"RXD", "TXD" OFF	MEMOLINK communication stop. ③	–
4	"I/F ACTIVE" OFF (MASTER OK OFF)	Stopped data exchange with PCs. ④	–
5	"BATT ALARM" OFF	Battery voltage lower than the specified value (2.5 V).	• Replace a battery. • Refer to Par. 6.3.4.

Note: Refer to Par. 6.2.

① Error display (E □)
Error code E 6 (allocation data trouble, etc.) also occurs if memory data is not held well or is faulty. A module failure can be suspected if the error E □ is displayed during operation. Replace the module.

② MEMOLINK communication error
The failed slave station No. is indicated on the numerical indicator if this error occurs. (See Table 3.3.) Check for the following:
① Broken optical fiber
② Failure of optical connector power
③ Failure of slave PC power
④ Slave station No. setting
⑤ Slave module condition

③ MEMOLINK communications stop
Check for the following if E □ is not displayed:
① Link data allocated
② MEMOLINK communications started (or communications restarted after stopping)
③ MEOLINK communications stopped

④ Stopped data exchange with PCs
Check for the following:
① MEMOLINK communications stopped
② PCs stopped
③ Correct I/O allocation of PCs
④ Matching of I/O allocation and link data allocation

Table 6.3 Master Module Error Indication

Error	COMM ERR	I/F ACTIVE	TXD	RXD	READY	Error Code
System ROM Error	○				○	E1
System RAM Error	○			○		E2
System RAM Error	○			○	○	E3
System RAM Error	○		○			E4
MEMOBUS Port Parameter						E5
Allocation Data Error	○		○	○		E6
WDT Error	○		○	○	○	E7
MEMOLINK Communication ROM Error	○	○				E8
MEMOLINK Communication RAM Error	○	○			○	E9

Note:
1. ○: LED is blinking
2. Check MEMOBUS port with Port 2. If MEMOBUS port parameter trouble is detected during power increase, the condition is determined to be an initial status and a default value will be.

6.3.2 Slave Module Check

A MEMOLINK communication gose to error if the slave module is in trouble. This error can be checked by the master module.

Table 6.4 Troubles and Ceuses

No.	Light ON/OFF	Cause	Remarks
1	Module status shown by blinking	Self diagnos is error	Refer to Table 6.5
2	"COMM ERR" ON	MEMOLINK communication error. ①	–
3	"RXD," "TXD" ON	MEMOLINK communication stop. ②	–
4	"I/F ACTIVE" OFF ("SLAVE OK" OFF)	Stopped data exchange with PCs. ③	–
5	"EXT PWR OK" OFF	No external power for optical connector.	• Check voltage. • Check fuse.

Note: Refer to Par. 6.2.

① MEMOLINK communication error
This is basically a time-out error. Check for the followng:
① Broken optical fiber
② External power for optical connectors.
③ Master station condition (Refer to Par. 6.3.1.)

② MEMOLINK communication stop
Check for the following:
① Correct station No. setting
② MEMOLINK communications stopped
③ MEMOLINK communications started (or communications restarted after stopping)
④ Power to the master station turned on

②, ③, and ④ are problems on the master side (Refer to Par. 6.3.1).

③ Stop of data exchange with PCs
Check for the following:
① PCs stopped
② COMM ERR lit

Table 6.5 Slave Module Error Indication

Error	COMM ERR	I/F ACTIVE	TXD	RXD	READY
System ROM Error	○				○
System RAM Error	○			○	
System RAM Error	○			○	○
System RAM Error	○		○		
Allocation Data Error	○		○	○	
WDT Error	○		○	○	○
MEMOLINK Communication ROM Error	○	○			
MEMOLINK Communication RAM Error	○	○			○

Note:
1. ○ : LED is blinking.
2. Allocation data is sent from the master during start. An allocation data error is activated if this data is incorrect or is destroyed.

6.3.3 I/O Slave Module Check

A MEMOLINK communication goes to error if the I/O slave module is in trouble. This error can be checked by the master module.

Table 6.6 Troubles and Causes

No.	Light ON/OFF	Cause	Remarks
1	Module status shown by blinking	Self-diagnosis error	Refer to Table 6.7.
2	"COMM ERR" ON	MEMOLINK communication error	
3	"RXD", "TXD" ON	MEMOLINK communication stop	
4	"I/F ACTIVE" OFF	Data transmit/receive with I/O stopped*	
5	"I/O BUS ERR" ON	2000 Series I/O bus error	

* Check for the following:
  - I/O modules positively inserted.
  - COMM ERR lit.

Table 6.7 Slave Module Error Indication

Error	COMM ERR	TXD	RXD	READY
System ROM Error	○			○
System RAM Error	○		○	
System RAM Error	○		○	○
Allocation Data Error	○	○	○	
WDT Error	○	○	○	○

Note:
1. ○: LED is blinking.
2. Allocation data is sent from the master during start. An allocation data error is activated if this data is incorrect or is destroyed.

6.3.4 Status Reading

The status of the master module can be checked on the programming panel. The status is displayed hexadecimally in four digits.

Table 6.8 Status Codes

Code	Status
0 0 0 1	
0 0 0 2	
0 0 0 4	No data exchange with slave PC
0 0 0 8	WDT (Watchdog timer) error
0 0 1 0	MEMOLINK communication error
0 0 2 0	MEMOLINK communication ROM error
0 0 4 0	MEMOLINK communication RAM error
0 0 8 0	System ROM error
0 1 0 0	System RAM error
0 2 0 0	System RAM error
0 4 0 0	No data exchange with master PC
0 8 0 0	MEMOBUS port 1 communication error
1 0 0 0	MEMOBUS port 2 communication error
2 0 0 0	Allocation data error
4 0 0 0	MEMOBUS port parameter error
8 0 0 0	MEMOBUS stop flag

6.3.5 Battery Replacement

Backup power for master module memory is provided by a battery. It is recommended that this battery be replaced every two years. The battery service life varies with the environmental conditions (temperature and humidity) and working time (AC power failure time).

Table 6.9 Battery Specifications

Item	Specifications
Battery	Lithium battery
Type	BR-2/3A-1 (Wiring tab provided)
Manufacturer	Matsushita Battery Industry Co., Ltd.
Nominal Rated Voltage	3 V
Nominal Rated Capacity	1200 mAH
Ambient Temperature	0 to + 55℃
Storage Temperature	20 to + 45 ℃
Life	5-year warranty at 25 ℃, 2 years for memory holding without conduction at 25℃.
Approx Weight	15 g

Note: When the battery in the table above is required, contact Yaskawa representative.

Replace the battery within one month if the "BATT ALARM" indicator lights on the master module.

Battery replacement:

1. Preheat a soldering iron.

2. Stop feeding power to the mounting base on which the master module is mounted.

3. Remove the master module from the mounting base.

4. Remove the master-module side panel. [See Fig. 6.2 (a).]

5. Disconnect the connector mounted at the tip of the lead wire from the printed circuit board.

6. Remove the battery from the battery holder using a screwdriver or other tool. [See Fig. 6.2 (b).]

7. Remove the lead wire from the soldering tab of the battery using the preheated soldering iron.

8. Solder the disconnected lead wire on the new battery soldering tab. Use care to observe polarity. (Positive : red lead; negative : black lead)

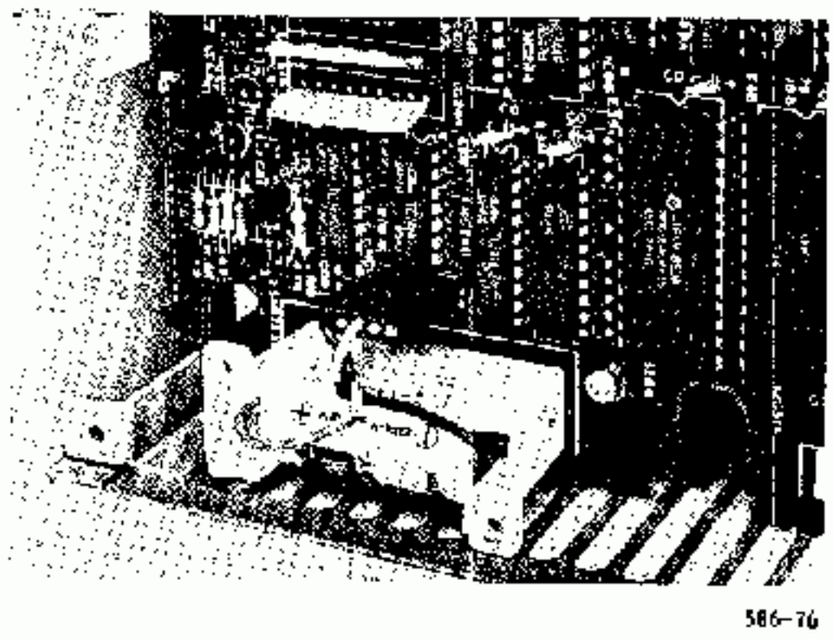
9. Place the new battery in the battery holder and insert the connector at the tip of the lead wire in connector of the printed circuit board. Be careful not to disconnect the connector pin.

10. Remount the master-module side panel.

11. Remount the master module on the mounting base and turn on power. Check that "BATT ALARM" lamp is off.

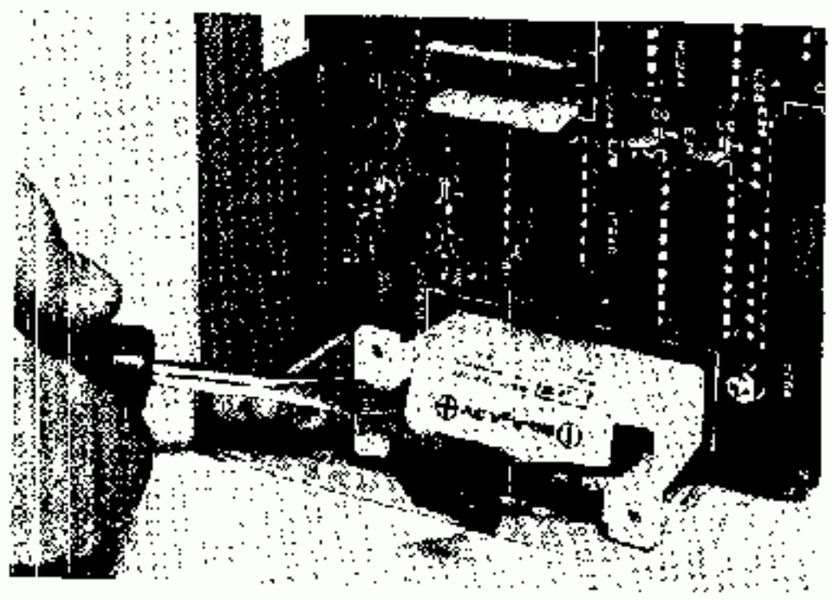
This completes the battery replacement.

Check that allocation data error (error code: E6) is not activated. If data are destroyed, reload data dumped on a tape or a floppy disk beforehand using the loader function of the programming panel.



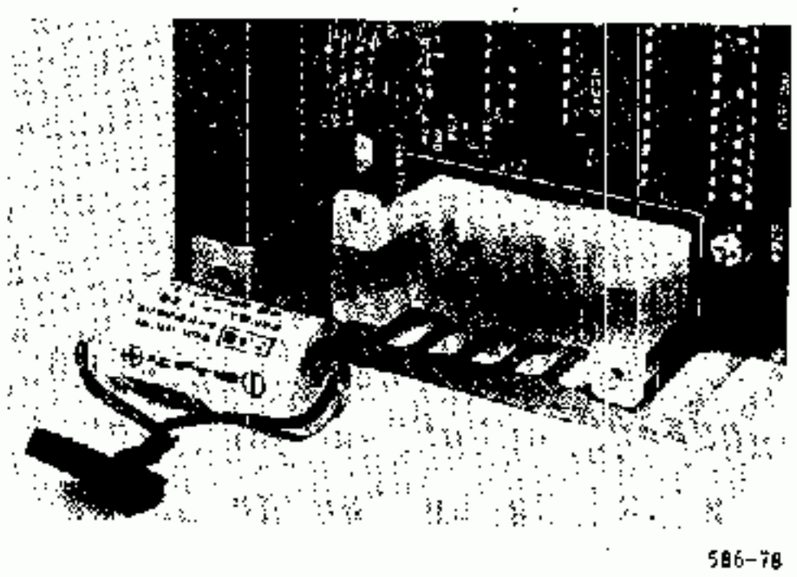
586-76

(a) Side Plate Remored



586-77

(b) Removing Battery from Battery Holder



586-78

(c) Removing Leads from So dered Tab

Fig. 6.2 Battery Removal

7. OPERATIONAL PRECAUTIONS

7.1 BACKUP FUNCTION IN POWER FAILURE

The following three types of data are saved in the event of a power failure. A battary backs up the master module memory.

(1) Allocation data
(2) Disable table
(3) MEMOBUS port parameters

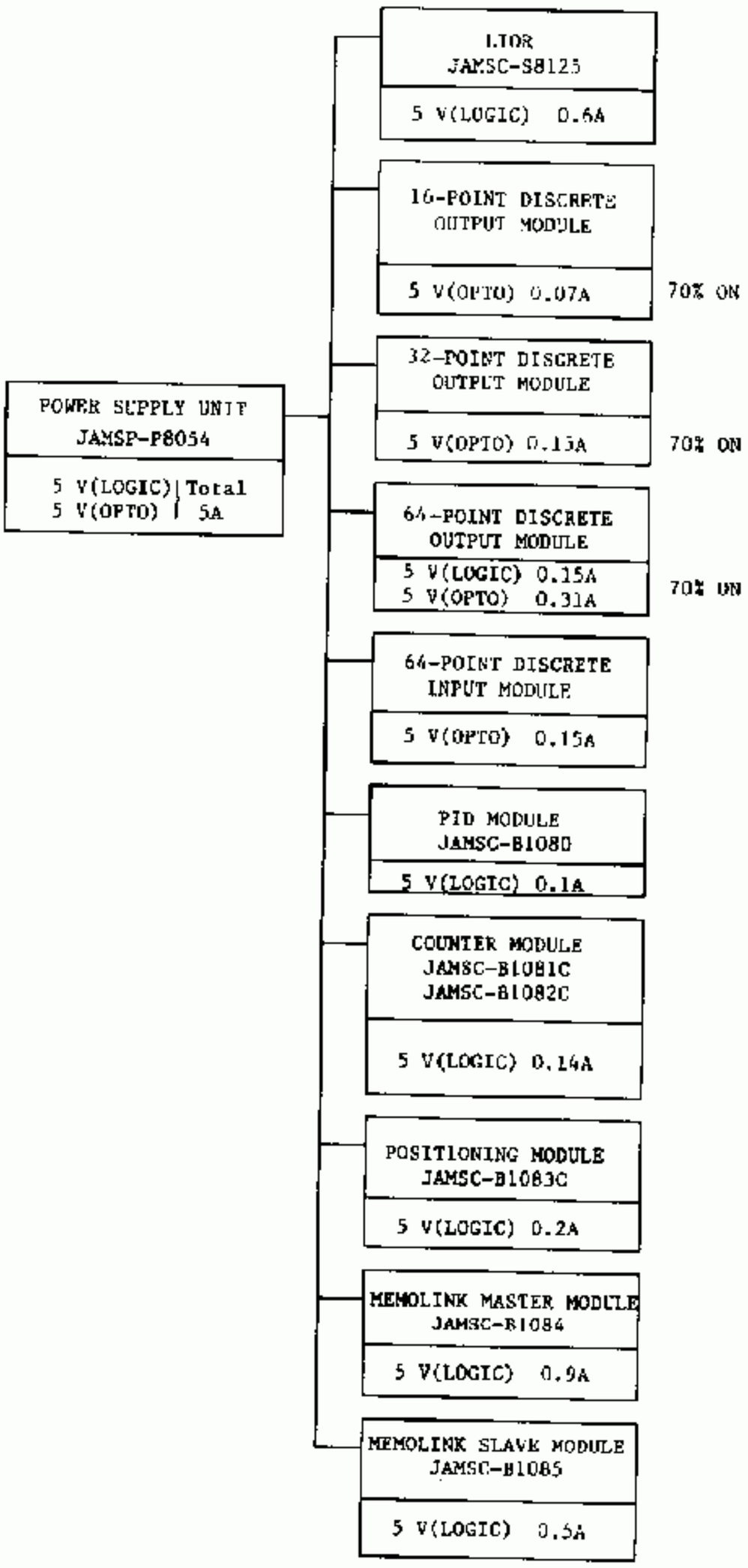
The MEMOBUS port parameters are set to default values if parameter error is detected at a power-on check, and normal operation can be continued. Operation is stopped if trouble with other allocation data or disable table occurs. (Refer to Tables 3.3 and 6.3.)

The memory data are not destroyed by power failures during normal operation However, data may be destroyed if a power failure occurs during a change of allocated data or disable status by the programming panel. Clear the memory and write allocated data correctly. Reload if data were dumped on a tape or a floppy disk beforehand.

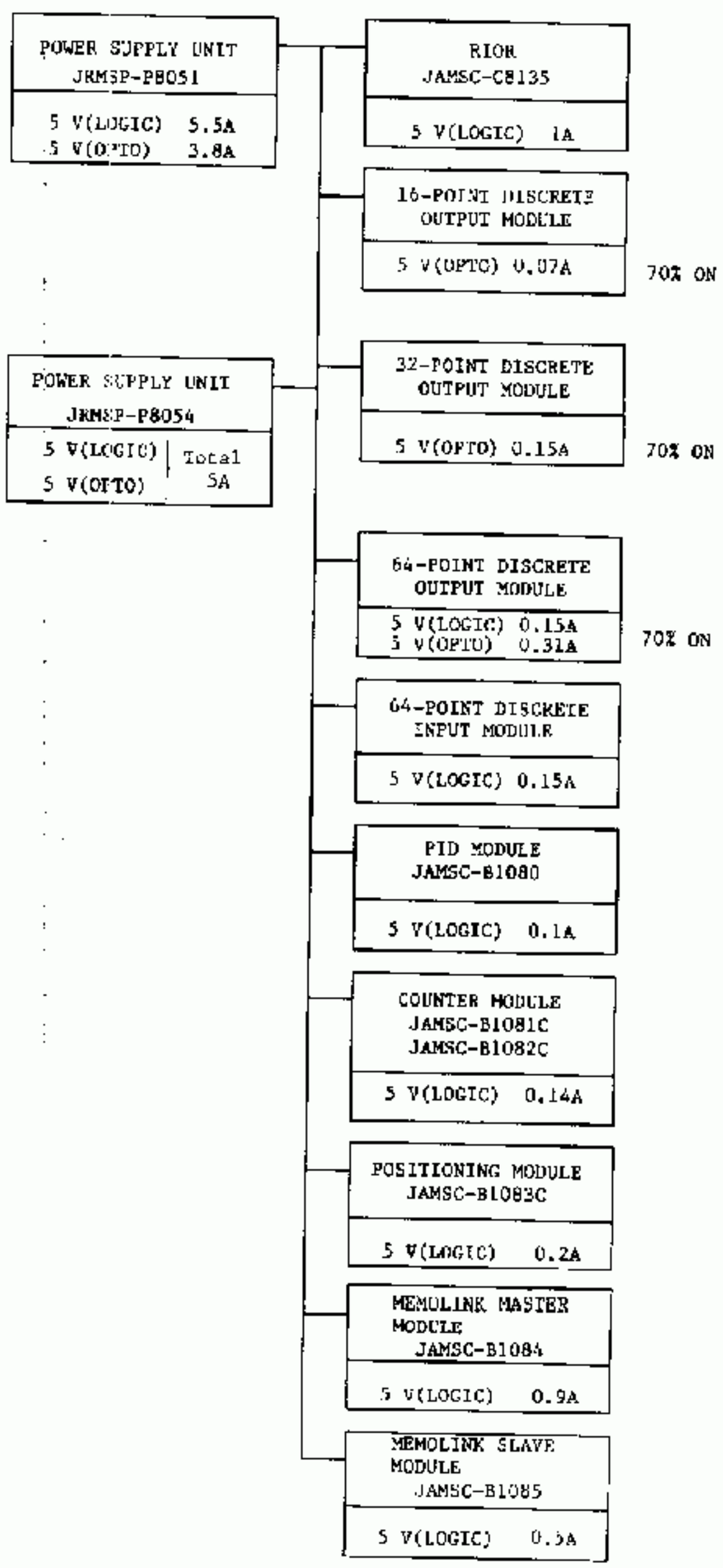
7.2 POWER SUPPLY CAPACITY

The number of modules to be mounted depends on the power supply unit capacity, and the total current consumption.

(1) U84 LOCAL



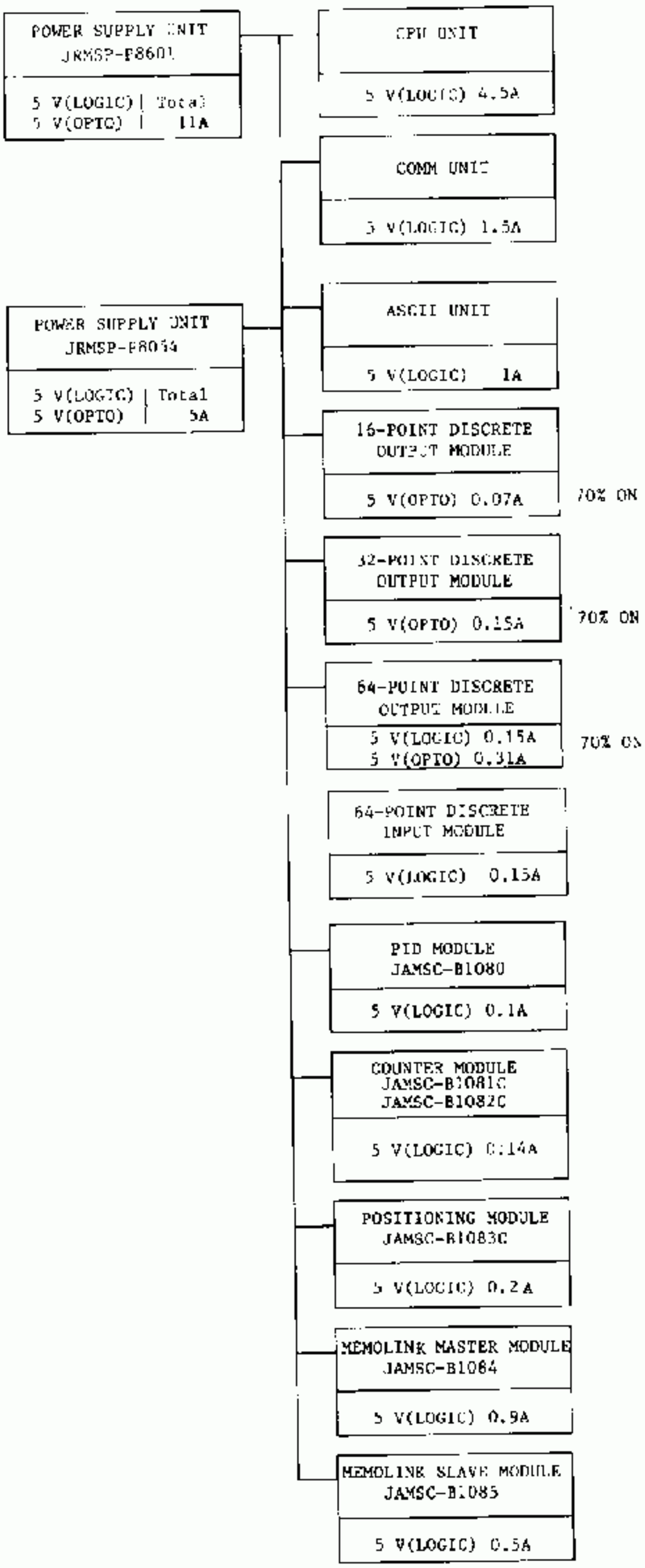
(2) U84 REMOTE



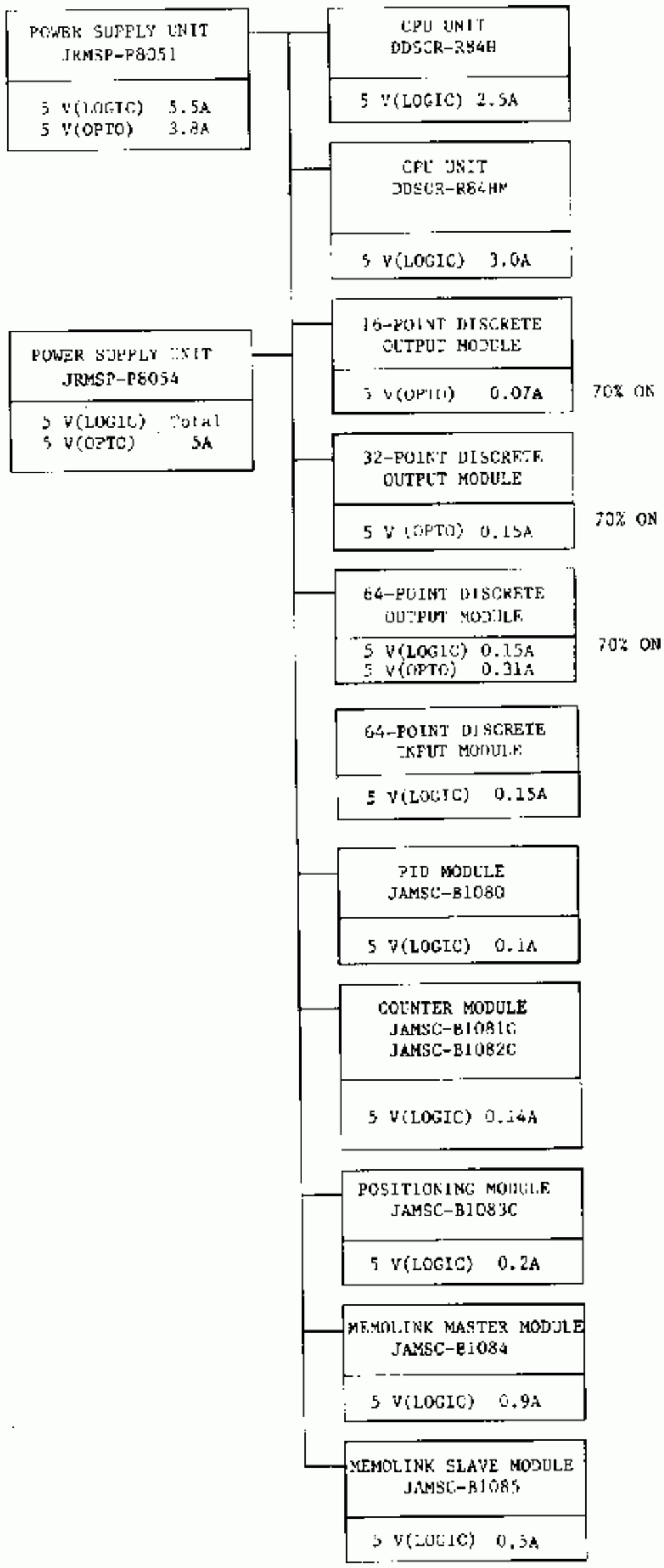
Note: The other modules are not considered for calculation of current consumption.

7.2 POWER SUPPLY CAPACITY (Cont'd)

(3) U84S



(4) R84H



7.3 EXTERNAL POWER SUPPLY FOR OPTICAL CONNECTORS

External 24 -VDC power supply is needed to operate slave module optical connectors. See Table 3.11 for specifications.

If this power is turned on, communications with downstream stations can be activated normally even if power to PC of the station is turned off.

7.4 MASTER MODULE MOUNTING POSITION

The direction to open and close the cover of the external wiring connector terminals on the faceplate of the master module is opposite that of other modules. Therefore, mounting at the right end of the mounting base is recommended to avoid module wiring interference, etc.

8. OPTICAL FIBER CABLES

8.1 INTERMODULE CONNECTIONS

Optical fiber cables are installed to connect the master module (B1084) and slave module (B1085) and between slave modules. The master module has one connector for an optical fiber cable while a slave module has two such connectors as shown in Figs. 3.2 and 3.10. The optical fiber cable connectors for a slave module are called UP WARD and DOWN WARD as shown in Fig. 8.1.

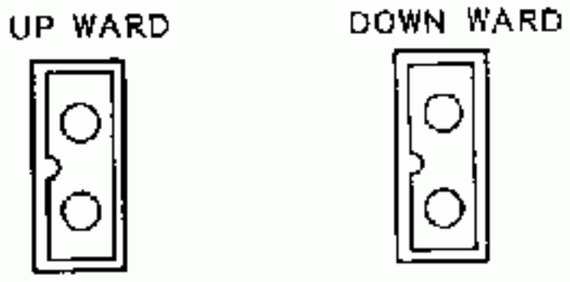


Fig. 8.1 Slave Optical Connectors

UP WARD: The optical fiber cable from the master module or the slave module in the preceding stage is connected. (For connection upstream)
DOWN WARD: The optical fiber cable to the slave module in the subsequent stage is connected. (For connection downstream.) Connect the connectors as shown in Fig. 8.2.

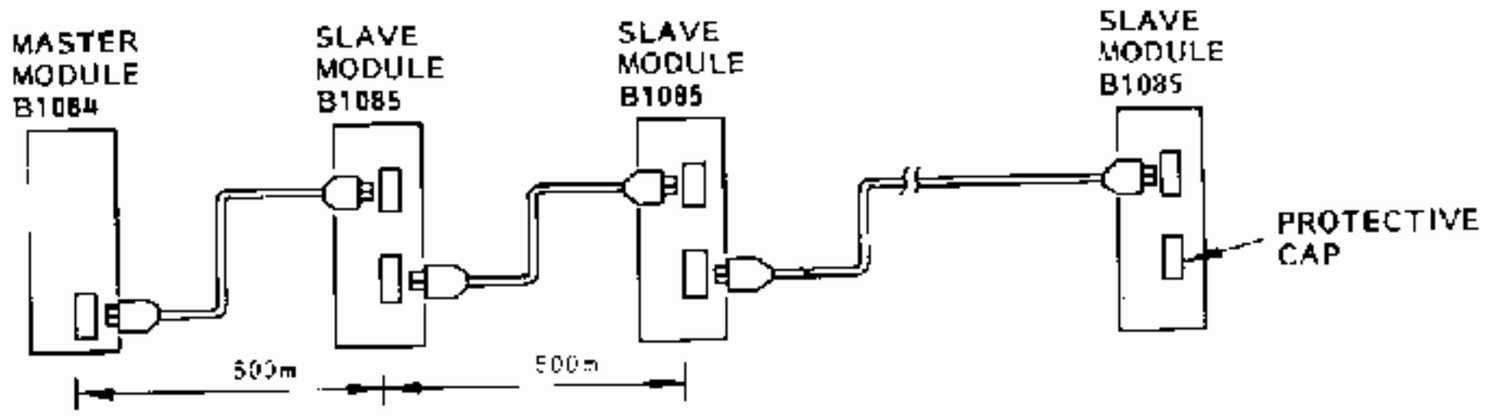


Fig. 8.2 Optical Fiber Cable Connections

The connectos of the master and slave modules, as well as of optical fiber cables, are provided with protective caps to prevent contamination by foreign matter or damage. Do not remove these protective caps until immediately before the optical fiber cables are connected.

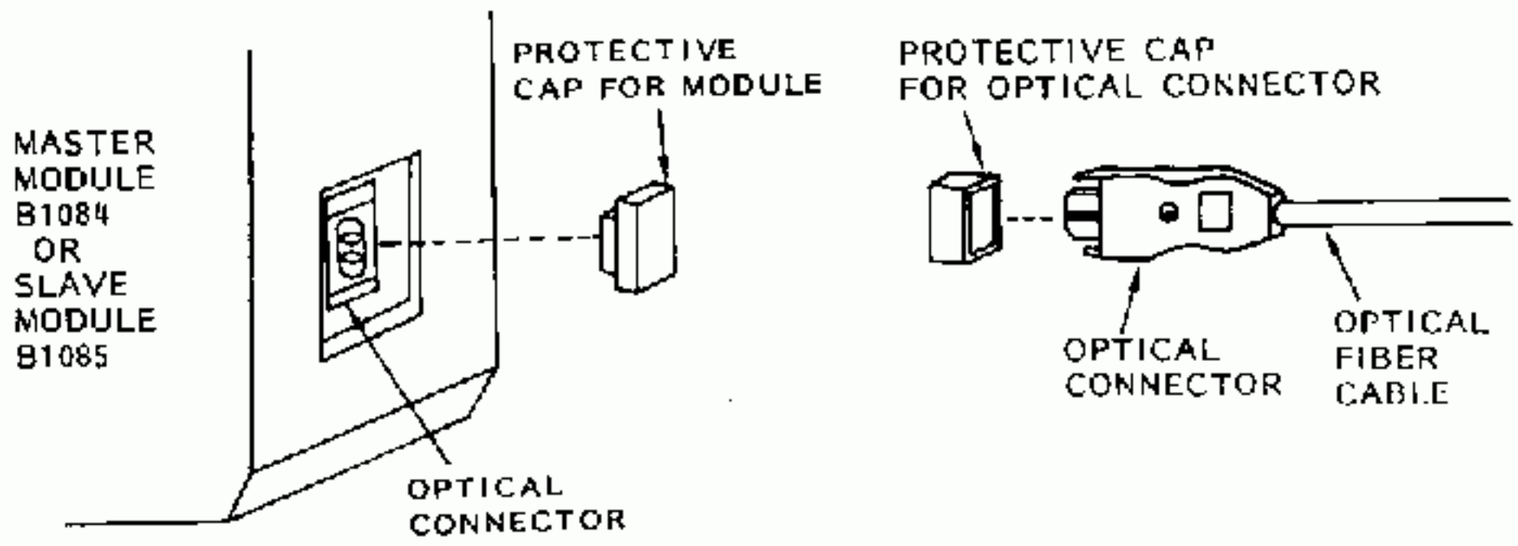
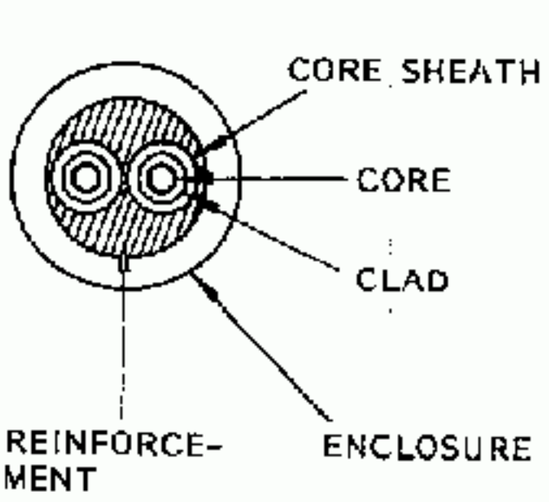
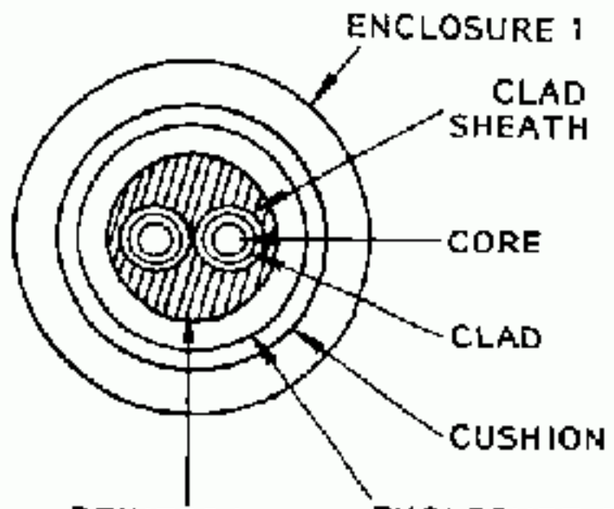


Fig. 8.3 Protective Cap

8.2 SPECIFICATIONS OF OPTICAL FIBER CABLES

Table 8.1 Specifications of Optical Fiber Cable

Item	Specifications	
Cable	2-core, Type SI, compound glass fiber (indoor use)	
Type	Type CA9003-[]M-AH	Type CA9003-[]M-BL
Length	5 to 500 m (in increments of 5 m)	5 to 1000 m (in increments of 5 m)
Transmission Loss	24 dB/km	12 dB/km
Connecting Loss	2 dB max	
Ambient Temperature	-20 to +75 ℃	
Operating Temperature	-10 to +70 ℃	
Allowable Tension	20 kg max (3 kg max for connected part)	
Allowable Bending Radius	45 mm min (90 mm min for installation)	85 mm min (170 mm min for installation)
Compression Strength	5 kg • cm max	10 kg • cm max
Core	200 μm	
Cladding	250 μm	
Core Sheathing	Nylon resin (Outer diameger: 0.9 mm)	
Reinforcement	FRP	
Cable Sheathing	PVC (orange)	
Finish Outer Diameter	4.5 mm	8.5 mm
Approx Weight	15 kg/km	65 kg/km
Sectional View		

Note:

1. The optical fiber cables are provided with connectors at both ends. Sufficient allowance of cable length should be given in wiring. Select a type suited to the wiring distsnce and then specify the length in 5-m units corresponding to [] of the type when ordering from Yaskawa representative.
2. For information on optical fiber cable with tension member, consult Yaskawa representative.

8.3 OPERATIONAL PRECAUTIONS FOR OPTICAL FIBER CABLE

Optical fiber cables contain thin glass fibers as their cores, and these optical fibers may break if they are bent, pulled or subjected to unreasonably strong force. If these optical fibers are broken, they cannnot be spliced as in electric wires, and the following precautions should be taken:

(1) Do not bend the cables sharply. Use the allowable bending radius shown in Table 8.1 as a reference.

(2) Do not pull the cables excessively. Use the allowable tension shown in Table 8.1 as a reference.

(3) Do not compress the cables or subject them to damaging situations.

(4) Do not step on the cables or place articles on them.

(5) Do not twist the cables.

(6) Do not pull them by hodling the optical connector.

(7) Do not insert the optical connectors diagonally. When connecting them, insert the optical connectors straight and push them until they are positively locked.

(8) When disconnecting the optical connectors, remove the optical connector pushing the metal locking pieces on both sides with the lock unlocked. (Do not pull the cable.)

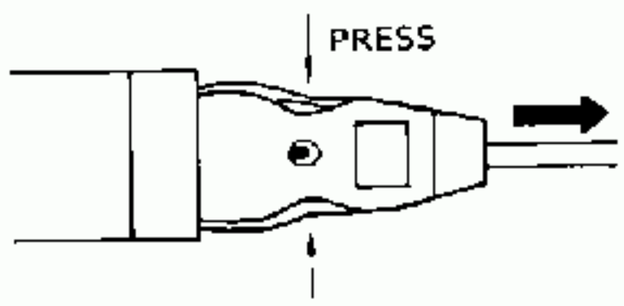


Fig. 8.4 Optical Connector Removal

8.4 OPTICAL FIBER CABLE INSTALLATION

(1) Use optical fiber cables of the specifications given in Table 8.1. When ordering, specify lengths in 5 -m units. Provide a sufficient surplus to the lengths for optical fiber cables.

Table 8.2 Applicable Optical Fiber Cable

Item		Operation Fiber Cable Type	
		CA9003-□M-AH	CA9003-□M-BL
Length		5 to 500 m	5 to 1000 m
Finished Outer Diameter		45 mm	85 mm
Allowable		45 mm min (90 mm when installed)	85 mm min (170 mm when installed)
Allowable Tension	Cable	20 kg max	20 kg max
	Connector	3 kg max	3 kg max

Note:
1. □ in the optical fiber cable type column is the length in 5 -m units.
2. Both ends of a cable have connectors.
3. The cables are for indoor use.

(2) Check for obstacles along the route for installing the optical fiber cables. Select routes that assure safety of the optical fiber cables.

(3) Install the optical fiber cables so that they are physically separated from other electrical cables whenever possible. If they must be installed in the same pits or ducts, install the optical fiber cables last.

(4) Place protective pieces or padding at the corners of structures or at curves of the cable routes to protect the optical fiber cables.

(5) Do not bend excessively or apply strong tension or pressure to the optical fibers during installation. As the parts of the optical connectors are not strong, do not hold the optical connectors when installing the optical fiber cables.

(6) Before installing the optical fiber cables, place the optical connectors inside vinyl pipe or other similar material and secure them using vinyl tape.

(7) Fig. 8.5 shows how to attach a pulling cord at the tip of an optical fiber cable.

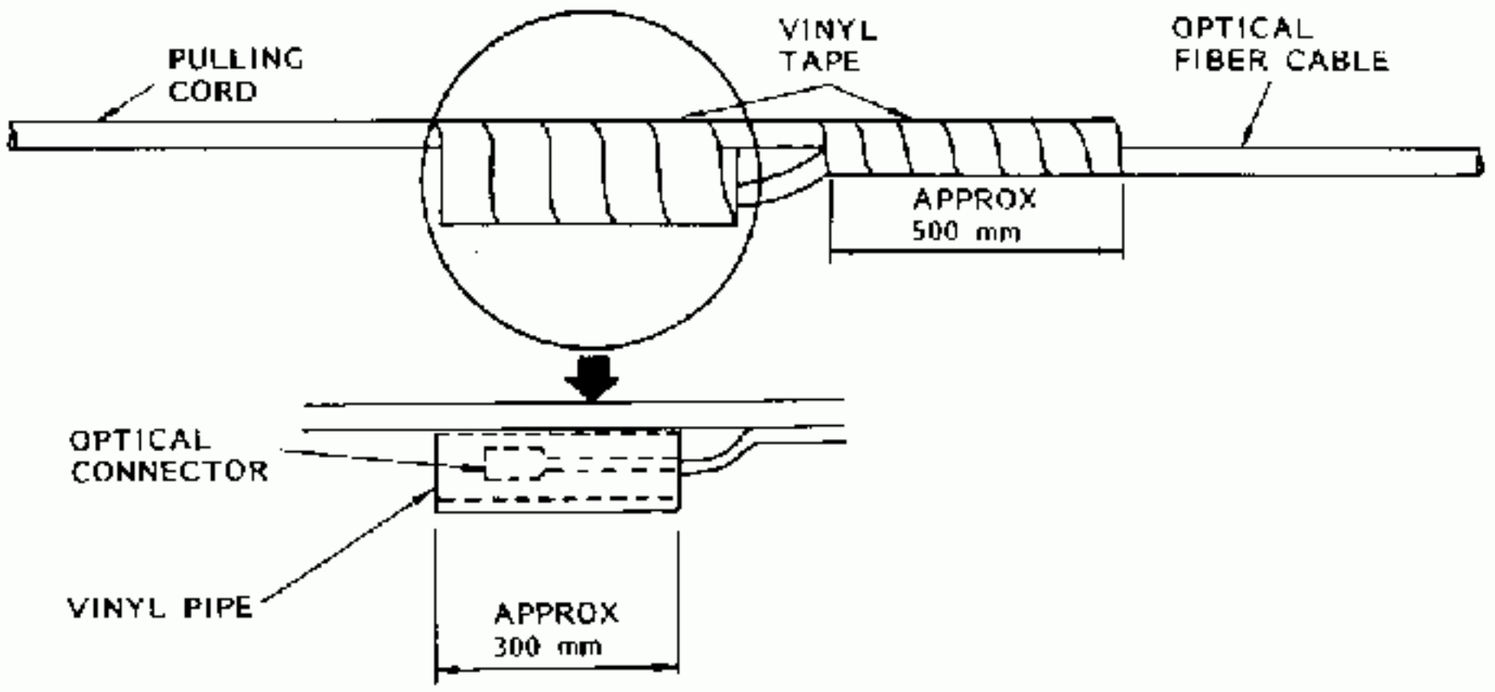


Fig. 8.5 Pulling Cord at Tip of Optical Fiber Cable

(8) Anchor the cable drum (bobbin) at the installation start point when installing an optical fiber cable. Rotate the drum (bobbin) to pay out the cable and pull the cord. Install the cables at a pulling rate of less than 10 m/minute.

(9) Install the optical fiber cables straight without twisting them. The cables may kink and cause breakage of the optical fibers if the cables are twisted.

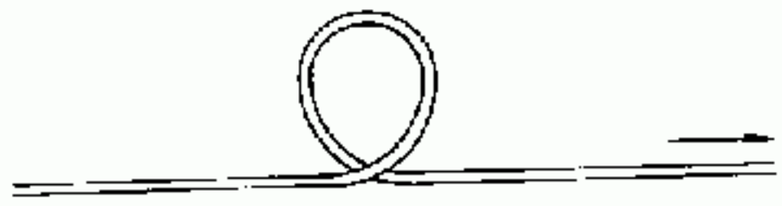


Fig. 8.6 Cable Kink

(10) After installing the optical fiber cables, connect the optical connectors of the optical fiber cables to those of the master and slave modules. Remove the optical connector protective caps. Insert the optical connectors straight and push till the connectors are positively locked. (Do not push excessively.) Clamp the optical fiber cable so that force is not applied to the optical connectors.

(11) After installing the optical fiber cables, check for broken fibers if this is possible, using one of the following methods:

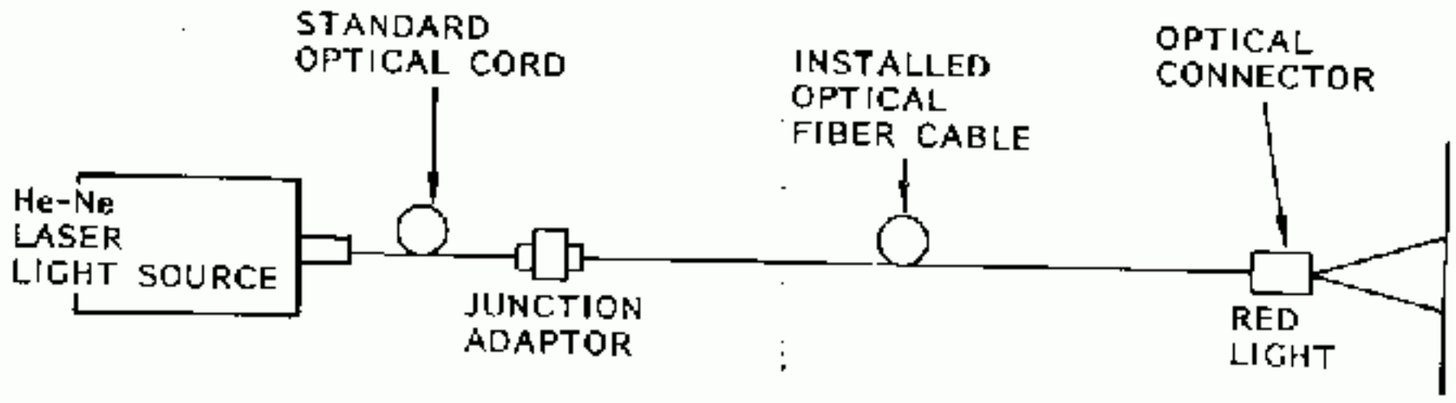


Fig. 8.7 Check for Broken Cord Using He-Ne Laser Beam

① Emit a He-Ne laser beam (visible red beam) form one end of the optical fiber cable and visually check the beam at the other end.

② Optical fiber loss measurement
Broken optical fibers are located by measuring optical fiber losses using a standard lights source.

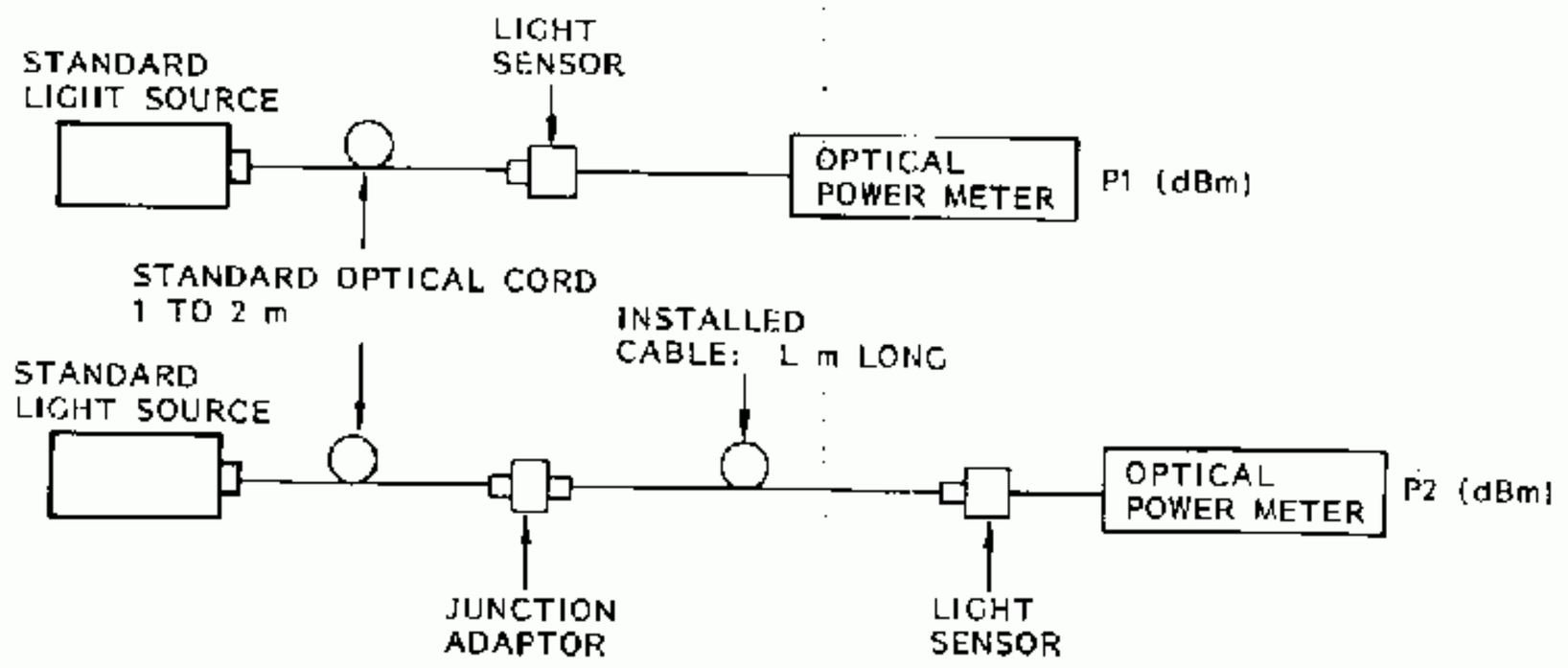


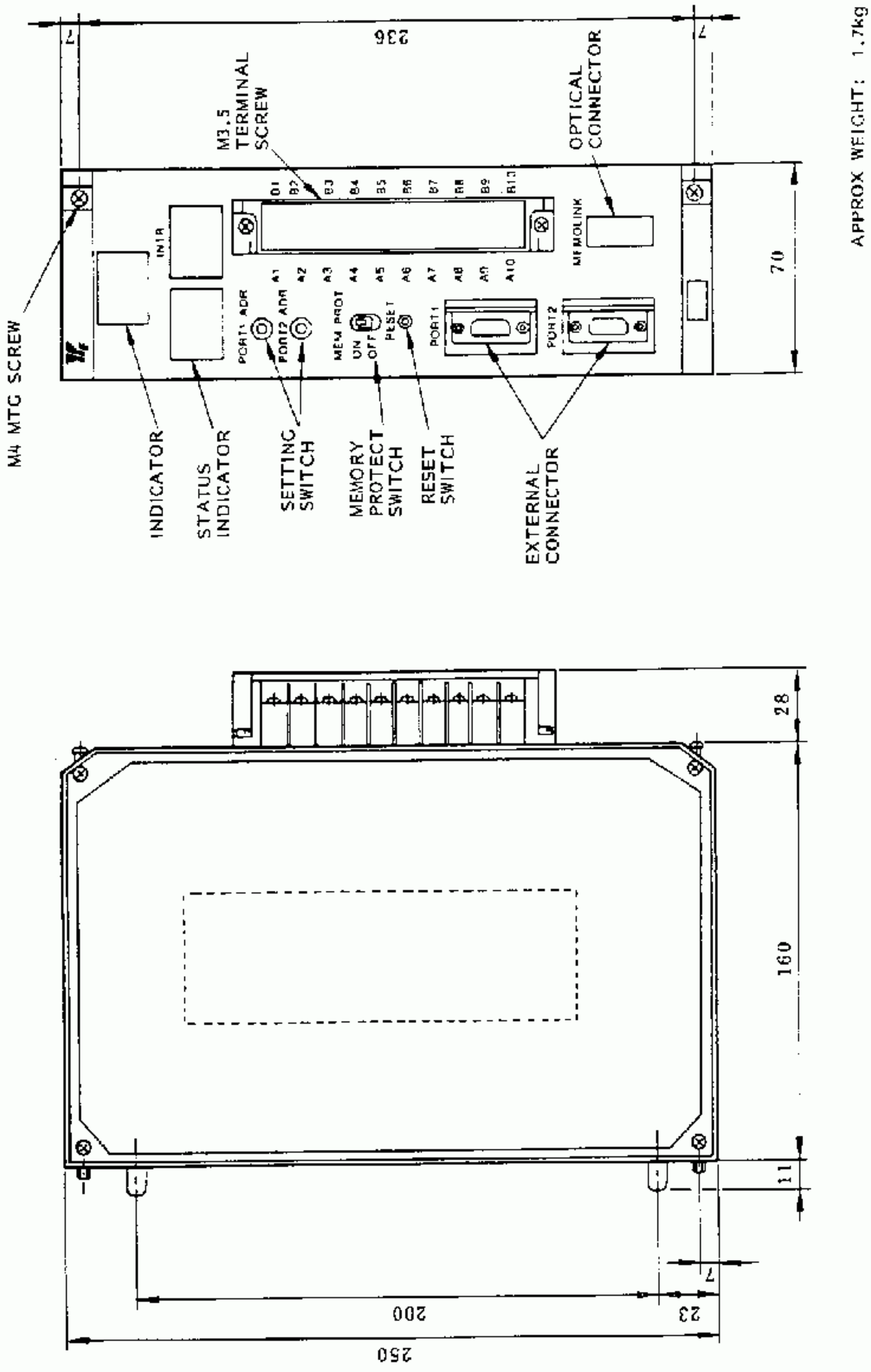
Fig. 8.8 Check for Broken Cord by Optical Fiber Loss Measurement

Assuming the loss (catalog value) per km of the installed optical fiber cable to be z (dB), the transmission loss = P1 − P2 $\quad$ L × z/1000 (dBm)

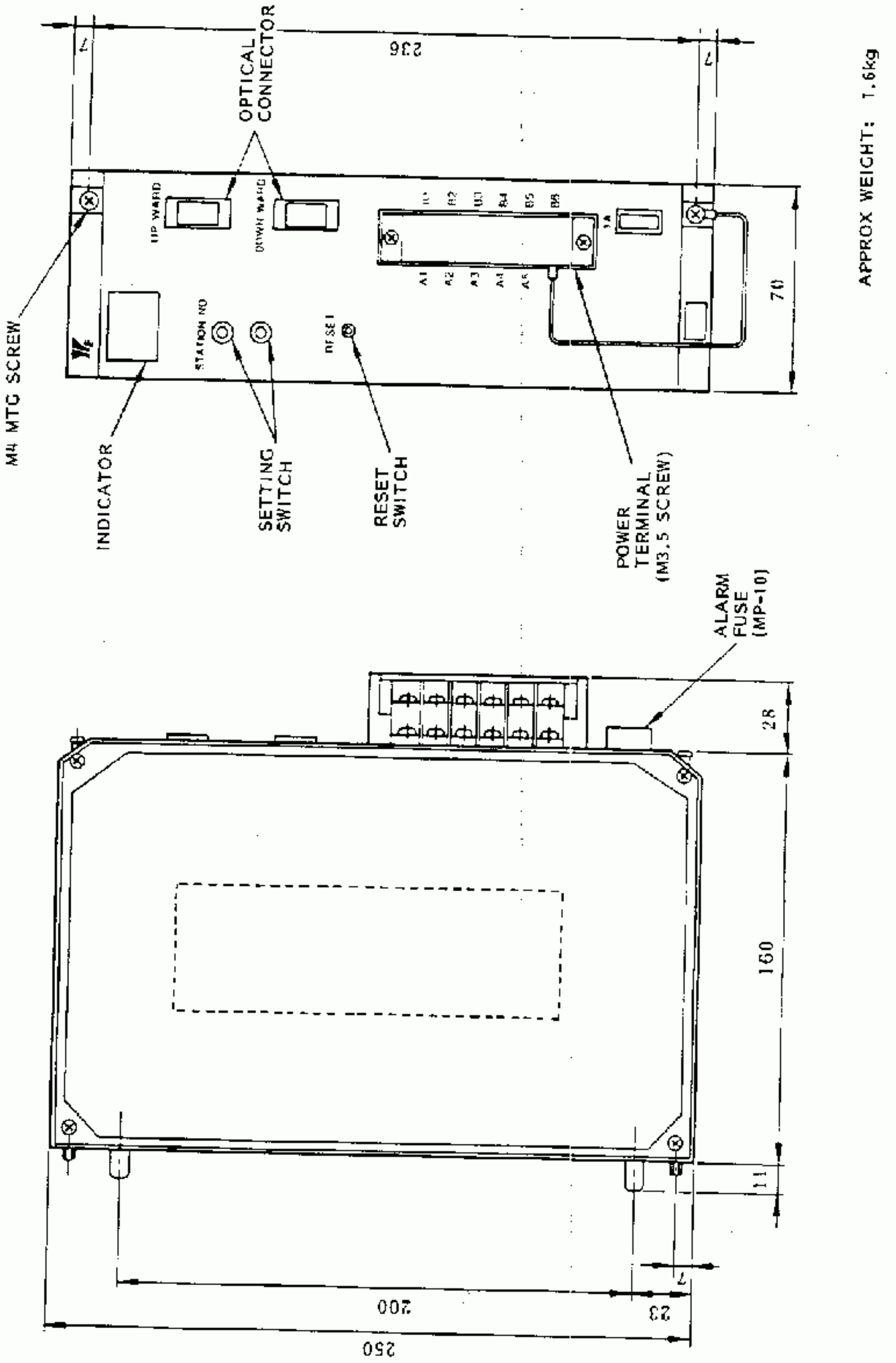
③ Transmission optical power measurement
Optical fiber breakage is located by measuring the optical transmission power from the master module using an optical power meter at the reception end of the slave module side after actually operating the MEMOLINK system.

9. DIMENSIONS in mm

(1) Master Module Type JAMSC -B1084

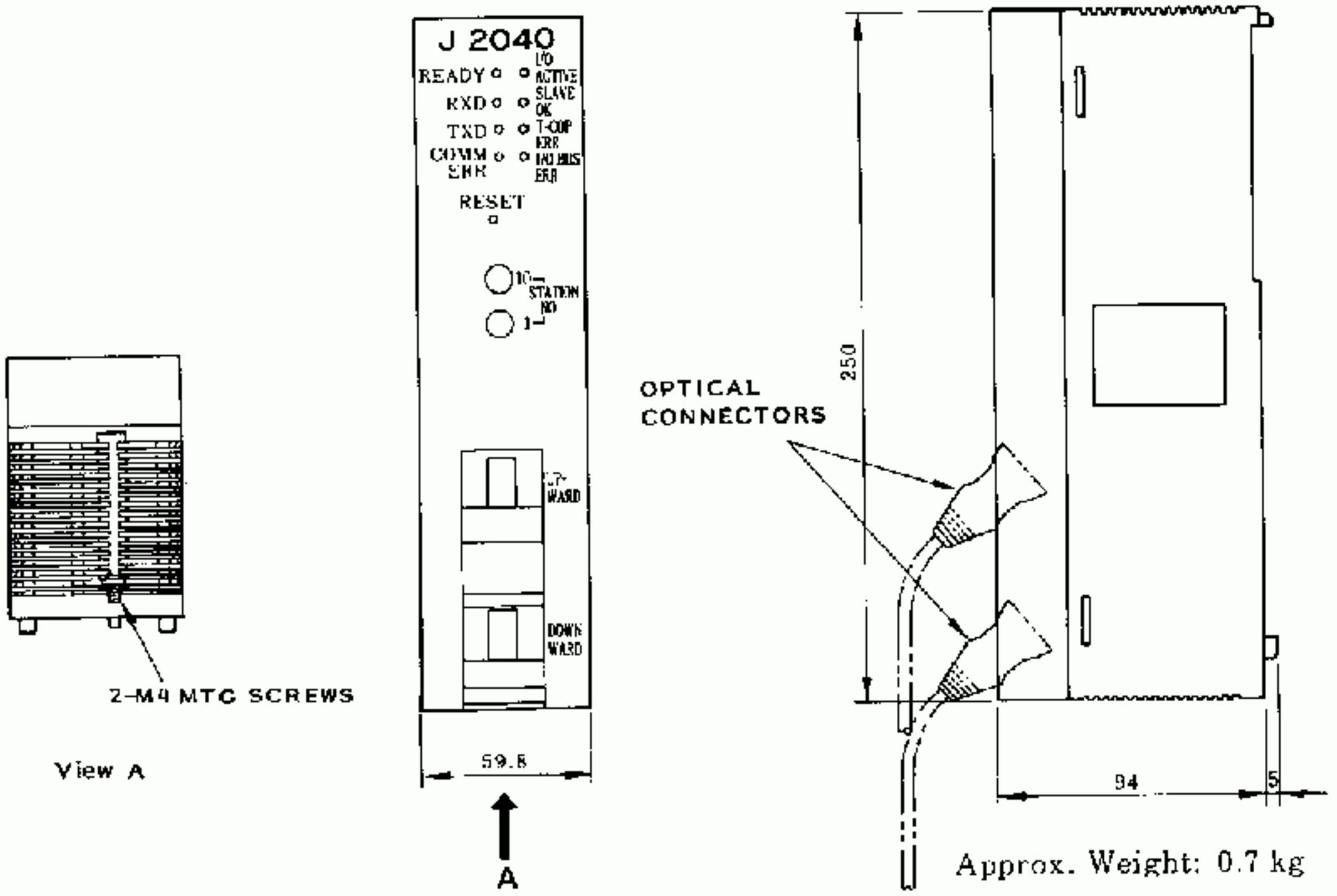


(2) Slave Module Type JAMSC-B1085



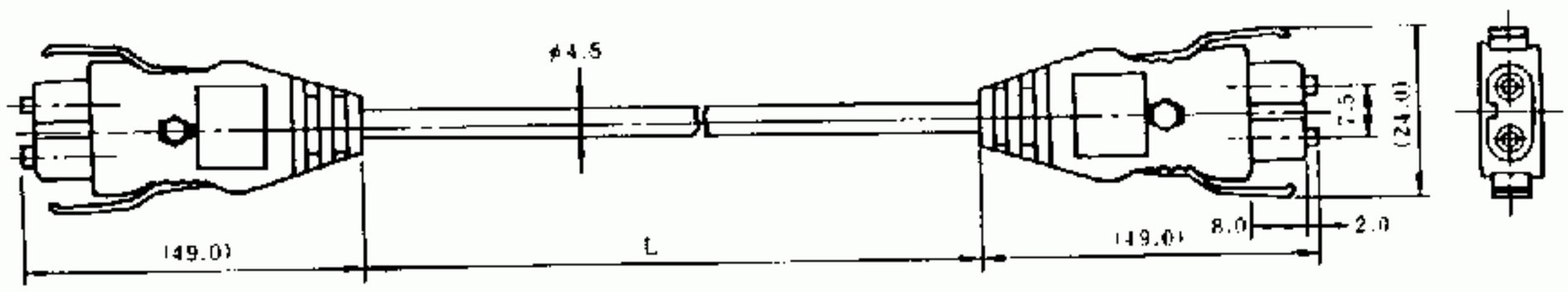
9. DIMENSIONS in mm (Cont'd)

(3) I/O Slave Module Type DISCT-J2040



Approx. Weight: 0.7 kg

(4) Optical Fiber Cable Type CA9003-[ ]M-AH

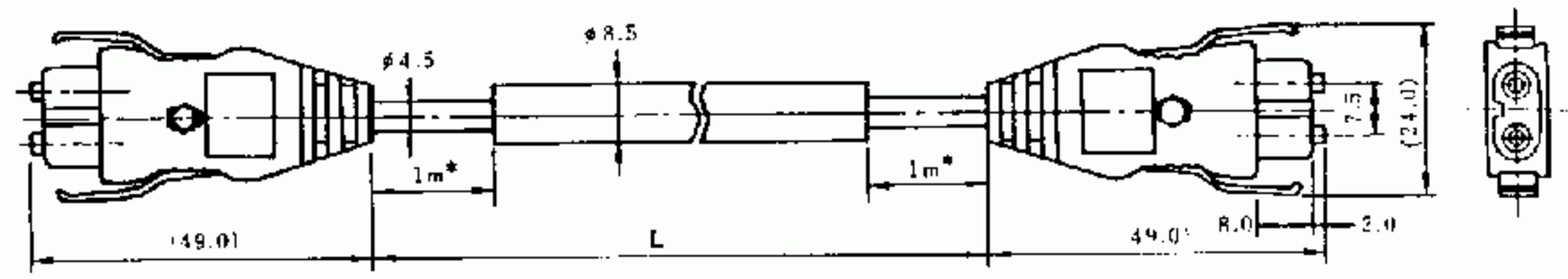


Approx. Weight: 15 kg/km

Note:

1. [ ] of type indicates length L.
2. L = 5 to 300 m in incrments of 5 m.

(5) Optical Fiber Cable Type CA9003-[ ]M-BL



Approx. Weight: 65 kg/km

Note:

1. [ ] of type indicates length L.
2. L = 305 to 500 m in increments of 5 m.
3. When L = 5 m, asterisked length is 0.5 m.

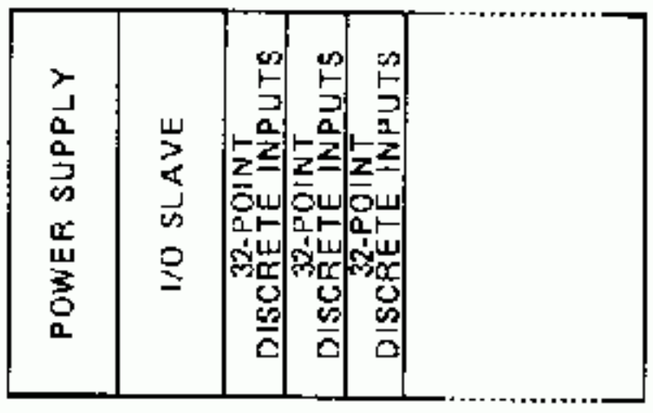
APPENDIX J2040 REGISTER SERVICE

Normally, discrete data is sent to the discrete module, and register data to the register module. In the following cases, register data is sent to the discrete module:

(1) Registers are allocated to the discrete module.

(2) The register allocation is larger than the register module size, and the discrete module has an empty space for more than 2 bytes. In this case register data is sent beginning with the next byte of the discrete data.

Example 1: As shown below, the rack contains discrete modules only.



LINK DATA ALLOCATION:

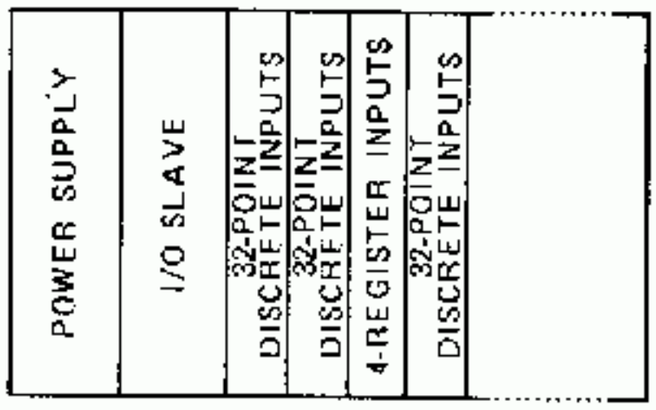
4-REGISTER INPUTS

I/O service of J2040 is as follows:

- Slot 1: 2 Registers (Registers 1, 2)*
- Slot 2: 2 Registers (Registers 3, 4)*
- Slot 3: · · · · ·

* The register Nos. in parentehses ( ) correspond to the allocation Nos. For example, the input of the first register set in the allocation is sent to the first 16 points of slot 1.

Example 2: As shown below, the rack contains modules in slots 1 to 4.



LINK DATA ALLOCATION:

- 48-POINT DISCRETE INPUTS
- 6-REGISTER INPUTS

I/O service of J2040 is as follows:

- Slot 1: 32-Point discretes
- Slot 2: 16-Point discretes + 1-Register (Register 1)*
- Slot 3: 4-Registers (Registers 3 to 6)*
- Slot 4: 1-Registers (Registers 2)*

* The register Nos. in parentehses ( ) correspond to the allocation Nos. For example, the input of the first register set in the allocation is sent to the last 16 points of slot 2.

J2040 register service for output is available as well.

MEMOLINK™

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