Cat. No. W79-E1-1

OMRON USER'S MANUAL

Programming Console

(for flowchart programming-type SYSMAC-C Series Programmable Controller)

Types

3G2A5-PRO19E/ 3G2A6-PRO20E

ONICS CO.

Introduction

The programming console for the flowchart programming-type SYSMAC-C series is a peripheral device designed by drawing on OMRON's abundant experience and highly sophisticated control techniques.

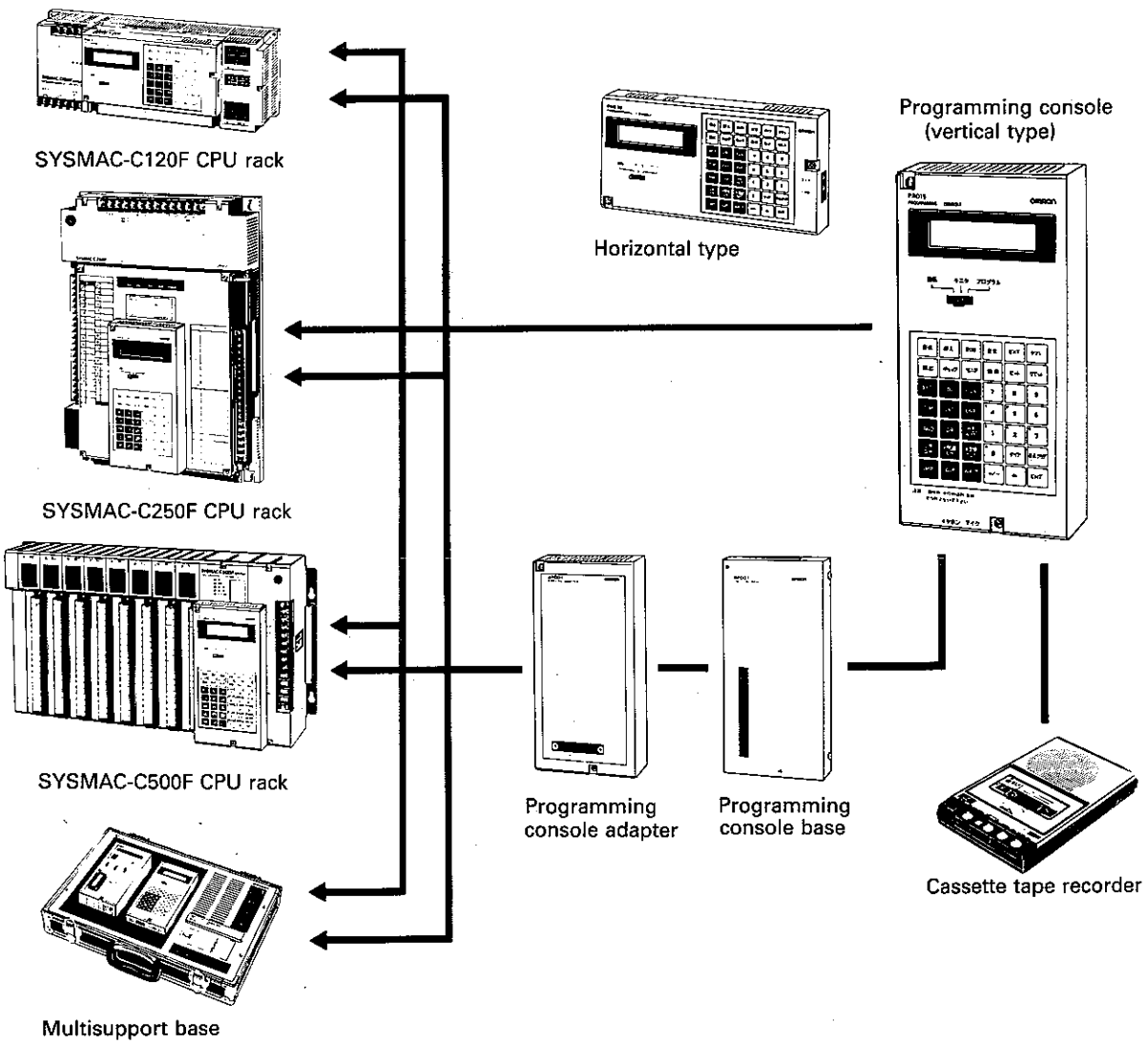
This manual mainly covers the operation of the programming console.

Please read this manual thoroughly and familiarize yourself with the functions, characteristics, and applications of the programming console before trying to operate it.

CONTENTS

Chapter 1
System Configuration and Features

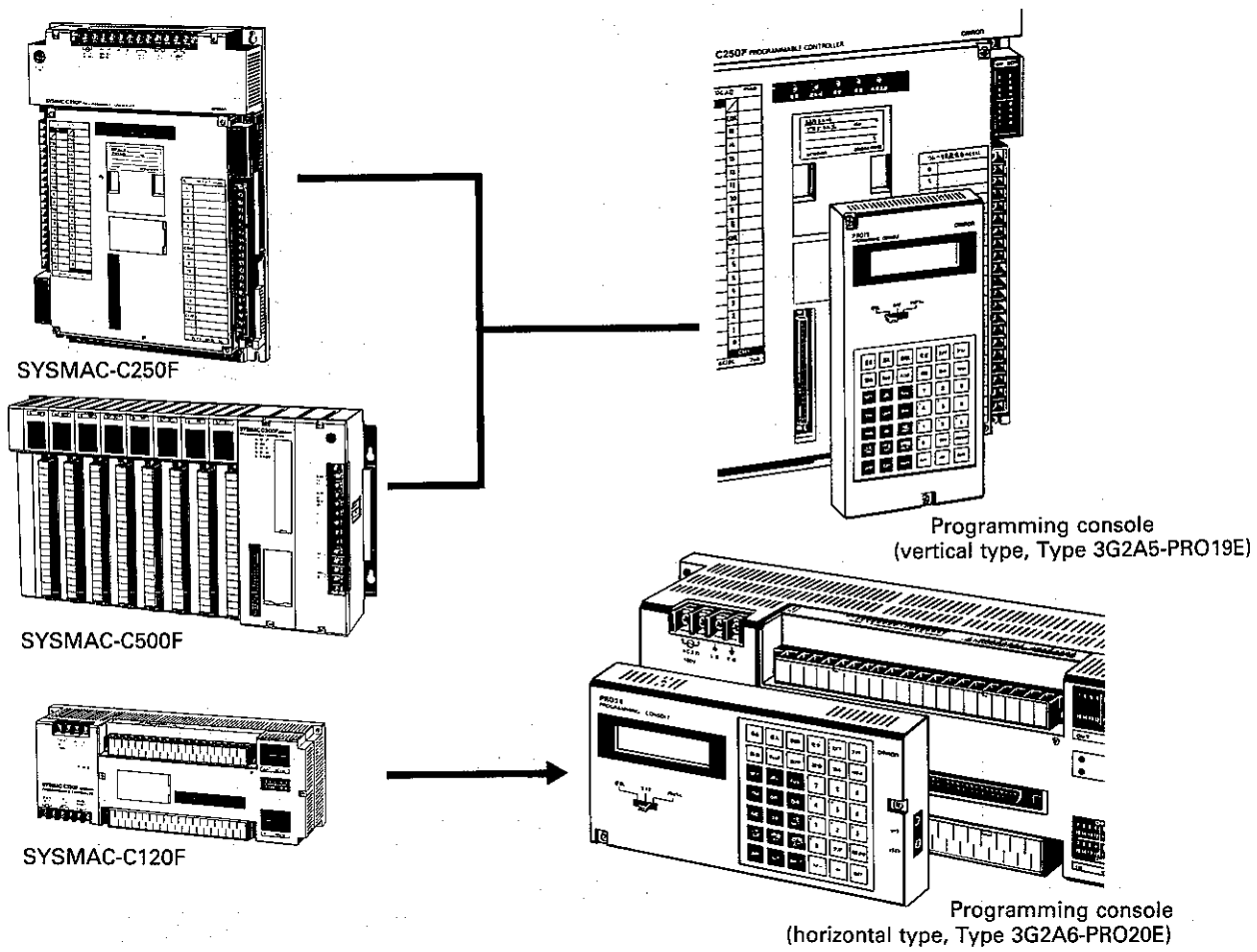
Applicable to a Variety of Devices



- **Applicable to all types of the flowchart programming-type SYSMAC-C series**
  Also applicable to the multisupport base unit
- **Hand-held operation as well as desk-top operation**
  Hand-held operation as well as desk-top operation possible when used with the SYSMAC-C series programming console adapter and programming console base
- **Connectable to cassette tape recorder**
  Allows user program to be stored with or reproduced by a cassette tape recorder
- **Employment of LCD**
  Employment of an LCD allows a variety of messages to be displayed on the programming console. Also, the programming console can be attached to or detached from the SYSMAC-C series on-line

Chapter 2
Mounting Procedure

2.1 Connecting to SYSMAC-C Series



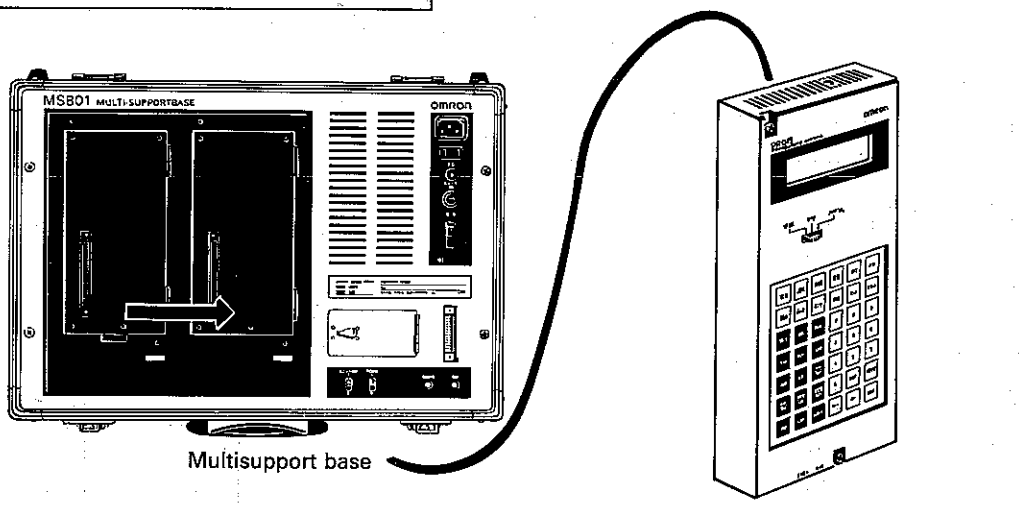
The programming console can be easily attached with mounting screws to the flowchart programming-type SYSMAC-C series programmable controller (PC).

It can be attached to the PC regardless of whether the power is being applied to the PC. When mounting the programming console to the PC, securely tighten the mounting screws.

When the programming console is attached to the PC, a message indicating the attachment is displayed on the programming console.

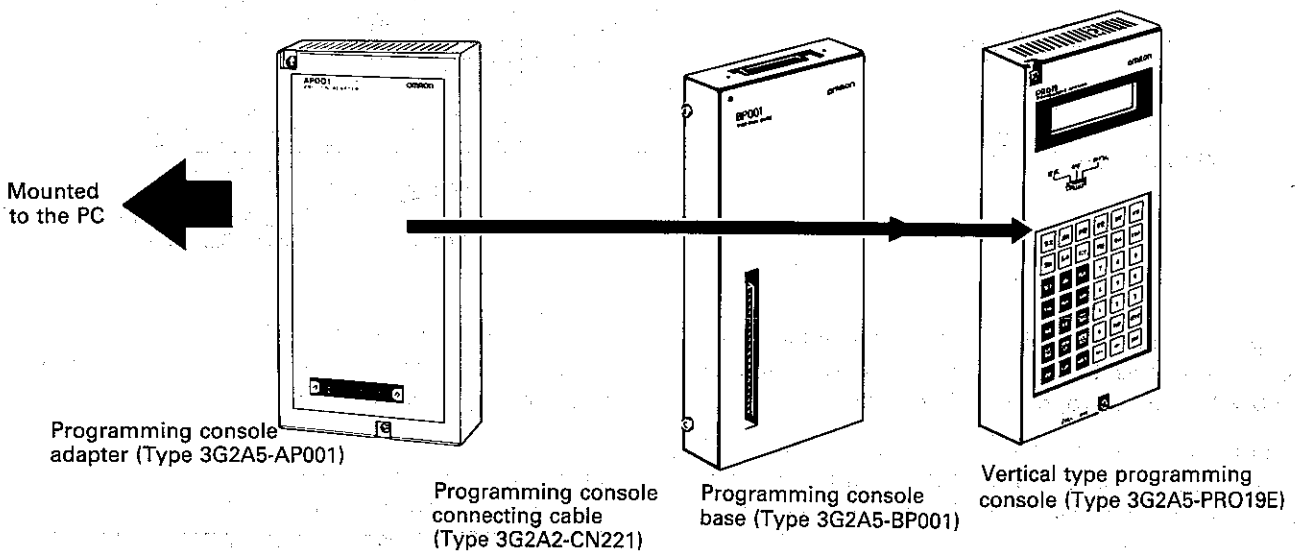
This programming console can be mounted to any type of SYSMAC-C series programmable controller. For the SYSMAC-C120F, however, employment of the horizontal-type programming console (Type 3G2A6-PRO20E) is recommended.

2.2 Connecting to Multisupport Base



The programming console can be attached to or detached from the multisupport base on-line.

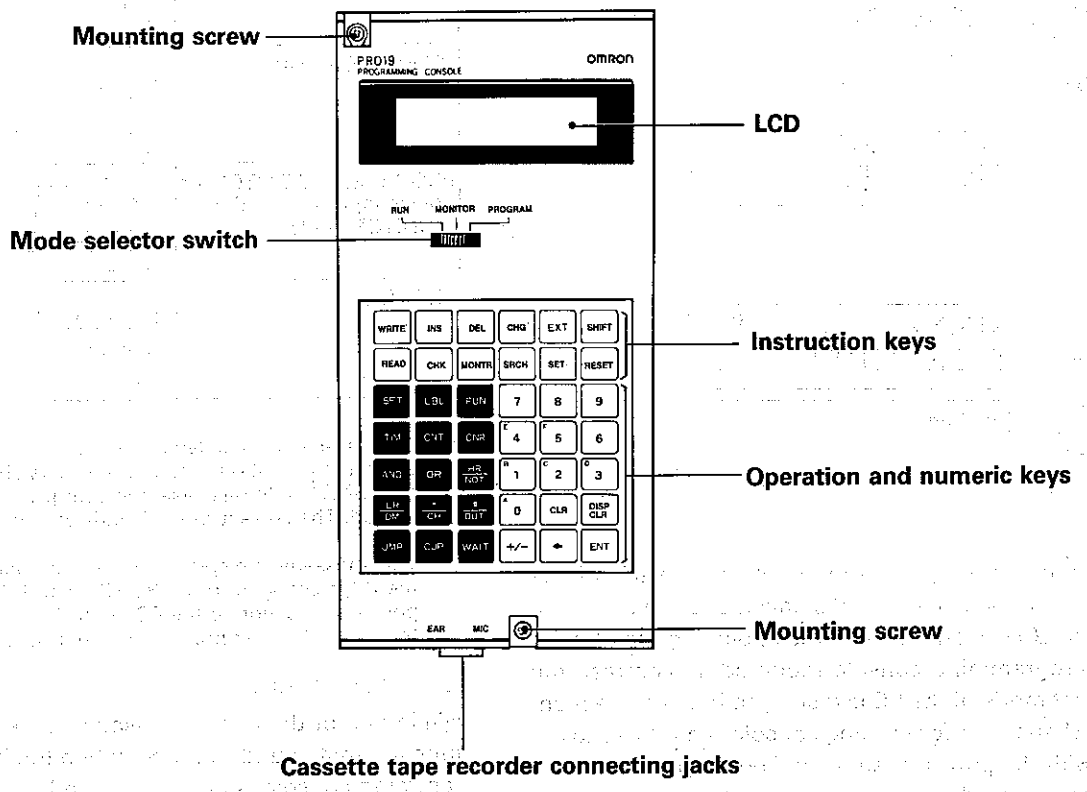
2.3 Hand-held and Desk-top Operations



The programming console can be mounted to the PC at any time, regardless of whether the SYSMAC-C series is in operation. In addition, it can be used detached from the PC, allowing hand-held or desk-top operation of the programming console.

Chapter 3
Operating Procedure

3.1 Names of Respective Parts



3.2 Cautions for Correct Operation

3.2.1. OPERATION MODE OF PC

The following operation modes of the SYSMAC-C series are set on power application or when a peripheral device(s) is connected on-line to the PC.

Peripheral device	On power application	On-line connection*1
Programming console	According to the mode selector switch position of the programming console	Current operation mode is continued*2
Peripheral interface unit, PROM writer, and printer interface unit	PROGRAM	Current operation mode is continued
None	RUN	

*1: "On-line connection" means connecting a peripheral device to the PC while the PC is being supplied with power.

*2: "Current operation mode" is the mode that was already set when the power is applied or when a peripheral device is connected to the PC. For example, if a peripheral device is connected to the PC while the PC is in the RUN mode, the PC will remain in the RUN mode.

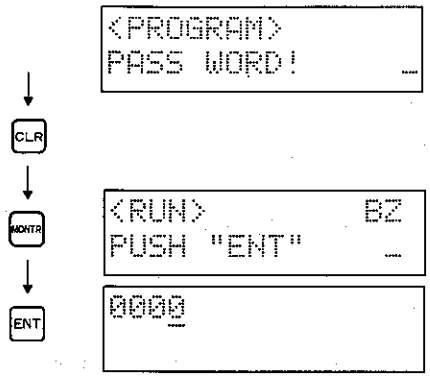
● Cautions for initial power application

PASSWORD

When power is applied, the words "PASSWORD" are displayed. This requires you to press the **CLR**, **MONTR**, and **ENT** keys in succession, and does not actually require a password. When this is done the operation mode can be selected.

OPERATING PROCEDURE

● **Display**



NOTE:

1. The mode set by the mode selector switch of the programming console is displayed enclosed in < > on the LCD when the power is applied to the PC with the programming console mounted. In contrast, the current mode of the PC is displayed in the same manner when the programming console is mounted to the PC with the power already applied to the PC. In both cases, the mode selector switch of the programming console can be changed to set a desired mode.
2. The operation of the programming console can be performed after the password key sequence. To input this sequence, depress the **CLR** key followed by the **MONTR** key, then depress the **ENT** key.
3. For details on the operation of the programming console when it is connected to the multisupport base, refer to Section **3.37** and the sections that follow it.

After the password key sequence has been input or when the operation mode has been changed, one of the following messages will be displayed on the programming console.

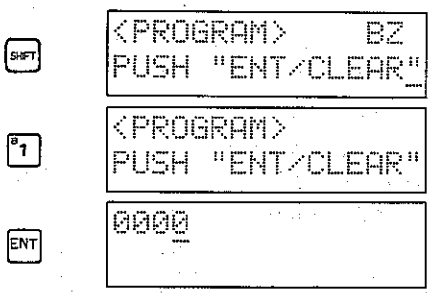
Mode	Display
RUN	<RUN> BZ PUSH "ENT" _
RUN to MONITOR	*1 <MONITOR> **BZ <DEBUG>
PROGRAM to MONITOR, or power application in the MONITOR mode	*2 <MONITOR> BZ <DEBUG> **
PROGRAM	<PROGRAM> BZ PUSH "ENT/CLEAR"

*1: This message is displayed on the programming console when the operation mode of the PC is changed from RUN to MONITOR. In this case, the user program will be executed. The current mode is indicated by two asterisks (**).

*2: This message is displayed when the operation mode of the PC is changed from PROGRAM to MONITOR or upon power application to the PC in the MONITOR mode. In this case, the user program will not be executed.

● Buzzer function

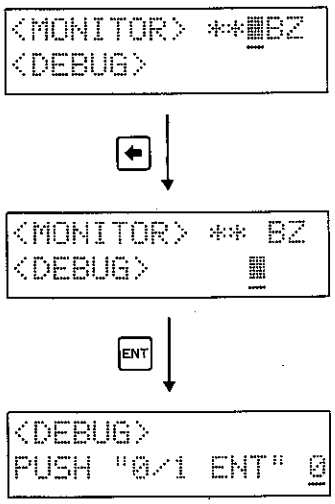
While one of the above messages is being displayed, a function that sounds a buzzer when the key on the programming console is depressed can be selected. However, the buzzer does not sound if the ENT key is depressed after the message BZ has disappeared.



3.2.2. MODE SWITCHING BETWEEN MONITOR AND DEBUG

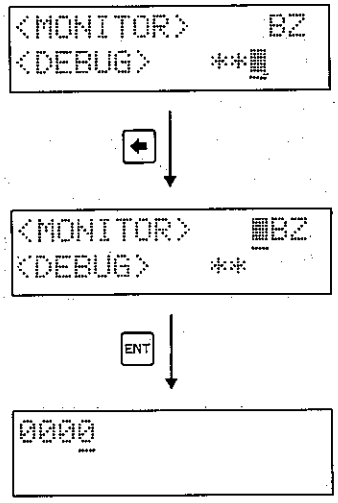
The operation mode should be switched between MONITOR and DEBUG as shown below. These messages are displayed when the mode selector switch is set to the MONITOR position.

(1) To change from MONITOR to DEBUG



The PC will operate in the DEBUG mode.

(2) To change from DEBUG to MONITOR



The PC will operate in the MONITOR mode.

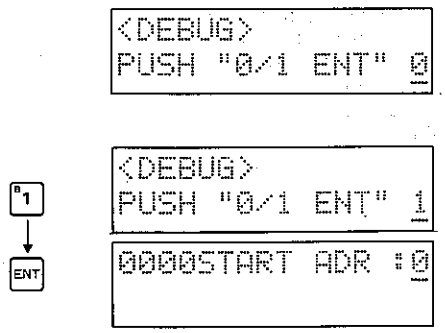
The two asterisks (**) on the display represents the current mode. That is, in example (1), the current mode is MONITOR (the PC is in operation) whereas, in (2) it is DEBUG (the PC is not in operation). Depressing the ← key causes the blinking square to move.

When the **ENT** key is depressed, the mode indicated by the blinking square is set.

While the PC is in the REMOTE mode, it cannot be changed to the DEBUG mode.

3.2.3. FUNCTION SELECTION IN DEBUG MODE

Functions available in the DEBUG mode can be selected while the message <DEBUG> is being displayed.

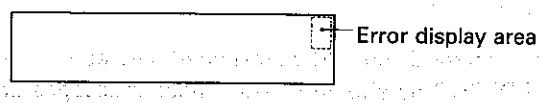


NOTE:

1. When the **1** key is depressed followed by the **ENT** key, the operation of the PC is performed according to the program.
2. When the **0** key and then the **ENT** key are depressed, either the main program alone is executed or the program is executed in units of a group program.

3.2.4. ERROR DISPLAY AREA

When an error occurs during the Program Read or Write operation, one of the following error codes appears in the error display area.

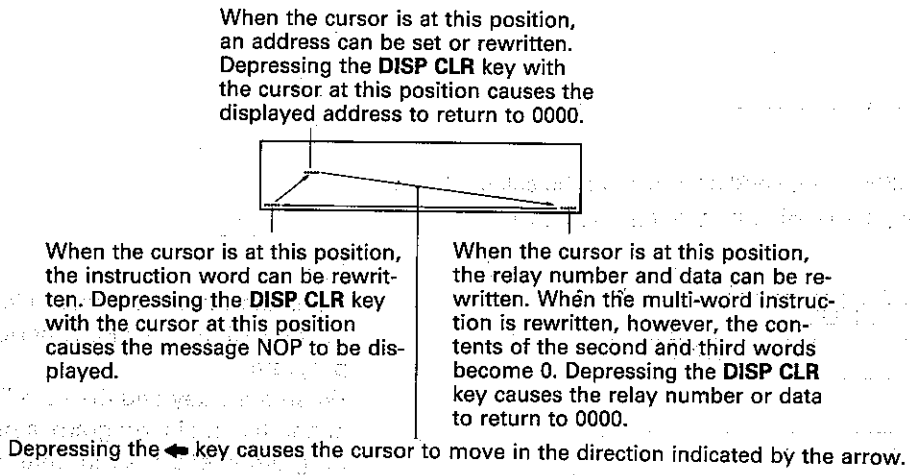


Code	Error	Description
O	Address over	Program Read or Write exceeding the end address is executed.
R	ROM	ROM is used as the user memory in Program Write operation.
S	Syntax error	The format of an instruction word in the Program Write operation is incorrect (e.g., the range of the operand, or the second or the third word of a multi-word instruction is incorrect).
P	Program over	An instruction is inserted or a multi-word instruction is written exceeding the memory capacity.
F	Format error	The parameter of an instruction entered from the program console is incorrect.
N	Search error	The searched instruction is not found during the Search operation.

3.2.5. CURSOR

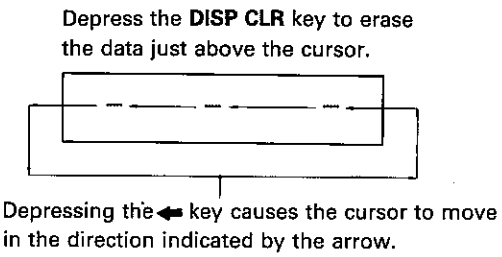
During Program Read or Write operation

The cursor is moved as follows. However, since the cursor moves automatically during the Program Read or Write operation, normally manual operation is not required.



During Monitor operation

For the cursor movement during a Monitor operation, refer to the operating procedures of each Monitor operation.



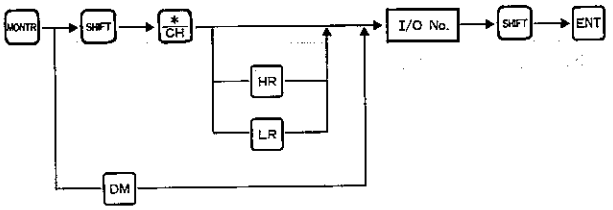
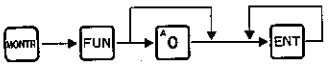
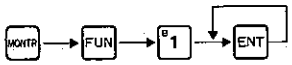
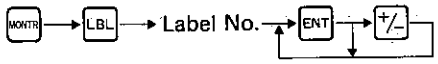
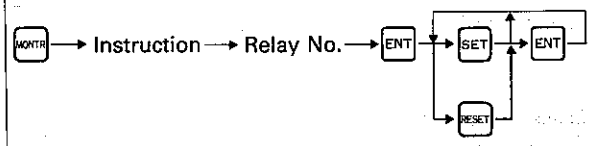
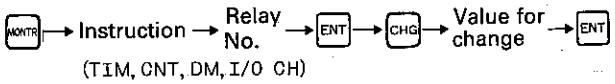
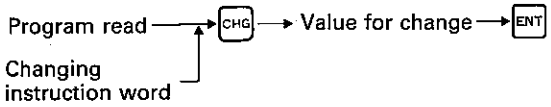
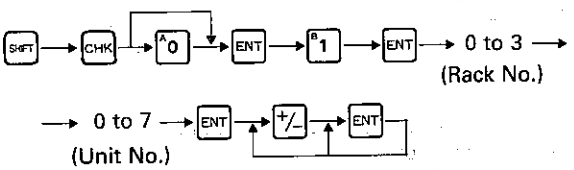
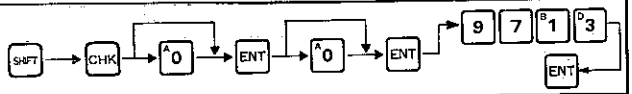
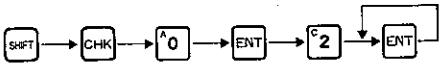
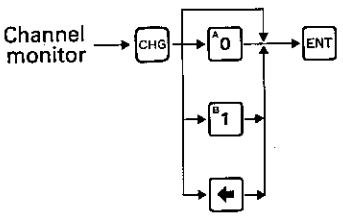
3.2.6. + AND − SIGNS

Either the + or − sign is displayed in the error display area on the LCD.

During Program Read, Start Address Setting, or Trace Check operation	When the + sign is displayed, the data at the set address + 1 is displayed each time the **ENT** key is depressed. With the − sign displayed the data at the set address − 1 is displayed each time the **ENT** key is depressed.
During Monitor operation	When the cursor is positioned below an I/O relay, auxiliary relay, holding relay, or data memory number with the + sign displayed, the relay number is incremented by one and displayed each time the **ENT** key is depressed. With the − sign displayed, however, the relay number is decremented by one and displayed each time the **ENT** key is depressed.

3.3 List of Operations

	Operation Name	Mode				Operating procedure
		RUN	MONITOR	DEBUG	PROGRAM	
1	All program clear				○	CLR → 9 → 7 → B 1 → D 3 → ENT → Step No. → ENT; → HR →; → DM →
2	Expansion data memory capacity setting/reading	○	○	○	○	SHIFT → CHK → B 1 → ENT → 0 to 7 → ENT
3	Address setting	○	○		○	B 1 → C 2 → D 3 → E 4
4	Program write				○	WRITE → Instruction → Relay No. → ENT
5	Program read	○	○		○	READ → +/- → ENT ------ ENT
6	Program check				○	CHK → ENT ------ ENT (CLR The operation is terminated by depressing the **CLR** key.)
7	Instruction search	○	○	○	○	SRCH → Instruction → Relay No. → ENT ------ ENT
8	Instruction insert				○	Address setting → SRCH → Instruction → Relay No. → ENT; Instruction word search
9	Instruction delete				○	Address setting → DEL → ENT; Instruction word search
10	Multimonitor	○	○	○	○	MONTR → Instruction → Relay No. → ENT → (To monitor the relay); → ← → Channel type → Channel No. → ENT → (To monitor the channel); → ← → TIM/CNT → TIM/CNT No. → ENT (To monitor the timer or counter)

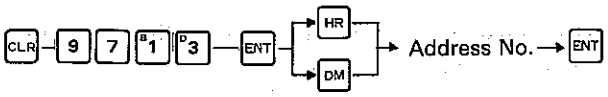
	Operation Name	Mode				Operating procedure
		RUN	MONITOR	DEBUG	PROGRAM	
11	Channel monitor	○	○	○	○	
12	Error read/reset	○	○	○	○	
13	Group monitor	○	○	○		
14	Trace check		○			
15	Forced set/reset		○	○	○	
16	Present value change		○	○	○	
17	Set value change		○	○		
18	I/O table read	○	○	○	○	
19	I/O table generation				○	
20	I/O table verify	○	○	○	○	
21	Channel write		○	○	○	

	Operation Name	Mode				Operating procedure
		RUN	MONITOR	DEBUG	PROGRAM	
22	Address monitor	○	○			SHIFT → MONTR → ENT
23	Start address setting			○		CLR *(ENT) → A 0 → Start address, in 4 digits → ENT → ENT → +/-
24	Stop address setting			○		CLR *(ENT) → B 1 → Stop address, in 4 digits → ENT
25	1-step execution			○		CLR *(ENT) → C 2 → ENT
26	RUN (program execution)			○		CLR *(ENT) → D 3 → ENT → (ENT) The RUN operation is stopped upon depression of the (**ENT**) key.
27	Forced YES branch			○		CLR *(ENT) → E 4 → ENT
28	Forced NO branch			○		CLR *(ENT) → F 5 → ENT
29	Cassette write of user memory				○	EXT → A 0 → ENT → A 0 → ENT → File No. → ENT → Start address → ENT → Stop address → ENT
30	Cassette read of user memory				○	EXT → A 0 → ENT → B 1 → ENT → File No. → ENT → Start address → ENT
31	Cassette verify of user memory				○	EXT → A 0 → ENT → C 2 → ENT → File No. → ENT → Start address → ENT
32	Cassette write of data memory				○	EXT → B 1 → ENT → A 0 → ENT → File No. → ENT
33	Cassette read of data memory				○	EXT → B 1 → ENT → B 1 → ENT → File No. → ENT
34	Cassette verify of data memory				○	EXT → B 1 → ENT → C 2 → ENT → File No. → ENT

3.4 All Program Clear Operation

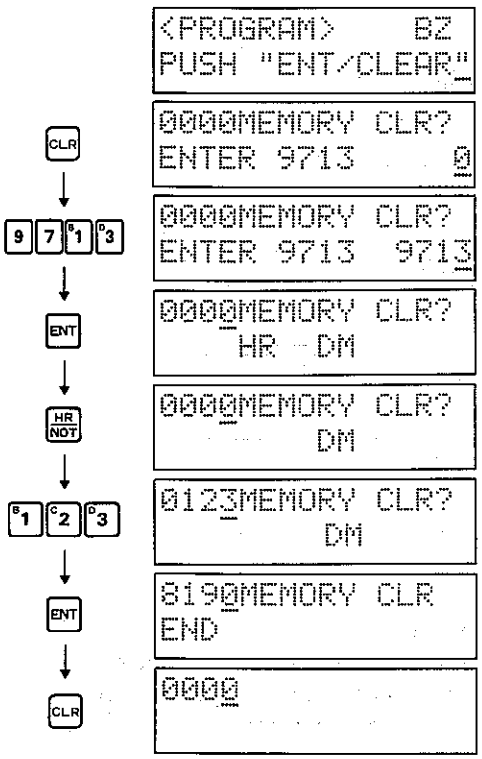
Since the RAM in the CPU, backed up by a battery, retains previously stored data, all the memory contents should be cleared before writing a new program into it. It is possible but not recommended to write a new program over the old one because program errors are likely to occur.

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
×	×	×	○

● **Display**



NOTE:

1. By the All Clear operation, the program from the specified address to the end address in the user program area and the data in the I/O relays, internal auxiliary relays, and shift registers are cleared. Thus the user program is treated as NOP.
2. The data in holding relays (HR) and data memories (DM) can be retained as is by depressing the **HR/NOT** and **LR/DM** keys, respectively. Unless these keys are used, the data will be cleared.
3. The expansion data memory is also cleared in the same manner.
4. The user program is not cleared when the ROM is mounted to the PC or when an error occurs during address setting (i.e., an address is specified exceeding the user program area). The data in the holding relays (HR) and the data memories are cleared, however.

3.5 Expansion Data Memory Capacity Setting/Reading Operation

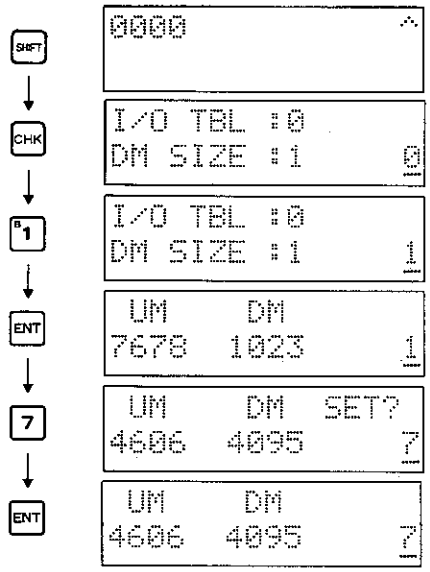
When an 8K-address memory is mounted to the PC as the user program memory, part of the user program memory can be used for data memory.

Operating procedure

SHIFT → CHK → B 1 → ENT → 0 to 7 → ENT

RUN	MONITOR	DEBUG	PROGRAM
○	○	○	○

● **Display**



The number appearing at the lower right corner of the LCD represents the maximum number of addresses of the user memory and the maximum number of channels of the data memory. The relation between them is as follows:

Entry	Max. user memory steps	Max. data memory channels
0	8190	511
1	7678	1023
2	7166	1535
3	6654	2047
4	6142	2559
5	5630	3071
6	5118	3593
7	4606	4095

NOTE:
The set capacity of the expansion data memory can be changed in the PROGRAM mode only.
Only reading the set capacity is allowed in the other modes.
Also, the setting cannot be changed when the ROM is used as the user memory.

3.6 Address Setting Operation

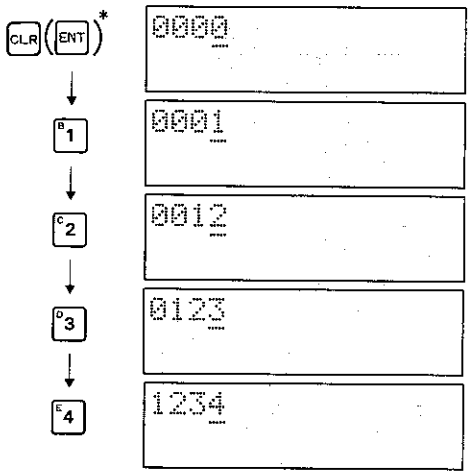
Addresses must be specified to perform the Program Write, Read, and Insert operations.

Operating procedure

CLR* (ENT*) → B 1 → C 2 → D 3 → E 4

RUN	MONITOR	DEBUG	PROGRAM
○	○	×	○

● **Display**



NOTE:
1. An address is specified as a 4-digit numeric value. Since the address displayed on the LCD is set, no key operation of the programming console is required for specifying the address currently displayed on the LCD.
2. No data will be displayed on the LCD by merely setting an address. To display the data, depress the **READ** and **ENT** keys.

* Depress the **ENT** key immediately after power application to the PC or mode switching only.

3.7 Program Write Operation

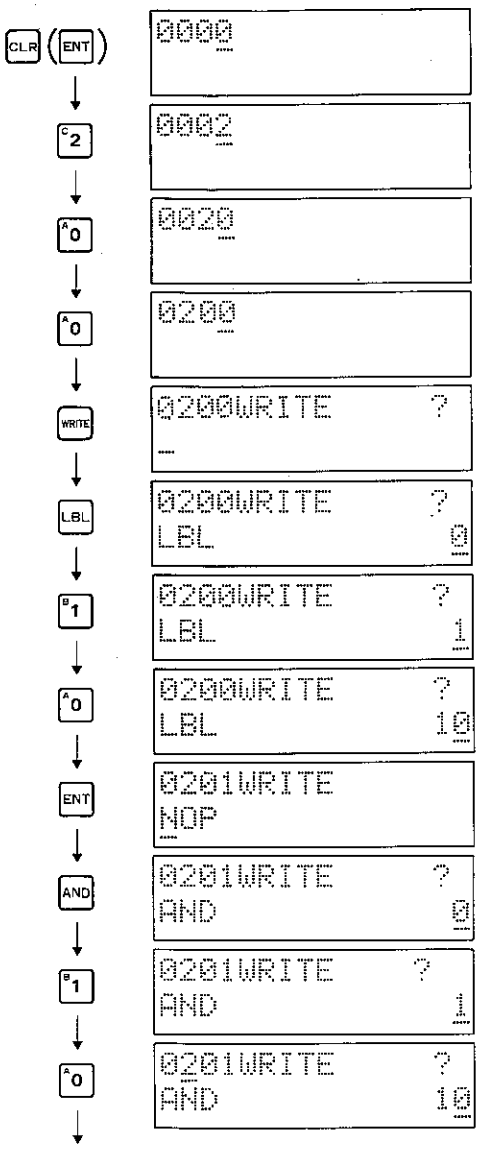
This operation is used to store a program (flowchart) in the user memory.

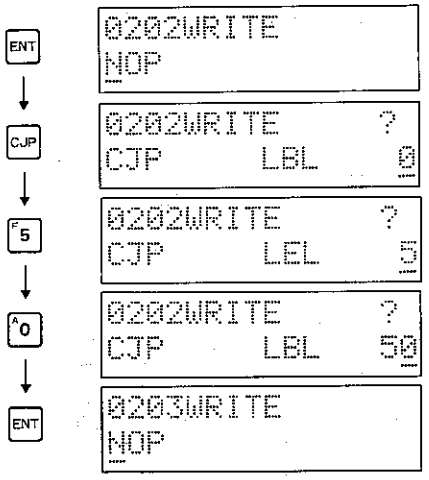
Operating procedure

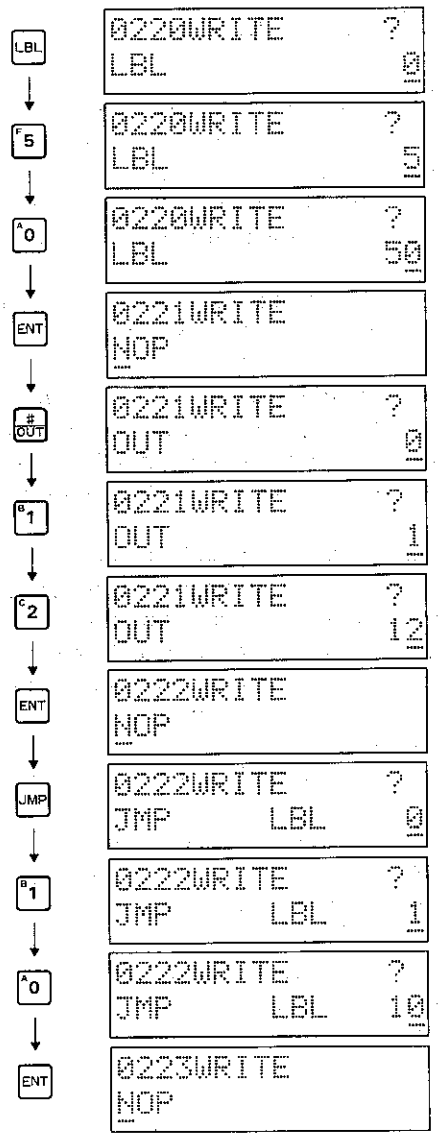
CLR (ENT) → WRITE → Instruction → Relay No. → ENT

RUN	MONITOR	DEBUG	PROGRAM
×	×	×	○

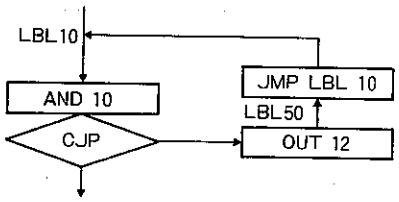
● **Display**







Flowchart for exercise and programming example



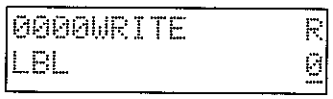
Address	OP	Data	Address	OP	Data
–			–		
0200	LBL	10	0220	LBL	50
0201	AND	10	0221	OUT	12
0202	CJP.LBL	50	0222	JMP.LBL	10
–			–		

NOTE:

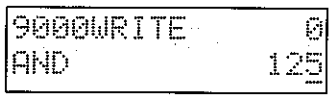
1. Specify the addresses in which the program is to be written.
2. An instruction word is input by using instruction keys and numeric keys. The numeral displayed on the LCD is shifted to the left each time a numeric key is depressed.
3. When the **ENT** key is depressed, the data and instruction displayed on the LCD are written into the memory.
4. When a single-word instruction is changed to a multi-word instruction, the program addresses corresponding to the number of words in the multi-word instruction minus one are shifted backward to the end address.
5. When a multi-word instruction is changed to a single-word instruction, the program addresses corresponding to the number of words in the multi-word instruction minus one are shifted forward to the end address.
6. The data in the data area of a multi-word instruction cannot be cleared. Also, no instruction can be written to this data area.
7. When an instruction word is written incorrectly, move the cursor by using the ← key and depress the **DISP/CLR** key to clear the display and to write the correct word.
8. To stop the program write operation under execution, depress the **CLR** key.
9. In place of the **CLR** key, depress the **ENT** key shown in parentheses only when power is applied or immediately after the operation mode is changed.

When the following messages are displayed, the Program Write operation is disabled.

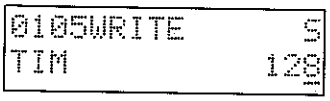
1. Message indicating an incorrect memory (i.e., the ROM is used as the user memory).



2. Message indicating an address over condition (i.e., the maximum number of addresses is 8190).



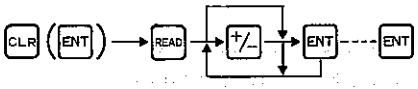
3. Message indicating that the operand of an instruction word is incorrect (i.e., the maximum number of available timer instructions is 128).



3.8 Program Read Operation

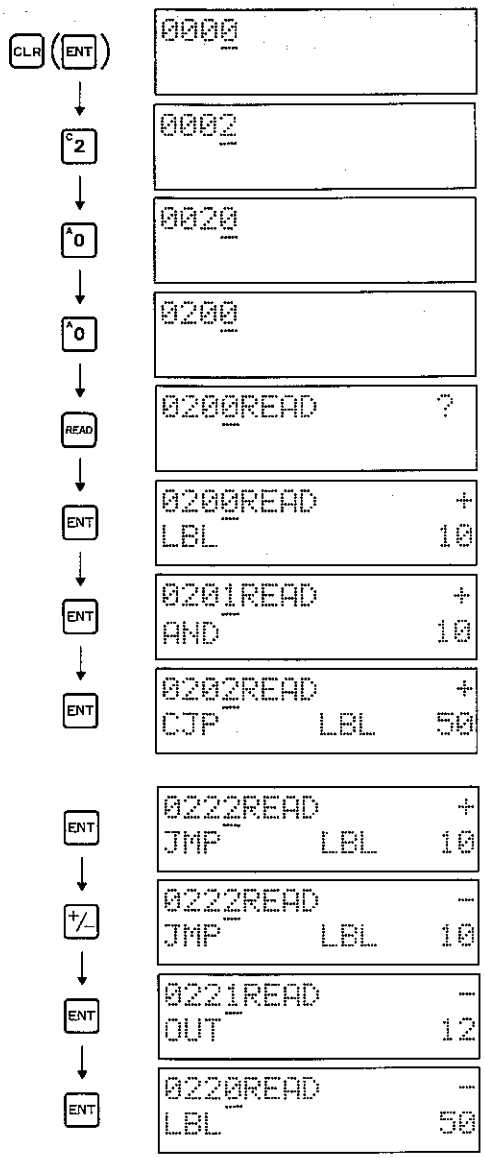
This operation is used to confirm whether the data have been written properly into the specified addresses of the user memory.

Operating procedure

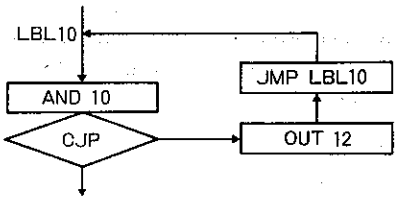


RUN	MONITOR	DEBUG	PROGRAM
○	○	×	○

● **Display**



Flowchart for exercise and programming example

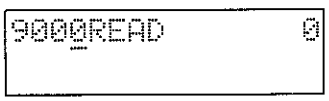


Address	OP	Data	Address	OP	Data
–			–		
0200	LBL	10	0220	LBL	50
0201	AND	10	0221	OUT	12
0202	CJP LBL	50	0222	JMP LBL	10
–			–		

NOTE:

1. First, the addresses at which data are to be read must be specified or the output instruction must be searched.
2. When the + sign appears on the upper right corner of the LCD, the address whose data is displayed is incremented by one each time the **ENT** key is depressed and the data of that address is displayed. When the – sign is displayed, the set address is decremented by one each time the ENT key is depressed.
3. The data are automatically read, incremented, or decremented in succession by holding down the **ENT** key.
4. To stop the Program Read operation under execution, depress the **CLR** key.
5. In place of the **CLR** key, depress the **ENT** key shown in parentheses only when power is applied or immediately after the operation mode is changed.

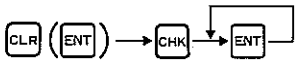
When the message indicating an address over condition is displayed on the LCD, the Program Read operation is disabled.



3.9 Program Check Operation

This operation is used to confirm whether the contents of the user program are in agreement with the predetermined rules (syntax).

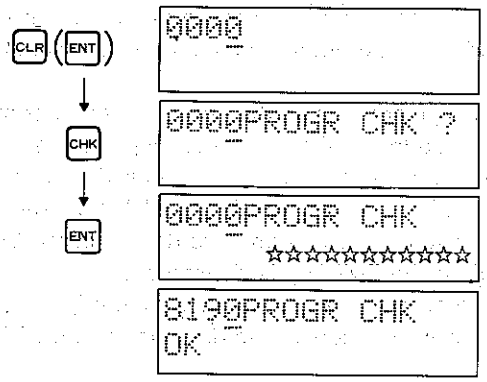
Operating procedure



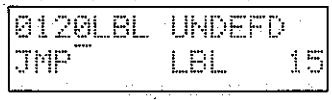
The operation is terminated by depressing the **CLR** key.

RUN	MONITOR	DEBUG	PROGRAM
×	×	×	○

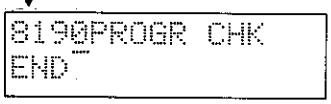
● **Display**



● **When an error exists in the program,** this message appears.



Depressing the **ENT** key causes the program check to be continued from the next address.



NOTE:

1. This operation checks the program written into the memory through the programming console. Perform this operation whenever a program has been written or read.
2. If a program error exists, the address where the error exists and its contents are displayed on the LCD each time the **ENT** key is depressed. This check can be continued up to the end address by holding down the **ENT** key.
3. If any program error is discovered, correct it in accordance with the program write procedure.
4. For description of the star marks (☆) on the LCD, refer to next page.
5. In place of the **CLR** key, depress the **ENT** key shown in parentheses only when power is applied or immediately after the operation mode is changed.

When the Program Check operation results in an error, refer to Chapter 4 of this manual.

Display	Function
0000PROGR CHK MEMORY ERR	Checks whether any undefined code exists in the user program.
0000PROGR CHK SYNTAX1 ERR	Checks whether the operand of an instruction is within the defined value.
0000PROGR CHK SYNTAX2 ERR	Checks whether instructions such as AND, OR, TIM, CNT, DIFU, DIFD, SBT, WAIT, and CJP are used correctly.
0000PROGR CHK DIF DUPL	Checks whether the same relay numbers are used in duplicate in the DIFU or DIFD instruction.
0000PROGR CHK LBL DUPL	Checks whether the same labels of an instruction are used in duplicate.
0000PROGR CHK LBL UNDEFD	Checks whether the label of instructions such as JMP, CJP, and RPT is defined.
0000PROGR CHK GN DUPL	Checks whether the same GN instructions are used in duplicate.
0000PROGR CHK GN UNDEFD	Checks whether the GN instruction that specifies the group number of the GS, GP, GC and GR instructions is defined.
0000PROGR CHK SBN DUPL	Checks whether the same SBN instructions are used in duplicate.
0000PROGR CHK SBN UNDEFD	Checks whether the SBN instruction that specifies the subroutine number of the SBS and SBT instructions is defined.
0000PROGR CHK SBN-RET ERR	Checks whether the RET and SBN instructions are used in pairs. During execution of the JMP or branch instruction, if the address specified for the RET instruction is greater than that specified for the SBN instruction, an error occurs.
0000PROGR CHK T/C DUPL	Checks whether the same timer or counter numbers are used in duplicate in the TIM or CNT instruction.
0000PROGR CHK JMP ERR	Checks whether the destination of the JMP instruction is in another group or exceeds the range of another group.
0000PORGR CHK IL-ILC ERR	Checks whether the IL and ILC instructions are used in pairs.

3.10 Instruction Search Operation

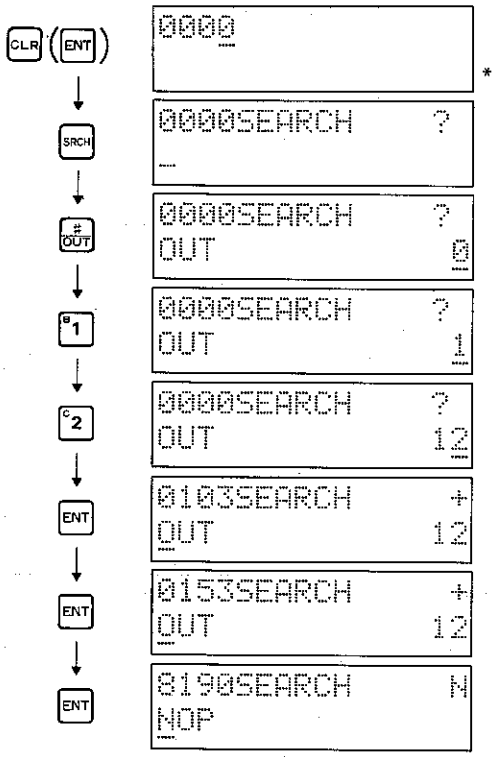
This operation is used to search the instructions written in the user memory.

Operating procedure

CLR (ENT) → SRCH → Instruction → Relay No. → ENT ------ ENT

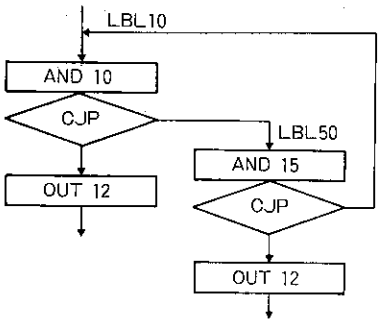
RUN	MONITOR	DEBUG	PROGRAM
○	○	○	○

● **Display**



* For further information on the messages in the DEBUG mode, refer to 3.2, Cautions for correct operation.

Flowchart for exercise and programming example



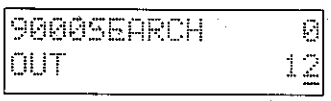
Address	OP	Data	Address	OP	Data
0100	LBL	10	0150	LBL	50
0101	AND	10	0151	AND	15
0102	CJP LBL	50	0152	CJP LBL	10
0103	OUT	12	0153	OUT	12
–			–		

NOTE:

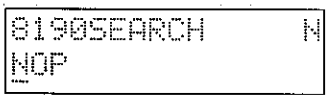
1. To display the address where the instruction is stored, first depress the **SRCH** key. Then, specify the instruction and relay number followed by depression of the **ENT** key. Each time the **ENT** key is depressed, all the addresses where the same instructions are stored are searched. That is, the instruction is searched starting from the address currently displayed on the LCD to the end of the program.
2. The set value of the instruction cannot be directly read out. Therefore, to search the set value of the TIM or CNT instruction, for example, first search the instruction. Then depress the **READ** and **ENT** keys. The set values of the other multi-word instructions can be displayed in the same manner.
3. To stop the Search operation under execution, depress the **CLR** key.
4. In place of the **CLR** key, depress the **ENT** key shown in parentheses only when power is applied or immediately after the operation mode is changed.

When these messages are displayed on the LCD, the Search operation of an instruction word is disabled.

1. Message indicating an address over condition (i.e., the maximum number of addresses is 8190.)



2. Message indicating that the corresponding instruction word cannot be found



3.11 Instruction Insert Operation

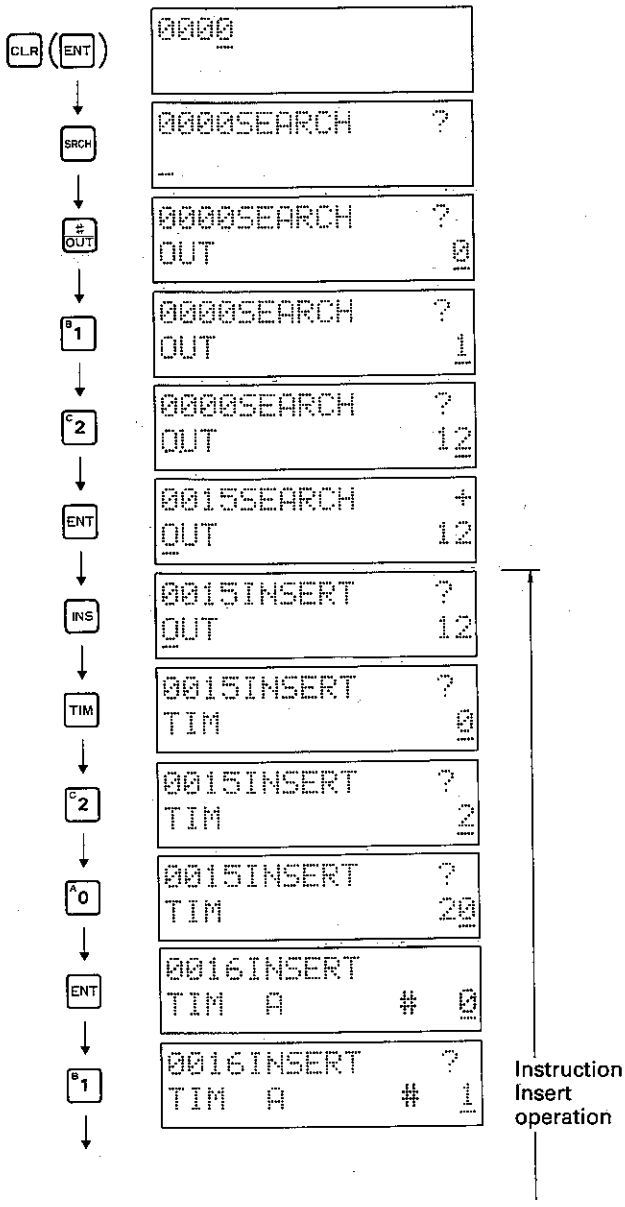
This operation is needed to add instructions when the flowchart of the program is modified.

Operating procedure

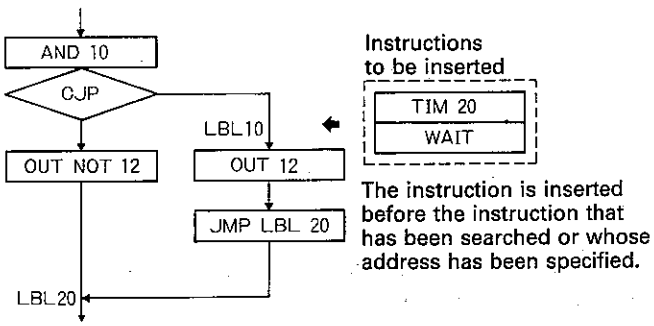
Address setting → [INS] → Instruction → Relay No. → [ENT]
Searching instruction

RUN	MONITOR	DEBUG	PROGRAM
×	×	×	○

● **Display**



Flowchart for exercise and programming example



Before insertion

Address	OP	Data	Address	OP	Data
0005	AND	10	0014	LBL	10
0006	CJP LBL	10	0015	OUT	12
0007	OUT NOT	12	0016	JMP LBL	20
0008	LBL	20	–		
–			–		

After insertion

Address	OP	Data	Address	OP	Data
0005	AND	10	0014	LBL	10
0006	CJP LBL	10	0015	TIM	20
0007	OUT NOT	12	0016		100
0008	LBL	20	0017	WAIT	
–			0018	OUT	12

NOTE:

1. To stop the Instruction Insert operation, depress the **CLR** key.
2. In place of the **CLR** key, depress the **ENT** key shown in parentheses only when power is applied or immediately after the operation mode is changed.

In the following cases, **the Instruction Insert operation cannot be performed.**

1. When an address over condition occurs

```
9000INSERT      0
TIM            20
```

2. When a program over condition occurs
   If the program uses the end address, pay particular attention when inserting multi-word instructions.

```
0050INSERT      P
TIM            20
```

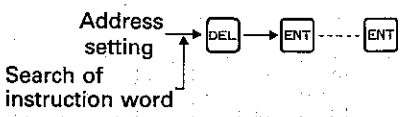
3. When the ROM is used as the user memory

```
0016INSERT      R
TIM            20
```

3.12 Instruction Delete Operation

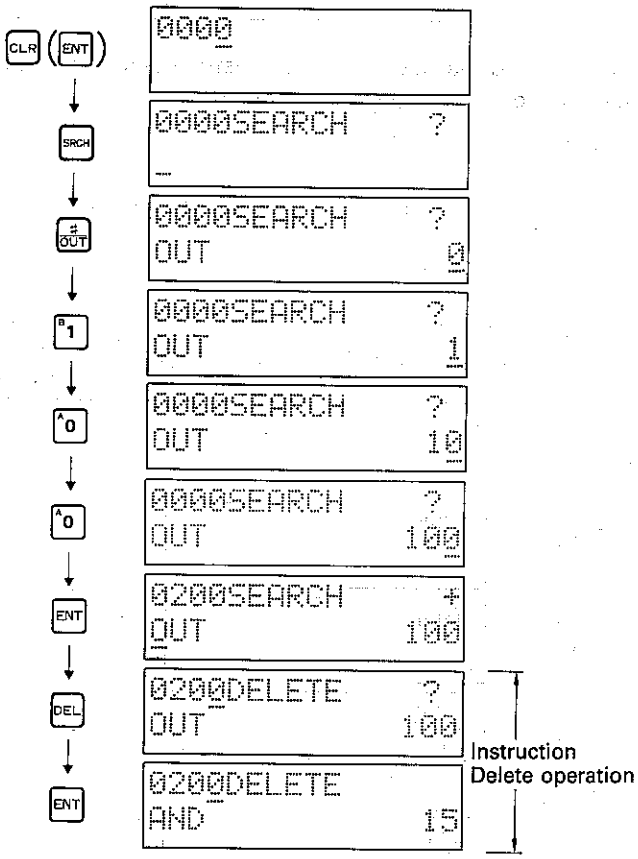
This operation is used to delete instructions from the program when its flowchart is modified.

Operating procedure

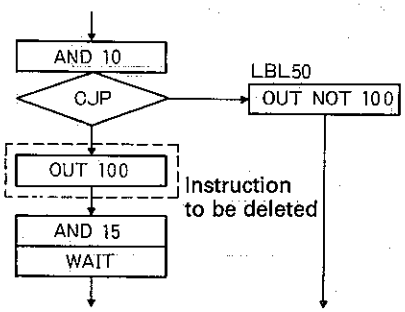


RUN	MONITOR	DEBUG	PROGRAM
×	×	×	○

● **Display**



Flowchart for execution and programming example



Before deletion

Address	OP	Data	Address	OP	Data
–			0202	WAIT	
0198	AND	10	–		
0199	CJP LBL	50	0250	LBL	50
0200	OUT	100	0251	OUT NOT	100
0201	AND	15	–		

After deletion

Address	OP	Data	Address	OP	Data
–			–		
0198	AND	10	0249	LBL	50
0199	CJP LBL	50	0250	OUT NOT	10
0200	AND	15	–		
0201	WAIT		–		

NOTE:

1. The instructions can be successively deleted by holding down the **ENT** key.
2. To stop the Instruction Delete operation under execution, depress the **CLR** key.
3. In place of the **CLR** key, depress the **ENT** key shown in parentheses only when power is applied or immediately after the operation mode is changed.

When one of the following messages is displayed on the LCD, the Instruction Delete operation is disabled.

1. Message indicating a set value

```
0253DELETE      F
TIM  A       # 54
```

2. Message indicating an incorrect user memory (i.e., the ROM is used as the user memory)

```
0200DELETE      R
OUT           100
```

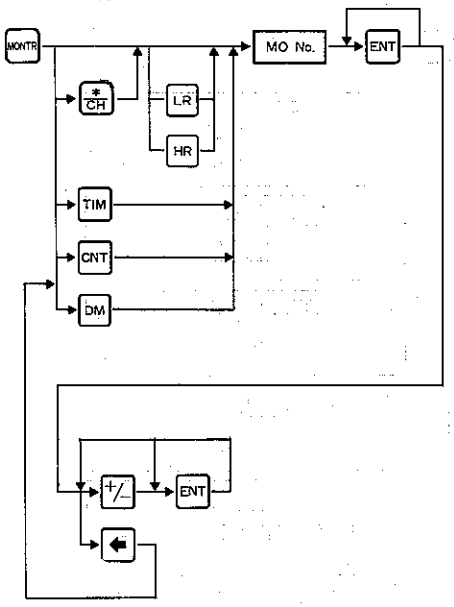
3. Message indicating an address over condition

```
9000DELETE      0
OUT           100
```

3.13 Multimonitor Operation

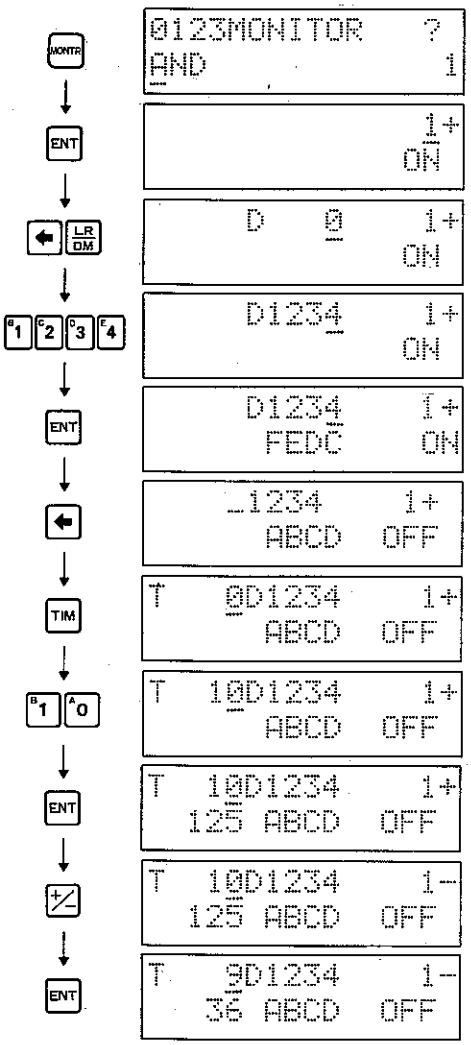
This operation is used to monitor and to display simultaneously the operating states of a maximum of three points of I/O relays, auxiliary relays, holding relays (HR), link relays (LR), timers, counters, or data memories (DM) during the execution of a program.

Operation procedure



RUN	MONITOR	DEBUG	PROGRAM
○	○	○	○

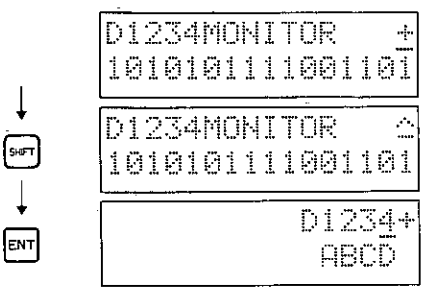
● display



Operating procedure

Channel monitor → SHIFT ENT

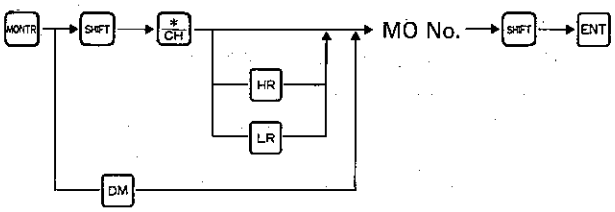
● Display



3.14 Channel Monitor Operation

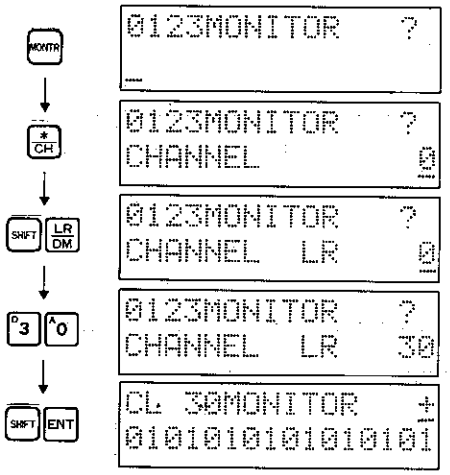
This operation is used to monitor and to display simultaneously the operating states of the channels (in units of 16-digit binary numbers) of the I/O relays, auxiliary relays, holding relays (HR), link relays (LR) or data memories (DM) during the execution of a program.

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
○	○	○	○

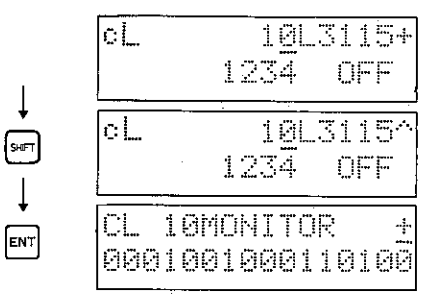
● Display



Operating procedure

Multimonitor → SHIFT ENT

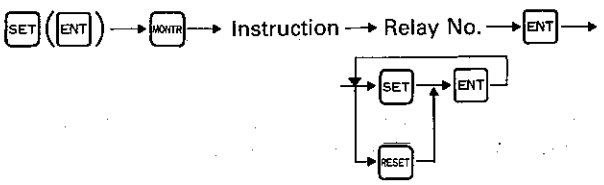
● Display



3.15 Forced Set/Reset Operation

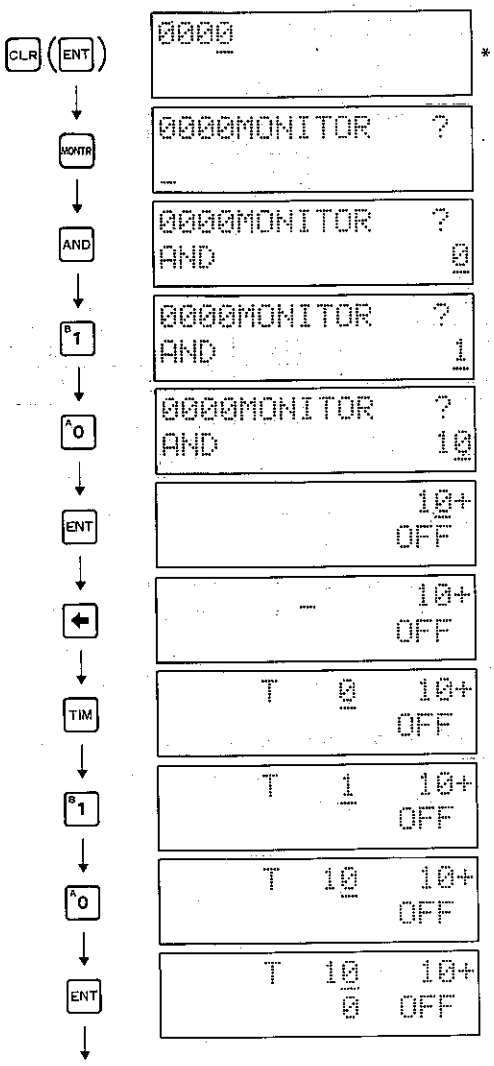
This operation is used to forcibly set or reset the operating state of the I/O relays, auxiliary relays, timers, counters, holding relays (HR), or link relays (LR) during the execution of a program.

Operating procedure

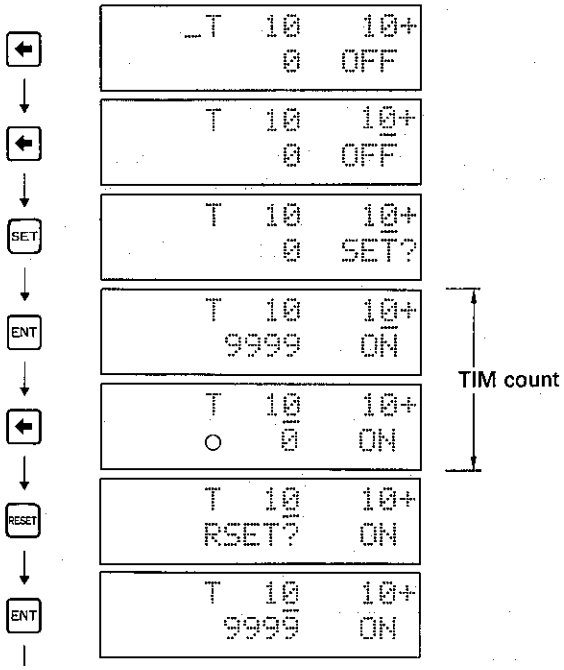


RUN	MONITOR	DEBUG	PROGRAM
×	○	○	○

● **Display**

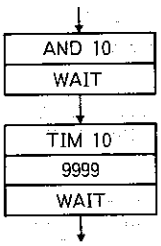


*



* For further information on the messages in the DEBUG mode, refer to 3.2, Cautions for correct operation.

Flowchart for execution and programming example



Address	OP	Data
0050	AND	10
0051	WAIT	
0052	TIM	10
0053		9999
0054	WAIT	

NOTE:

1. The I/O relay, auxiliary relay, timer, or counter displayed above the cursor can be forcibly set or reset by this operation.
2. In place of the **CLR** key, depress the **ENT** key shown in parentheses only when power is applied or immediately after the operation mode is changed.

3.16 Present Value Change Operation

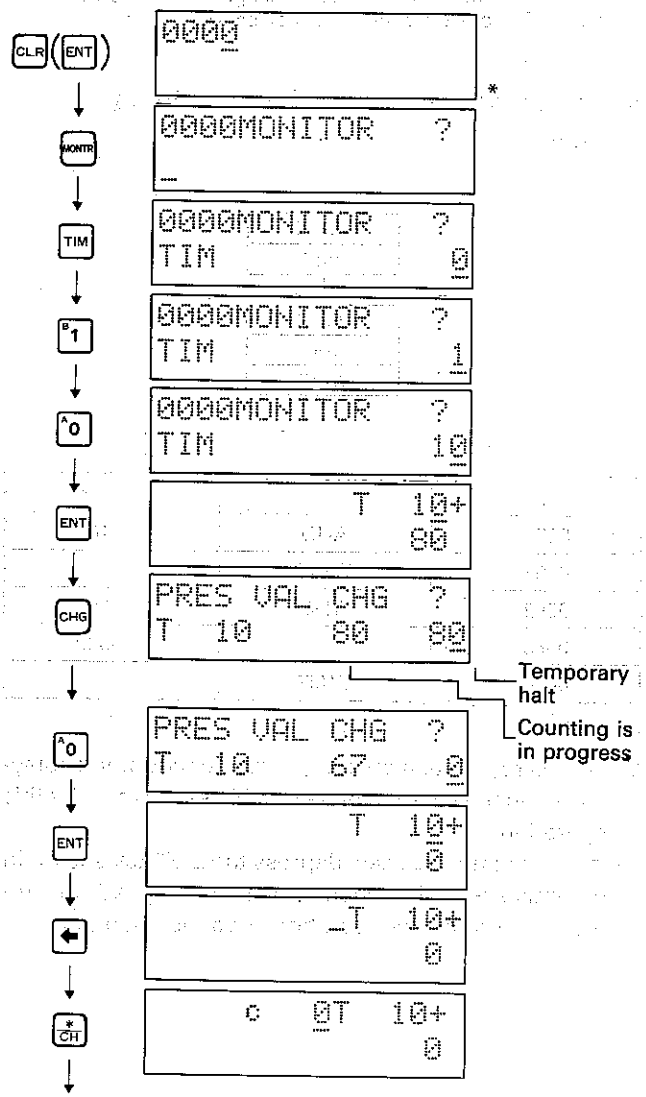
This operation is used to change the present value of the I/O relays, auxiliary relays, holding relays (HR), link relays (LR), timers, counter, or data memories (DM) in units of 4-digit hexadecimal or 4-digit decimal numbers during the execution of a program.

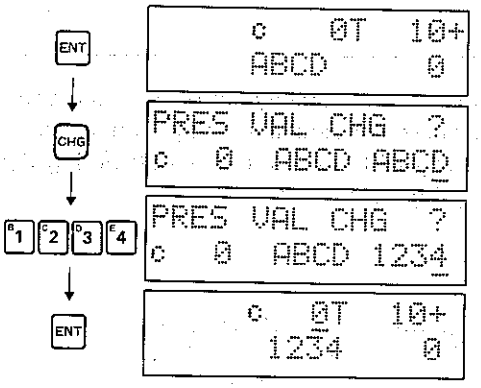
Operating procedure

CLR (ENT) → MONTR → Instruction → Relay No. → ENT →
→ CHG → Changed value → ENT

RUN	MONITOR	DEBUG	PROGRAM
×	○	○	○

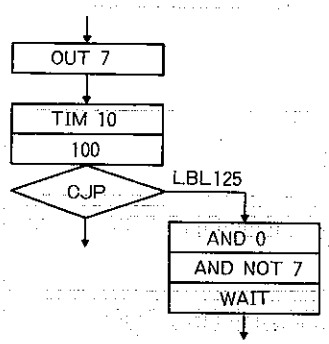
● **Display**





* For further information on the messages in the DEBUG mode, refer to 3.2, Cautions for correct operation.

Flowchart for execution and programming example



Address	Instruction	Data	Address	Instruction	Data
0100	OUT	7	0120	LBL	125
0101	TIM	10	0121	AND	0
0102		100	0122	AND NOT	7
0103	CJP LBL	125	0123	WAIT	
–			–		

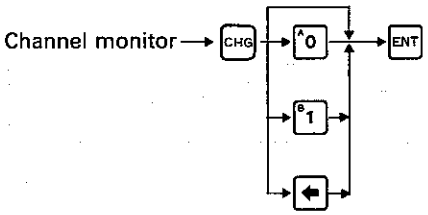
NOTE:

1. The value to which the present value of a timer or counter is to be changed must be input as a 4-digit decimal number.
   Input the values for the other relays as a 4-digit hexadecimal number.
2. The present values of channels 61 to 63 cannot be changed. If the keys specifying these channels are inadvertently depressed, a buzzer sounds, inhibiting the input.

3.17 Channel Write Operation

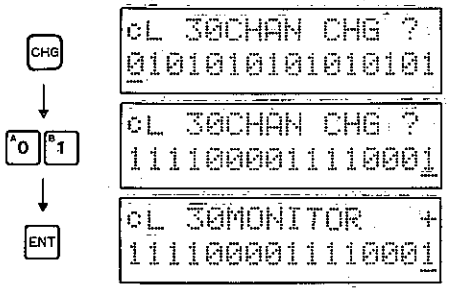
This operation is used to change the present value of the I/O relays, auxiliary relays, holding relays (HR), link relays (LR), or data memories (DM) by using a binary number (i.e., 0 and 1).

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
×	○	○	○

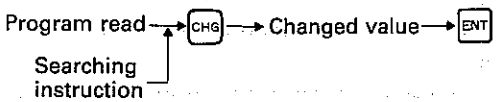
● **Display**



3.18 Set Value Change Operation for Timer or Counter

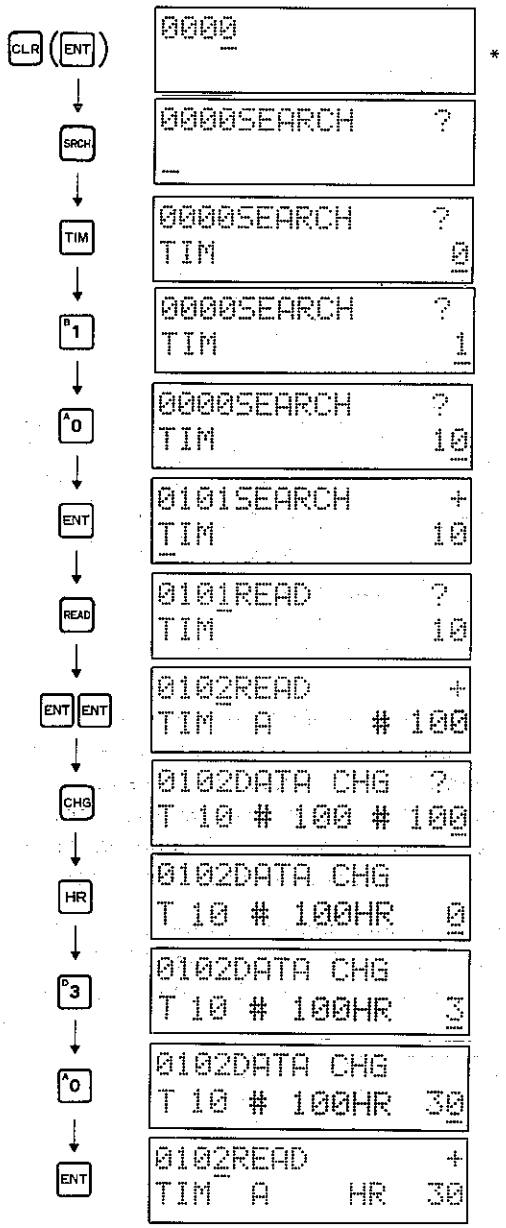
This operation is used to change the set value of the timers or counters during the execution of a program.

Operating procedure



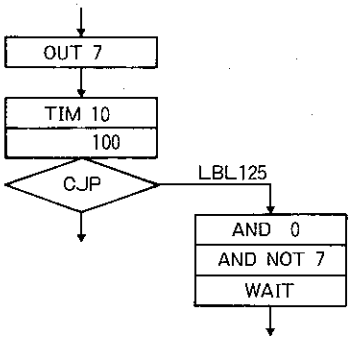
RUN	MONITOR	DEBUG	PROGRAM
×	○	○	×

● **Display**



* For further information on the messages in the DEBUG mode, refer to 3.2, Cautions for correct operation.

Flowchart for execution and programming example



Address	OP	Data	Address	OP	Data
0100	OUT	7	0120	LBL	125
0101	TIM	10	0121	AND	0
0102		100	0122	AND NOT	7
0103	CJP LBL	125	0123	WAIT	
–			–		

NOTE:

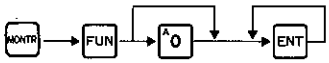
1. To change the set value of a timer or counter, read or search the address where the set value of the timer or counter is stored; then change the set value.
2. In place of the **CLR** key, depress the **ENT** key shown in parentheses only when power is applied or immediately after the operation mode is changed.

When the message indicating an incorrect user memory (i.e., the ROM is used as the user memory) is displayed on the LCD, the Set Value Change Operation is disabled.

3.19 Error Read/Reset Operation

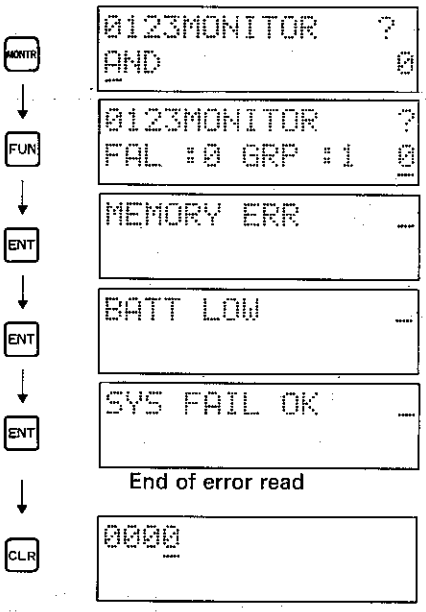
This operation is used to display an error that has occurred in the PC, thus allowing the operator to confirm the type of error.

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
○	○	○	○

● **Display**



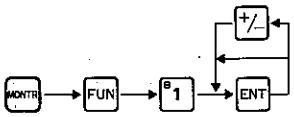
NOTE:

1. While an error is being displayed, depressing the **ENT** key causes the error to be reset. If the error will not be reset, a buzzer sounds. If this happens, refer to the Chapter 4, List of error messages for the corrective action.
2. If plural errors occur, depressing the **ENT** key causes the one displayed to be reset and then the next error to be displayed.
3. To stop the Error Read operation under execution, depress the **CLR** key.

3.20 Group Monitor Operation

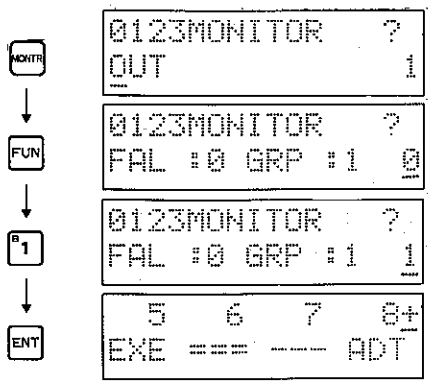
This operation is used to display the state of each group program during the RUN operation.

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
○	○	○	×

● **Display**

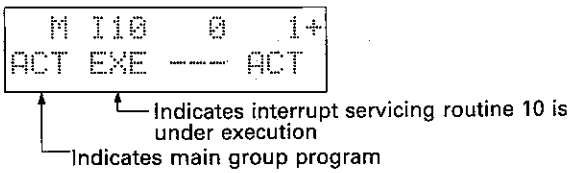


NOTE:

The message in the upper line on the LCD indicates the group number. First, four group programs of the group programs following the program being executed are displayed.

Then, the group numbers of group programs 0 to 31, the main group program, and the interrupt servicing routine can be monitored in sequence.

Each time the **ENT** key is depressed, the displayed group number is incremented by one. If the group number of the interrupt subroutine is displayed, depressing the **ENT** key causes the group number of group program 0 to be displayed again.

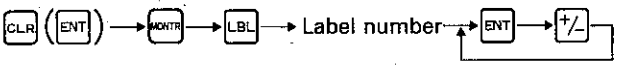


ACT: Indicates the execution wait state of the group program
EXE: Indicates that the group program is being executed
===: Indicates that the execution of the program is caused by the GP instruction
---: Indicates that no group program is executed.

3.21 Trace Check Operation

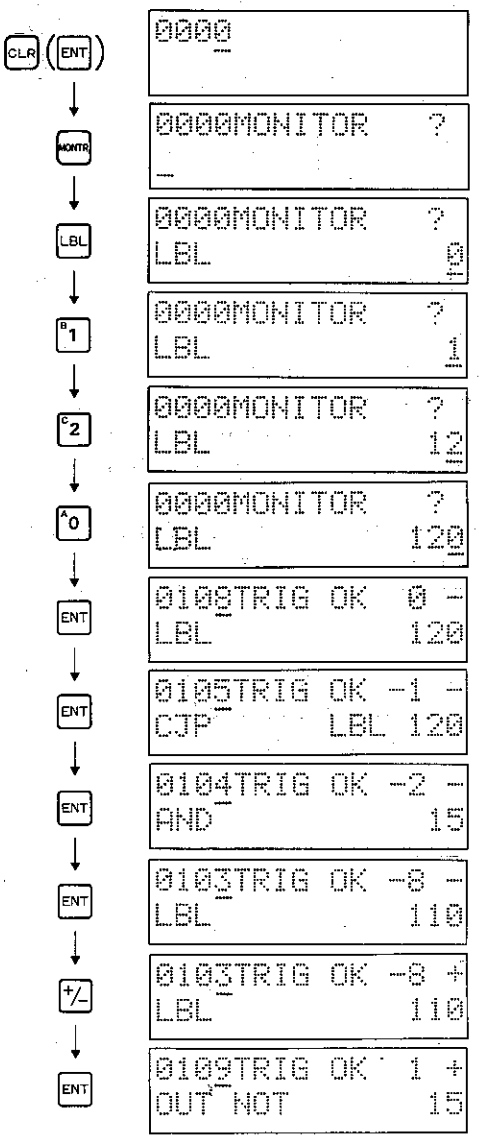
This operation is used to check the execution of the program specified by a label. After the program has been executed, it is also used to read eight addresses before and one address after the specified label.

Operating procedure

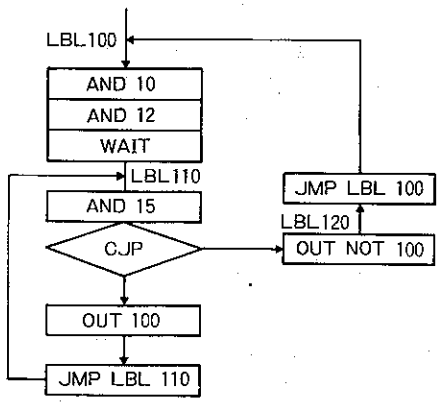


RUN	MONITOR	DEBUG	PROGRAM
×	○	×	×

● **Display**



Flowchart for execution and programming example



Address	OP	Data	Address	OP	Data
0100	AND	10	0106	OUT	100
0101	AND	12	0107	JMP LBL	110
0102	WAIT		0108	LBL	120
0103	LBL	110	0109	OUT NOT	100
0104	AND	15	0110	JMP LBL	100
0105	CJP LBL	120			

NOTE:

1. To stop the Trace Check operation under execution, depress the **CLR** key.
2. The eight addresses before and one address after a specified label can be read only when the message TRIG OK is displayed on the LCD. The addresses cannot be checked when the program is in the WAIT state which is indicated by the message TRIG WAIT displayed on the LCD.
3. In place of the **CLR** key, depress the **ENT** key shown in parentheses only when power is applied or immediately after the operation mode is changed.

When one of these messages is displayed on the LCD, the Trace Check Operation is disabled.

1. Message indicating that a specified label number is not found

```
0000MONITOR   ?
LBL           200
```

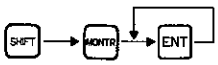
In this case, the CPU will not accept any **ENT** key input.

2. Message indicating that a program is in WAIT

3.22 Address Monitor Operation

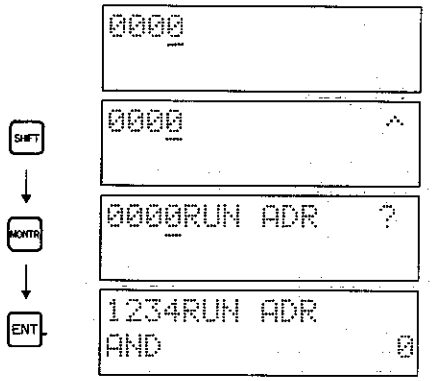
This operation is used to display the addresses of the user program currently executed.

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
○	○	×	×

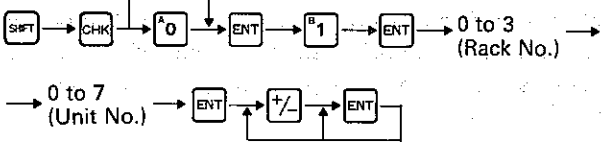
● **Display**



3.23 I/O Table Read Operation

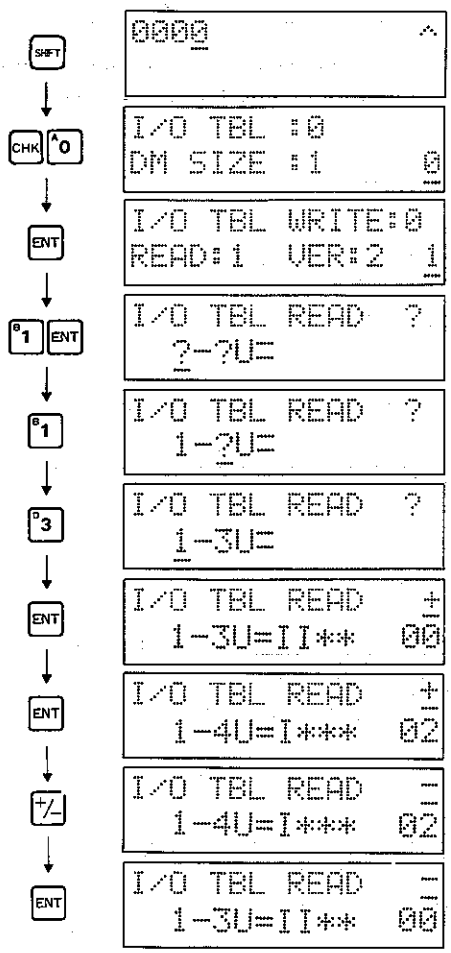
This operation is used to read the contents of the I/O table registered in memory.

Operation procedure

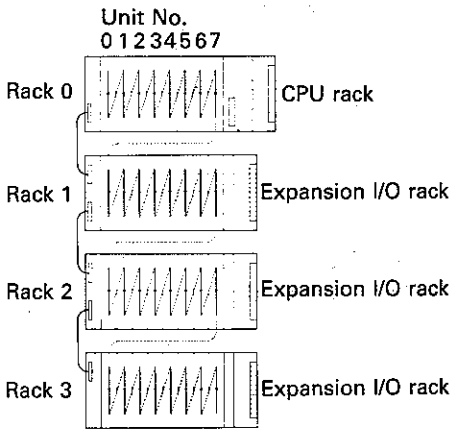


RUN	MONITOR	DEBUG	PROGRAM
○	○	○	○

● **Display**



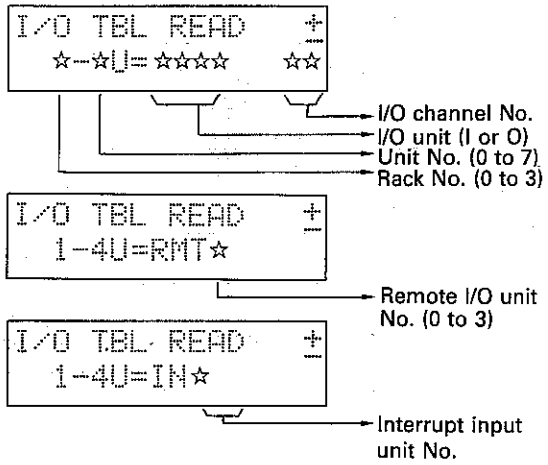
Example of I/O unit mounting



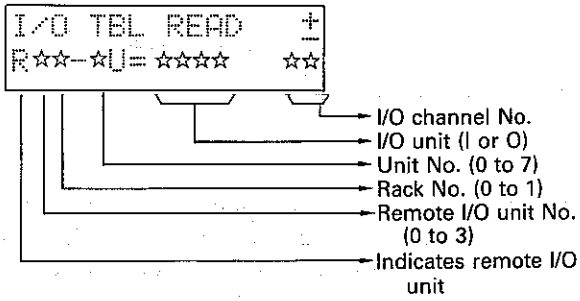
NOTE:
When the **ENT** key is depressed, only the I/O unit registered in the I/O table is displayed.

A combination of the character I or O and asterisks appears on the LCD to indicate whether the unit is an input (I) or output (O) unit, and the number of points of that unit. The number of points is indicated as follows:

1. 16-point unit: I***
   32-point unit: II***
   64-point unit: IIII
   (The message INT may also appear on the LCD to identify the interrupt input unit.)
2. The information concerning the CPU rack and the expansion I/O rack is displayed as follows:



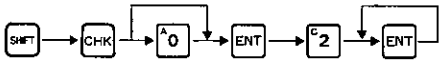
3. The information concerning the remote I/O unit is displayed as follows:



3.24 I/O Table Verify Operation

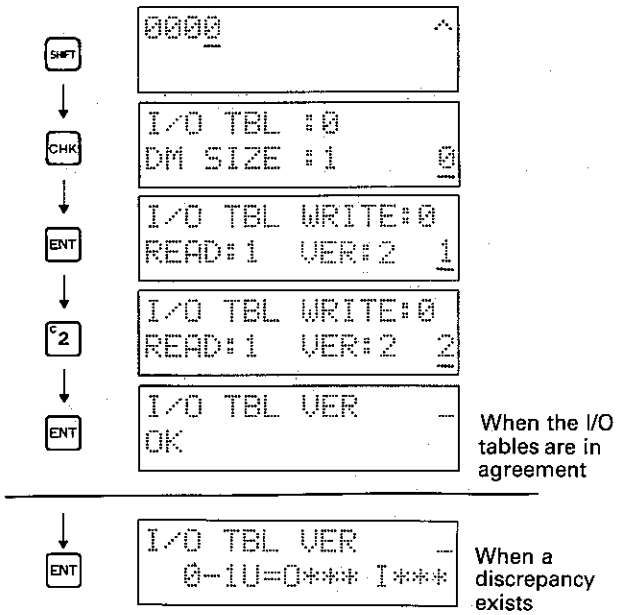
This operation is used to verify agreement of the contents of the I/O table registered in memory against those of the actual I/O table.

Operating procedure

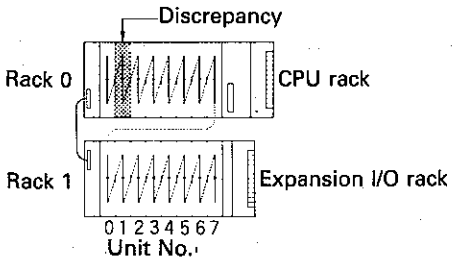


RUN	MONITOR	DEBUG	PROGRAM
○	○	○	○

● **Display**

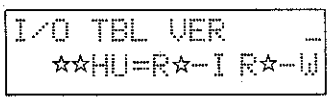


Example of I/O unit mounting

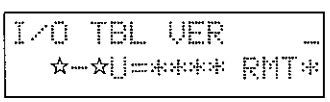


NOTE:
Unless an I/O table is generated, the previous data will remain in the registered I/O table even after I/O units have been mounted to the CPU rack or expansion I/O rack.

1. Message indicating that an optical transmitting I/O unit is used in duplicate



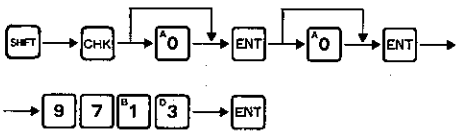
2. Message indicating that a remote I/O not existing in the registered I/O table is mounted



3.25 I/O Table Change Operation

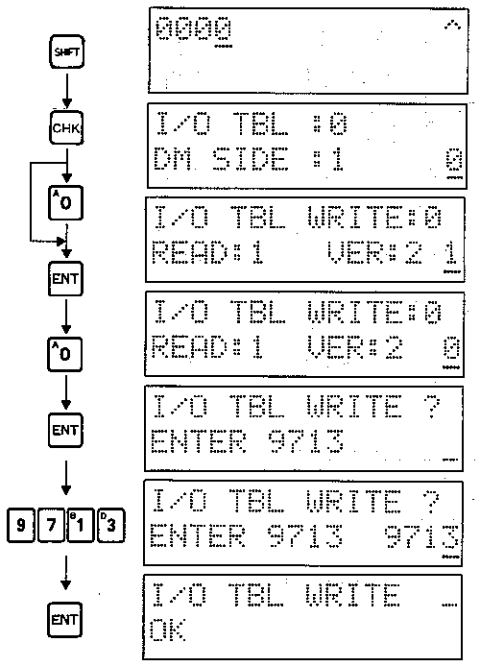
This operation is used to change the contents of the I/O table registered in memory using those of the actual I/O table.

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
x	×	×	○

● **Display**

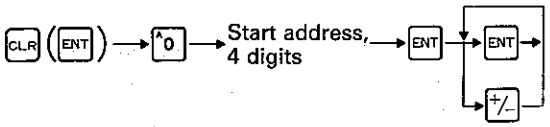


NOTE:
Be sure to generate the I/O table whenever the setting of the I/O units on the PC is changed.

3.26 Start Address Setting Operation

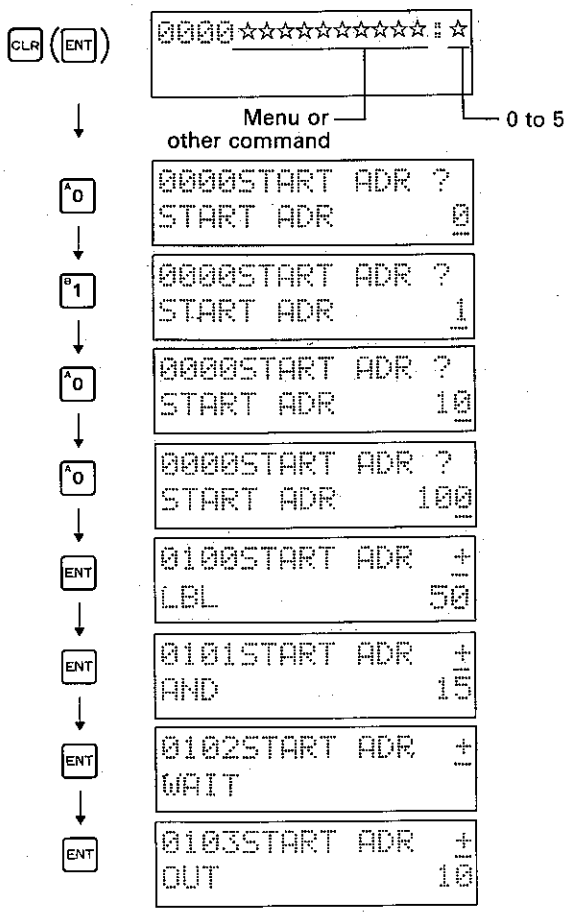
When the RUN (program execution) operation is to be performed in the DEBUG mode, this operation is used to specify the start address in the user program from which the program debugging starts. This operation also permits a program read in the DEBUG mode.

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
×	×	○	×

● **Display**



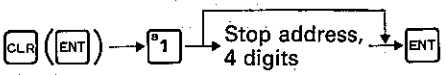
NOTE:

1. The Start Address Setting operation is used to set an address in the RUN (program execution) operation and to read the program, but not to execute the program.
2. To stop the Start Address Setting operation, depress the **CLR** key.
3. In place of the **CLR** key, depress the **ENT** key shown in parentheses only when power is applied or immediately after the operation mode is changed.

3.27 Stop Address Setting Operation

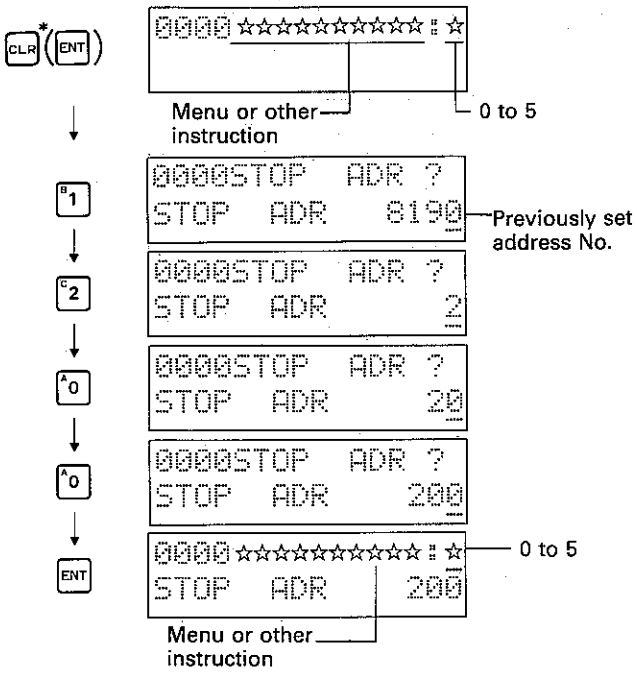
When the RUN (program execution) operation is to be performed in the DEBUG mode, this operation is used to specify the stop address in the user program at which the program debugging stops.

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
×	×	○	×

● **Display**



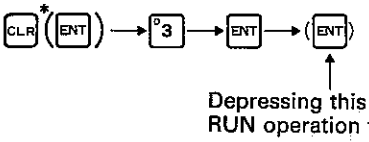
NOTE:

1. The Stop Address Setting operation is used to set an address in the RUN (program execution) operation but not to execute the program.
2. To stop the Stop Address Setting operation under execution, depress the **CLR** key.
3. In place of the **CLR** key, depress the **ENT** key shown in parentheses only when power is applied or immediately after the operation mode is changed.

3.28 RUN (Program Execution) Operation

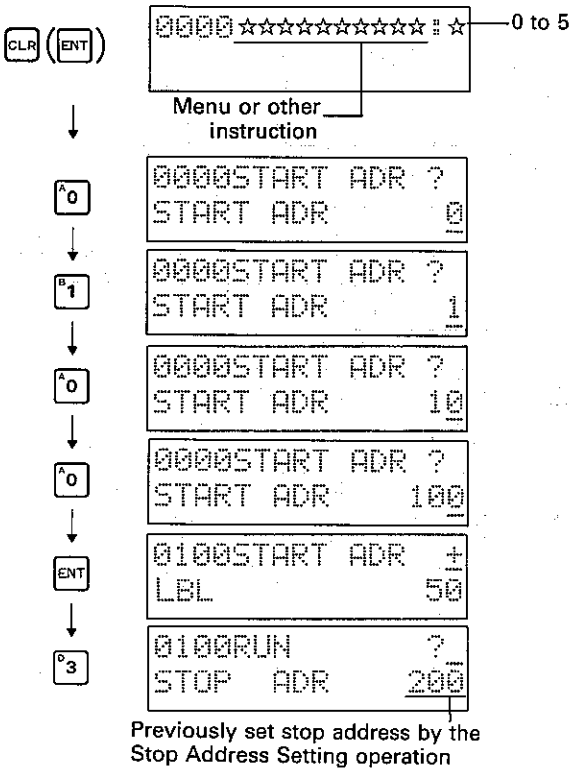
This operation is used to execute the program from the set start address to the set stop address.

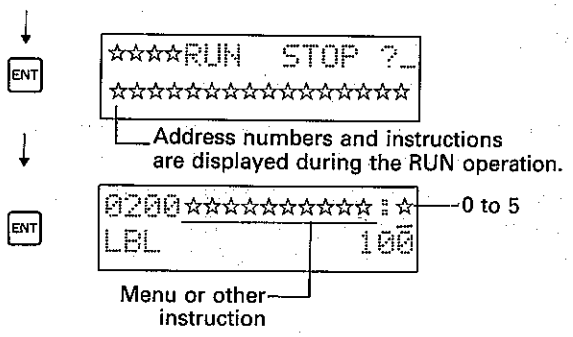
Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
×	×	○	×

● **Display**





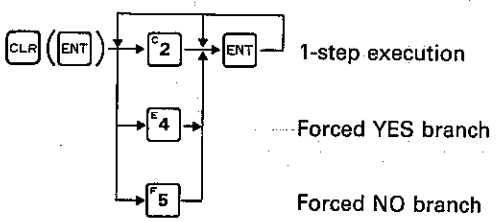
NOTE:

1. The key operation of the programming console shown at the left is for executing the program from address 0100 to address 0200.
2. Be sure to perform the RUN operation after specifying the start address.
3. If a multi-word instruction is written in the specified stop address, the RUN operation stops at the first address of that word.
4. In place of the **CLR** key, depress the **ENT** key shown in parentheses only when power is applied or immediately after the operation mode is changed.

3.29 1-Step Execution, Forced YES Branch, and Forced NO Branch Operations

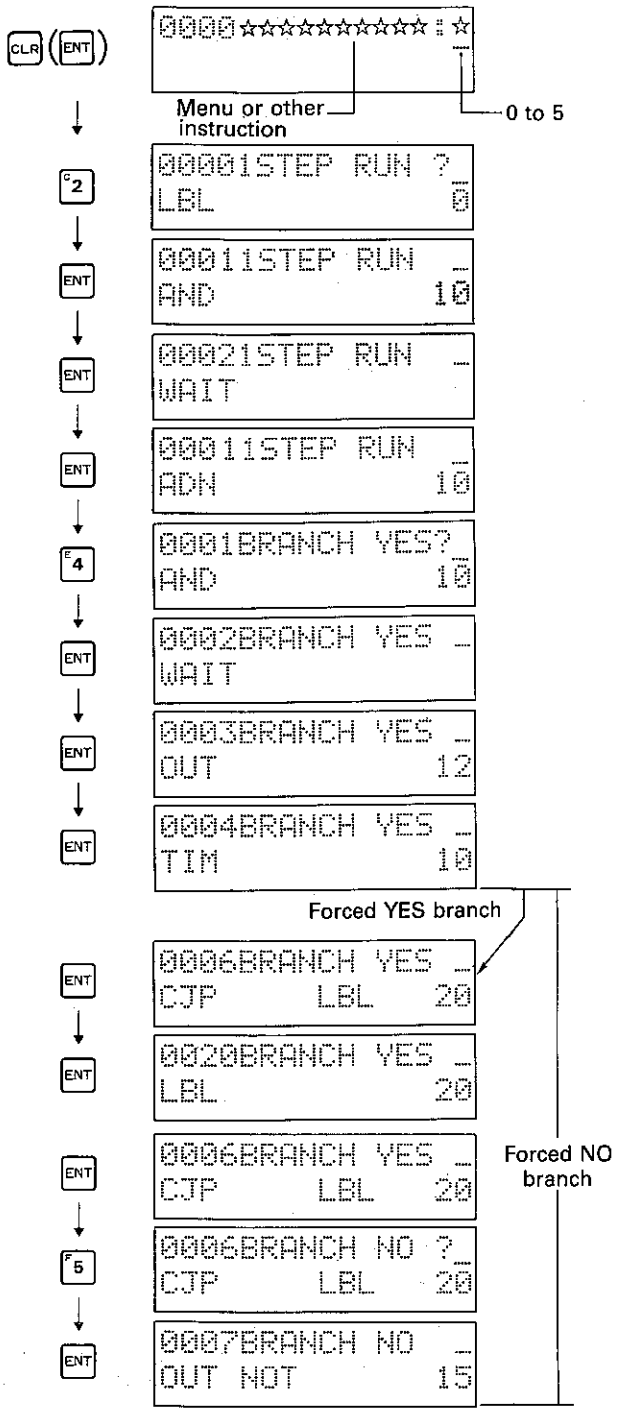
These operations are used to execute the program on an step-by-step basis so that the input and output states of the program can be checked against the flowchart.

Operating procedure

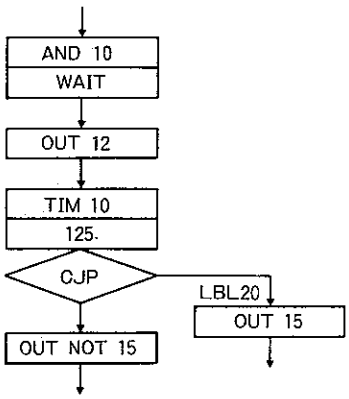


RUN	MONITOR	DEBUG	PROGRAM
×	×	○	×

● **Display**



Flowchart for execution and programming example

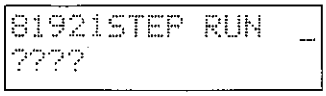


Address	OP	Data
0000	LBL	0
0001	AND	10
0002	WAIT	
0003	OUT	12
0004	TIM	10
0005		125
0006	CJP LBL	20
0007	OUT NOT	15
0020	LBL	20
0021	OUT	15

NOTE:

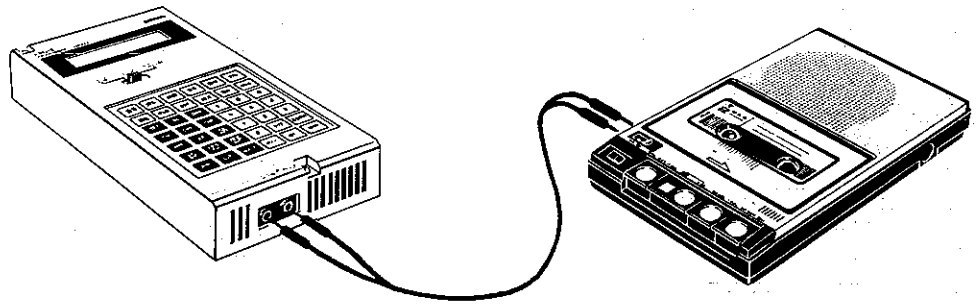
1. The message BRANCH YES displayed on the LCD indicates the Forced YES Branch operation that establishes the conditions specified by the WAIT and BRANCH instructions.
2. The message BRANCH NO displayed on the LCD indicates the Forced NO Branch operation that inhibits establishing the conditions specified by the WAIT and BRANCH instructions.
3. To stop the 1-Step Execution operation under execution, depress the **CLR** key.
4. In place of the **CLR** key, depress the **ENT** key shown in parentheses only when power is applied or immediately after the operation mode is changed.

If an address over condition occurs, **the 1-Step Execution operation cannot be performed.** If this happens, the following message is displayed on the LCD, indicating that the 1-step execution has stopped.



3.30 Connecting Cassette Tape Recorder

Connecting cassette tape recorder

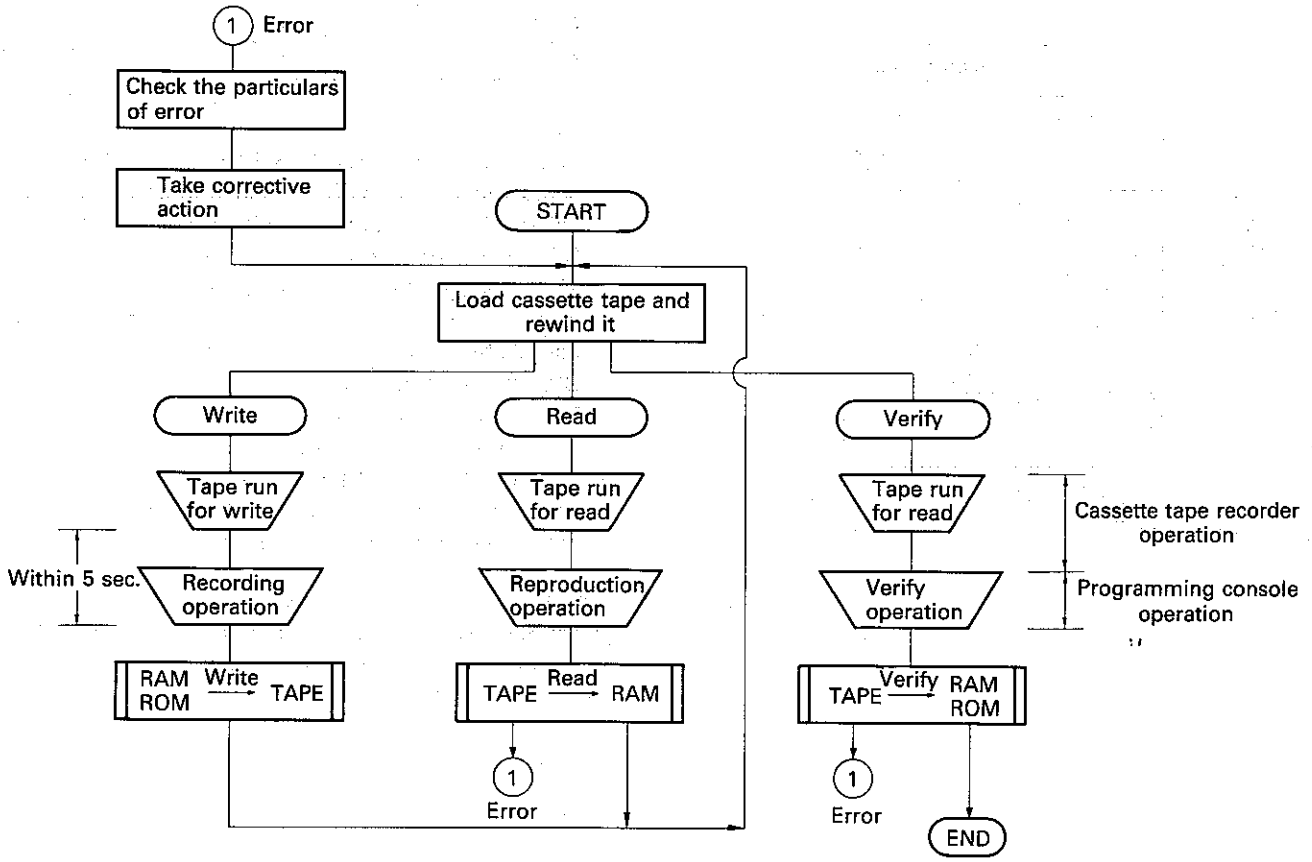


Use Type SCYPOR-PLG01 as a connecting cable.

Connect the MIC and EAR jacks of the programming console to those of the cassette tape recorder with the connecting cable.

Set the VOL. and TONE controls of the cassette tape recorder to the MAX. position.

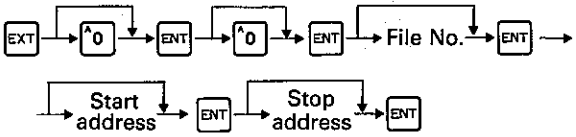
Operation of cassette tape recorder



3.31 Tape Write Operation of User Memory

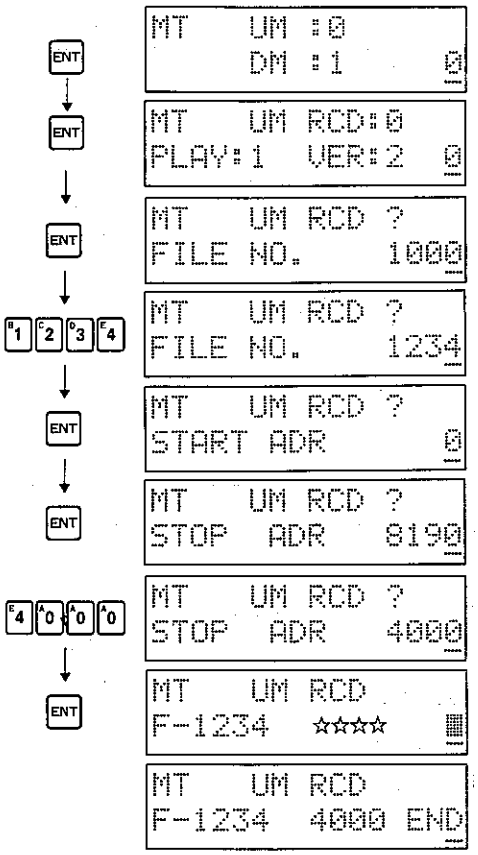
This operation is used to record the contents of the user program on a cassette tape.

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
x	×	×	○

● **Display**



NOTE:

1. When the Tape Write operation is completed, be sure to perform the Tape Verify operation to confirm that the data have been properly recorded on the tape.
2. Even if the tape jams or otherwise does not run, data will be transferred unilaterally from the user memory. Therefore, be sure to confirm that the tape is running smoothly.
3. Should the power be turned off or the cassette tape be ejected during the Tape Write operation, the tape write will be interrupted. Repeat the tape write operation from the beginning.
4. To stop the Tape Write operation under execution, either depress the **CLR** key or operate the mode selector switch.
5. The program number is recorded as the file number on the tape.
6. When the start address is specified, for example, as 100, the data stored from address 0100 to the specified stop address in the user memory are recorded on the tape.

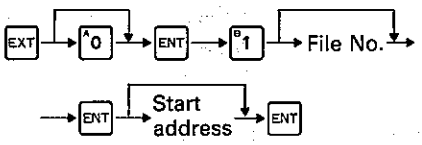
When start address is set exceeding the stop address, the following message indicating a format error appears on the LCD and the Tape Write operation is disabled.

```
MT   UM RCD F
STOP ADR     0
```

3.32 Tape Read Operation of User Memory

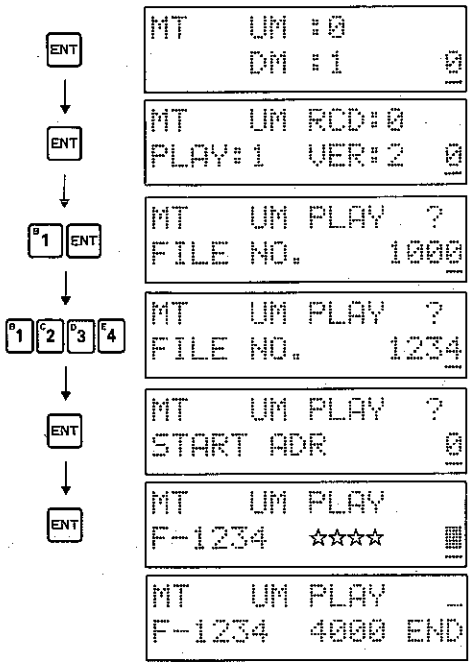
This operation is used to transfer the data recorded on the cassette tape to the user memory.

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
x	×	×	○

● **Display**



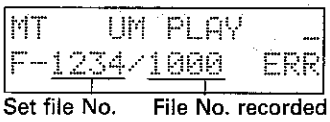
NOTE:

1. On completion of the Tape Read operation, be sure to perform the Tape Verify operation to confirm that the data have been transferred properly from the tape to the user memory.
2. If the power is turned off or the cassette is ejected during the Tape Read operation, the tape read will be interrupted. Repeat the Tape Read operation from the beginning.
3. To stop the Tape Read operation under execution, either depress the **CLR** key or operate the mode selector switch.
4. Be sure to set the VOL. and TONE controls of the cassette tape recorder to the MAX. position.
5. When the start address is specified, for example, as 100, the data recorded on the tape will be transferred to the user memory from address 0100.

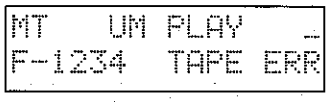
When one of the following messages appears on the LCD, the Tape Read operation is disabled.

1. Message indicating an incorrect user memory (i.e., the ROM is used as the user memory)

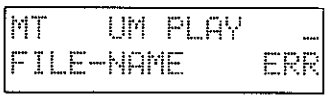
2. Message indicating a file No. mismatch error (i.e., the set file No. does not agree with that recorded on the tape)



3. Message indicating a tape error (i.e., cassette tape or cassette tape recorder is defective)



4. Message indicating a file name mismatch error



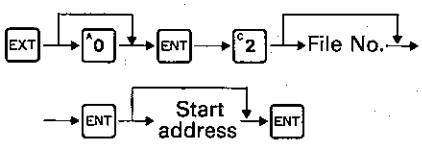
5. Message indicating that data exceeds the memory capacity

6. When the CLR key is depressed

3.33 Tape Verify Operation of User Memory

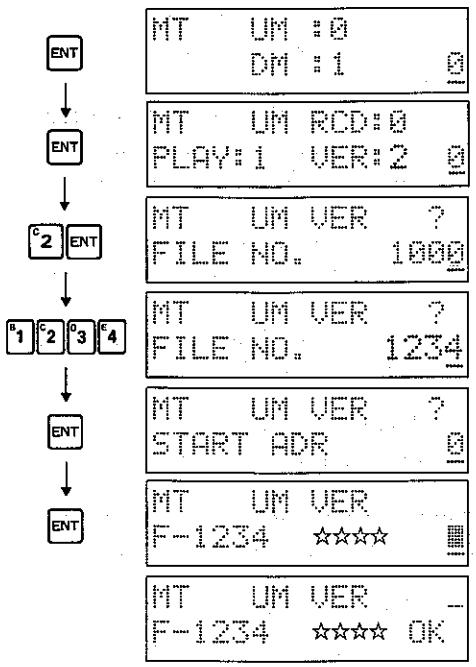
This operation is used to verify the contents of the user program against the contents of a cassette tape.

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
×	×	×	O

● **Display**

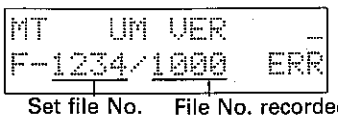


NOTE:

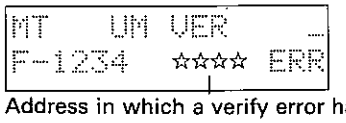
1. If the power is turned off or the cassette tape is ejected during the Tape Verify operation, the tape read will be interrupted. Repeat the Tape Verify operation from the beginning.
2. To stop the Tape Verify operation under execution, either depress the **CLR** key or operate the mode selector switch.
3. Set the VOL. and TONE controls of the cassette tape recorder to the MAX. position.
4. When the start address is specified, for example, as 100, user memory will be verified against the data recorded on the tape from address 0100.

When one of these messages appears on the LCD, the Tape Verify operation is disabled.

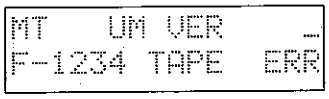
1. Message indicating a file No. mismatch error (i.e., the set file No. does not agree with that recorded on the tape)



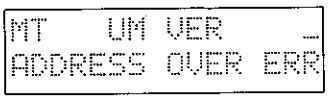
2. Message indicating a verify error



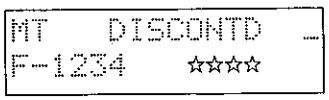
3. Message indicating a tape error (i.e., cassette tape or cassette tape recorder is defective)



4. Message indicating an address over error (i.e., the data exceeds the memory capacity)



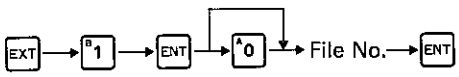
5. When the **CLR** key is depressed



3.34 Tape Write Operation of Data Memory

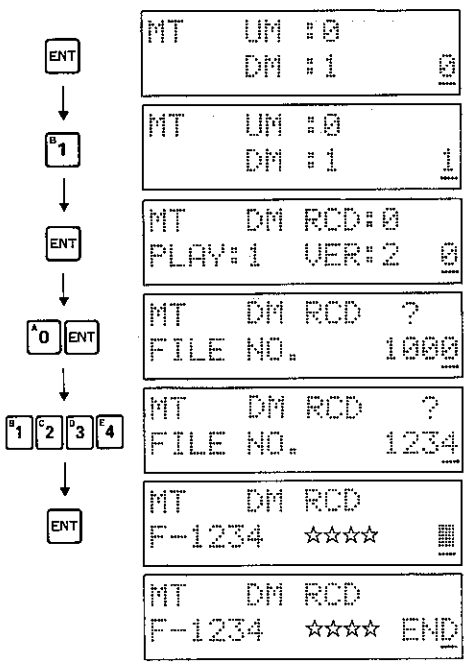
This operation is used to record the contents of the data memory on a cassette tape.

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
×	×	×	○

● **Display**



NOTE:

1. On completion of the Tape Write operation, be sure to perform the Tape Verify operation to confirm that the data have been recorded properly on the tape.
2. Even if the tape does not run, data will be transferred unilaterally from the data memory. Therefore, be sure to confirm that the tape is running smoothly.
3. If the power is turned off or the cassette is ejected during the Tape Write operation, the tape write will be interrupted. Repeat the Tape Write operation from the beginning in such cases.
4. To stop the Tape Write operation under execution, either depress the **CLR** key or operate the mode selector switch.
5. The program number is recorded as the file number on the tape.

3.35 Tape Read Operation of Data Memory

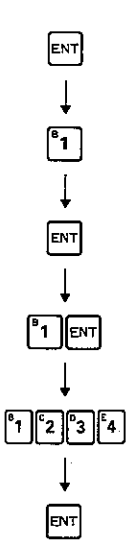
This operation is used to read the program data recorded on the cassette tape to the data memory.

Operating procedure

EXT → 1 → ENT → 1 → File No. → ENT

RUN	MONITOR	DEBUG	PROGRAM
×	×	×	O

● **Display**




```
MT   UM :0
     DM :1      0
```

```
MT   UM :0
     DM :1      1
```

```
MT   DM RCD:0
PLAY:1  VER:2  0
```

```
MT   DM PLAY  ?
FILE NO.      0
```

```
MT   DM PLAY  ?
FILE NO.   1234
```

```
MT   DM PLAY
F-1234  ☆☆☆☆
```

```
MT   DM PLAY
F-1234  ☆☆☆☆ END
```

NOTE:

1. On completion of the Tape Read operation, be sure to perform the Tape Verify operation to confirm that the data have been transferred properly from the cassette tape to the data memory.
2. If the power is turned off or the cassette is ejected during the Tape Read operation, the tape read will be interrupted. Repeat the Tape Read operation from the beginning.
3. To stop the Tape Read operation under execution, either depress the **CLR** key or operate the mode selector switch.
4. Be sure to set the VOL. and TONE controls of the cassette tape recorder to the MAX. position.

When one of the following messages appears on the LCD, the Tape Read operation is disabled.

1. Message indicating an incorrect user memory (i.e., the ROM is used as the user memory)

```
MT   DM PLAY   E
FILE NO.    1234
```

2. Message indicating a file No. mismatch error (i.e., the set file No. does not agree with that recorded on the tape)

```
MT   DM PLAY   _
F-1234/1000  ERR
```

Set file No. File No. recorded on the tape

3. Message indicating a tape error (i.e., cassette tape or cassette tape recorder is defective)

```
MT   DM PLAY   _
F-1234 TAPE  ERR
```

4. Message indicating a file name mismatch error

```
MT   DM PLAY   _
FILE-NAME    ERR
```

5. Message indicating an address over error (i.e., the data exceeds the memory capacity)

```
MT   DM PLAY   _
ADDRESS OVER ERR
```

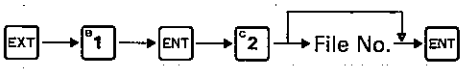
6. When the **CLR** key is depressed

```
MT   DISCONTD  _
F-1234  ☆☆☆☆
```

3.36 Tape Verify Operation of Data Memory

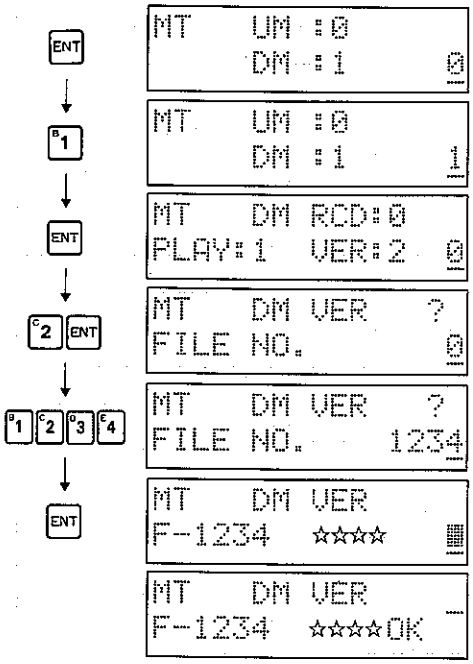
This operation is used to verify the contents of the data memory against the contents recorded on the cassette tape.

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
×	×	×	○

● **Display**

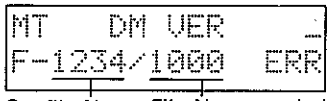


NOTE:

1. If the power is turned off or the cassette tape is ejected during the Tape Verify operation, the tape read will be interrupted. Repeat the Tape Verify operation from the beginning.
2. To stop the Tape Verify operation under execution, either depress the **CLR** key or operate the mode selector switch.
3. Set the VOL. and TONE controls of the cassette tape recorder to the MAX. position.

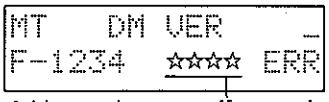
When one of these messages appears on the LCD, the Tape Verify operation is disabled.

1. Message indicating a file No. mismatch error (i.e., the set file No. does not agree with that recorded on the tape)



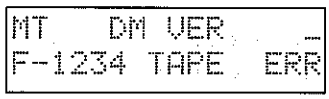
Set file No. File No. recorded on the tape

2. Message indicating a verify error

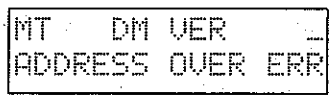


Address where a verify error has occurred

3. Message indicating a tape error (i.e., cassette tape or cassette tape recorder is defective)



4. Message indicating an address over error (i.e., the data exceeds the memory capacity)



5. When the **CLR** key is depressed

3.37 Using Multisupport Base

Preparation for operation

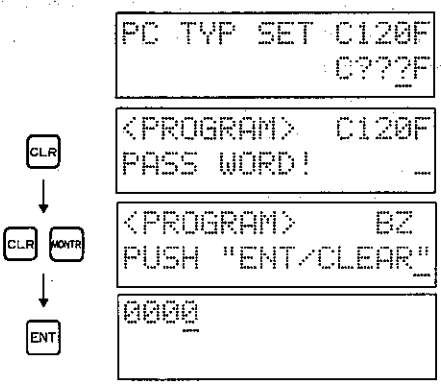
The following preparatory operations must be performed prior to the operations using the multisupport base.

1. When using multisupport base alone

(PC connecting switch on the multisupport base is OFF)

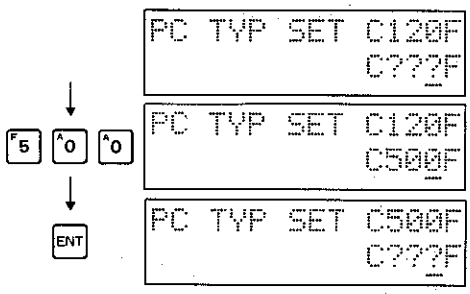
When type of the PC is not changed

● **Display**



When type of the PC is changed

● **Display**

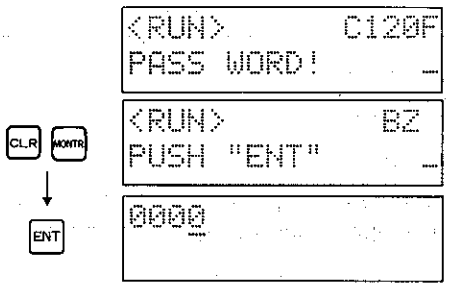


NOTE:

1. The multisupport base can operate independently of the PC only in the PROGRAM mode.
2. Three types of the flowchart programming-type SYSMAC-C series programmable controller are selectable: SYSMAC-C120F, SYSMAC-C250F, and SYSMAC-C500F.
3. After selecting the desired type of the SYSMAC-C series, set the PROGRAM mode and depress the **CLR** key twice followed by the **MONTR** key.

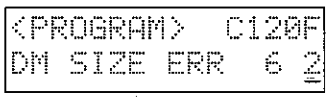
2. When using multisupport base with PC connected
(PC connecting switch is ON)

● **Display**



NOTE:

1. The operations (such as Monitor) of the multisupport base connected to the PC, the user program of the multisupport base, and that of the PC must be the same. Therefore, transfer the user program from the PC to the multisupport base before attempting to operate the multisupport base.
2. The password key sequence cannot be input to the multisupport base if its data memory capacity does not agree with that of the PC. If this is the case, turn off the PC connecting switch of the multisupport base to match the data memory capacities.



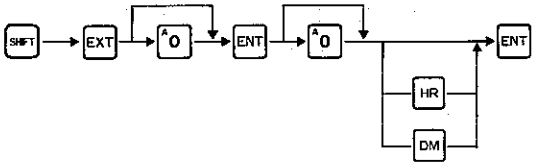
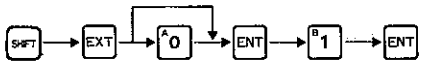
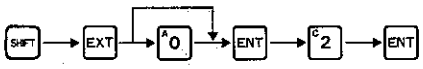
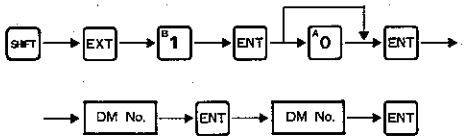
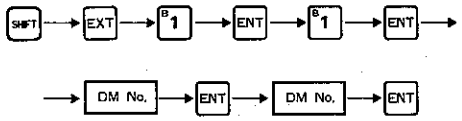
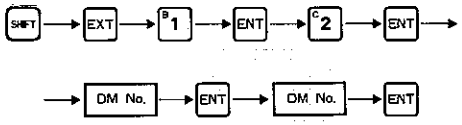
Multisupport base's DM capacity PC's DM capacity

List of operation examples

This shows multisupport base's operations which are the same as those of the SYSMAC-C series.

Name		RUN	MONITOR	DEBUG	PROGRAM	Independent
All program clear		×	×	×	×	○
Expansion DM capacity	Read	○	○	○	○	○
	Setting	×	×	×	○	○
Address setting		○	○	×	○	○
Program write		×	×	×	×	○
Program read		○	○	×	×	○
Program check		×	×	×	×	○
Instruction search		○	○	○	×	○
Instruction insert		×	×	×	×	○
Instruction delete		×	×	×	×	○
Multimotor		○	○	○	○	○
Channel monitor		○	○	○	○	○
Forced set/reset		×	○	○	○	×
Present value change		×	○	○	○	○
Channel write		×	○	○	○	○
Set value change for timer/counter		×	○	○	×	×
Error read/reset		○	○	○	○	×
Group monitor		○	○	○	×	×
Trace check		×	○	×	×	×
Address monitor		○	○	×	×	×
I/O table read		○	○	○	○	×
I/O table verify		○	○	○	○	×
I/O table generation		×	×	×	○	×
Start address setting		×	×	○	×	×
Stop address setting		×	×	○	×	×
1-step execution		×	×	○	×	×
RUN (program execution)		×	×	○	×	×
Forced YES branch		×	×	○	×	×
Forced NO branch		×	×	○	×	×
Tape write of user program		×	×	×	×	○
Tape read of user program		×	×	×	×	○
Tape verify of user program		×	×	×	×	○
Tape write of data memory		×	×	×	×	○
Tape read of data memory		×	×	×	×	○
Tape verify of data memory		×	×	×	×	○

Operations that multisupport base can perform independently

Name	RUN	MONITOR	DEBUG	PROGRAM	INDEPENDENT	Operating procedure
Program transfer (write)	×	×	×	○	×	
Program transfer (read)	○	○	○	○	×	
Program transfer (verify)	○	○	○	○	×	
Data memory transfer (write)	×	○	○	○	×	
Data memory transfer (read)	○	○	○	○	×	
Data memory transfer (verify)	○	○	○	○	×	

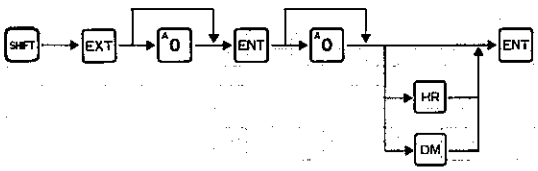
NOTE:

1. The RUN, MONITOR, DEBUG, or PROGRAM mode can be set when the multisupport base is connected to the SYSMAC-C series, that is, when the PC connecting switch of the multisupport base is turned on.
2. The heading "Independent" indicates that the multisupport base is disconnected from the SYSMAC-C series, that is, when the PC connecting switch is turned off.
3. The operations of the multisupport base when it is connected to the SYSMAC-C series can be performed provided that its user program is the same as that of the SYSMAC-C series.

3.38 Program Transfer (WRITE) Operation

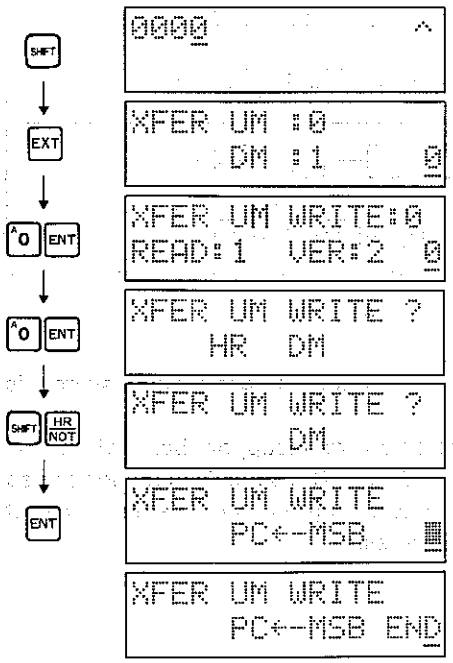
This operation is used to transfer the contents of the user memory of the multisupport base to that of the SYSMAC-C series.
This operation can be performed when the PC connecting switch is turned on.

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
×	×	×	○

● **Display**



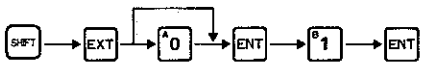
NOTE:

1. When the **HR** and **DM** keys are depressed, the states of the holding relays (HR) and the contents of data memories (DM) are retained.
   Unless these keys are depressed, the holding relay states and data memory contents will be cleared.
2. The user program is transferred from the start address to the end address. To stop the Program Transfer (Write) operation under execution, depress the **CLR** key.

3.39 Program Transfer (READ) Operation

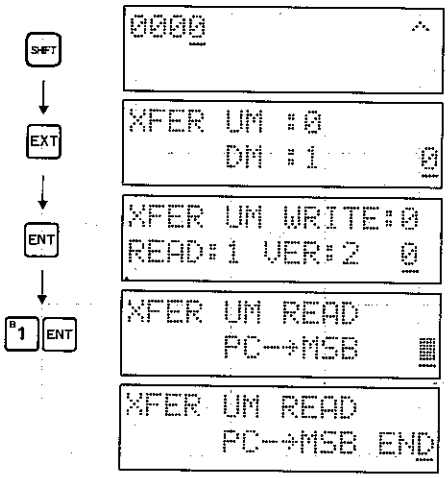
This operation is used to transfer the contents of the user memory of the PC to the user memory of the multisupport base.

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
○	○	○	○

● **Display**

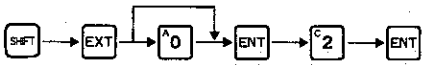


NOTE:
The program is transferred from the start address to the end address. To stop the Program Transfer (Read) operation under execution, depress the **CLR** key.

3.40 Program Transfer (VERIFY) Operation

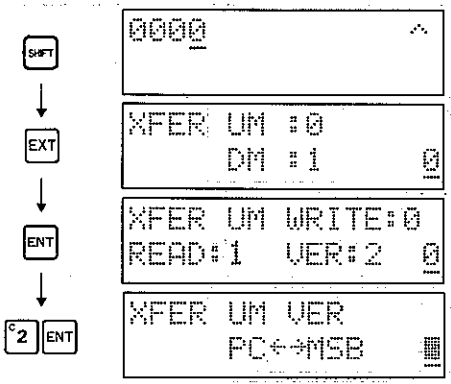
This operation is used to verify the user program of the multisupport base against that of the SYSMAC-C series. This operation can be performed when the PC connecting switch is turned on.

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
○	○	○	○

● **Display**



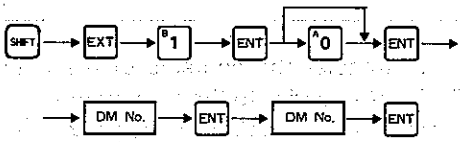
When a discrepancy exists

NOTE:
The program is verified from the start address to the end address. To stop the Program Verify operation under execution, depress the **CLR** key.

3.41 Data Memory Transfer (WRITE) Operation

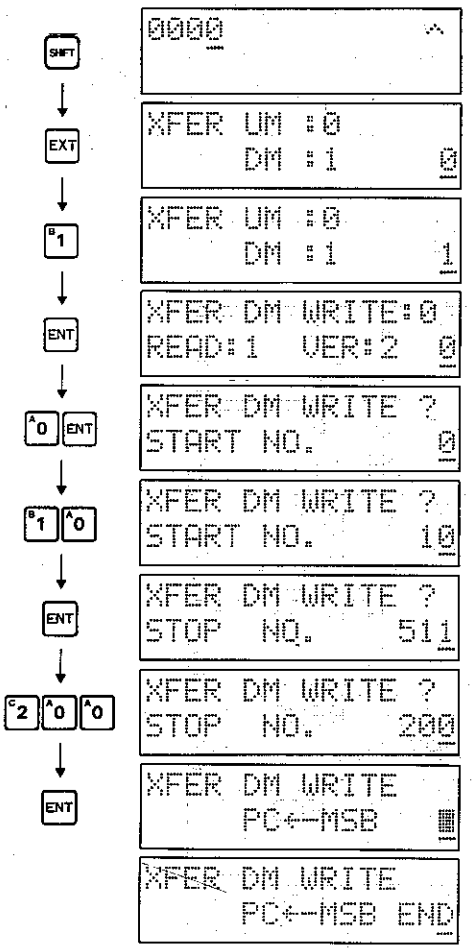
This operation is used to transfer the contents of the data memory (DM) of the multisupport base to the data memory of the SYSMAC-C series. This operation can be performed when the PC connecting switch is turned on.

Operating procedure



RUN	MONITOR	DEBUG	PROGRAM
×	○	○	○

● **Display**



← Present maximum DM capacity

NOTE:

1. The contents in a specified address range of data memory of the multisupport base are transferred to the specified address range of the PC's data memory. To stop the Data Memory Transfer (Write) operation under execution, depress the **CLR** key.
2. When addresses in the expansion data memory area of the multisupport base are specified with the ROM employed for the data memory area of the PC, Data Memory Transfer (Write) operation to both the standard and expansion data memory areas of the PC is not performed.

3.42 Data Memory Transfer (READ) Operation

This operation is to transfer the contents of the data memory of the SYSMAC-C series to the data memory of the multisupport base. This operation can be performed when the PC connecting switch is turned on.

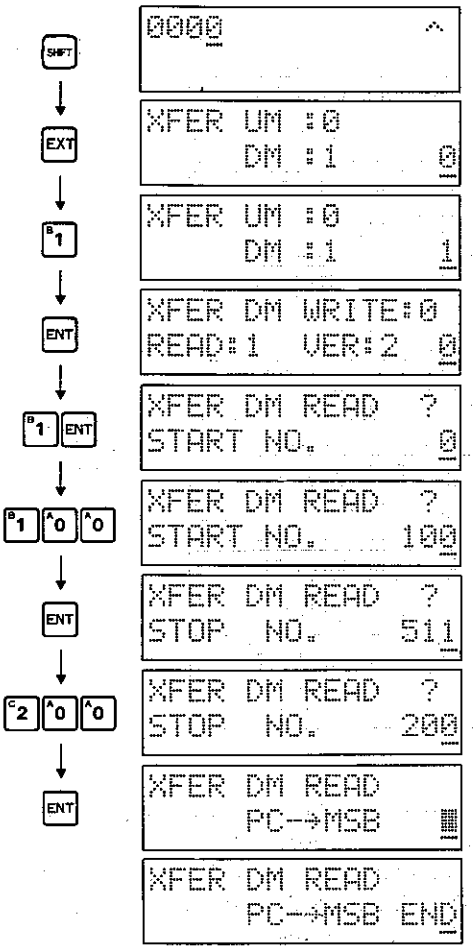
Operating procedure

SHIFT → EXT → B 1 → ENT → B 1 → ENT →

→ DM No. → ENT → DM No. → ENT

RUN	MONITOR	DEBUG	PROGRAM
○	○	○	○

● **Display**



NOTE:
The contents of the data memory of the PC are transferred up to the end address. To stop the Data Memory Transfer (Read) operation under execution, depress the **CLR** key.

3.43 Data Memory Transfer (VERIFY) Operation

This operation is used to verify the contents of the data memory of the multisupport base against those of the data memory of the SYSMAC-C series. This operation can be performed when the PC connecting switch is turned on.

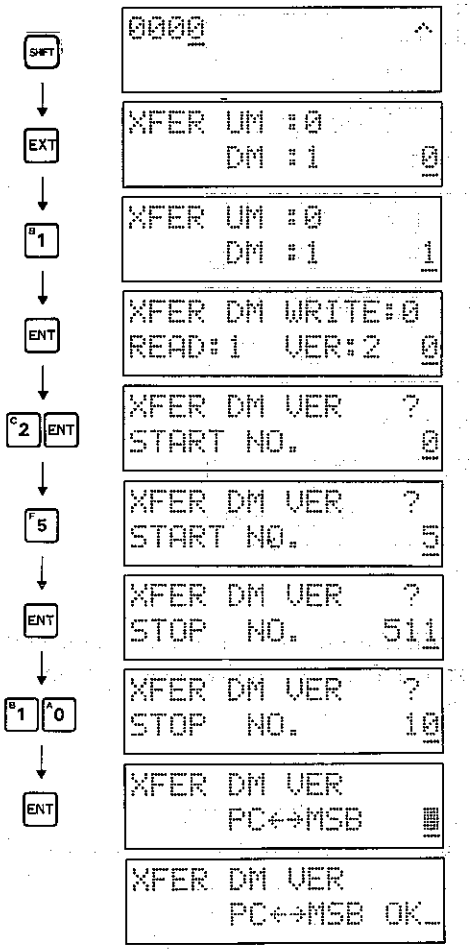
Operating procedure

SHIFT → EXT → B 1 → ENT → C 2 → ENT →

→ DM No. → ENT → DM No. → ENT

RUN	MONITOR	DEBUG	PROGRAM
○	○	○	○

● **Display**



When a discrepancy exists

NOTE:
The contents of the data memory are verified up to the end address. To stop the Data Memory Transfer (Verify) operation under execution, depress the **CLR** key.

Chapter 4
List of Error Messages

Error message	Remedy
☆☆☆☆JMP ERR	The destination of a JMP instruction exists in another group program or subroutine than that specified.
☆☆☆☆IL-ILC ERR	The IL and ILC instructions are not used in pairs. Check them and correct the program.
MEMORY ERR	• An error exists in the user program. Check whether the RAM or ROM is mounted to the PC. • An incorrect instruction (<????>) exists in the user program. Correct the program. Perform the Error Reset operation (see Section 3.19) each time the corrective action has been taken.
I/O BUS ERR **	A failure occurs in the bus line between the CPU and I/O unit. Check the bus line. Check the I/O units and expansion I/O rack for disconnection before power application.
I/O SET ERR	The registered I/O table does not agree with the state of the I/O unit mounted to the PC. The possible causes of this disagreement are disagreement of input points with output points, incorrect use of the remote I/O expansion rack, duplicate use of the optical I/O transmitting unit, etc. Check these causes by performing I/O Table Verify operation (see Section 3.24) and properly set the I/O unit. Then perform the I/O Table Change operation (see Section 3.25).
I/O UNIT OVER	The number of I/O points or of remote I/O points of the registered I/O table exceeds the limit. Check the number of points by performing the I/O Table Read operation (see Section 3.23) and properly set the I/O unit. Then perform the I/O Table Change operation (see Section 3.25).
BATT LOW	• Check whether the battery is correctly inserted in the socket. • The battery has been fully discharged. Replace with a new one.
I/O VER ERR	The registered I/O table does not agree with the states of the I/O units. Some I/O units probably were connected to the PC after the registeration. Check the connection by performing the I/O Table Verify operation (see Section 3.24). Then perform the I/O Table Change operation (see Section 3.25).
RMTE I/O ERR **	A failure occurs in the transmission line between the remote I/O unit and the PC. Check the transmission line. Check whether the slave station of the remote I/O expansion rack is normal.
< > MODE SET ERR	The RUN or MONITOR mode is selected with the PC connecting switch of the multisupport base turned off. Properly set the mode and the switch.
< > CPU WAITG	The RUN operation is not performed probably because the start switch is turned OFF or no power is applied to the remote I/O expansion rack. Determine the cause and take proper corrective action.
I/O TBL WRITE ERR	The I/O Table Change operation cannot be performed. A possible cause is connection of too many remote I/O units, duplicate use of optical transmitting I/O units, absence of remote I/O unit, or an excessive number of I/O points. Check the state of the I/O units.

CHAPTER 4 List of Error Messages

Error message	Remedy
☆☆☆☆MEMORY ERR	An undefined code exists in the user memory.
☆☆☆☆SYNTAX1 ERR	Too many operands of an instruction are used.
☆☆☆☆SYNTAX2 ERR	Check whether instructions such as AND, OR, TIM, CNT, DIFU, DIFD, SBT, WAIT, and CJP are correctly used.
☆☆☆☆DIF DUPL	The same relay No. is used in duplicate for the DIFU or DIFD instruction.
☆☆☆☆LBL DUPL	The same labels are used in duplicate.
☆☆☆☆LBL UNDEFD	The instruction corresponding to the label No. used does not exist in the program.
☆☆☆☆GN DUPL	The same GN instructions are used more than once.
☆☆☆☆GN UNDEFD	The GN instruction corresponding to a group No. specified for the GS, GE, GP, GR, GOFF, or GC instruction does not exist in the program.
☆☆☆☆SBN DUPL	The same SBN instructions are used in duplicate.
☆☆☆☆SBN UNDEFD	The SBN instruction corresponding to the subroutine specified by the SBS and SBT instructions does not exist in the program.
☆☆☆☆SBN-RET ERR	The SBN and RET instructions are not used in pairs.
☆☆☆☆T/C DUPL	The same timer or counter Nos. are used in duplicate in the TIM or CNT instruction.
SYS FAIL FALS☆☆	The FALS instruction is executed.
XFER DISABLED	The connection between the multisupport base and the PC is abnormal. Check the cable and transmission line for connection.
XFER DATA ERR	The DM No. of the operand exceeds the set value.
DM SIZE OVER	An error occurs in the data transferred between the multisupport base and the PC. Repeat the Data Transfer operation.

Chapter 5
Maintenance and Handling

5.1 Specifications

Ambient temperature	Operating: 0°C to 45°C
Humidity	Operating: 35 to 85% RH (without condensation)
Supply voltage	DC 5V, 260mA max. Supplied from the PC or multisupport base.
Dimensions	96 (W)×192 (H)×30 (D) mm (Horizontal type: 192 (W)×96 (H)×30 (D) mm)
Weight	400g max.

5.2 Maintenance and Handling

The programming console calls for no special inspection or adjustment. However, the following points require your attention in using it.

- Do not apply excessive shock to the programming console, especially to its key pads during hand-held operation.
- In hand-held or desk-top operation of the programming console using the programming console adapter or programming console base unit, do not stretch or twist the cable.

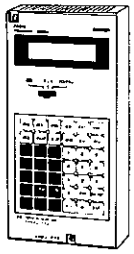
Appendix

How to Place Order

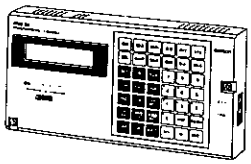
① Programming console	Programming console (vertical type)	For SYSMAC-C500F/C250F
	Programming console (horizontal type)	For SYSMAC-C120F

+

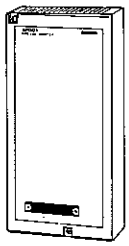
② Peripheral device	Programming console adapter	For hand-held operation of the programming console
	Programming console base unit	
	Programming console connecting cable	
	Cassette tape recorder	When using the programming console with cassette tape recorder
	Cassette tape recorder connecting cable	



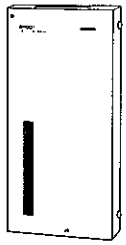
Programming console (vertical type)



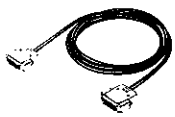
Programming console (horizontal type)



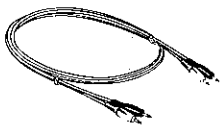
Programming console adapter



Programming console base unit



Programming console connecting cable



Cassette tape recorder connecting cable

Cassette tape recorder

Available types

Symbol	Name	Specifications		Type	Weight	Remarks
①	Programming console	Vertical type for SYSMAC-C500F/C250F		3G2A5-PRO19E	400g max.	Also used for SYSMAC-C120F
		Horizontal type for SYSMAC-C120F		3G2A6-PRO20E	400g max.	Also used for SYSMAC-C500F/C250F
②	Peripheral device	For expansion of programming console	Programming console adapter	3G2A5-AP001	400g max.	
			Programming console base unit	3G2A5-BP001	400g max.	
			Programming console connecting cable	3G2A2-CN221	350g max.	
		Cassette tape recorder	Cassette tape recorder	—	—	Commercially available
			Cassette tape recorder connecting cable	SCYPOR-PLG01	50g max.	