

**OMRON
USER'S
MANUAL**

**Programmable
Controller**

Model
SYSMAC-**CRT10**

INTRODUCTION

The OMRON SYSMAC-CRT10 Graphic Programming Console is an optional equipment intended for use with the Model SYSMAC-M1R/-M5R Programmable Controller and serves as a convenient device for programming and simulation (or debugging) through graphic display.

This console incorporates a cassette tape adapter for use in program dumping onto cassette tape, and a PROM writer for writing of debugged programs into EPROM chips. In addition, the console has an RS-232C interface connector to permit the connection of a printer for hard-copy output of programmed data.

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1. Features

- **Quick visible pattern generation is possible.**

The console automatically displays N.O. contacts which account for 70% of all ladder diagram symbols used in sequence circuits. Each ladder diagram symbol can be produced quickly on a screen by merely programming a number, and the cursor automatically moves to the next character position for programming.
- **User program generation is possible.**

If the same circuit or a fixed circuit pattern is to be used repeatedly in ladder diagram programming, such a circuit can be programmed in advance and stored in the memory as a standard circuit. The stored standard circuits can be called any time from the user program memory and used for programming. This helps reduce programming time significantly.
- **Labeling function is incorporated.**

Each relay number can be expressed by a system label number which is entered into the memory in 4-digit alphanumeric code, thus facilitating the identification of I/O during monitoring.
- **Hard copy output is possible with printer.**

The data stored in the CRT program memory can be output on printer in the form of a ladder diagram, listing, etc., thus saving a great deal of time and labor for drawing circuit diagrams.
- **Programs can be recorded on cassette tape.**

By connection of the exclusive interface cords, programs in the CRT program memory can be dumped onto a commercially available cassette tape.
- **PROM writer function is incorporated.**

With the built-in PROM writer, debugged programs can be written into an EPROM chip.

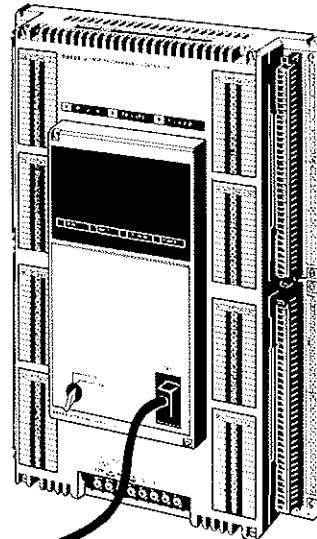
2. System Configuration and Specifications

2.1 Available Types

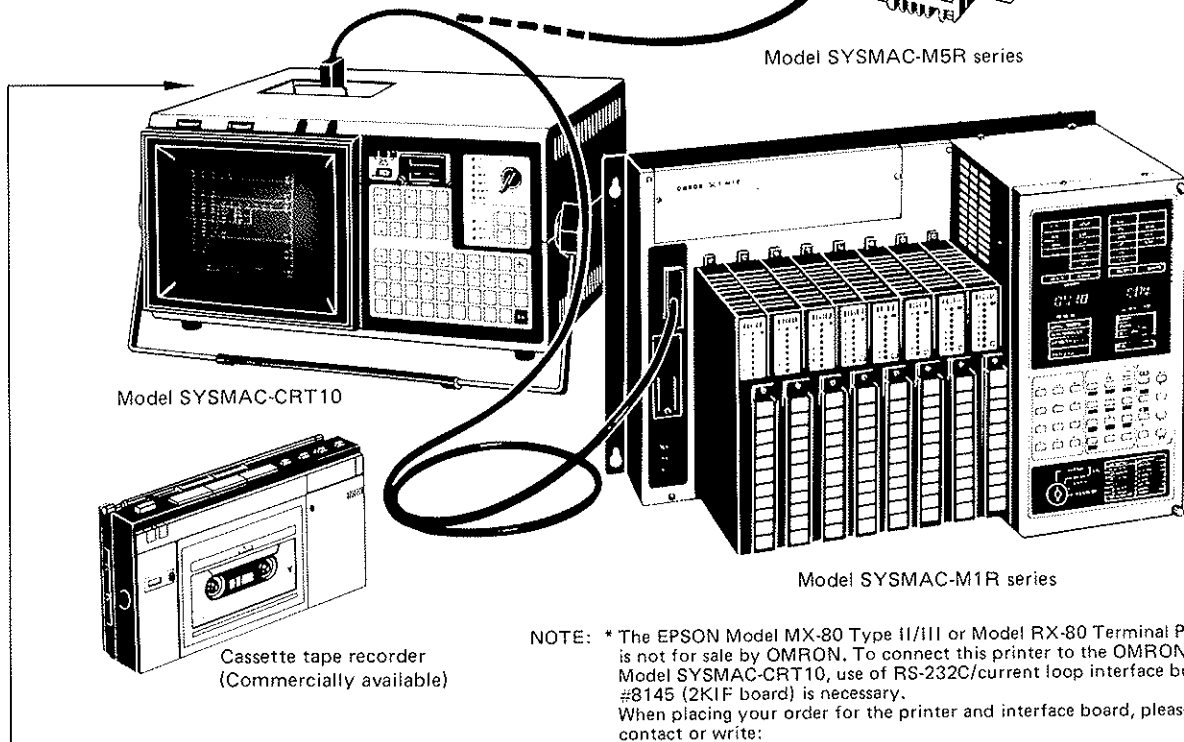
The available types of the Model SCY-CRT10 Graphic Programming Console and its accessories are as shown in the following table.

As peripheral equipment, a commercially available cassette tape recorder or a printer may be connected to the Model SCY-CRT10.

Classification	Specification	Type
Graphic programming console (CRT)	Supply voltage: AC 110/120V	SCY-CRT10-81E
	Supply voltage: AC 220/240V	SCY-CRT10-82E
SCY-M1R/M6R interface cable	Cable length: 2m	SCY-CN200
RS-232C interface cable	Cable length: 2m	SCY-CN201
Cassette interface cable	—	SCY-PLG01
EPROM chip	1K words/chip	ROM-F
Battery	Lithium battery	SCYP0R-BAT01



Model SYSMAC-M5R series

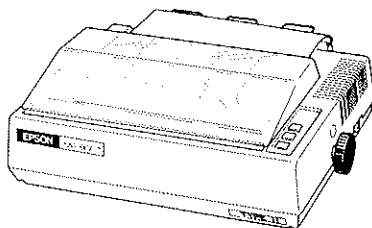


Model SYSMAC-CRT10

Model SYSMAC-M1R series

Cassette tape recorder
(Commercially available)

Connect the printer RS-232C interface connector.



EPSON Terminal Printer*
(Model MX-80 TYPE II/III
or Model RX-80)

NOTE: * The EPSON Model MX-80 Type II/III or Model RX-80 Terminal Printer is not for sale by OMRON. To connect this printer to the OMRON Model SYSMAC-CRT10, use of RS-232C/current loop interface board #8145 (2K1F board) is necessary. When placing your order for the printer and interface board, please contact or write:

EPSON AMERICA, INC.
3415 Kashiwa Street
Torrance, CA 90505 U.S.A.
Phone: (213) 539-9140
Telex: 182412

EPSON DEUTSCHLAND GmbH
Am Seestern 24
4000 Düsseldorf 11
F.R. Germany
Phone: (0211) 596-1001
Telex: 8584786

EPSON ELECTRONICS
TRADING LTD.
Room 411, Tsimshatsui Centre,
East Wing 6, Ching Yee Road
Tsimshatsui Kowloon, Hong Kong
Phone: 3-694343/4
3-7213427
3-7214331/3
Telex: 64714

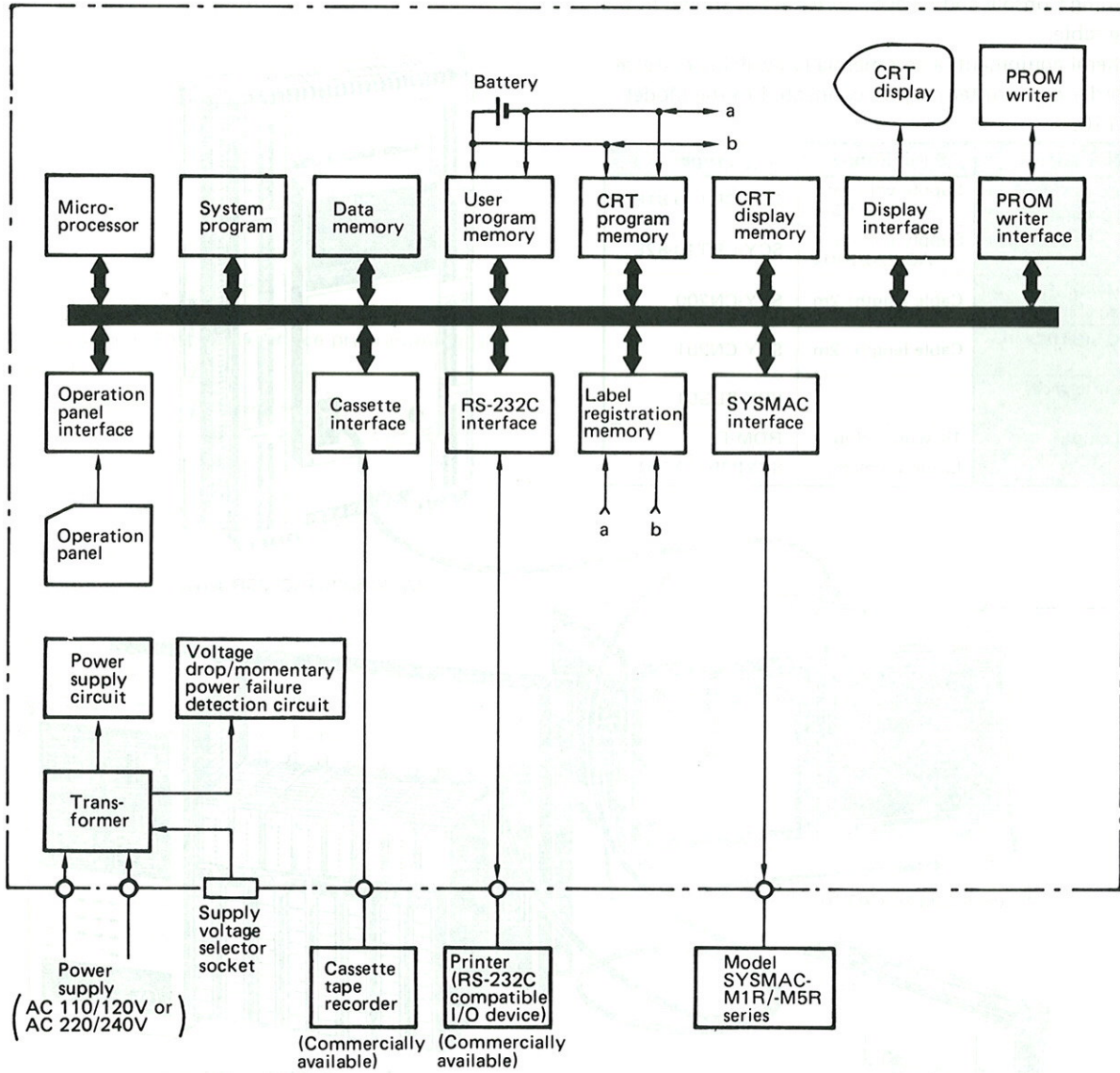
EPSON UK LTD
Dorland House
388 High Road,
Wembley, Middlesex, HA9 6UH, U.K.
Phone: (01) 900-0466/7/8/9
Telex: 8814169

EPSON ELECTRONICS
(SINGAPORE) PTE. LTD.
#09-13/#09-14, World Trade Centre,
No. 1 Maritime Square, Singapore 0409
Phone: 2786071/2

EPSON ELECTRONICS TRADING LTD.
TAIWAN BRANCH
1, 81F K.Y. Wealthy Bldg. 206, Nanking
E. Road, Sec. 2, Taipei, Taiwan, R.O.C.
Phone: 536-4339
536-3567

2.2 System Configuration

The system block diagram of the SCY-CRT10 is shown below.



2.3 Specifications

■ RATINGS

Supply voltage	Type SCY-CRT10-81E: AC 110/120V, 50/60Hz Type SCY-CRT10-82E: AC 220/240V, 50/60Hz
Operating voltage range	85 to 110% of rated voltage*
Power consumption	100VA max.
Insulation resistance	2M Ω min. at DC 500V (between external terminal and outer casing)
Dielectric strength	AC 1,500V, 50/60Hz for 1 minute (between external terminal and outer casing)
Noise immunity	1,000Vp-p Rise time: 1 nsec Pulse width: 2 μ sec
Vibration	16.7Hz, 3-mm double amplitude for 2 hrs.
Shock	10G's (in X, Y, Z directions, respectively 3 times)
Ambient temperature	Operating: 5 to +40°C Storage: 0 to +45°C
Humidity	30 to 90% RH (without condensation)
Atmosphere	Must be free from corrosive gases
Structure	Package type
Coating	Ivory white
Weight	13kg max.
Outside dimensions	480(W) x 210(H) x 460(D) mm

NOTE: * A momentary power failure of less than 1/2 cycle is ignored by the microprocessor in the console. If a momentary power failure of 1/2 to 1 cycle occurs, the power failure condition may or may not be detected by the microprocessor since it is in an unstable area. If a momentary power failure of more than 1 cycle occurs, the microprocessor detects the power failure.

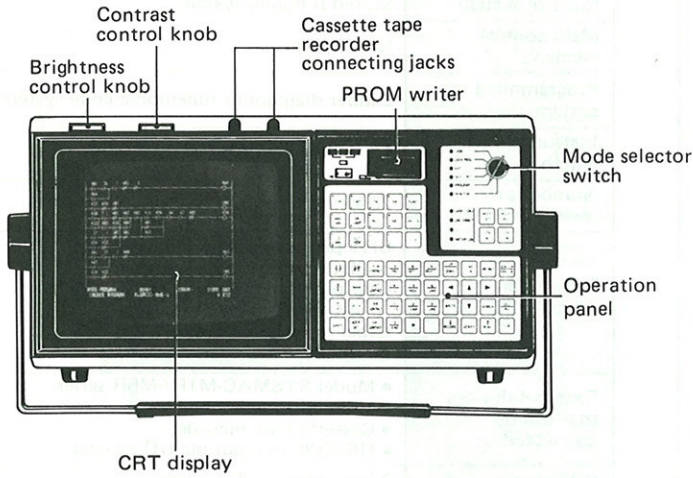
■ CHARACTERISTICS

Control system	Stored program system
Main control element	NMOS, TTL
Programming system	Ladder diagram or mnemonic code system
Instruction word length	1 word or 2 words (16 bits/word)
Number of instructions	26 kinds
Programming capacity	CRT program memory area (RAM)*: 4K words User program memory area (RAM)*: 4K words Label registration area (RAM)*: 768 items
External devices that can be connected	<ul style="list-style-type: none"> ● Model SYSMAC-M1R/-M5R series ● Video printer ● Cassette tape recorder ● RS-232C compatible I/O devices
CRT display	9-inch monitor TV, green
Screen memory	12 x 2K bits
Circuit display on screen	(Horizontal) 11 contacts + 1 coil = 12 (Vertical) 11 lines for circuit (ladder diagram) generation area 2 lines for status display area
Display method	TV scanning system
Display character	Alphabetic characters (A ~ Z): 26 Numeric characters (0 ~ 9): 10 Special symbols: 27 kinds Relay contact symbols: 20 kinds
Brightness control	High and Low brightness
Cursor	Blinking
Operation panel	Flat keyboard: 59 keys
Operational confirmation	Valid key input: Buzzer sounds one time. Invalid key input: Buzzer sounds 3 times.

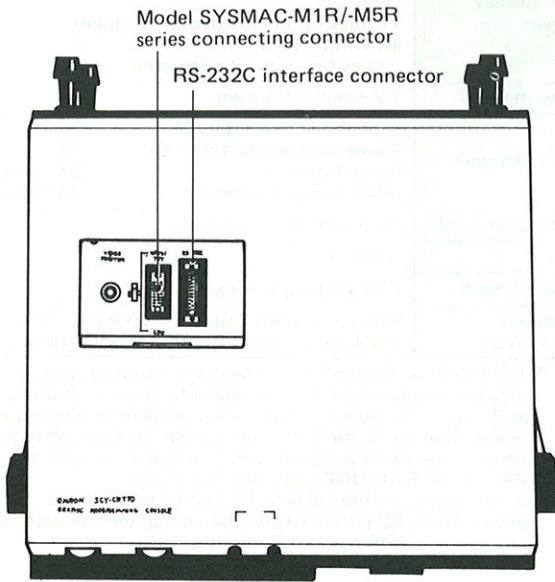
NOTE: * The RAMs are backed up for memory retention with a lithium battery which has a service life of about 2 years at 25°C. If the battery is used at an ambient temperature higher than 25°C, the life of the battery will be shortened. Be sure to replace the battery within one week after the BATTERY FAILURE indicator illuminates. Before replacing the battery, be sure to turn off the power of the SCY-CRT10 and then complete the battery replacement within about 3 minutes.

2.4 Names of Respective Parts

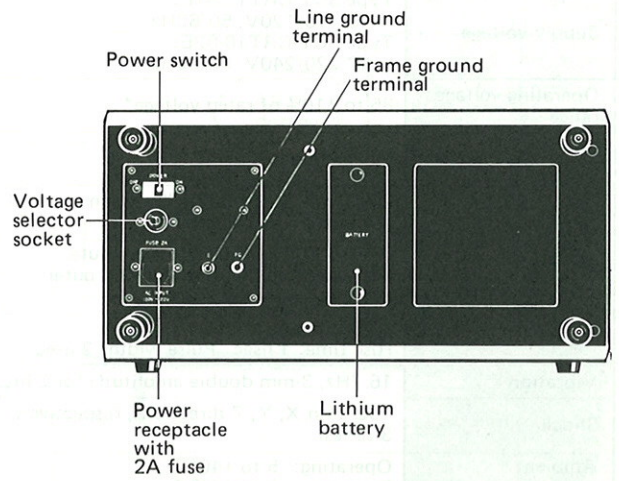
● Front view



● Top view

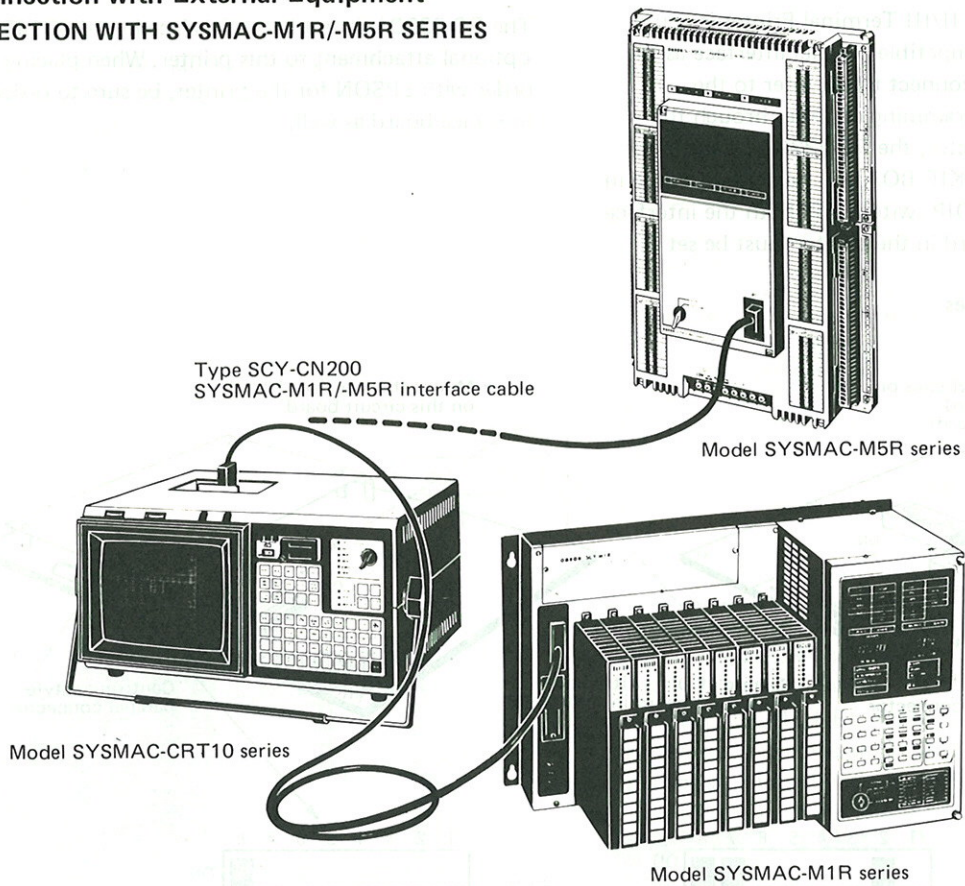


● Rear view

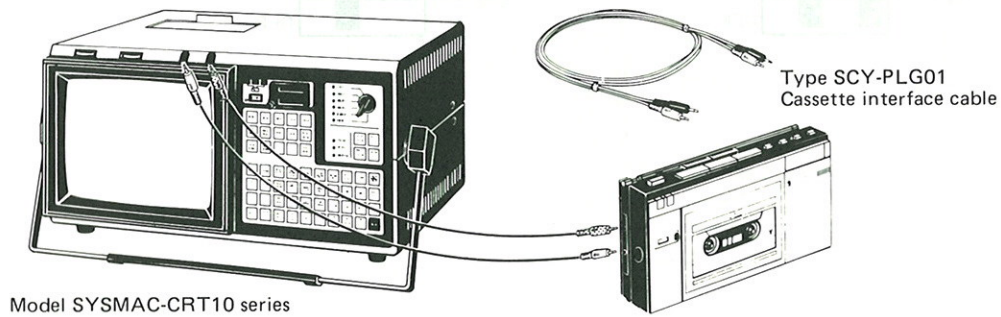


2.5 Connection with External Equipment

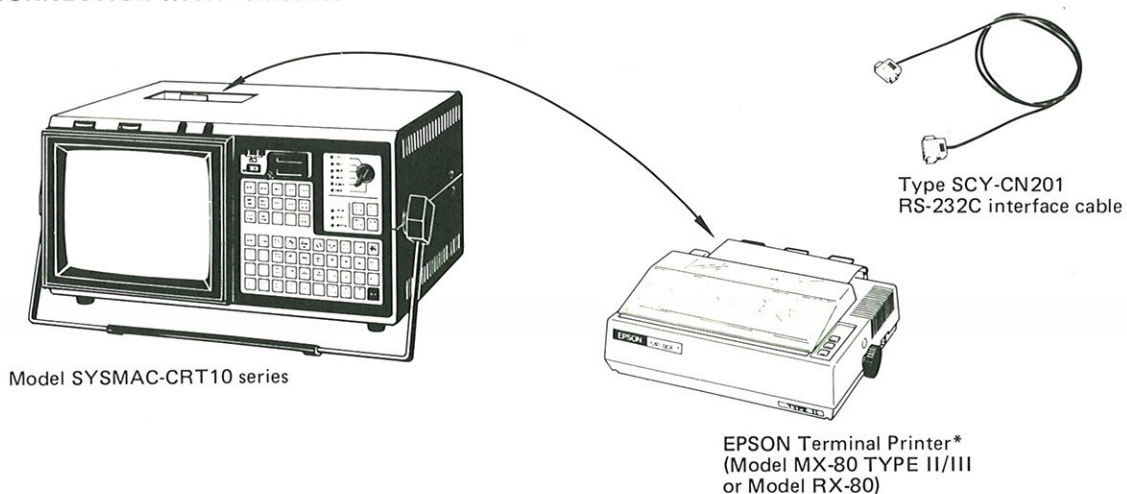
■ CONNECTION WITH SYSMAC-M1R/-M5R SERIES



■ CONNECTION WITH CASSETTE TAPE RECORDER



■ CONNECTION WITH PRINTER

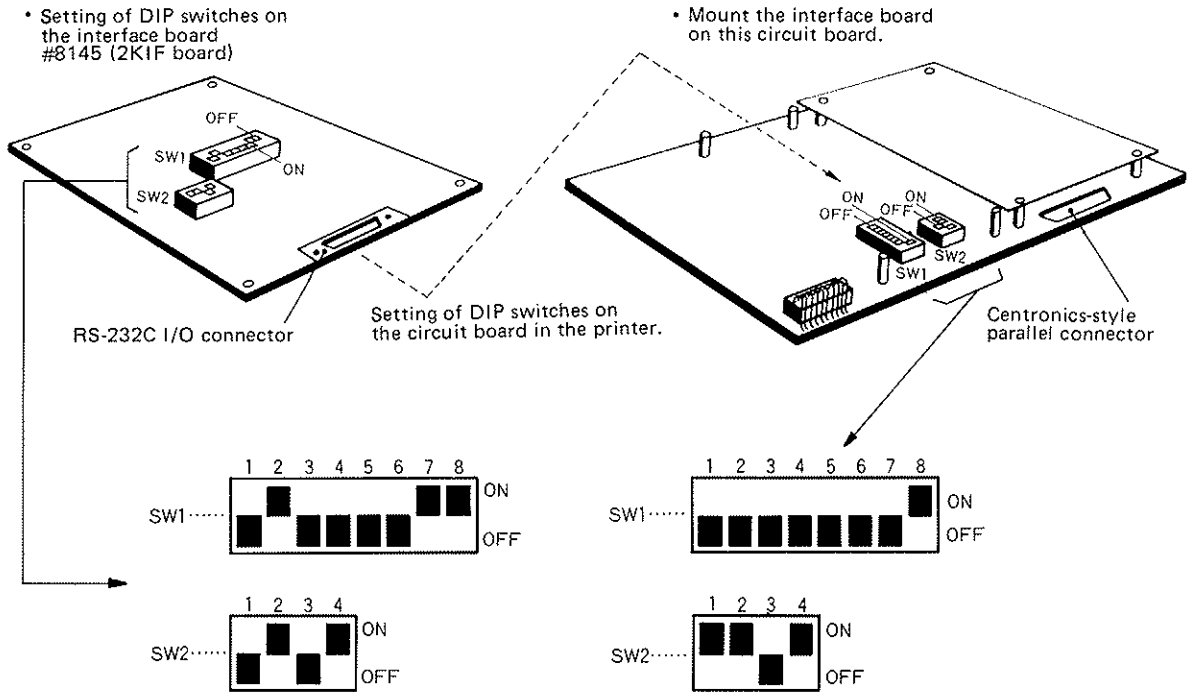


■ PRINTER SPECIFICATIONS

The EPSON MX-80 Type II/III Terminal Printer is equipped with a Centronics-compatible parallel interface as the standard equipment. To connect this printer to the SCY-CRT10 graphic programming console through the RS-232C interface connector, the RS-232C/current loop interface board #8145 (2K1F BOARD) must be installed in the printer and then the DIP switches on both the interface board and the circuit board in the printer must be set as shown below.

● How to set DIP switches

The RS-232C/current loop interface board #8145 is an optional attachment to this printer. When placing your order with EPSON for the printer, be sure to order this interface board as well.

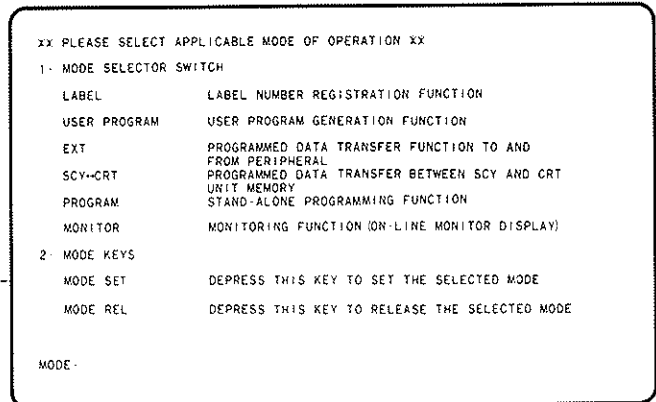


3. Operating Procedure

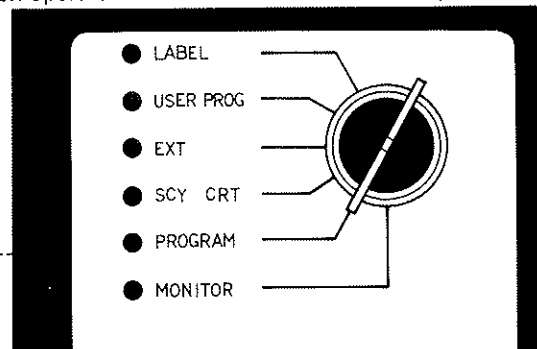
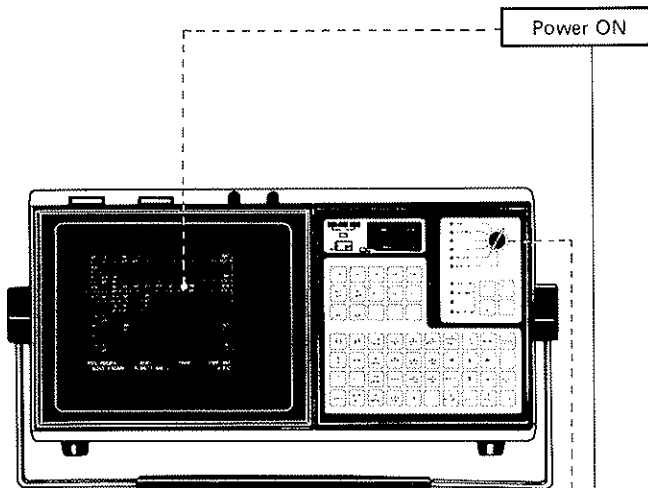
3.1 Mode Selection and Selectable Functions

The Model SCY-CRT10 allows selection of 6 different modes of operation, and each mode is provided with abundance of functions.

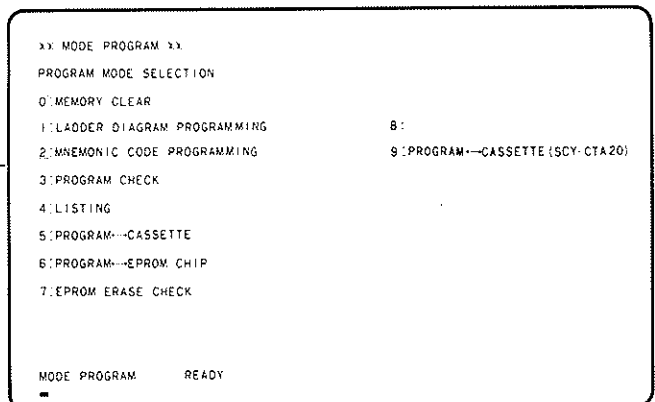
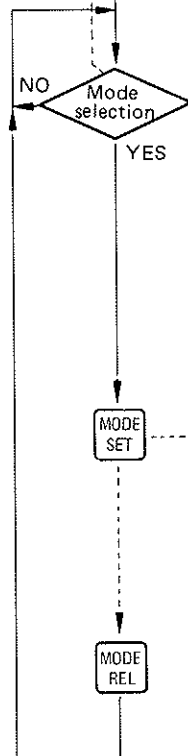
■ MODE SELECTION



When the power switch is turned on, and the above screen will appear on the CRT screen as shown above. In the above messages, MODE SET means the mode selection, and MODE REL means the mode release. In other words, the messages indicate that you must select the appropriate mode by the Mode Selector Switch and then operate either of the two Mode Set keys.



The SCY-CRT10 has 6 modes of operations as shown above.



(Ex.) The above display screen shows the functions in Program mode. Namely, the Program mode is provided with 8 kinds of functions.

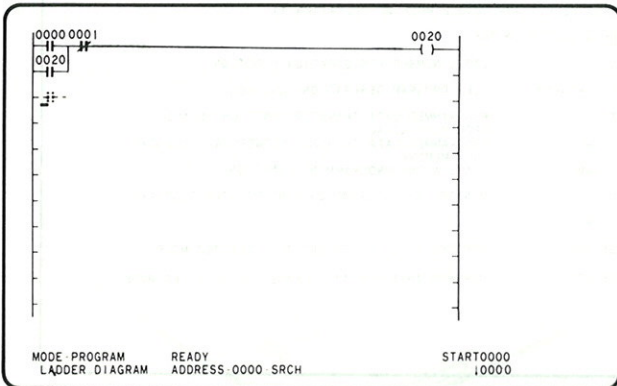
■ **MODE FUNCTIONS**

1. PROGRAM

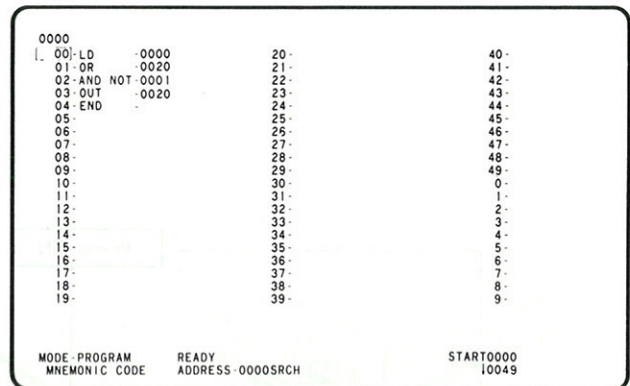
This mode is for program generation.

Two methods of program generation are available; one is programming by a ladder diagram, and the other is programming in mnemonic language (ANDXXXX).

Ladder diagram programming



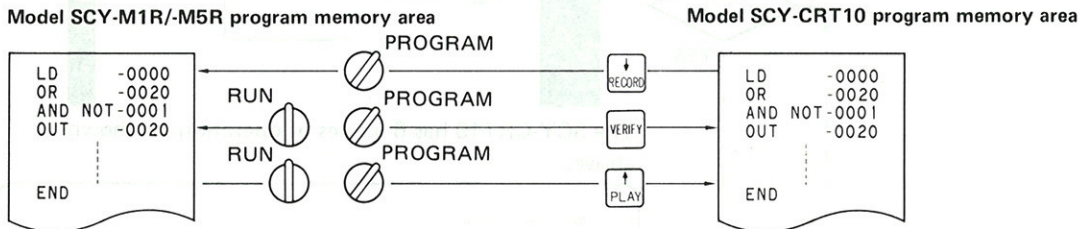
Mnemonic code programming



- A user program (standard circuit) can be read from the user program memory and then inserted into the program being written.
- The listed outputs and relay contacts can be displayed on the CRT screen.
- Programs stored in the CRT program memory areas can be dumped onto cassette tape or copied into an EPROM chip.

2. SCY ↔ CRT TRANSFER

This mode allows program transfer between the SCY-M1R/-M5R program memory area and the SCY-CRT10 program memory area.



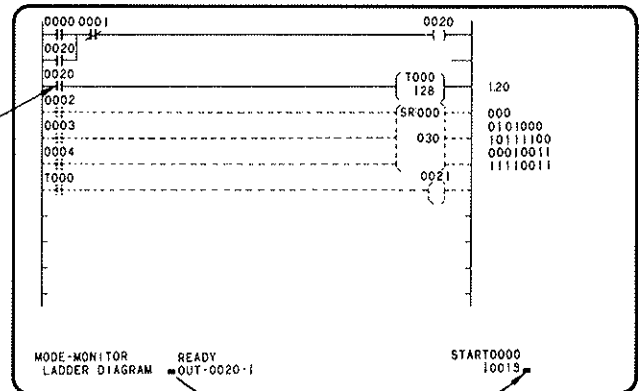
- Transfers the contents of the CRT program memory to the SCY-M1R/-M5R program memory area.
- Verifies the contents of the CRT program memory against the contents of SCY-M1R/-M5R program memory area.
- Transfers the contents of the SCY-M1R/-M5R program memory area to the CRT program memory area.

3. MONITOR

This mode allows monitoring of the operating state of a CRT program memory area.

- Ladder diagram monitoring, multiple output monitoring and mnemonic code monitoring can be executed.
- In the ladder diagram monitor operation, the relay numbers entered into the memory by the system label numbers can be monitored.
- By moving the cursor to the Forced ON/OFF position, output instructions such as TIM, CNT, KR and SR are forced to set or reset.

If the established condition is satisfied, the relay contact in the ladder diagram is displayed in high brightness on the CRT screen.



Forced ON/OFF position of cursor

4. EXT

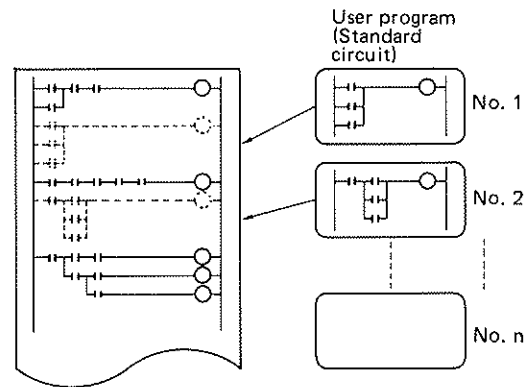
This mode allows data transfer between the SCY-CRT10 and an external RS-232C compatible device such as printer.

- By connecting a printer to the graphic programming console, a ladder diagram can be printed out. The ladder diagram can be printed out with the system label names in place of relay numbers.

5. USER PROGRAM

This mode allows the generation of a user program. In ladder diagram programming, if the same circuit or a fixed circuit pattern is to be used repeatedly, such a circuit can be programmed in advance into the memory area as a user program (standard circuit) with a registration number assigned to it. When programming a sequence circuit by the ladder diagram programming method in the PROGRAM mode, any of the user program (standard circuits) stored in the user program memory area can be called by entering the assigned registration number and inserted into the program being written.

- The user program memory area has a capacity of 2K words and registration numbers (U. No.) 000 ~ 999 can be used. One circuit pattern is limited to (11 + 1) x 11 lines per screen.



6. LABEL

This mode allows relay numbers (000 ~ 1377) to be changed to system label numbers (PB01, LF01). System label numbers corresponding to relay numbers must be entered into memory beforehand in 4-digit alphanumeric code.

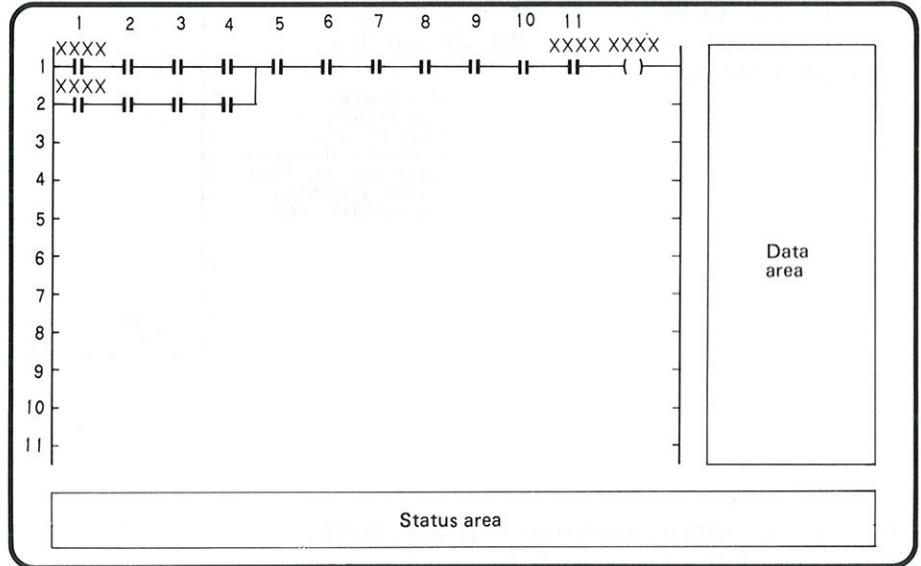
- When a ladder diagram is to be output on printer in the EXT mode during the ladder diagram monitor operation, relay numbers will be expressed by system label numbers.

3.2 Display Screen

The CRT screen of the SCY-CRT10 is divided into the following 3 areas.

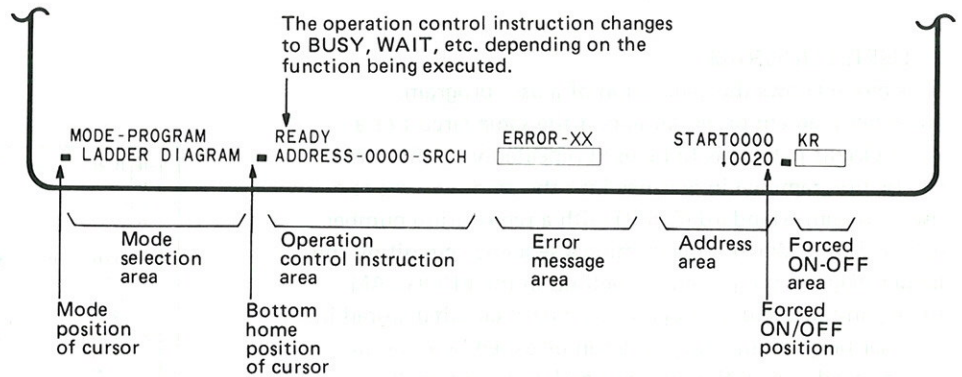
- Circuit generation area: An area to generate a sequence circuit (ladder diagram)
- Status area: This area is divided into 5 sectors as shown below, and provides the operation control instructions.
- Data area: This area shows the data value of timer, counter, and SR during monitor operation.

■ DISPLAY CONTENTS



- A ladder diagram is configured of (11 + 1) x 11 lines per screen.

■ STATUS AREA



- In the status area, 3 cursor positions are provided. From the left of the screen, they are Mode position, Bottom home position, and Forced ON/OFF position.
- The cursor should be at the Mode position when a mode is to be released.
- The cursor in the status area can be moved freely from left to right or vice versa by means of keys.
- When the cursor is in the circuit generation area, it can be moved down to the Bottom home position by means of key.

■ DATA AREA

The data area shows the operating state of each relay or data value when the TIM, CNT, SR, MOV, MOV.NOT, COM, ADD, or SUBTRACT instruction is monitored in the MONITOR mode.

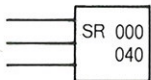
Monitored instruction word	Information Displayed on Screen		Remarks														
	Circuit area	Data area															
Timer (TIM)		XXX (present value of timer)															
		XXX - XXX (present value of timer) (set value of timer)															
Counter (CNT)		XXX (present value of counter)															
		XXX - XXX (present value of counter) (set value of counter)															
Shift register (SR)		X X 0 0 1 0 1 0 1 1 0 ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ Bit 7 Bit 6 Bit 5 Bit 4 Bit 3 Bit 2 Bit 1 Bit 0	0: each SR bit is OFF. 1: each SR bit is ON. See NOTE 1.														
MOVE (MOV)		XXX (present value of counter)	<table border="1"> <thead> <tr> <th>Upper row setting (contents of Data transferred)</th> <th>Display contents in data area</th> </tr> </thead> <tbody> <tr> <td>XXX</td> <td>XX</td> </tr> <tr> <td>KR XX</td> <td>XX</td> </tr> <tr> <td>T XXX</td> <td>XXX</td> </tr> <tr> <td>C XXX</td> <td>XXX</td> </tr> <tr> <td>SR XX</td> <td>XX</td> </tr> <tr> <td>(SR *XXX)</td> <td>(XX)</td> </tr> </tbody> </table>	Upper row setting (contents of Data transferred)	Display contents in data area	XXX	XX	KR XX	XX	T XXX	XXX	C XXX	XXX	SR XX	XX	(SR *XXX)	(XX)
Upper row setting (contents of Data transferred)	Display contents in data area																
XXX	XX																
KR XX	XX																
T XXX	XXX																
C XXX	XXX																
SR XX	XX																
(SR *XXX)	(XX)																
MOVE NOT (MOV.NOT)		XX (contents of relay number)															

NOTE 1:

The operating state of each shift register is displayed in max. 32 bits. (8 bits x 4 rows)

In case of shift registers with 32 or more bits, move the operating state display by keys to check the operating state of the shift register. (In this case, the cursor must be at the Forced ON/OFF position.)

(Ex.)







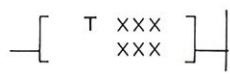

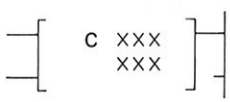




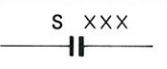
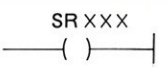
SR No.	Data area							
Channel \ Bit	7	6	5	4	3	2	1	0
00	0	1	0	1	0	1	0	1
01	1	0	1	0	1	0	1	0
02	0	0	0	1	1	1	0	0
03	1	1	1	0	0	0	1	1

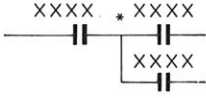



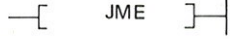

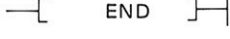
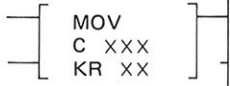
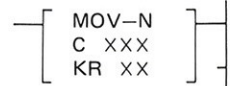

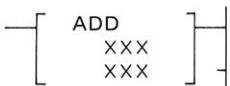
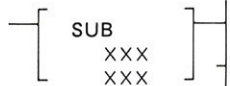
When key is depressed, data changes as shown on the left.

SR No.	Data area							
Channel \ Bit	7	6	5	4	3	2	1	0
01	1	0	1	0	1	0	1	0
02	0	0	0	1	1	1	0	0
03	1	1	1	0	0	0	1	1
04	0	0	0	0	1	1	1	1

Monitored instruction word	Information Displayed on Screen		Remarks										
	Circuit area	Data area											
COMPARE (CMP)		XX (Contents of shift register) XX (Contents of relay No.)	<table border="1"> <tr> <td>Upper row setting</td> <td>Display contents in data area</td> </tr> <tr> <td>XXX</td> <td>XX</td> </tr> <tr> <td>KR XX</td> <td>XX</td> </tr> <tr> <td>SR XX</td> <td>XX</td> </tr> <tr> <td>(SR XXX)</td> <td>(XX)</td> </tr> </table>	Upper row setting	Display contents in data area	XXX	XX	KR XX	XX	SR XX	XX	(SR XXX)	(XX)
Upper row setting	Display contents in data area												
XXX	XX												
KR XX	XX												
SR XX	XX												
(SR XXX)	(XX)												
ADD (+)		XX (Contents of constant) XX (Contents of latching relay)	<table border="1"> <tr> <td>Lower row setting</td> <td>Display contents in data area</td> </tr> <tr> <td>XXX</td> <td>XX</td> </tr> <tr> <td>KR XX</td> <td>XX</td> </tr> <tr> <td>SR XX</td> <td>XX</td> </tr> </table>	Lower row setting	Display contents in data area	XXX	XX	KR XX	XX	SR XX	XX		
Lower row setting	Display contents in data area												
XXX	XX												
KR XX	XX												
SR XX	XX												
SUBTRACT (-)		XX (Contents of relay No.) XX (Contents of shift register)	<table border="1"> <tr> <td>XXX</td> <td>XX</td> </tr> <tr> <td>KR XX</td> <td>XX</td> </tr> <tr> <td>SR XX</td> <td>XX</td> </tr> </table>	XXX	XX	KR XX	XX	SR XX	XX				
XXX	XX												
KR XX	XX												
SR XX	XX												

■ INSTRUCTION WORDS AND THEIR SYMBOLS DISPLAY

Instruction word	Symbol Displayed on Screen	Remarks
N.O. CONTACT (\overline{H} XXXX)		
N.C. CONTACT (\overline{H} XXXX)		
OUTPUT (OUT XXXX)		
OUTPUT NOT (OUT NOT XXXX)		
TIMER COIL (TIM XXX) XXX		
TIMER CONTACT (TIM contact XXX)		
COUNTER COIL (CNT XXX) XXX		
COUNTER CONTACT (CNT contact XXX)		
LATCHING RELAY COIL (KR XXX)		
LATCHING RELAY CONTACT (KR contact XXX)		
SHIFT REGISTER COIL (SR XX0) XX0		Unit: 8 bits
SHIFT REGISTER CONTACT (SR contact XXX)		
SHIFT REGISTER COIL (OUT SR XXX)		Unit: 1 bit

Instruction word	Symbol Displayed on Screen	Remarks
TEMPORARY MEMORY RELAY (TR X)		TR instruction will be inserted automatically.
INTERLOCK (IL)		
INTERLOCK CLEAR (ILC)		
JUMP (JMP)		
JUMP END (JME)		
DIAGNOSTIC (FAL XX)		
END (END)		
MOVE (MOV CNT XXX) KR XX		
MOVE NOT (MOV.NOT CNTXXX) KR XX		
COMPARE (CMP *XX) SRXX		
ADD (+XXX) XXX		
SUBTRACT (-XXX) XXX		

3.3 Basic Console Operations before Programming

The basic console operations required before programming are explained in this section.

Table 1

XX PLEASE SELECT APPLICABLE MODE OF OPERATION XX	
1- MODE SELECTOR SWITCH	
LABEL	LABEL NUMBER REGISTRATION FUNCTION
USER PROGRAM	USER PROGRAM GENERATION FUNCTION
EXT	PROGRAMMED DATA TRANSFER FUNCTION TO AND FROM PERIPHERAL
SCY-CRT	PROGRAMMED DATA TRANSFER BETWEEN SCY AND CRT UNIT MEMORY
PROGRAM	STAND-ALONE PROGRAMMING FUNCTION
MONITOR	MONITORING FUNCTION (ON-LINE MONITOR DISPLAY)
2- MODE KEYS	
MODE SET	DEPRESS THIS KEY TO SET THE SELECTED MODE
MODE REL	DEPRESS THIS KEY TO RELEASE THE SELECTED MODE
MODE-	

When the above messages appear on the CRT screen after the power switch is turned on, the SCY-CRT10 is ready for mode selection.

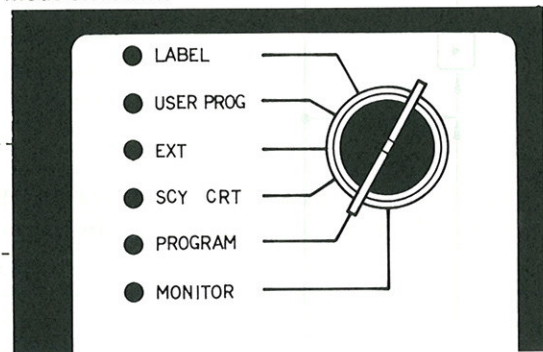



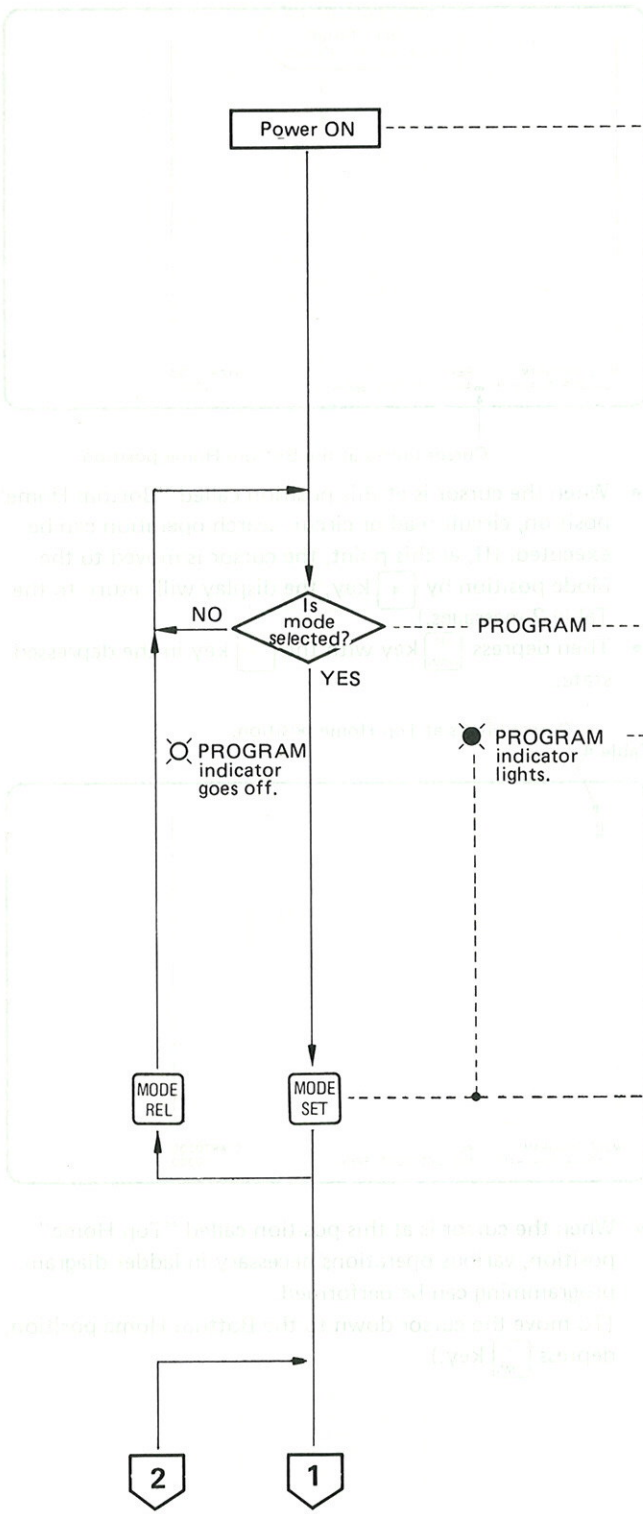
Table 2

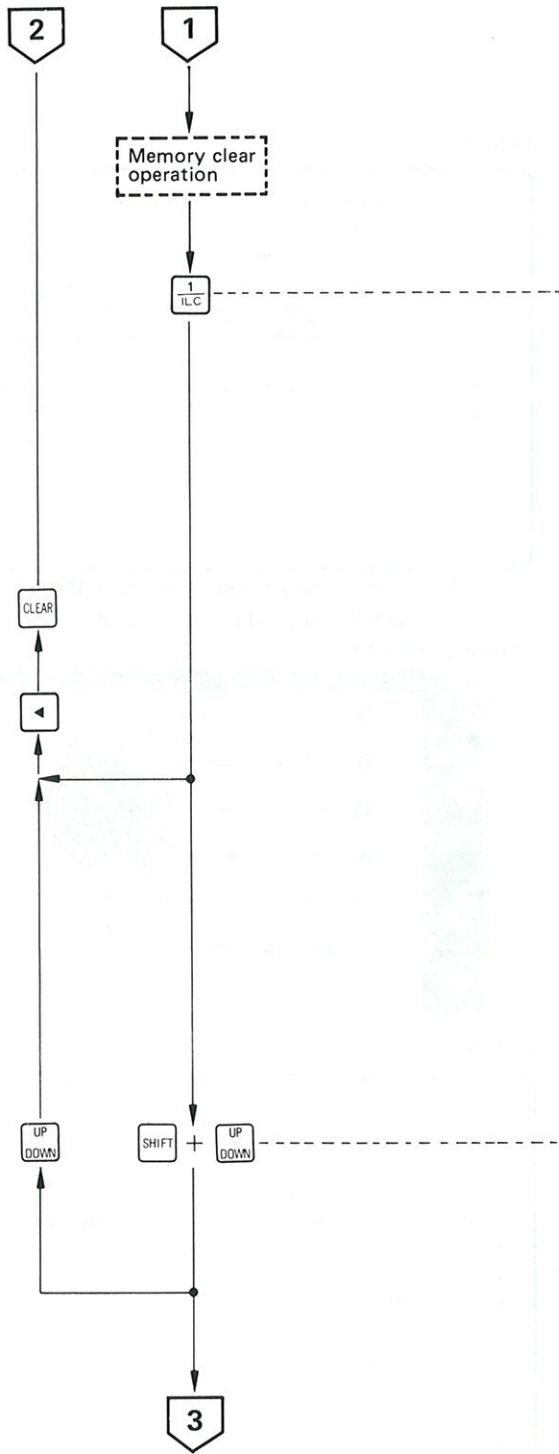
XX MODE-PROGRAM XX	
PROGRAM MODE SELECTION	
0: MEMORY CLEAR	
1: LADDER DIAGRAM PROGRAMMING	8:
2: MNEMONIC CODE PROGRAMMING	9: PROGRAM--CASSETTE (SCY-CTA 20)
3: PROGRAM CHECK	
4: LISTING	
5: PROGRAM--CASSETTE	
6: PROGRAM--EPROM CHIP	
7: EPROM ERASE CHECK	
MODE-PROGRAM READY	

Cursor blinks at the Mode position.

- When the cursor is at this position called "Mode" position, one of the functions 0 ~ 9 indicated in the above messages can be selected. If  (Mode Release) key is depressed at this point, the display will return to the Table 1 messages.

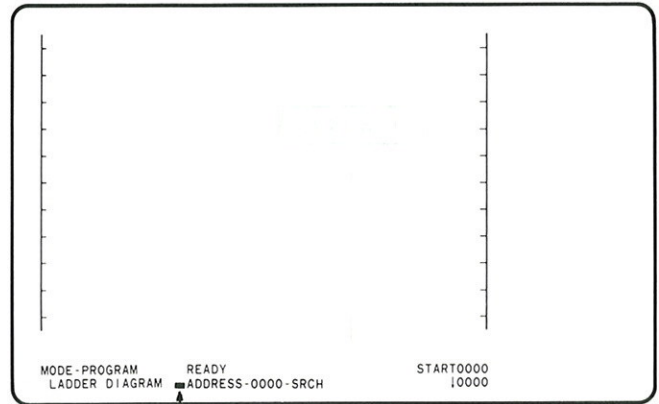
NOTE: * This function is available only for the version destined for the Japanese market.





- In this example, the ladder diagram programming function will be selected. Depress $\boxed{1}$ ILC key.

Table 3

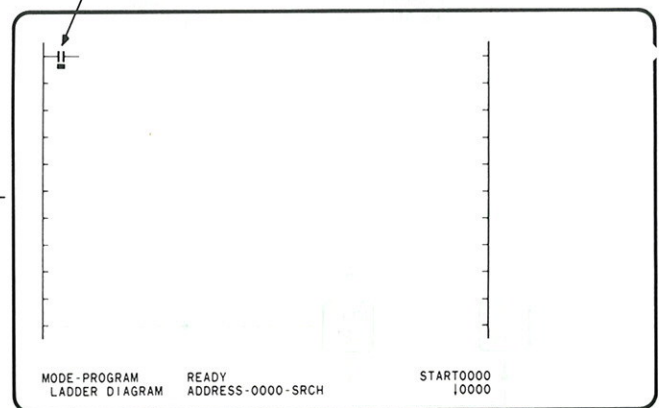


Cursor blinks at the Bottom Home position.

- When the cursor is at this position called "Bottom Home" position, circuit read or circuit search operation can be executed. (If, at this point, the cursor is moved to the Mode position by $\boxed{\leftarrow}$ key, the display will return to the Table 2 messages.)
- Then depress $\boxed{\text{UP/DOWN}}$ key with the $\boxed{\text{SHIFT}}$ key in the depressed state.

Cursor blinks at Top Home position.

Table 4



- When the cursor is at this position called "Top Home" position, various operations necessary in ladder diagram programming can be performed. (To move the cursor down to the Bottom Home position, depress $\boxed{\text{UP/DOWN}}$ key.)

NOTE: The cursor position is very important in executing various functions of the SCY-CRT10. So always pay attention to the position of this cursor.

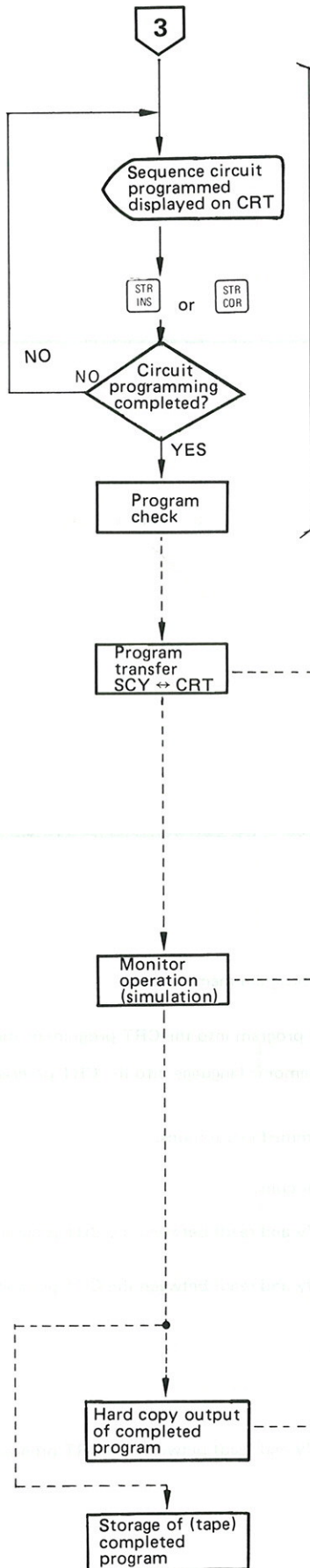
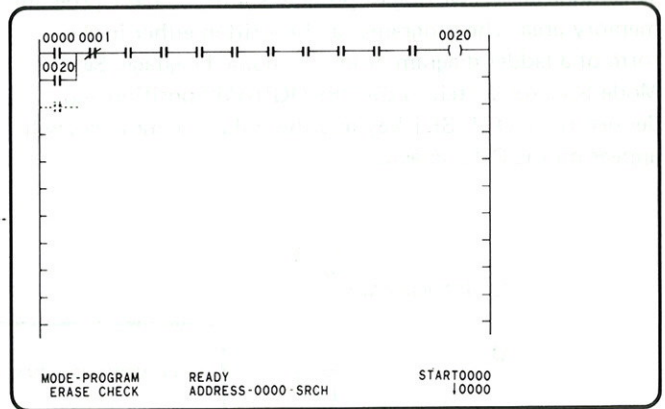


Table 5



- Be sure to perform the program check after the programming of a ladder diagram has been completed.

Table 6



- Be sure to perform the Data Verify operation after the transfer of a program to and from the SCY-CRT10.

Table 7

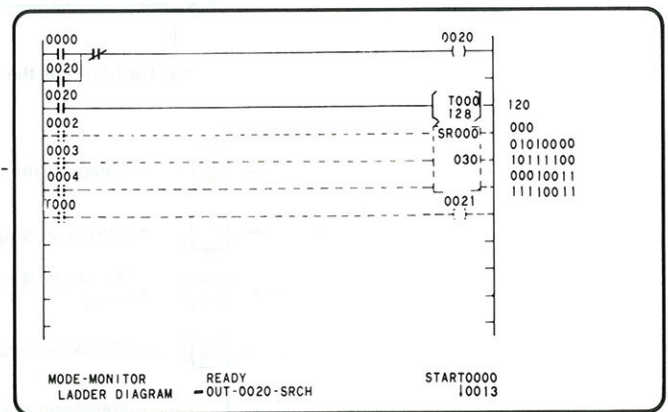
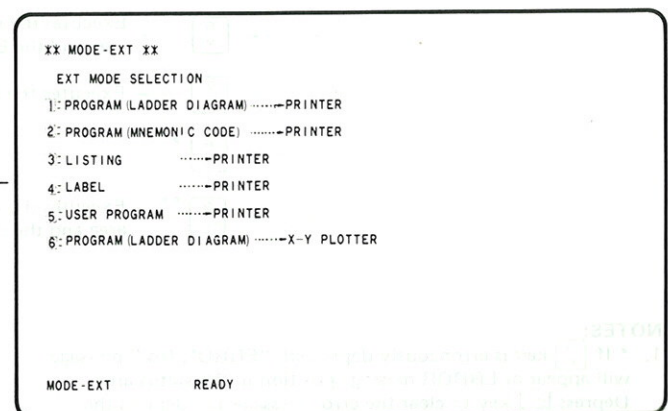
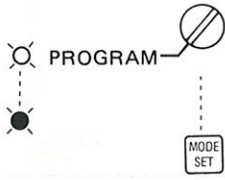


Table 8



3.4 Program

This mode allows writing of programs into the CRT program memory area. The programs can be written either in the form of a ladder diagram or in mnemonic language. Set the Mode Selector switch to the "PROGRAM" position and depress the MODE SET key and the following messages will appear on the CRT screen.



```

XX MODE-PROGRAM XX
PROGRAM MODE SELECTION
[0] MEMORY CLEAR
[1] LADDER DIAGRAM PROGRAMMING
[2] MNEMONIC CODE PROGRAMMING
[3] PROGRAM CHECK
[4] LISTING
[5] PROGRAM→CASSETTE
[6] PROGRAM→EPROM CHIP
[7] EPROM ERASE CHECK

MODE-PROGRAM     READY
    
```

Cursor blinks at the Mode position.

- [0] END → Clears all the contents of the CRT program memory area.
- [1] ILC → Allows writing of a ladder diagram program into the CRT program memory area.
- [2] CMP → Allows writing of a program in mnemonic language into the CRT program memory area.
- [3] JME → Checks a circuit containing programmed instructions.
- [4] IL → Generates a list of relay contacts or coils.
- [5] MOV → Executes data transfer (write, verify and read) between the CRT program memory area and cassette tape recorder.
- [6] JMP → Executes data transfer (write, verify and read) between the CRT program memory area and the EPROM.
- [7] FAL → Executes the EPROM erase check.
- [8] SET* → *
- [9] RESET** → Executes data transfer (write, verify and read) between the CRT program memory area and the SCY-CTA20.

NOTES:

1. * If [8] SET key is erroneously depressed, "ERROR No." message will appear at ERROR message position in the status area. Depress [8] SET key to clear the error message and depress the correct key again for program mode selection.
2. ** This function is available only for the version destined for the Japanese market.

 **MEMORY CLEAR**

In this operation, all the contents of the CRT program memory area are cleared.



MEMORY CLEAR?
YES → ADDRESS SET
NO → CLEAR

MODE-PROGRAM READY
MEMORY CLEAR 

Cursor blinks at the Bottom Home position.

ADDR
SET

MEMORY CLEAR?
YES → SHIFT + DEL
NO → CLEAR

MODE-PROGRAM READY
MEMORY CLEAR ADDRESS-0000

SHIFT + DEL
INS

Depress both keys
simultaneously.

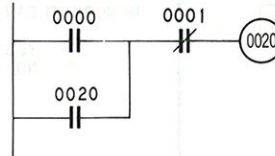
After the memory clear operation, the CRT display will return to the initial display in the PROGRAM mode.

1 ILC

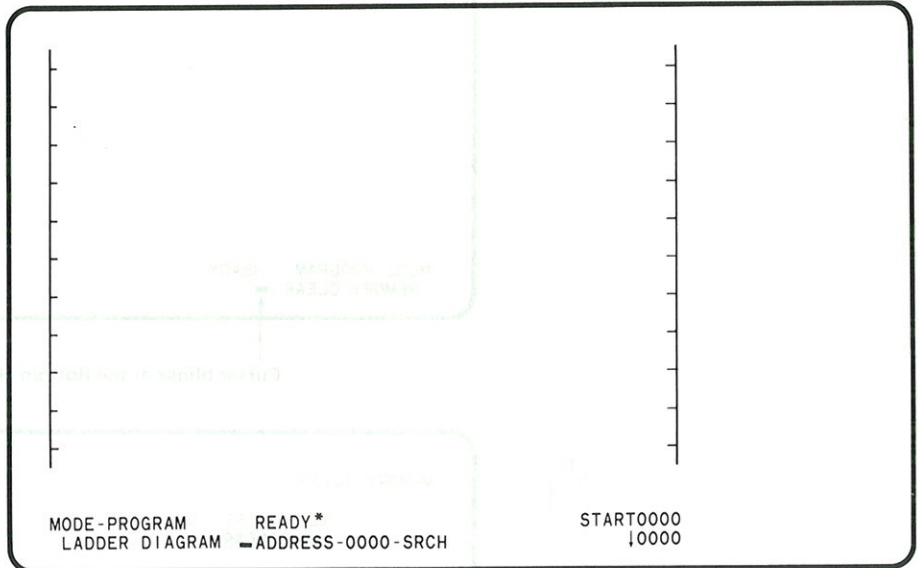
LADDER DIAGRAM PROGRAM

PROGRAM WRITE
(WRITING LADDER DIAGRAM PROGRAM INTO MEMORY)

The following circuit diagram will be programmed.

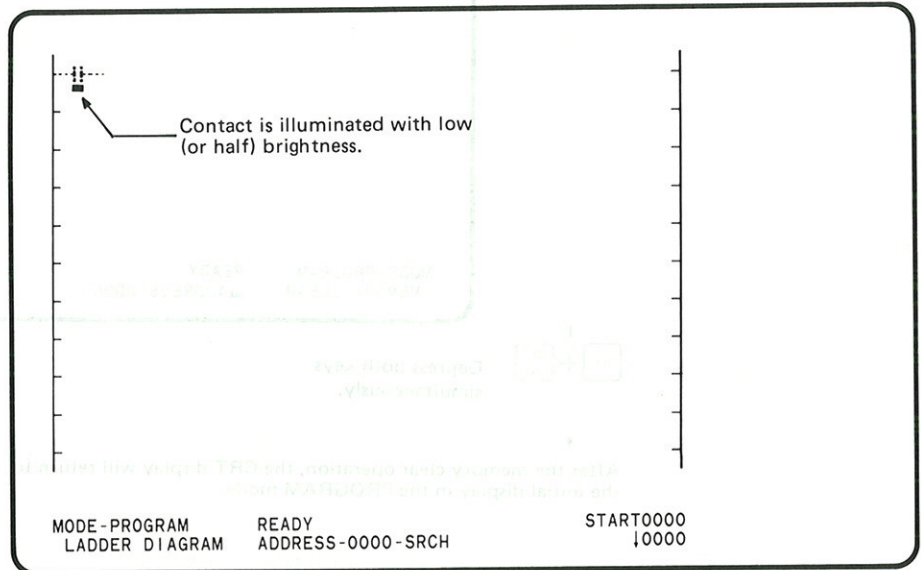


1 ILC



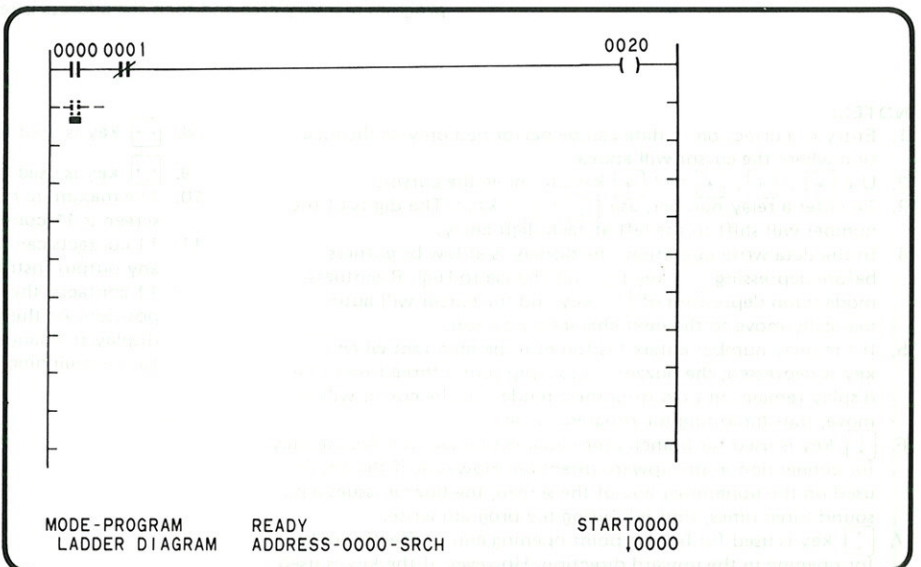
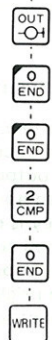
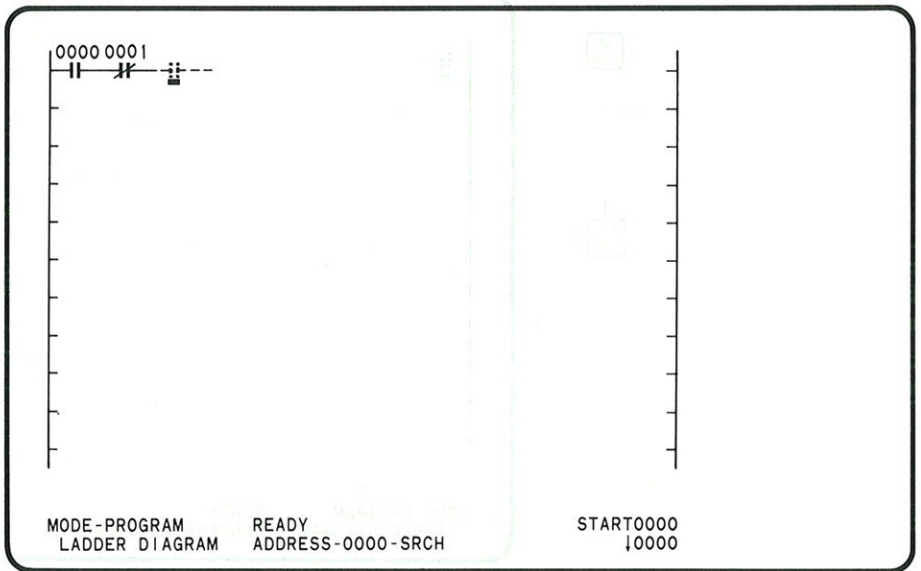
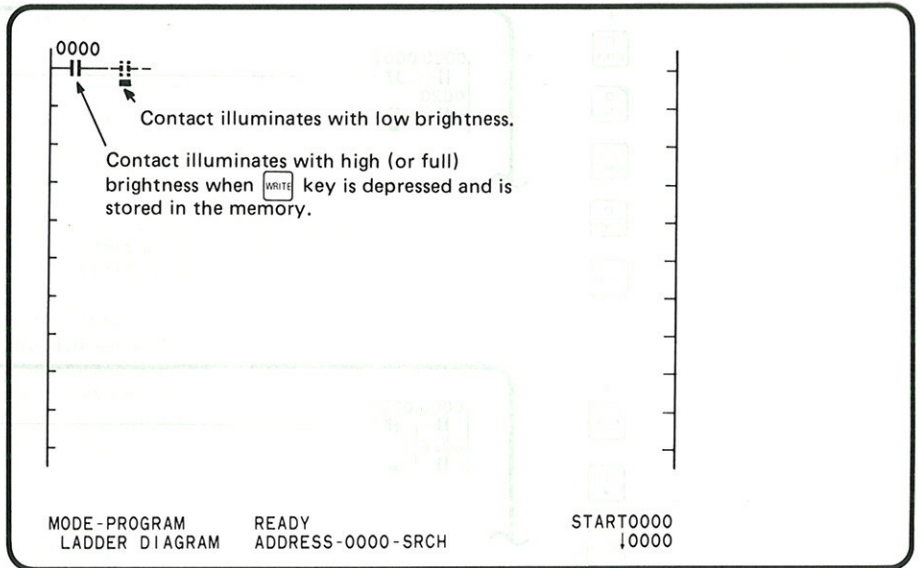
- In the absence of any stored program, only a bus bar will be displayed on the CRT screen. If any stored programs exist, the program for one circuit will be displayed on the CRT screen starting from address 000.

SHIFT UP DOWN

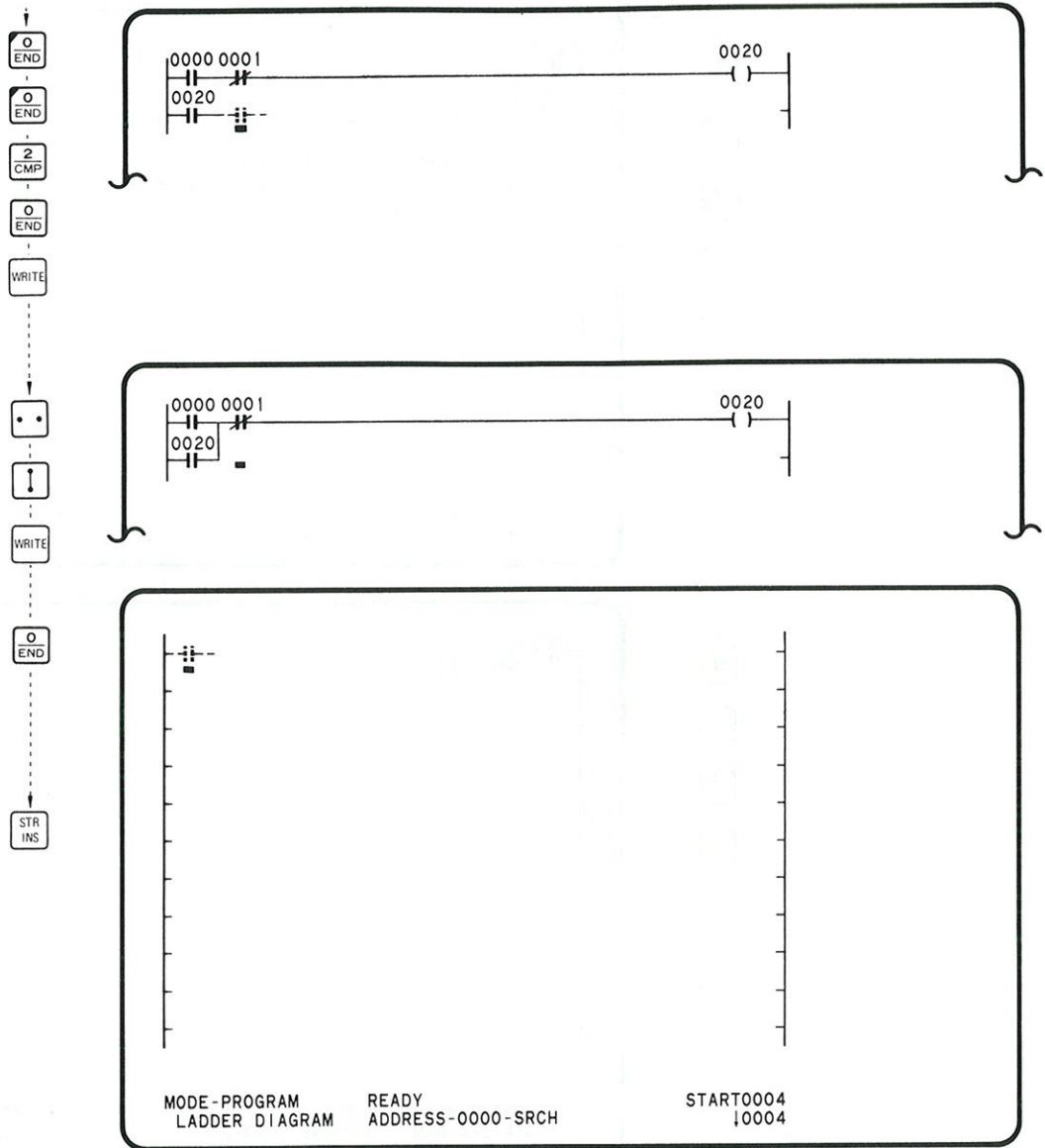


- Move the cursor to the program generation area.

NOTE: * The operation control instruction message changes to "READY" 4 to 5 seconds after the display of the initial message "WAIT".



- The cursor automatically moves to the right at each depression of the [WRITE] key.

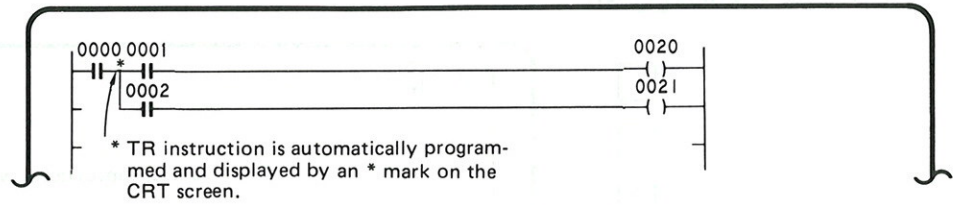


• Upon depression of key, the data shown on the CRT screen is transferred into the program memory area and then the address is renewed.

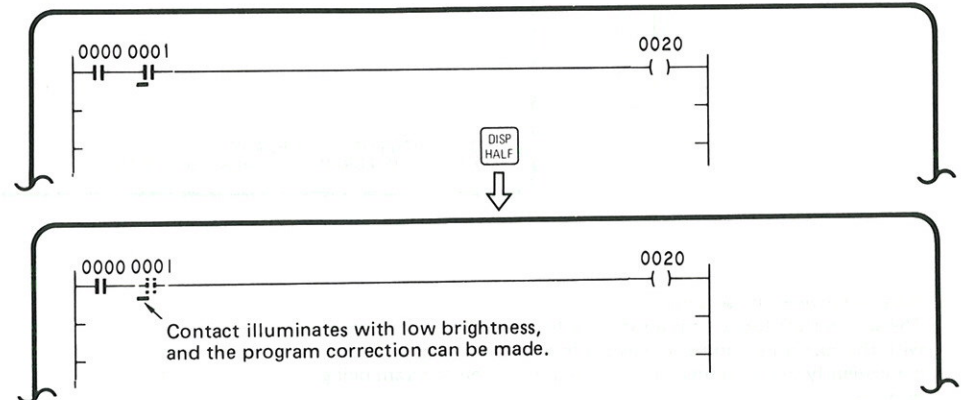
NOTES:

- Entry or correction of data can be performed only at the location where the cursor will appear.
- Use , , and keys to move the cursor.
- To enter a relay number, use ~ keys. The digits of the number will shift to the left at each digit entry.
- In the data write operation, the display is at low brightness before depressing key but will change to High Brightness mode upon depression of key and the cursor will automatically move to the next character position.
- If the relay number entered is found to be incorrect when key is depressed, the buzzer issues a pip sound three times, the display remains in Low Brightness mode and the cursor will not move, thus inhibiting the program write.
- key is used for branch point connection and is effective only for connection in the upward direction. However, if the key is used on the uppermost line of the screen, the buzzer issues a pip sound three times, thus inhibiting the program write.
- key is used for branch point opening and is effective only for opening in the upward direction. However, if the key is used on the uppermost line of the screen, the buzzer issues a pip sound three times, thus inhibiting the program write.
- key is used to short-circuit (or remove) a contact.
- key is used to open a line.
- The maximum number of circuits that can be written on a screen is 11 contacts + 1 output coil x 11 lines.
- 11 contacts can be written horizontally (per line). However, if any output instruction key is depressed before entering all the 11 contacts, the output coil automatically moves to the output position. At this position, depression of key causes the display to change to high brightness mode and the cursor moves to the beginning of the next row.

12. TR instruction will be automatically added when or key is depressed after writing or correcting a program for one screen.

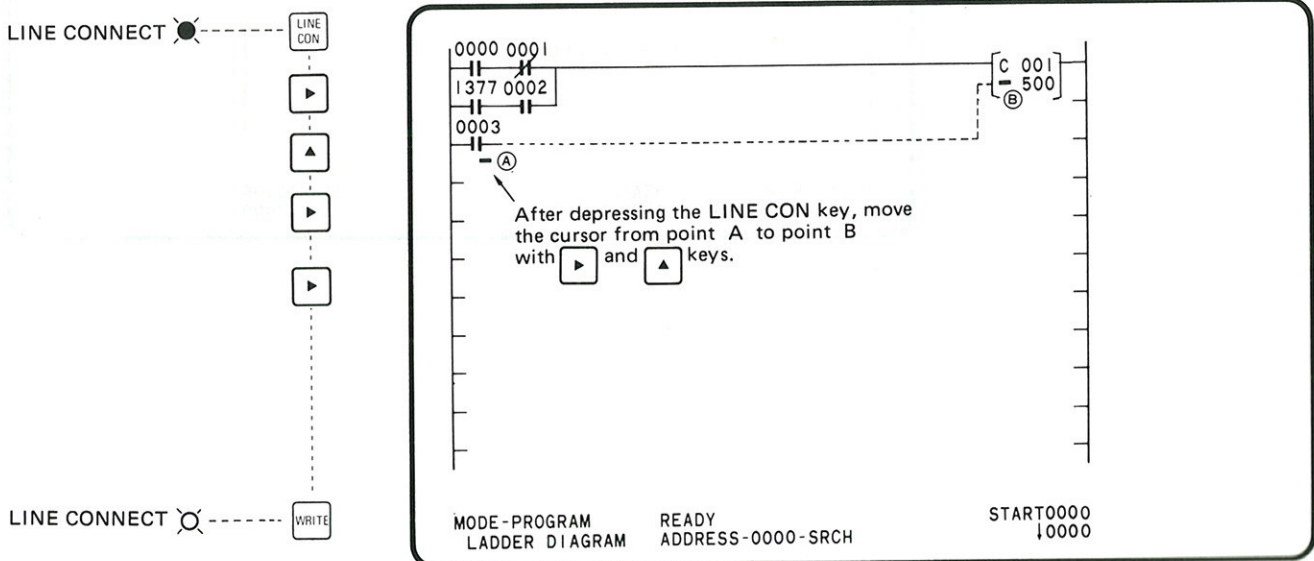


13. How to correct a program after depression of key:
- Move the cursor to the location where the data subject to correction exists, depress key and then correct the program. When key is depressed, the display will change to Low Brightness mode. The program correction cannot be performed while the display remains in High Brightness mode.




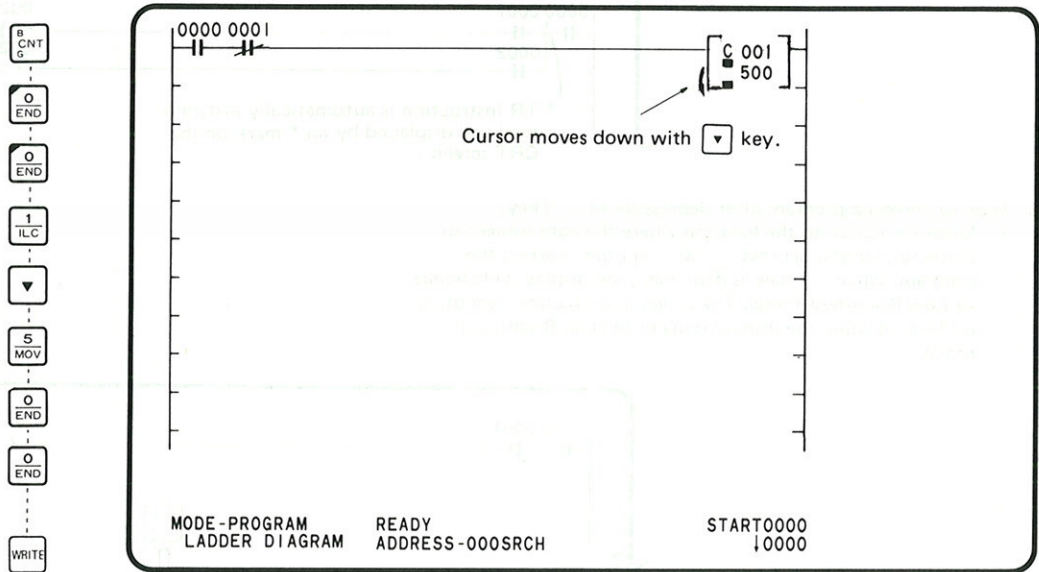
- By depressing and keys in succession, all the circuits being displayed on the CRT screen can be erased.
- When a circuit stored in the CRT program memory area is to be deleted completely, the coil of the ladder diagram to be erased must be first searched. Enter the output instruction (OUT XXXX) and depress key with the cursor at its bottom home position and OUT XXXX block will appear on the CRT screen. Then depress and keys, and keys or key and the OUT XXXX block will be erased from the memory.

14. How to operate the LINE CON key:
- The line connection function simplifies the connections of signal lines in a sequence circuit which are normally performed by operating or key for each display element (e.g., relay contact), by a single key operation.

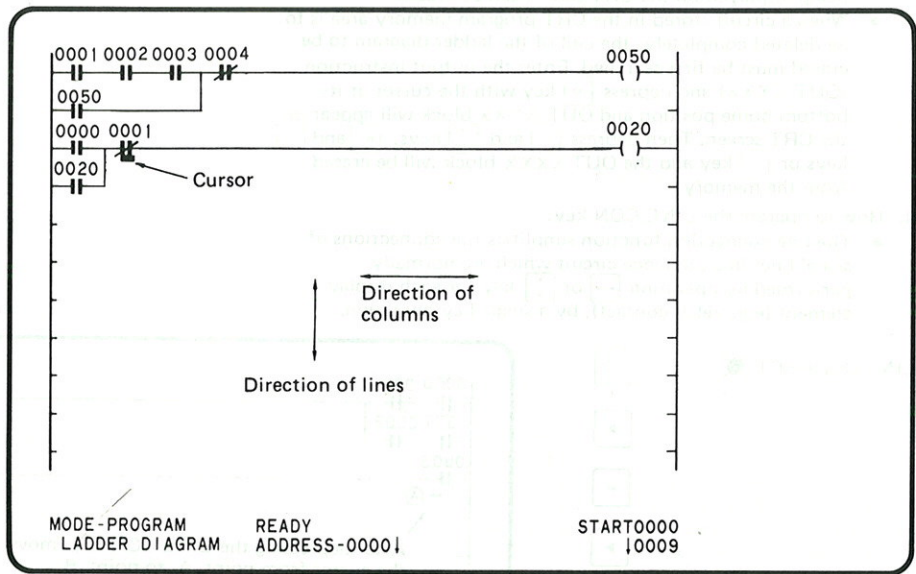


- To discontinue the line connection in process, depress key.

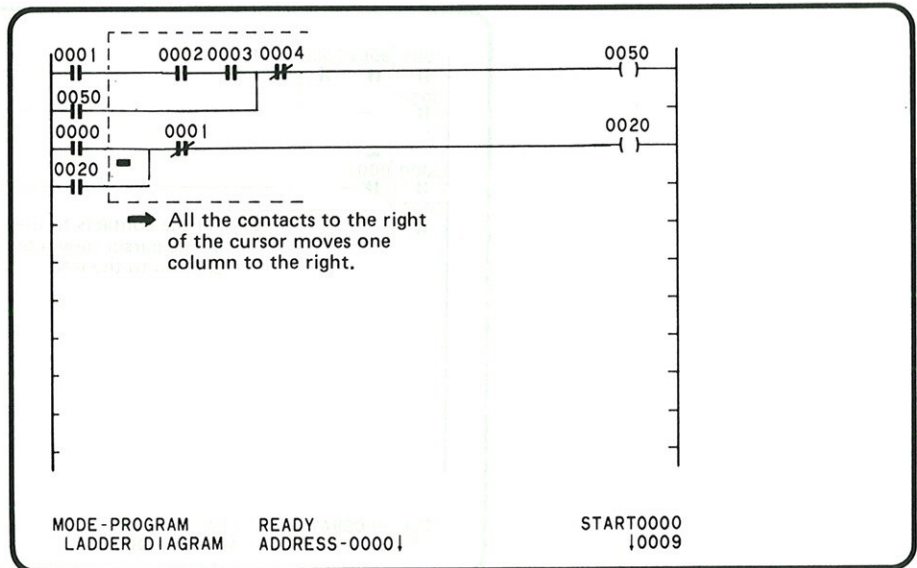
15. How to program an output instruction consisting of 2 words.
- When programming an output instruction consisting of 2 words such as TIM, CNT or SR, program the second word by moving the cursor with  key.



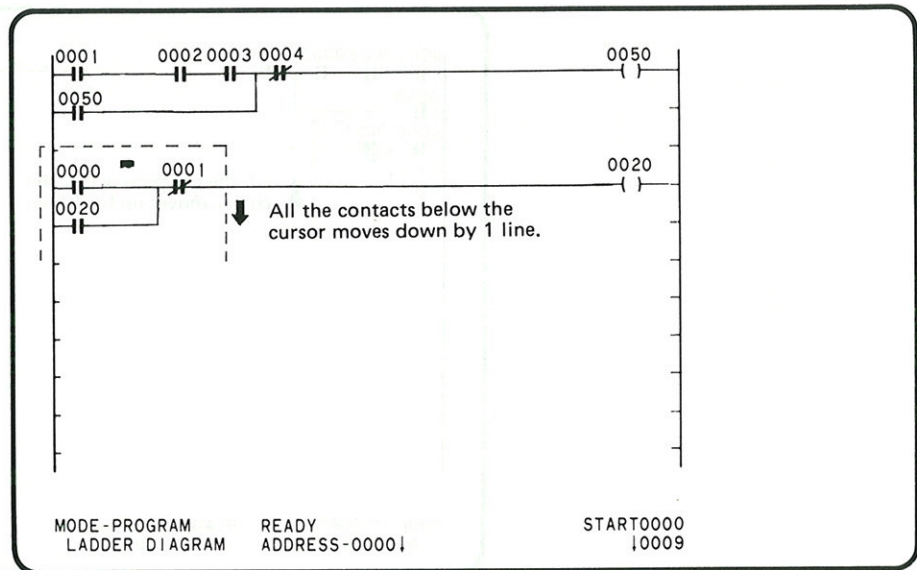
16. How to move entire screen:
- The screen shift function is a function to move the entire screen with the cursor position taken as a reference point and is used conveniently when adding a ladder diagram to the program being written.



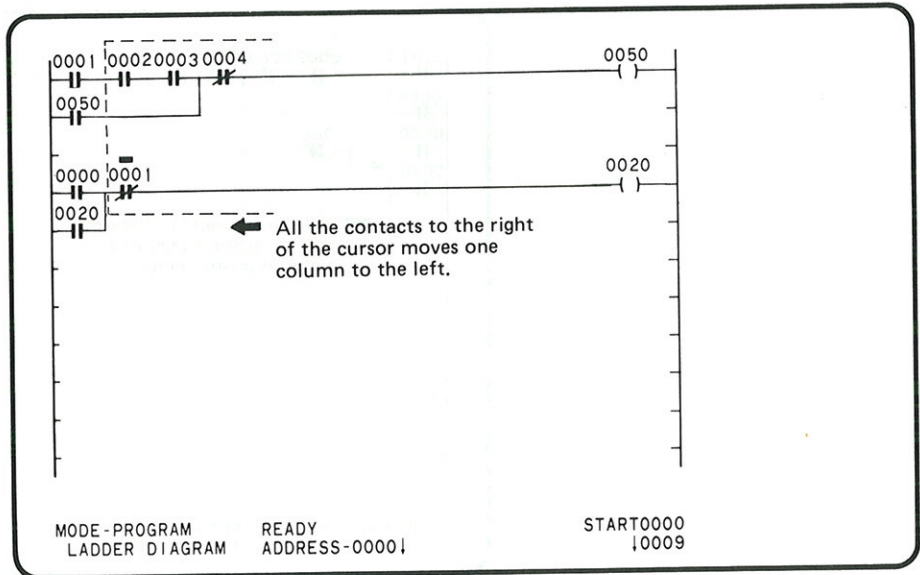
- If there are space for contacts in the direction of columns for all the circuits on the screen and a space for contacts in the direction of all the lines specified by the cursor, depression of **SHIFT** and **→** keys will cause all the circuits located to the right of the cursor position to move to the right.



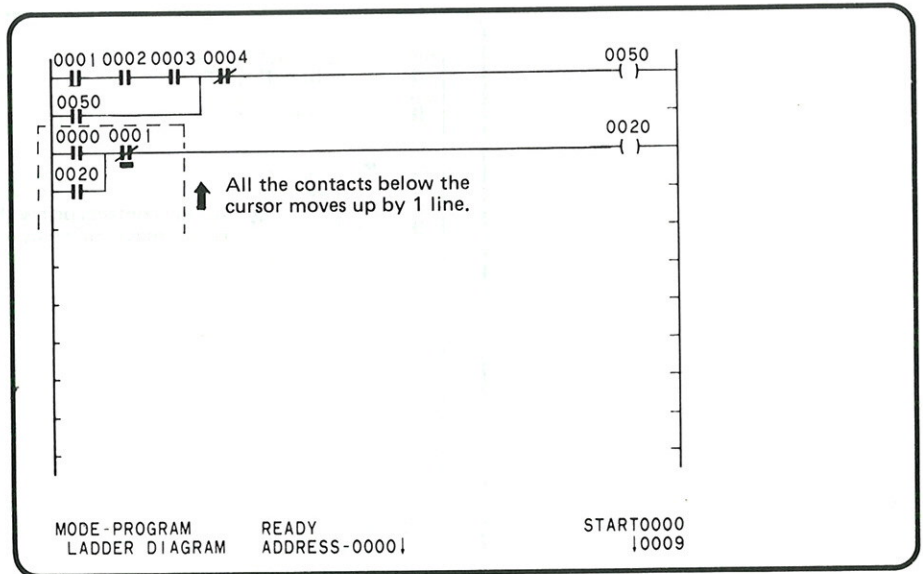
- If there is a space of more than 1 line in the downward direction of the line specified by the cursor, **SHIFT** and **↓** keys will cause all the circuits located below the cursor position to move down by 1 line.



- If there are a space for contacts in the direction of columns for all the circuits on the screen and a space for contacts in the direction of all the lines specified by the cursor, depression of **SHIFT** and **←** keys will cause all the circuits located to the right of the cursor position to move to the left.

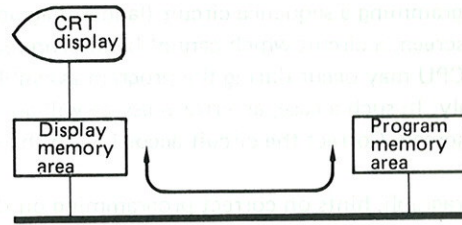


- If there is a space of more than 1 line in the upward direction of the line specified by the cursor, depression of **SHIFT** and **↑** keys will cause all the circuits located below the cursor position to move up by 1 line.



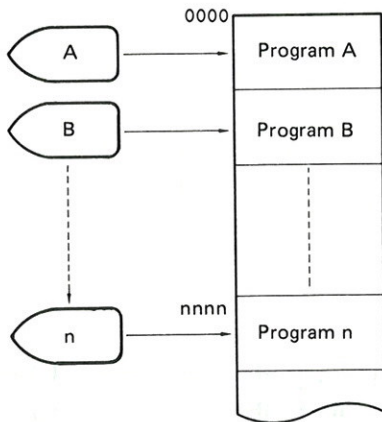
17. How to transfer program with $\boxed{\text{STR INS}}$ and $\boxed{\text{STR COR}}$ keys:

- By operating $\boxed{\text{STR INS}}$ or $\boxed{\text{STR COR}}$ key, the contents of the CRT display can be transferred into the CRT program memory area through the CPU bus line.

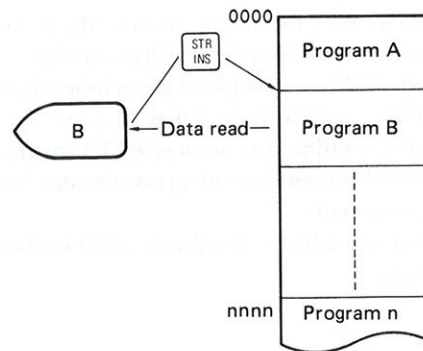


- When the contents of the CRT display memory area are to be transferred to the CRT program memory area, $\boxed{\text{STR INS}}$ key is used to add program(s) by inserting them from the address XXXX shown on the address display "START XXXX → ΔΔΔΔ" in the Status Area.

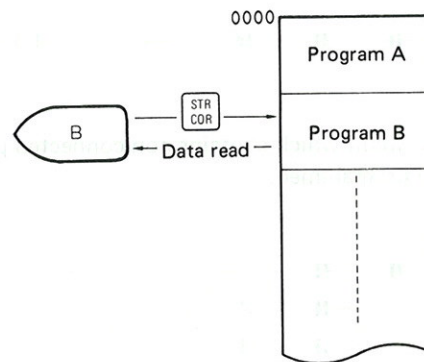
$\boxed{\text{STR INS}}$ after the memory clear



$\boxed{\text{STR INS}}$ after the data read



- When the contents of the CRT display memory area are to be transferred to the CRT program memory area, $\boxed{\text{STR COR}}$ key is used to correct the program(s) stored previously by writing the correct program(s) from the address XXXX shown on the address display "START XXXX → ΔΔΔΔ" in the Status Area.





- $\boxed{\text{STR INS}}$ and $\boxed{\text{STR COR}}$ keys function to transfer the contents of the CRT display memory area to the CRT program memory area. During the data transfer, the operation control instruction message in the Status Area will change from "READY" to "WAIT" and then return to "READY" again. Upon completion of the data transfer, a circuit programmed at the next address will be shown on the CRT screen. In the absence of any written program at the next address, a bus bar will be displayed on the CRT screen.
- During the transfer of the contents of the CRT display memory area to the CRT program memory area with $\boxed{\text{STR INS}}$ or $\boxed{\text{STR COR}}$ key, if the program to be transferred cannot be interpreted, the "ERROR NO." message will appear in the Status Area.

■ HINTS ON CORRECT PROGRAMMING ON CRT SCREEN

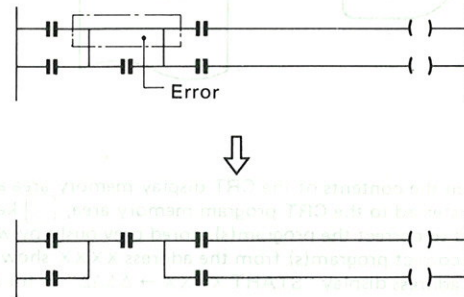
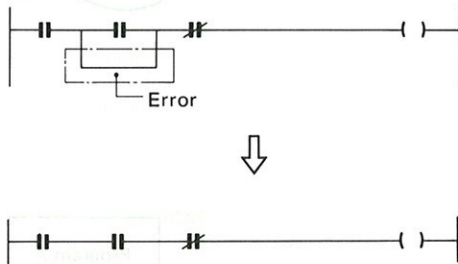
After programming a sequence circuit (ladder diagram) on the CRT screen, a circuit which cannot be interpreted by the CRT CPU may occur during the program assembly or disassembly. In such a case, an error message will appear on the CRT screen. Correct the circuit according to the error message.

In this paragraph, hints on correct programming on the CRT screen are explained.

1. Programming a sequence circuit

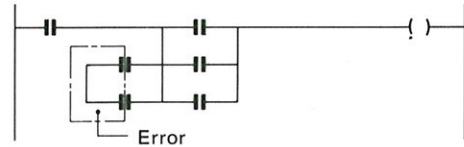
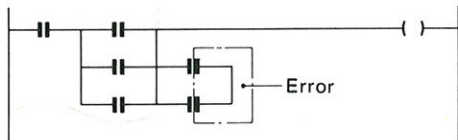
- The CRT screen allows the display of 11 contacts and 1 coil (output instruction) horizontally and 11 circuits vertically. If one block of a circuit exceeds this display screen capacity, the circuit cannot be programmed on the screen.
- After programming the circuit on the CRT screen, TR instruction will be automatically added by  or  key. A circuit capable of using more than 8 TR instructions will be regarded as an error. For the sake of interpretation, the number of TR instructions used may be different depending on the condition of the sequence circuit.
- Sequence circuit which has a short circuit cannot be programmed.

(Ex.)

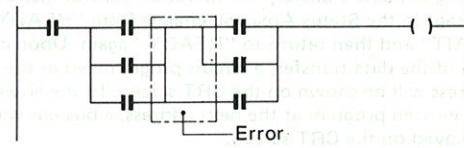
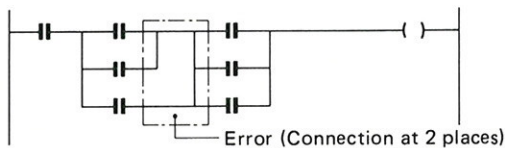


- Sequence circuit which contains non-connected parts cannot be programmed.

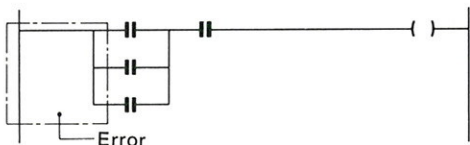
(Ex.)



(Ex.)

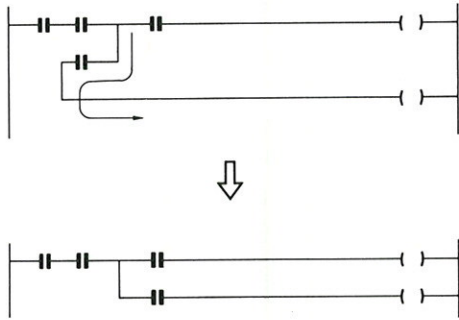


(Ex.)



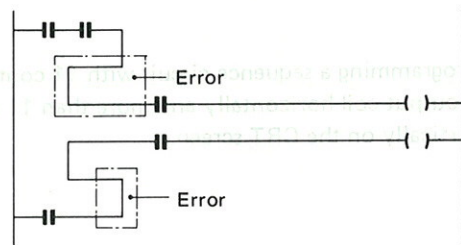
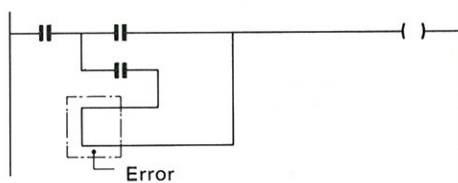
- A sequence circuit must always be programmed from left to right. No sneak path is allowed.

(Ex.)

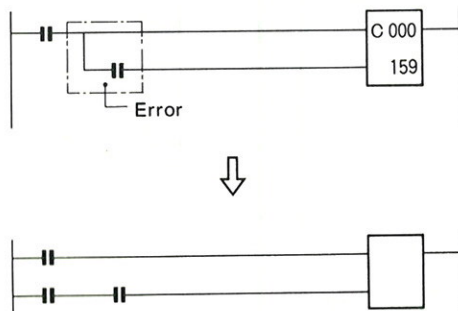


- Other errors

(Ex.)



(Ex.)



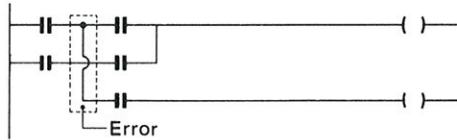
Only the output instruction with plural input terminals will be regarded as an error.

2. Circuit programmed from the programming console attached to the SCY-M1R/-M5R.

After the circuit programmed from the programming console attached to the SCY-M1R/-M5R is transferred to the SCY-CRT10, note that a disassemble error may occur when such a circuit is displayed on the CRT screen, depending on the programming order. Should a disassemble error occur, the circuit (program) will be displayed in mnemonic language.

- Programming order which prevents a branch point from being crossed when the circuit is displayed on the CRT screen.

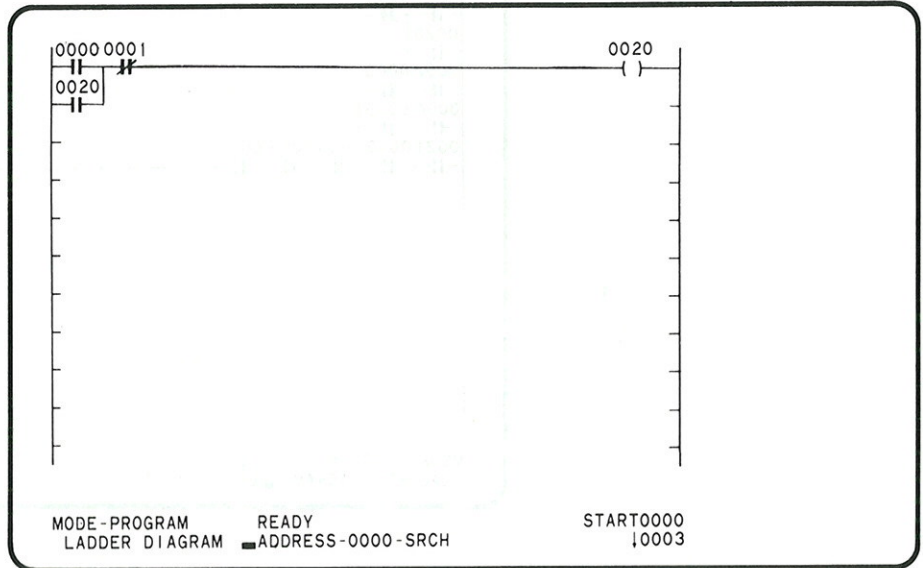
(Ex.)



- Programming a sequence circuit with 11 contacts and 1 output coil horizontally and more than 11 circuits vertically on the CRT screen.

PROGRAM READ (READING LADDER DIAGRAM FROM MEMORY)

1
ILC



OUT
OH

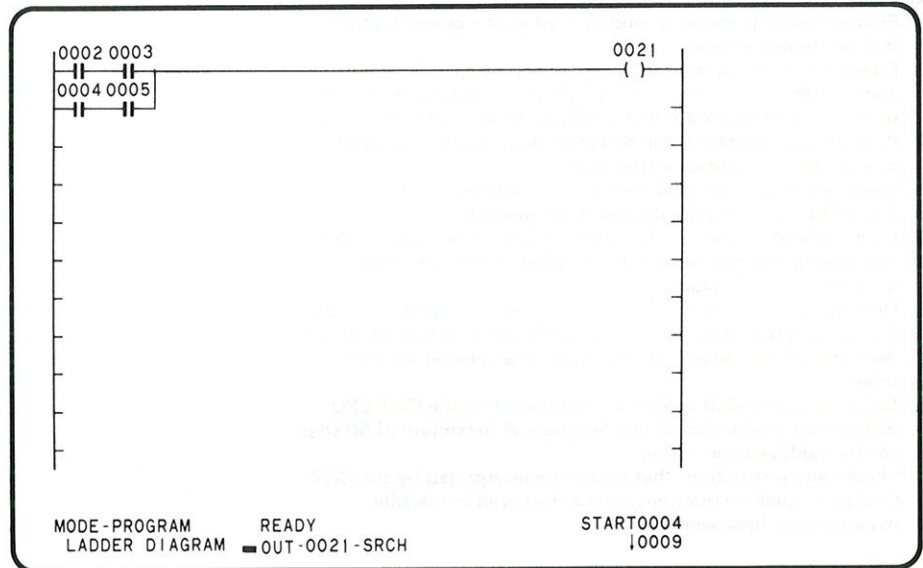
0
END

0
END

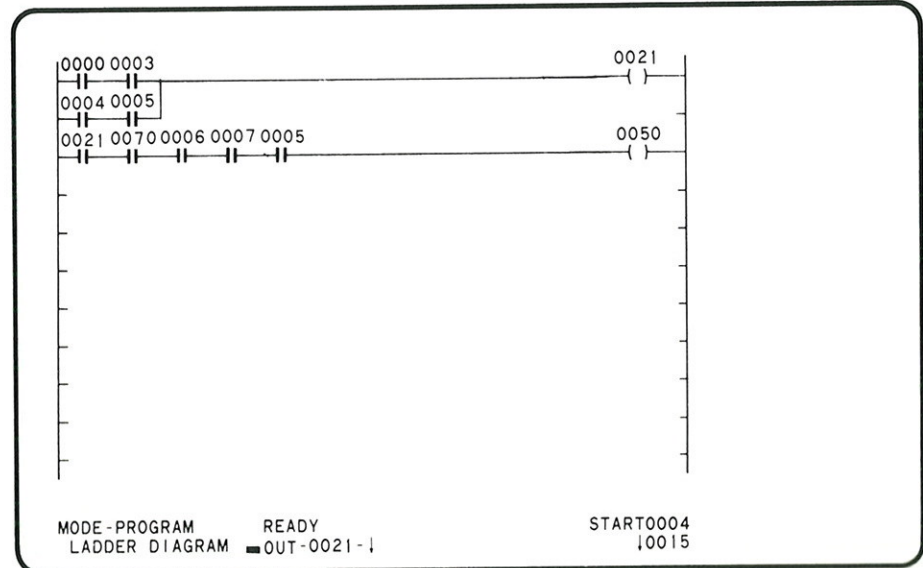
2
CMP

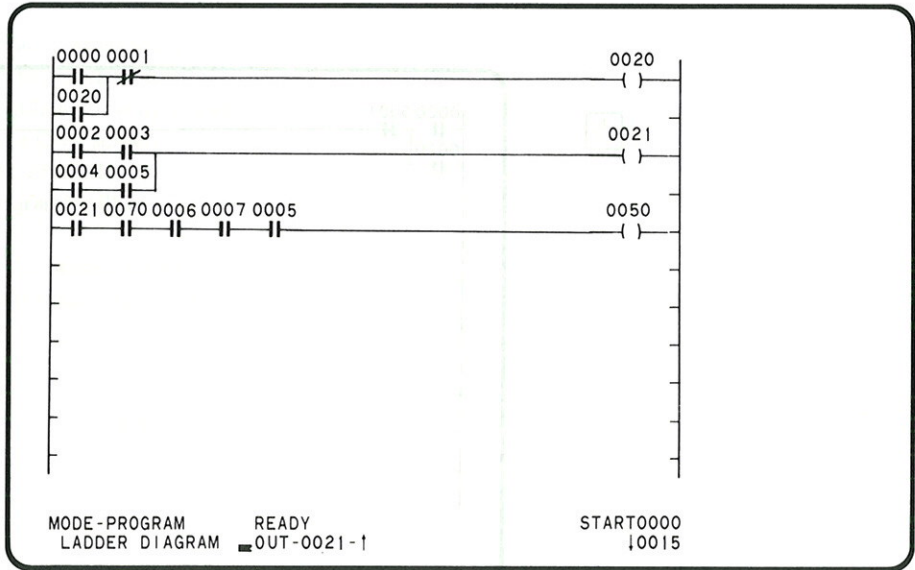
1
ILC

SEARCH



↓
RECORD





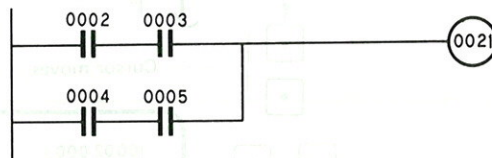
NOTES:

1. Program read operation is valid only when the cursor is at the Bottom Home position.
2. Program read operation can be performed by specifying an address. When **ADDR SET** XXXX and **SEARCH** keys are entered, a circuit related to address XXXX will be displayed on the CRT screen.
3. Program read operation can be performed by either an output instruction or a contact instruction. When **IF** $\Delta\Delta\Delta\Delta$, **SEARCH** and **SEARCH** keys are entered, the blocks related to **IF** $\Delta\Delta\Delta\Delta$ are displayed in sequence.
4. Depression of **RECORD** or **PLAY** key after the program read operation will cause plural circuits before and after the circuit being displayed, to be displayed.
5. Depression of **SHIFT** and **RECORD** keys or **SHIFT** and **PLAY** keys will cause the output number to be incremented or decremented by 1 and the block of the output number to be displayed on the CRT screen.
6. Ladder diagrams that cannot be interpreted by the CRT CPU will be displayed in mnemonic language. A maximum of 50 steps can be displayed per screen.
7. Should any instructions that cannot be interpreted by the CRT CPU exist, such instructions will be displayed in machine language (i.e., hexadecimal).

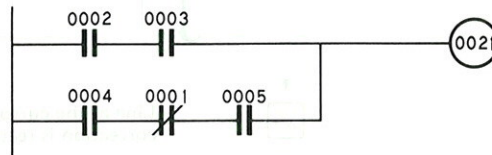
PROGRAM CORRECTION

The following circuits shown as examples 1 and 2 will be corrected.

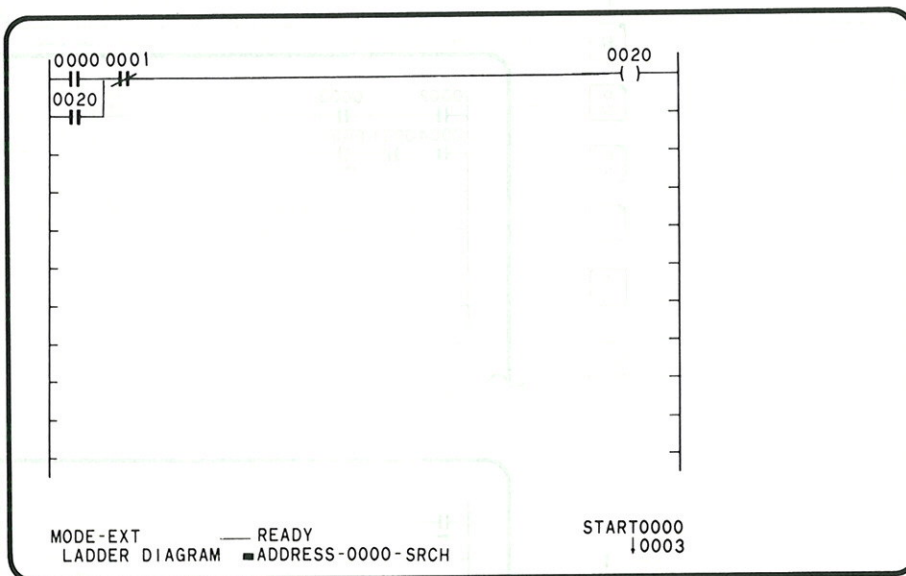
(Ex. 1)




(Ex. 2)



1
ILC



- The first single circuit stored in the program memory in read upon depression of  key.

OUT
O+

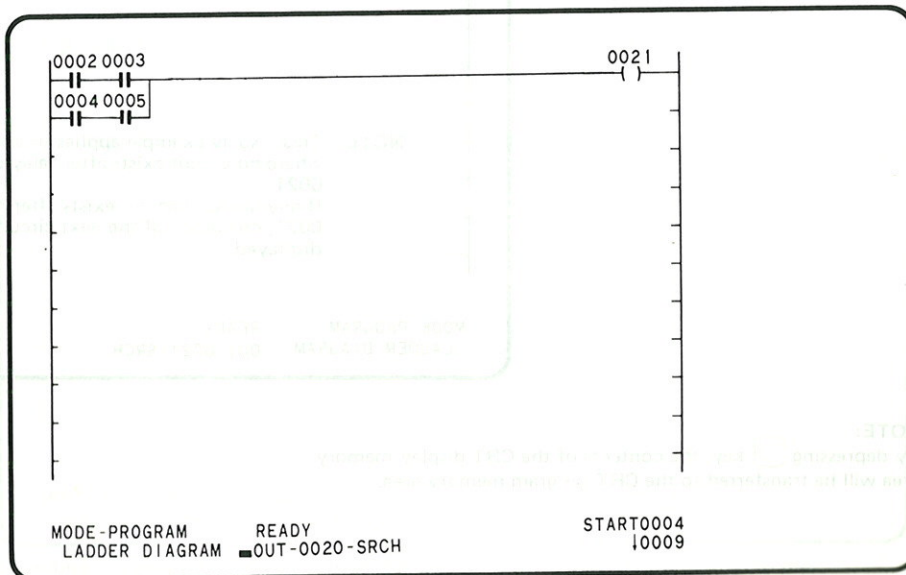
0
END

0
END

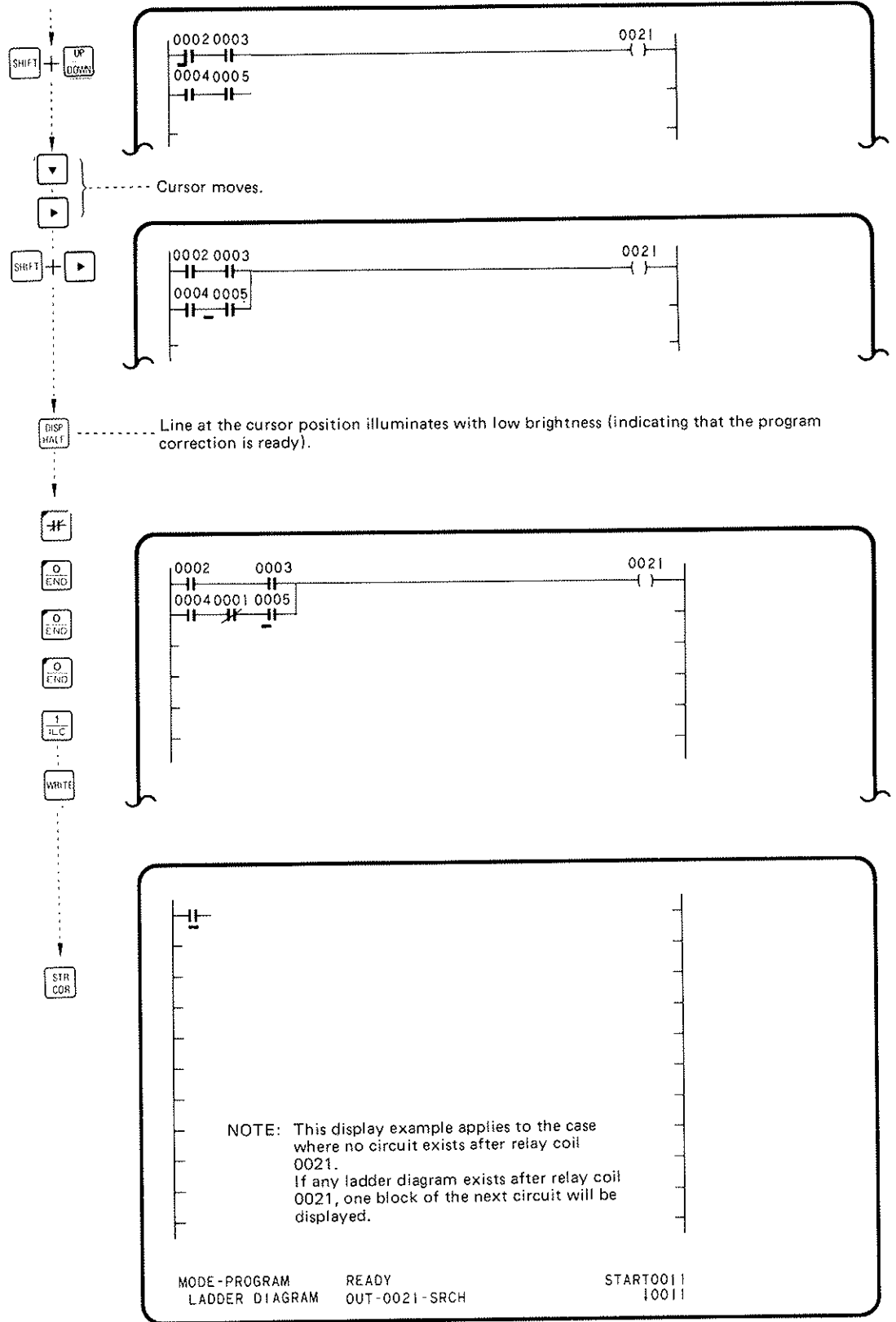
2
CMP


1
ILC

SEARCH

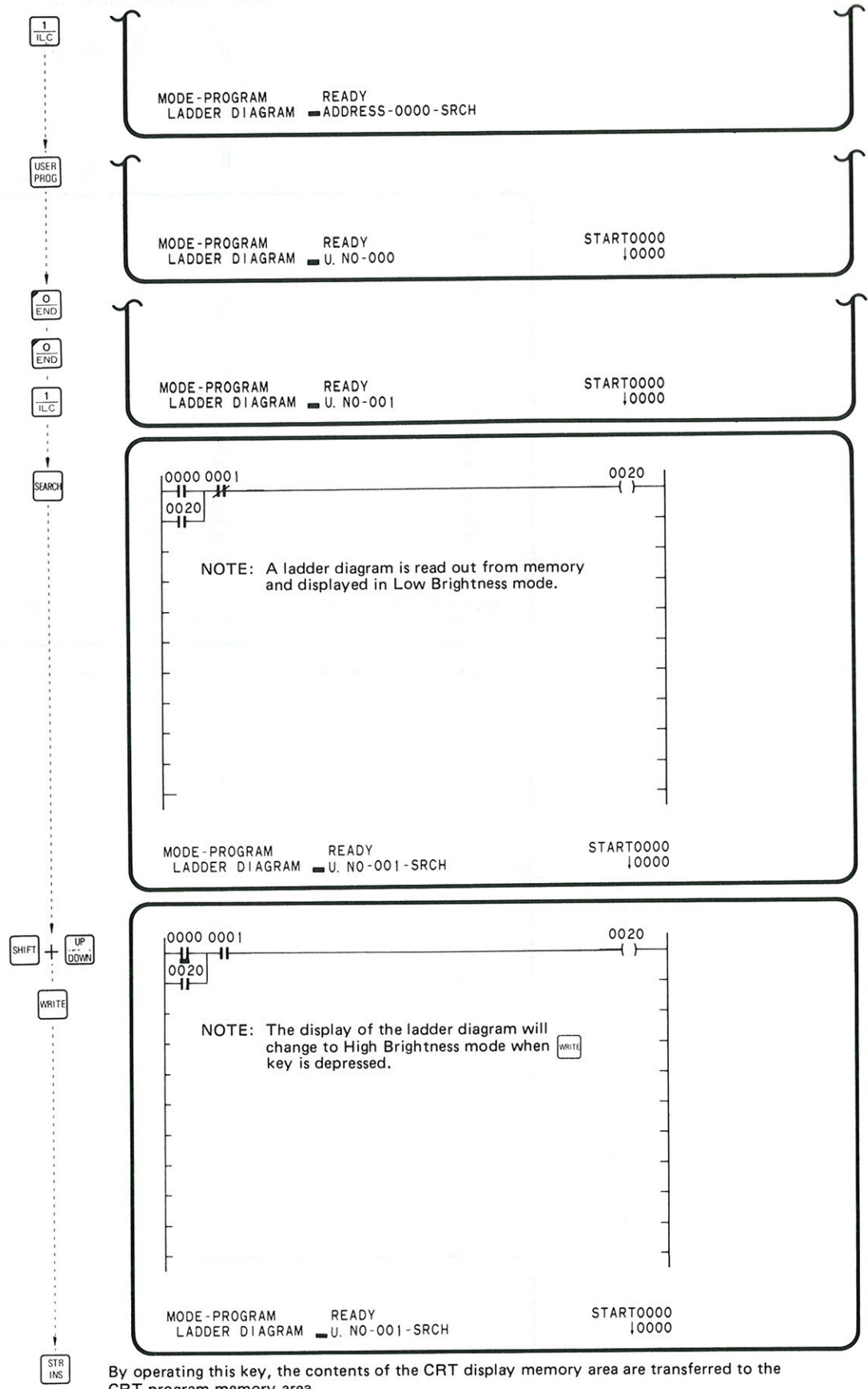


- A circuit to be corrected is searched.



NOTE:
 By depressing  key, the contents of the CRT display memory area will be transferred to the CRT program memory area.

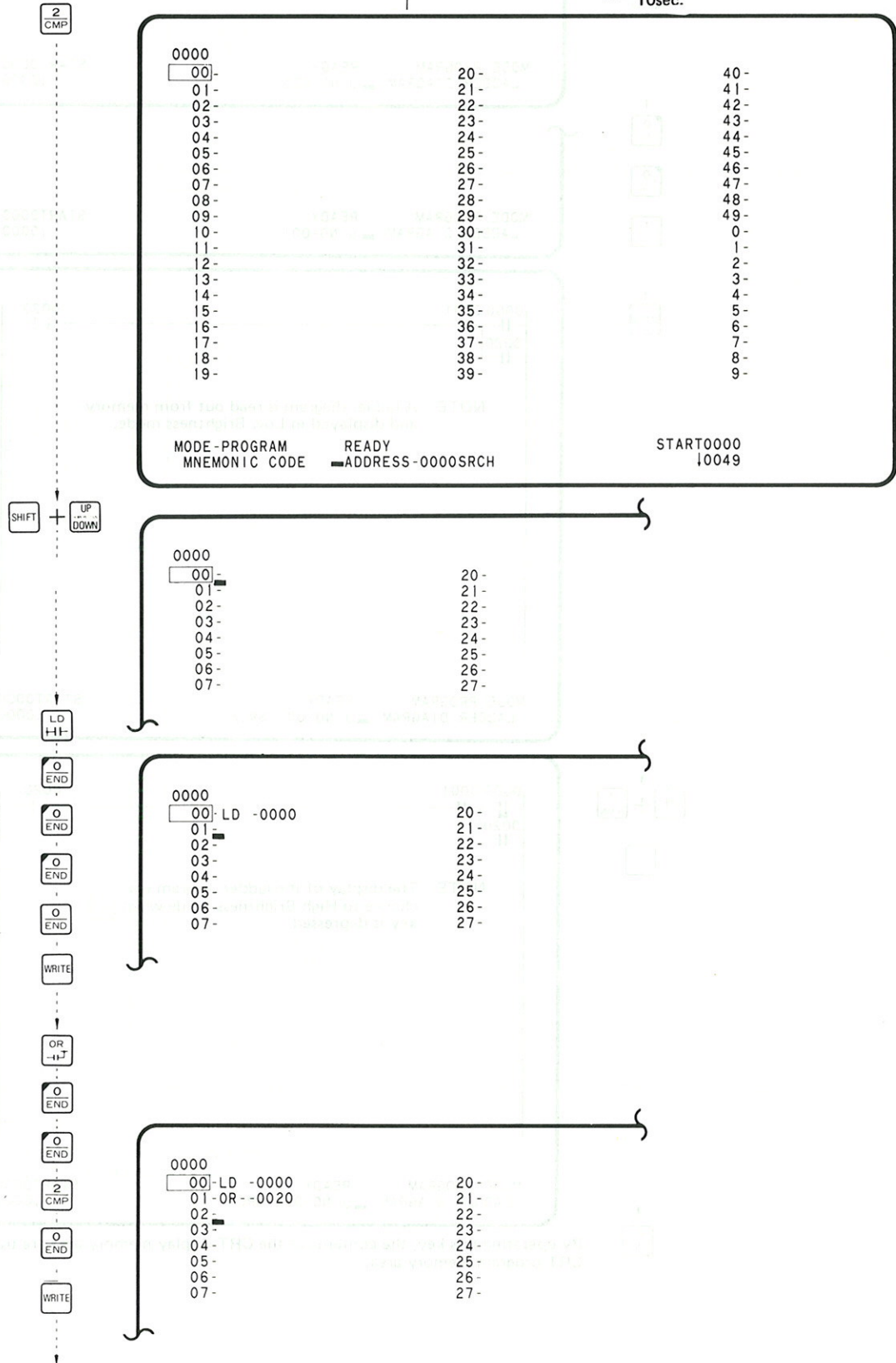
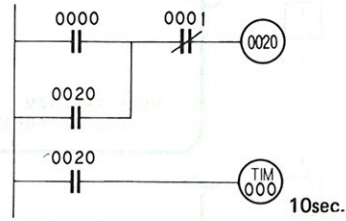
■ READ/WRITE OF USER PROGRAM



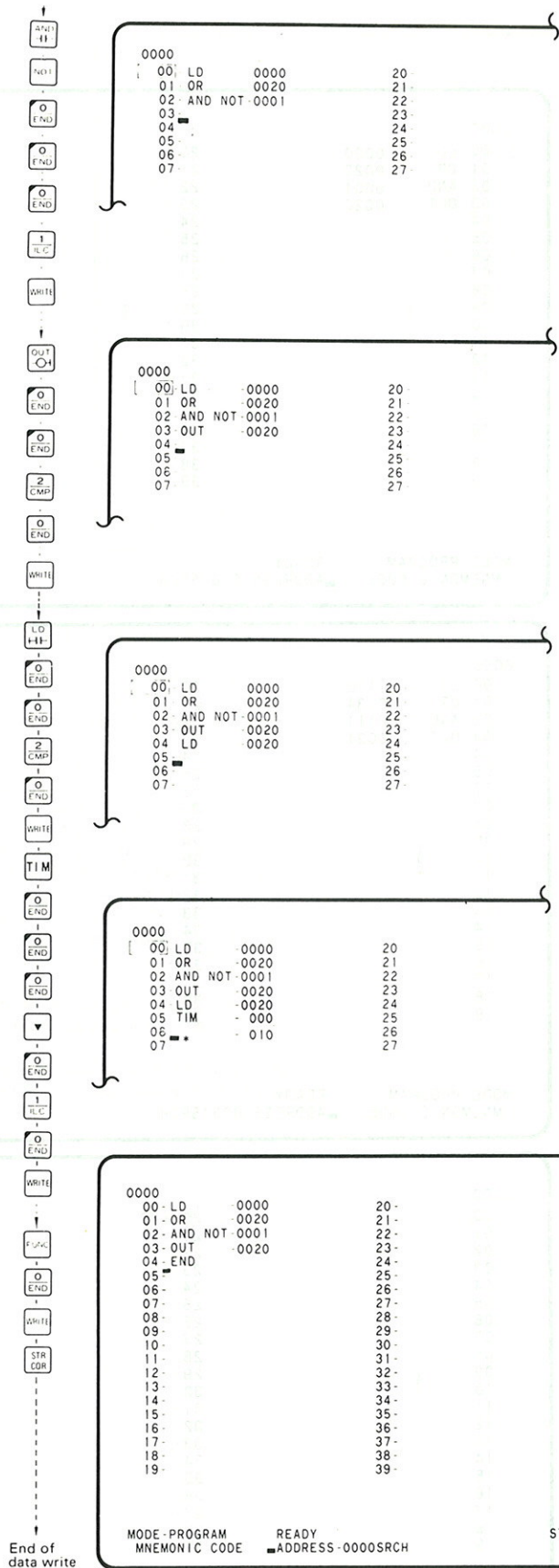
By operating this key, the contents of the CRT display memory area are transferred to the CRT program memory area.

2 MNEMONIC CODE PROGRAMMING
PROGRAM WRITE

The following circuit will be programmed.



PROGRAM READ



NOTES:

1. If any error is found before depressing **STR** key, the program can be changed freely by moving the cursor.
(Cursor movement → **DISP** → Instruction → **WRITE** → **STR**).
2. A program can be written in units of 50 steps maximum.
3. * Enter the counter or timer number, depress **↓** key to move the cursor down by 1 line and then enter the counter or timer value.

PROGRAM READ

2
CMP

```
0000
00- LD      0000      20-
01- OR      0020      21-
02- AND     0001      22-
03- OUT     0020      23-
04-                24-
05-                25-
06-                26-
07-                27-
08-                28-
09-                29-
10- )                30- )
11-                31-
12-                32-
13-                33-
14-                34-
15-                35-
16-                36-
17-                37-
18-                38-
19-                39-
40-
41-
42-
43-
44-
45-
46-
47-
48-
49- )
0-
1-
2-
3-
4-
5-
6-
7-
8-
9-
```

MODE-PROGRAM READY
MNEMONIC CODE ADDRESS-0000SRCH

START0000
|0049

OUT
O+

3
JME

1
ILC

SEARCH

```
0050
00- LD      0110      20-
01- OR      0134      21-
02- AND     0111      22-
03- OUT     0031      23-
04-                24-
05-                25-
06-                26-
07-                27-
08-                28-
09-                29-
10- )                30- )
11-                31-
12-                32-
13-                33-
14-                34-
15-                35-
16-                36-
17-                37-
18-                38-
19-                39-
00-
01-
02-
03-
04-
05-
06-
07-
08-
09- )
0-
1-
2-
3-
4-
5-
6-
7-
8-
9-
```

MODE-PROGRAM READY
MNEMONIC CODE ADDRESS-0031SRCH

START0050
|0099

RECORDS

```
0100
00-                20- END-
01-                21-
02-                22-
03-                23-
04-                24-
05-                25-
06-                26-
07-                27-
08-                28-
09-                29-
10- )                30-
11-                31-
12-                32-
13-                33-
14-                34-
15-                35-
16-                36-
17-                37-
18-                38-
19-                39-
40-
41-
42-
43-
44-
45-
46-
47-
48-
49- )
0-
1-
2-
3-
4-
5-
6-
7-
8-
9-
```

MODE-PROGRAM READY
MNEMONIC CODE ADDRESS-0000|

START0100
|0149



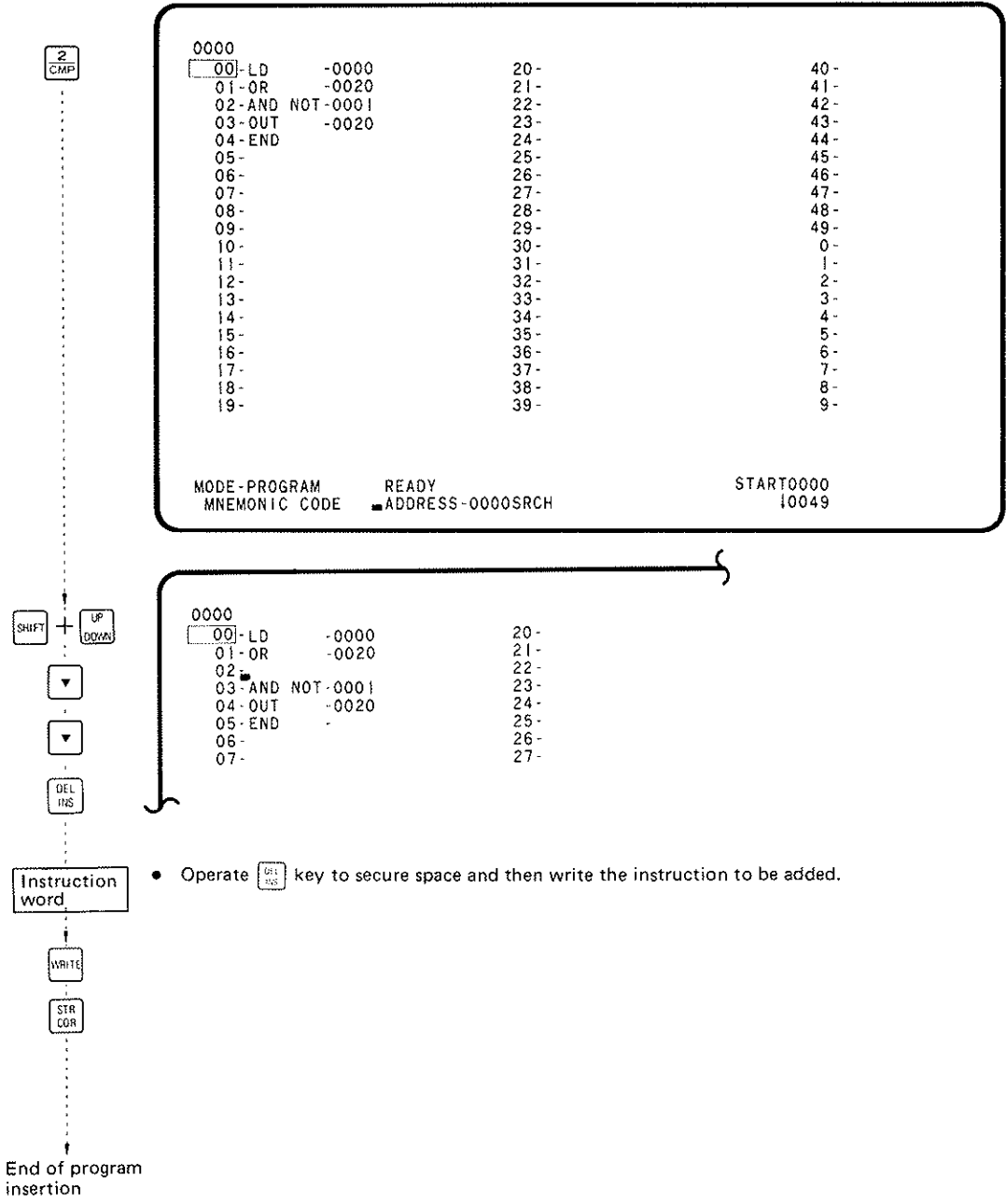
0050			
00-	LD	0110	20-
01-	OR	0134	21-
02-	AND	0111	22-
03-	OUT	0031	23-
04-			24-
05-			25-
06-			26-
07-			27-
08-			28-
09-			29-
10-)		30-
11-			31-
12-			32-
13-			33-
14-			34-
15-			35-
16-			36-
17-			37-
18-			38-
19-			39-
			00-
			01-
			02-
			03-
			04-
			05-
			06-
			07-
			08-
			09-
			0-
			1-
			2-
			3-
			4-
			5-
			6-
			7-
			8-
			9-

MODE-PROGRAM READY START0050
MNEMONIC CODE ADDRESS-00001 10099

NOTES:

1. Program read operation is valid only when the cursor is at the Bottom Home position.
2. Program read operation can be performed by specifying an address. When XXXX and keys are entered, a program for 50 steps related to address XXXX will be displayed on the CRT screen.
3. Program read operation can be performed by either an output instruction or a contact instruction. When , , and keys are entered, the blocks related to are displayed in sequence.
4. Depression of or key after the program read operation will cause programs before and after the program being displayed, to be displayed in mnemonic code and in units of 50 steps.
5. Depression of and keys or and keys will cause the output number to be incremented or decremented by 1 and the block of the output number to be displayed on the CRT screen.
6. Should any instructions that cannot be interpreted by the CRT CPU exist, such instructions will be displayed in machine language (i.e., hexadecimal).
7. In mnemonic code programming, a maximum of 3,999 steps may be programmed by updating the CRT screen in units of 50 steps.

■ PROGRAM INSERTION



NOTES:

1. Program insertion can be performed in units of 10 steps maximum.
2. 0 ~ 9 columns at the right-hand part of the screen are for the Data Area. If any instruction exists at address 0049 when **DEL INS** key is operated, the instruction will be displayed in the Data Area.

PROGRAM DELETION

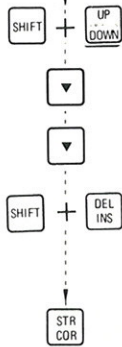
2
CMP

```

0000
00-LD - -0000      20-
01-OR - -0020      21-
02-AND - -0070      22-
03-AND NOT-0001    23-
04-OUT - -0020      24-
05-END - -0000      25-
06-          26-
07-          27-
08-          28-
09-          29-
10-          30-
11-          31-
12-          32-
13-          33-
14-          34-
15-          35-
16-          36-
17-          37-
18-          38-
19-          39-
40-
41-
42-
43-
44-
45-
46-
47-
48-
49-
0-
1-
2-
3-
4-
5-
6-
7-
8-
9-
    
```

MODE-PROGRAM READY
MNEMONIC CODE ADDRESS-0000SRCH

START0000
↓0049



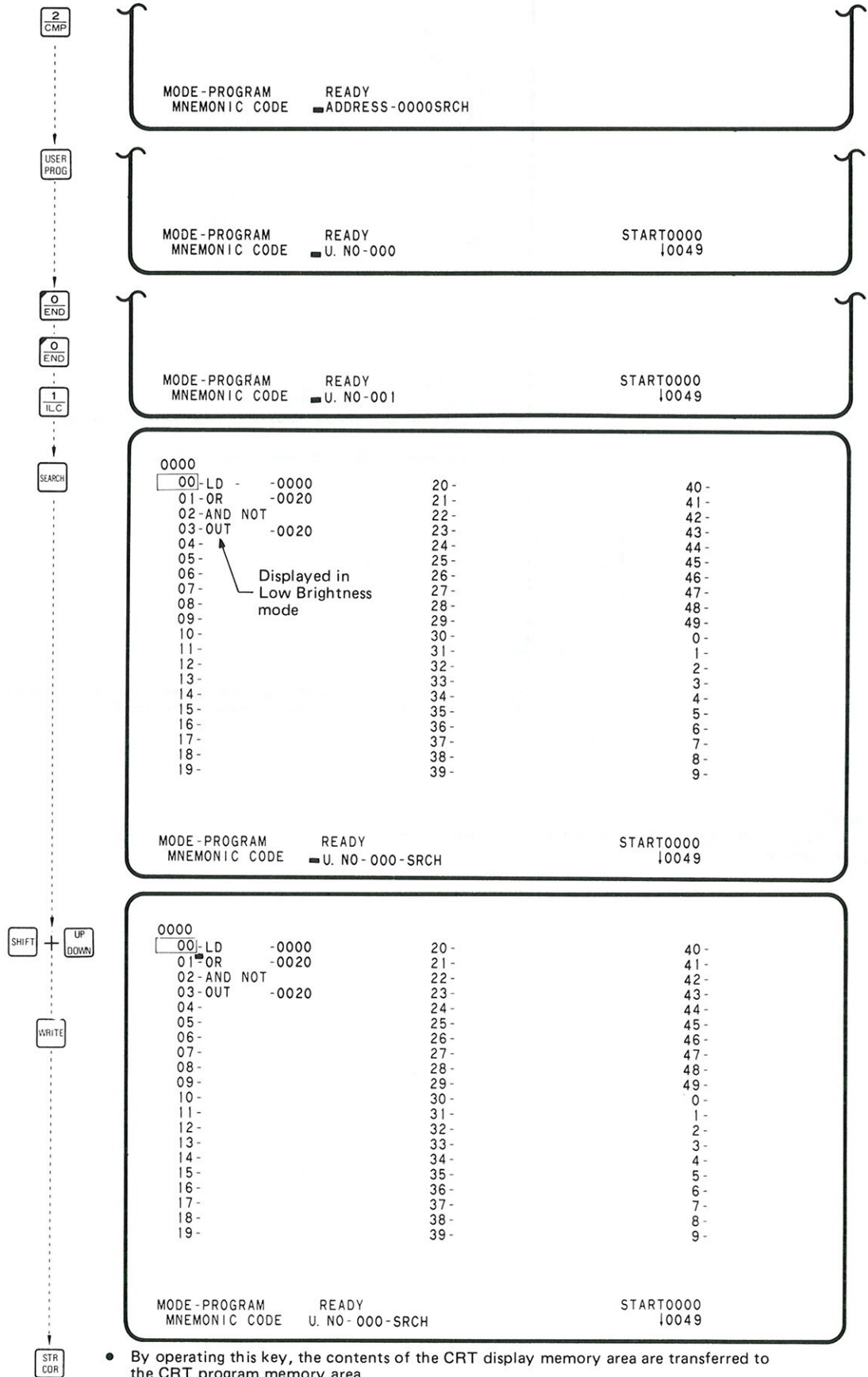
```

0000
00-LD - -0000      20-
01-OR - -0020      21-
02-AND NOT-0001    22-
03-OUT - -0020      23-
04-END -           24-
05-          25-
06-          26-
07-          27-
    
```

By operating **SHIFT** and **DEL/INS** keys in succession, the instruction to be deleted will be erased from the screen and all the subsequent program addresses will be decremented by 1.

NOTE:
The Data Area (0 ~ 9) on the CRT screen is independent of the program deletion operation.

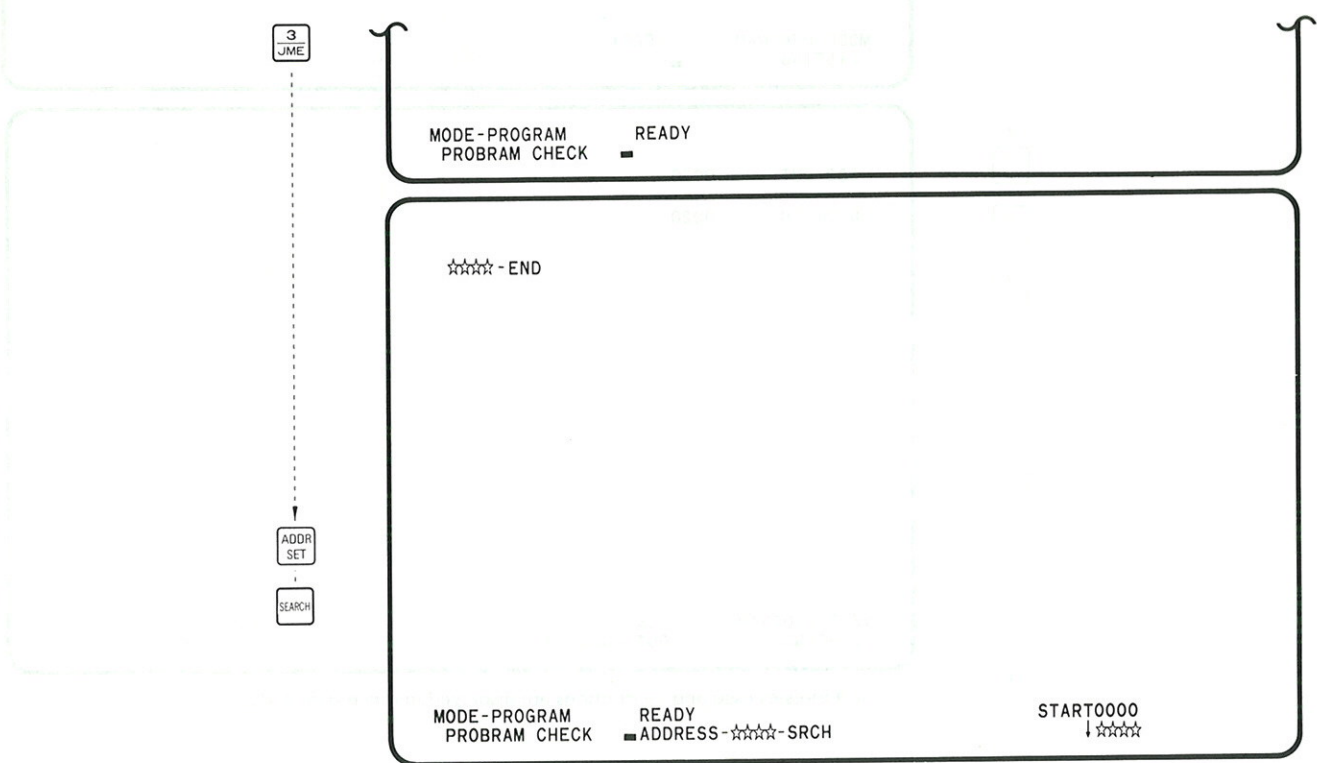
■ READ/WRITE OF USER PROGRAM



- By operating this key, the contents of the CRT display memory area are transferred to the CRT program memory area.

3 PROGRAM CHECK

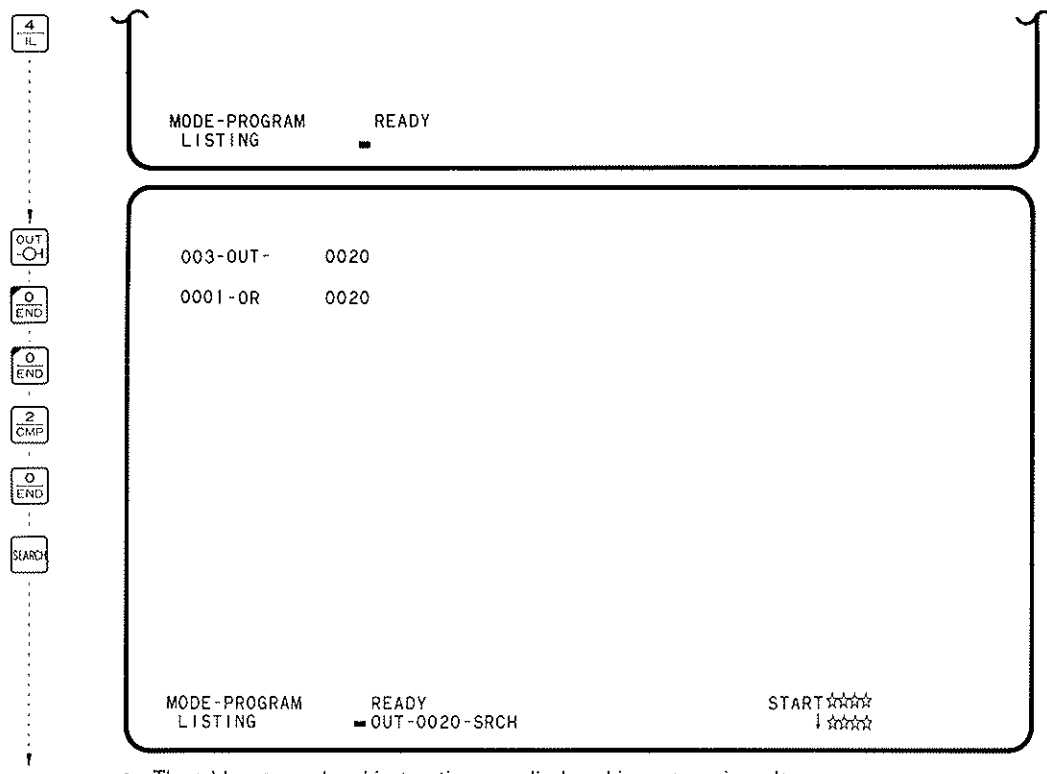
In this operation, syntax error check is executed for each written program to check the circuit for proper configuration.






NOTES:

1. Program check is executed from address 0000 to END instruction and completed almost instantaneously. (When the operation control instruction message changes from "BUSY" to "READY" again, the program check can be judged as completed.)
2. Should any error be found during the program check, the Error No. message will appear on the CRT screen together with the error address. (Refer to Section 3.9, Lists of Error Messages.)
3. Upon completion of writing a program, be sure to perform the program check operation.

 LISTING

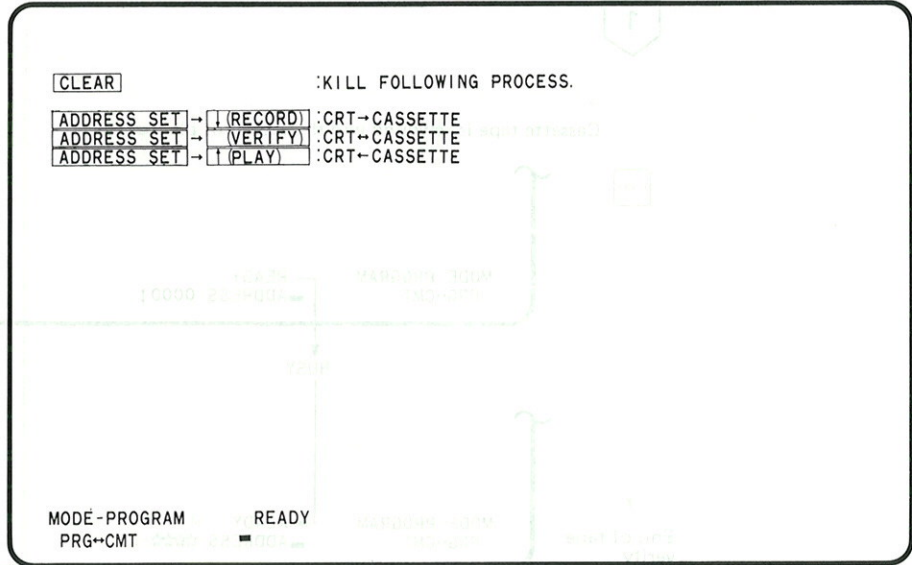


NOTES:

1. List of contacts can be generated. ( → Relay No. → )
2. List of all outputs can also be generated. (Output instruction TIM, CNT or OUT → )

5
MOV

PROGRAM ↔ CASSETTE



5
MOV

ADDR
SET

File No.



- File No. can be registered in 4-digit numeric code. This number prevents tape selection error at the time of a tape write, tape verify or tape read operation.

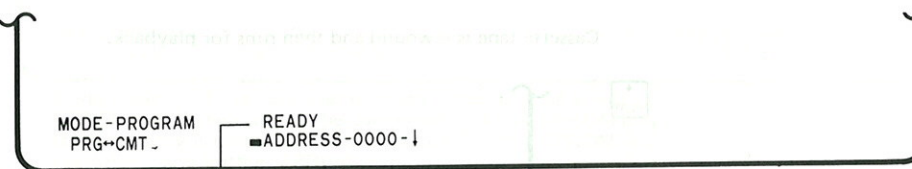
1



■ TAPE WRITE

Cassette tape is rewound and then runs for data recording.

RECORD




BUSY



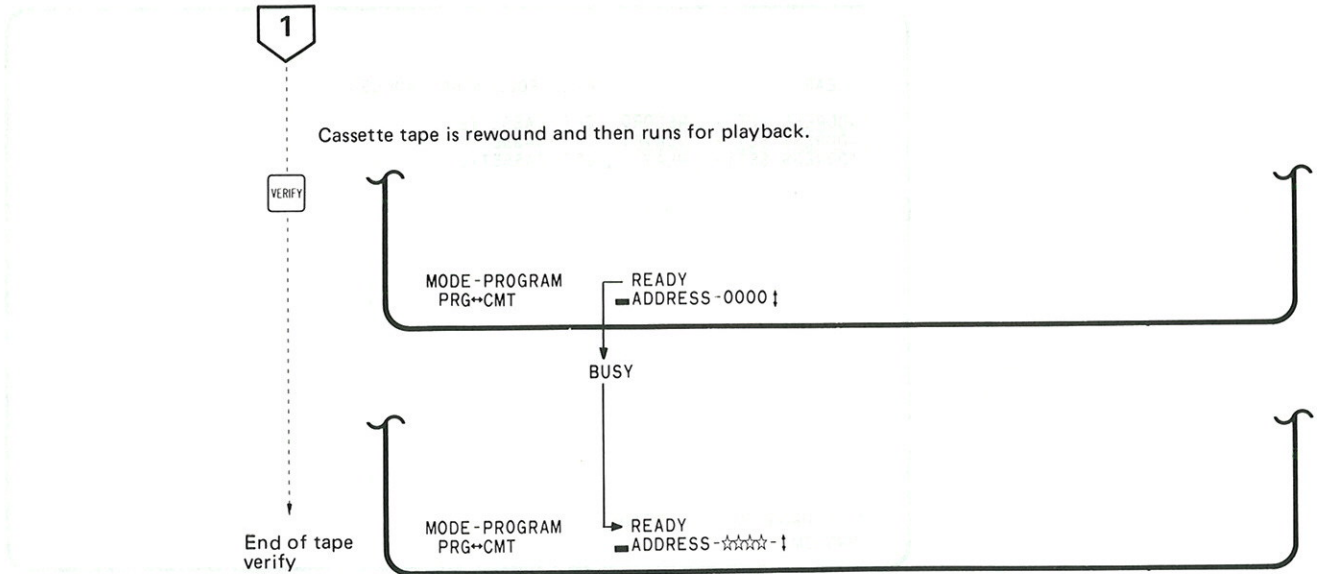
End of tape write

After the data have been recorded on tape, FILE becomes 0000.


NOTES:

1. The graphic programming console must be operated in close connection with the cassette tape recorder. Depress  key within 5 seconds after the start of the tape run.
2. The message "BUSY" indicates that data is being recorded on the tape.
3. The tape write operation can be judged as completed when the operation control instruction message changes from "BUSY" to "READY" again.

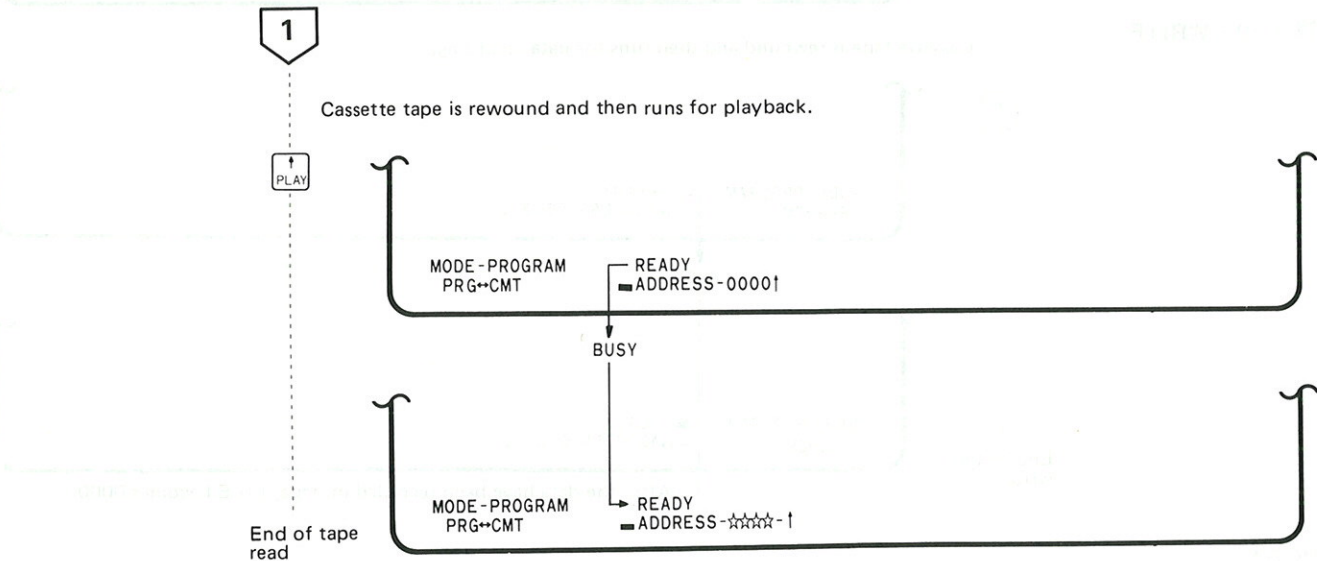
■ TAPE VERIFY




NOTES:

1. The graphic programming console must be operated in close connection with the cassette tape recorder. Depress  key within 5 seconds after the start of the tape run.
2. The message "BUSY" indicates that data are being verified.
3. The tape verify operation can be judged as completed when the operation control instruction message changes from "BUSY" to "READY" again.
4. Set the VOL and TONE controls of the cassette tape recorder to MAX.

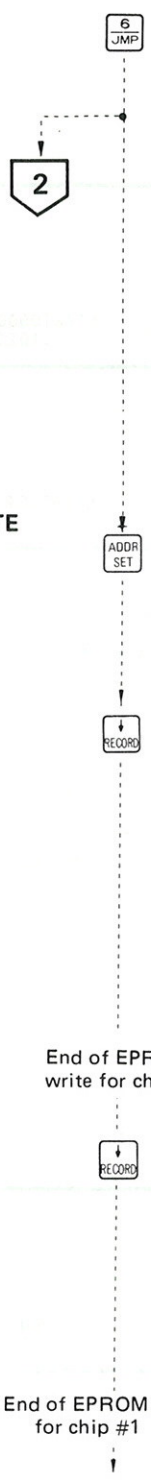
■ TAPE READ
 (READING DATA FROM CASSETTE TAPE)



NOTES:

1. The graphic programming console must be operated in close connection with the cassette tape recorder. Depress  key within 5 seconds after the start of the tape run.
2. The message "BUSY" indicates that data is being read.
3. The tape read operation can be judged as completed when the operation control instruction message changes from "BUSY" to "READY" again.
4. Set the VOL and TONE controls of the cassette tape recorder to MAX.

6 JUMP PROGRAM ↔ EPROM CHIP

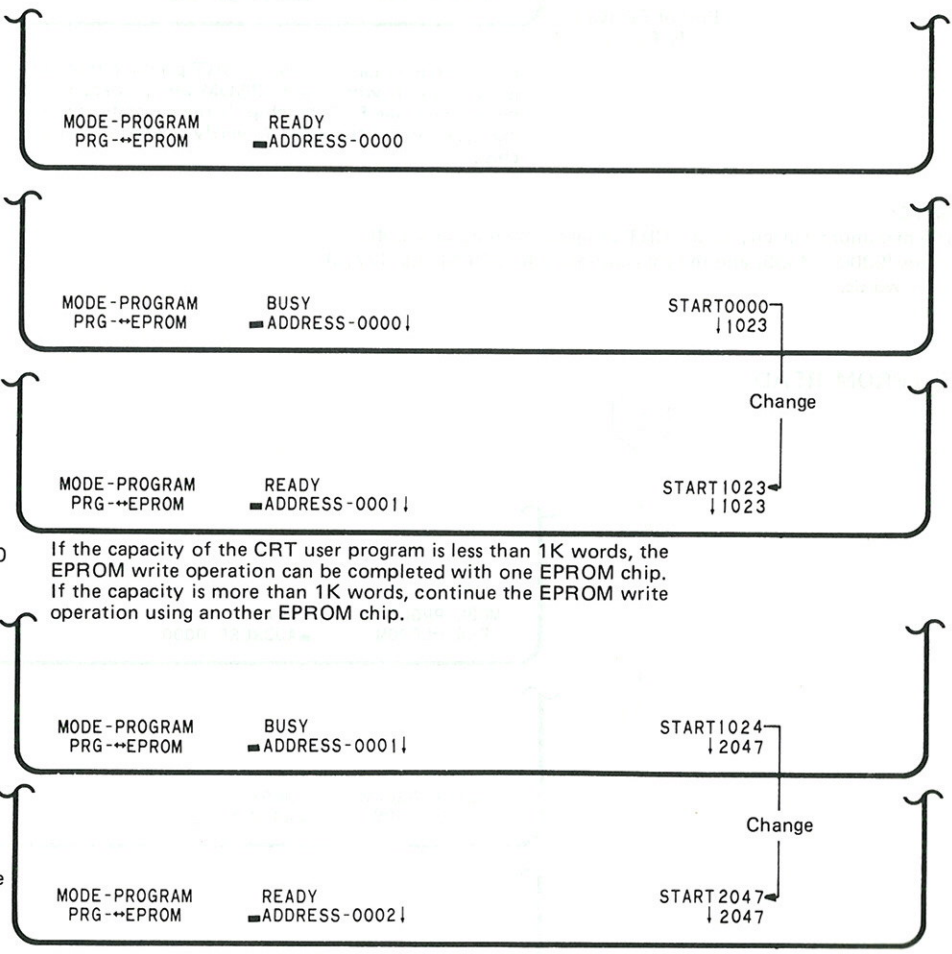


[CLEAR] :KILL FOLLOWING PROCESS.

ADDRESS SET	→	1 (RECORD)	:CRT→EPROM
ADDRESS SET	→	1 (VERIFY)	:CRT→EPROM
ADDRESS SET	→	1 (PLAY)	:CRT→EPROM

MODE-PROGRAM PRG. ↔EPROM READY

■ EPROM WRITE



End of EPROM write for chip #0

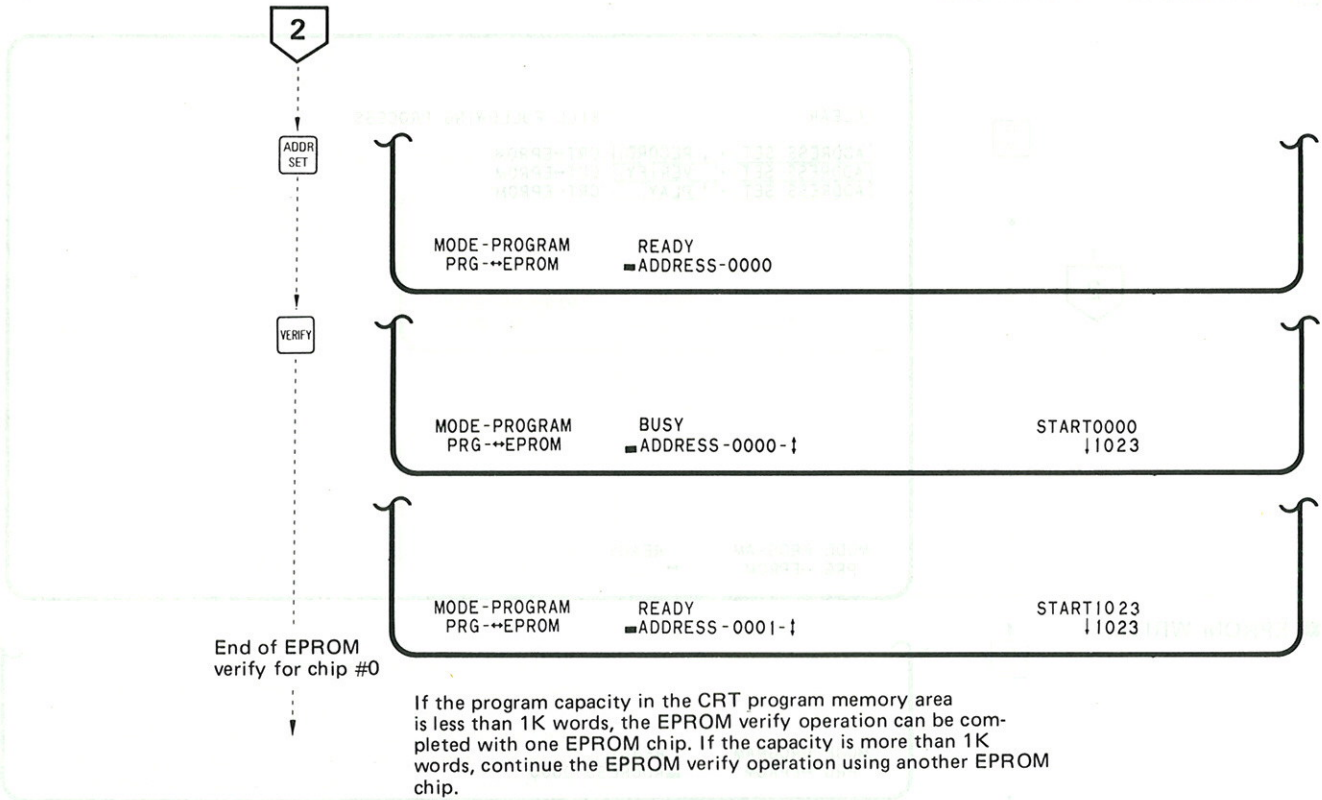
End of EPROM write for chip #1

If the capacity of the CRT user program is less than 1K words, the EPROM write operation can be completed with one EPROM chip. If the capacity is more than 1K words, continue the EPROM write operation using another EPROM chip.

NOTES:

1. The maximum capacity of the CRT program memory area is 4K words (0000 ~ 4095) and the capacity of each EPROM chip is 1K words.
2. Be sure to perform the EPROM read operation after writing data into the EPROM chip.

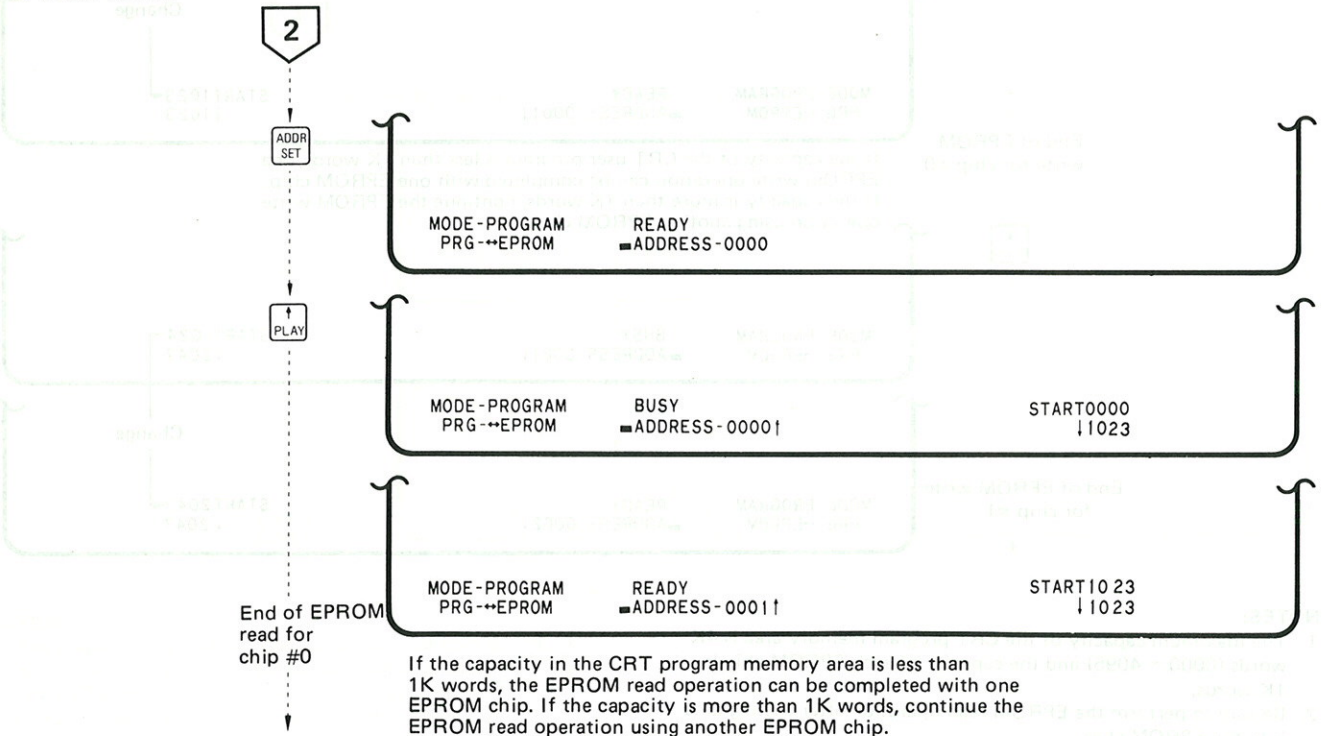
■ EPROM VERIFY



NOTE:

The maximum capacity of the CRT program memory area is 4K words (0000 ~ 4095) and the capacity of each EPROM chip (2716) is 1K words.

■ EPROM READ



NOTES:

1. The maximum capacity of the CRT program memory area is 4K words (0000 ~ 4095) and the capacity of each EPROM chip (2716) is 1K words.
2. Be sure to perform the EPROM read operation after writing data into the EPROM chip.

7
FAL

EPROM ERASE CHECK

7
FAL

MODE-PROGRAM ERASE CHECK READY

ADDR SET

MODE-PROGRAM ERASE CHECK READY
 ADDRESS-0000

VERIFY

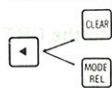
MODE-PROGRAM ERASE CHECK BUSY
 ADDRESS-0000!

End of EPROM erase check

MODE-PROGRAM ERASE CHECK READY
 ADDRESS-0000!

NOTES:

1. The EPROM erase check is executed and completed almost instantaneously. When the EPROM erase check has been completed, the operation control instruction message changes from "BUSY" to "READY" again. If the EPROM has not been erased completely, the erase error will be indicated by the ERROR No. message.
2. To discontinue the EPROM erase check under execution, move the cursor to the Mode position and then depress **CLEAR** key.

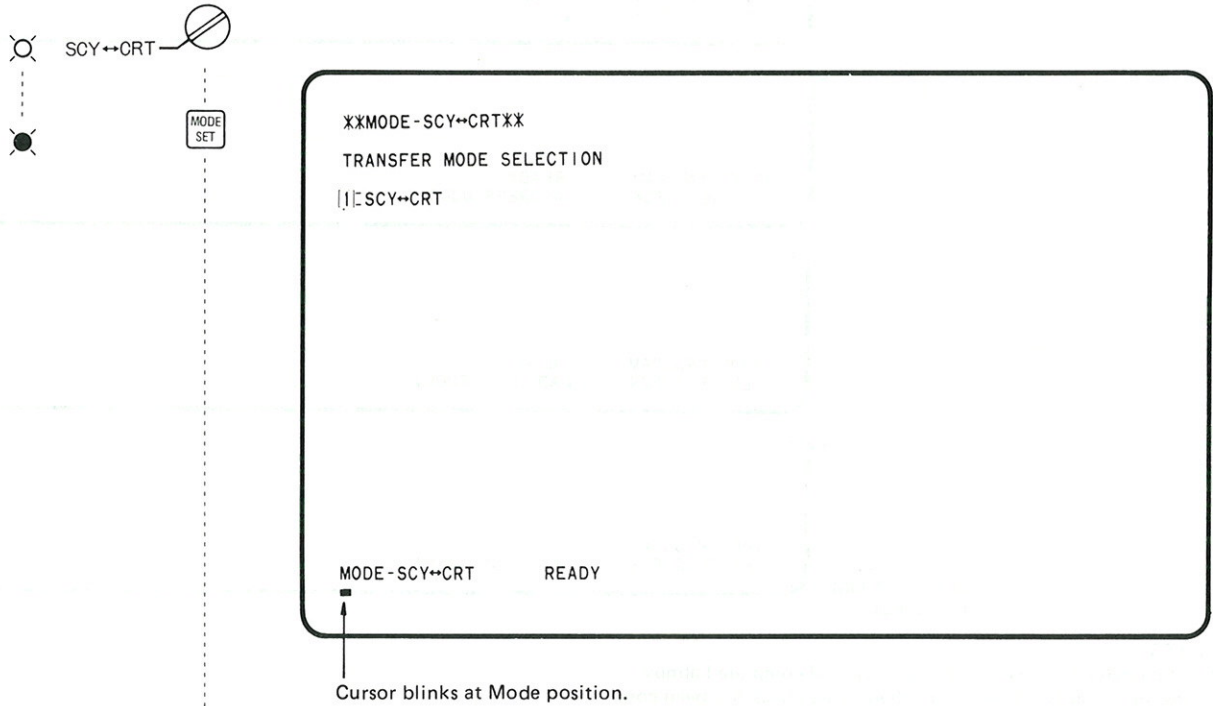


The display changes to the initial display in the "PROGRAM" mode.

This display changes to the initial display for mode selection at the time of power application.

3.5 SCY ↔ CRT (Transfer between SCY-M1R/-M5R and SCY-CRT10)

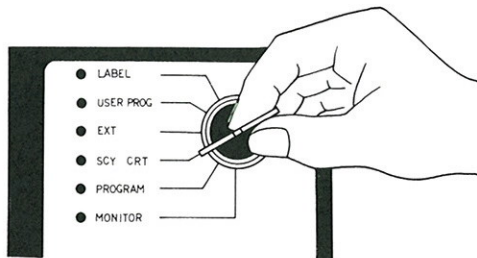
In this mode, data transfer is executed between the SYSMAC-M1R/-M5R program memory and the CRT program memory.



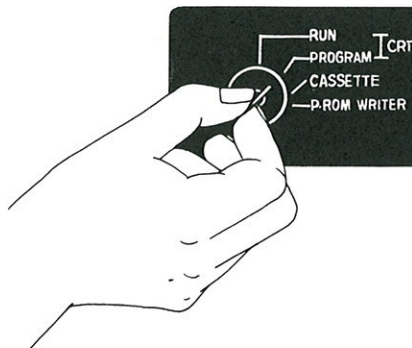
- Transfers the contents of the CRT program memory area to the SCY-M1R/-M5R program memory area.
- Verifies the contents of the CRT program memory area against the contents of the SCY-M1R/-M5R program memroy area.
- Transfers the contents of the SCY-M1R/-M5R program memory area to the CRT program memory area.

- NOTES:**
1. Program transfer from the SCY-CRT10 to the SCY-M1R/-M5R is possible when the SCY-M1R/-M5R is in the PROGRAM mode.
 2. Program transfer from the SCY-M1R/-M5R to the SCY-CRT10 is possible when the SCY-M1R/-M5R is in either the RUN or PROGRAM mode.

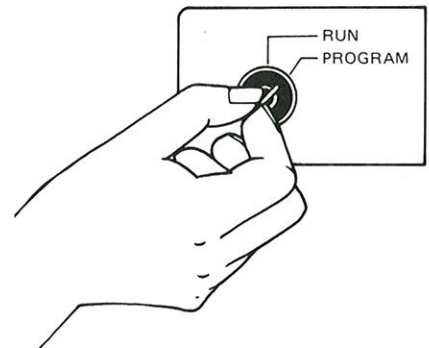
SCY-CRT10-82E



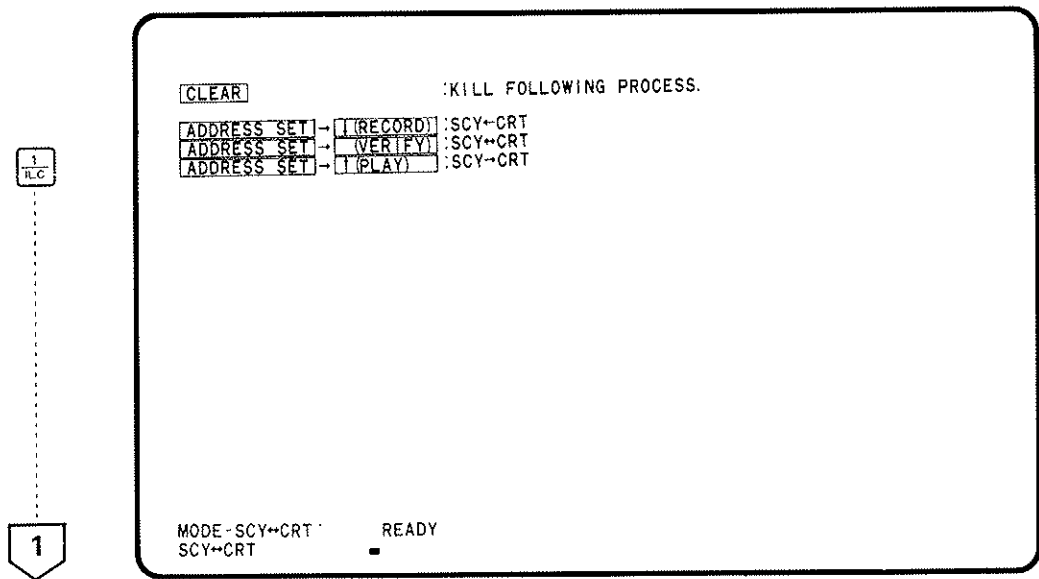
SCY-M1R CPU86E



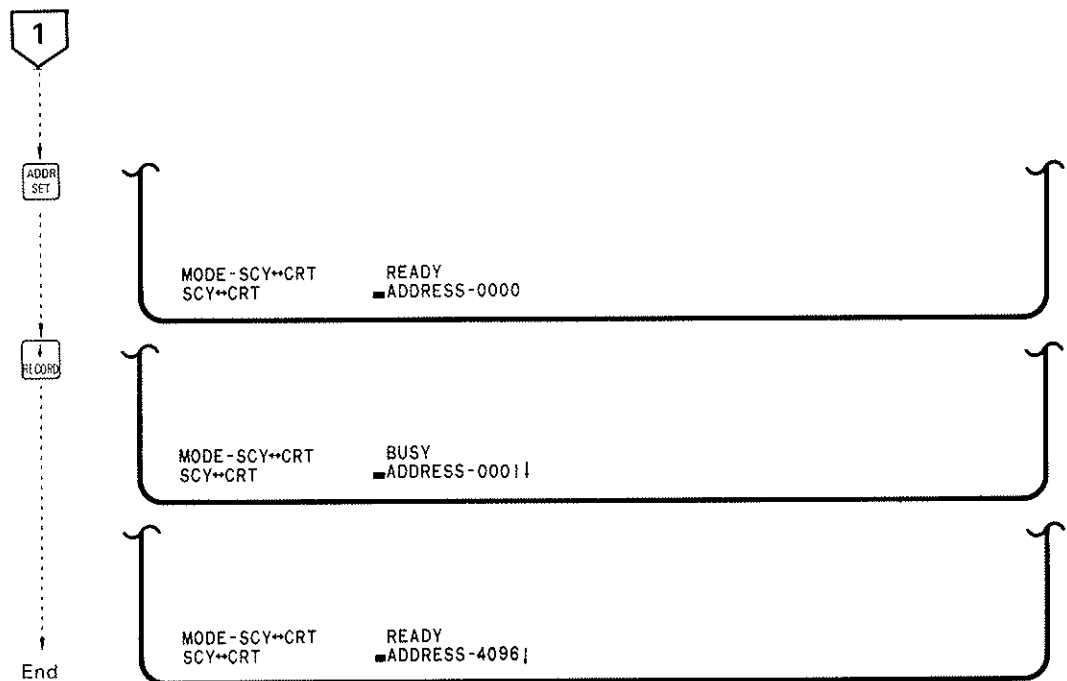
SCY-M5R interface card



1
1/2 TRANSFER BETWEEN SCY-M1R/-M5R PROGRAM MEMORY AND CRT PROGRAM MEMORY



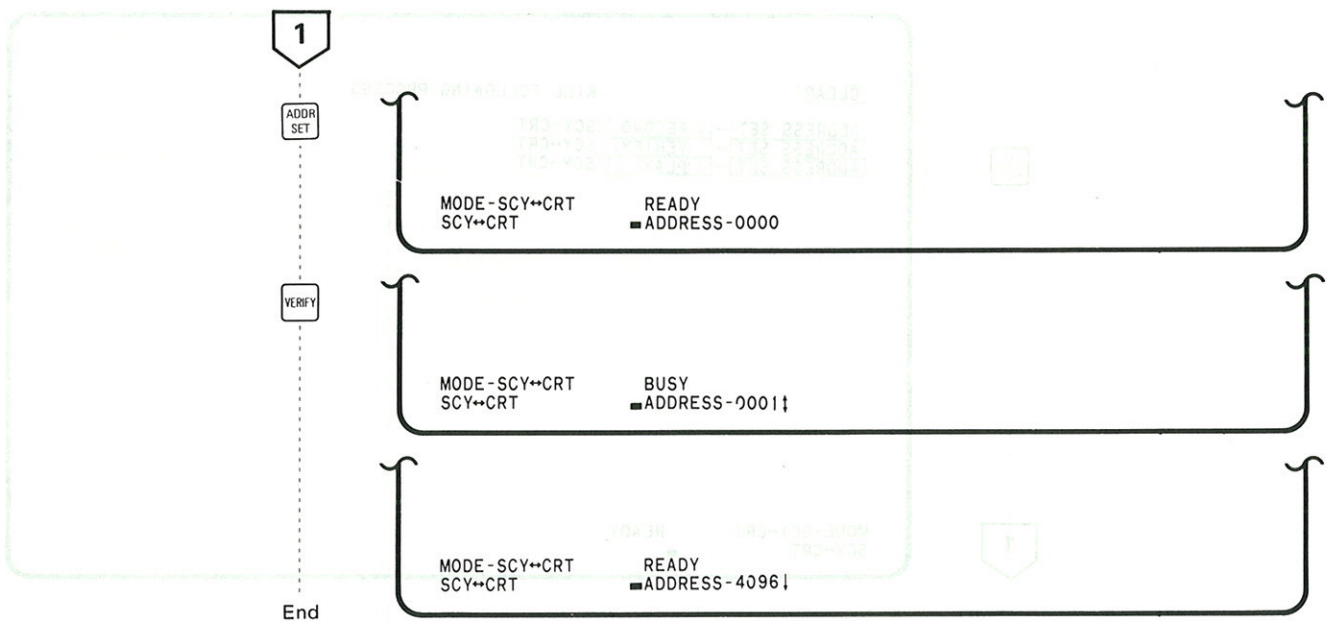
PROGRAM WRITE FROM CRT PROGRAM MEMORY INTO SCY-M1R/-M5R PROGRAM MEMORY



NOTES:

1. Program write operation will be executed upon depression of RECORD key and will be completed instantaneously.
2. Program write operation can be judged as completed when the message in the Status Area changes from "BUSY" to "READY" again.

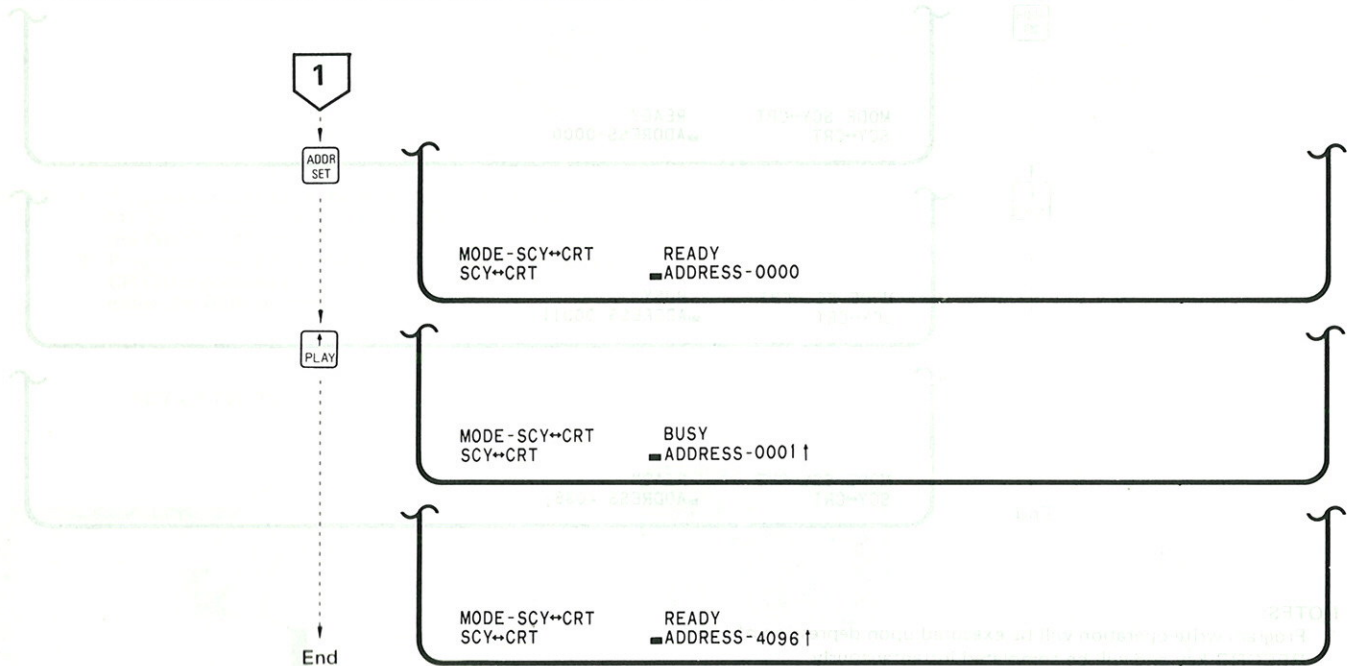
■ PROGRAM VERIFY BETWEEN SCY-M1R/-M5R PROGRAM MEMORY AND CRT PROGRAM MEMORY



NOTES:

1. Program verify operation will be executed upon depression of VERIFY key and will be completed instantaneously.
2. Program verify operation can be judged as completed when the message in the Status Area changes from "BUSY" to "READY" again.

■ PROGRAM READ FROM SCY-M1R/-M5R PROGRAM MEMORY INTO CRT PROGRAM MEMORY

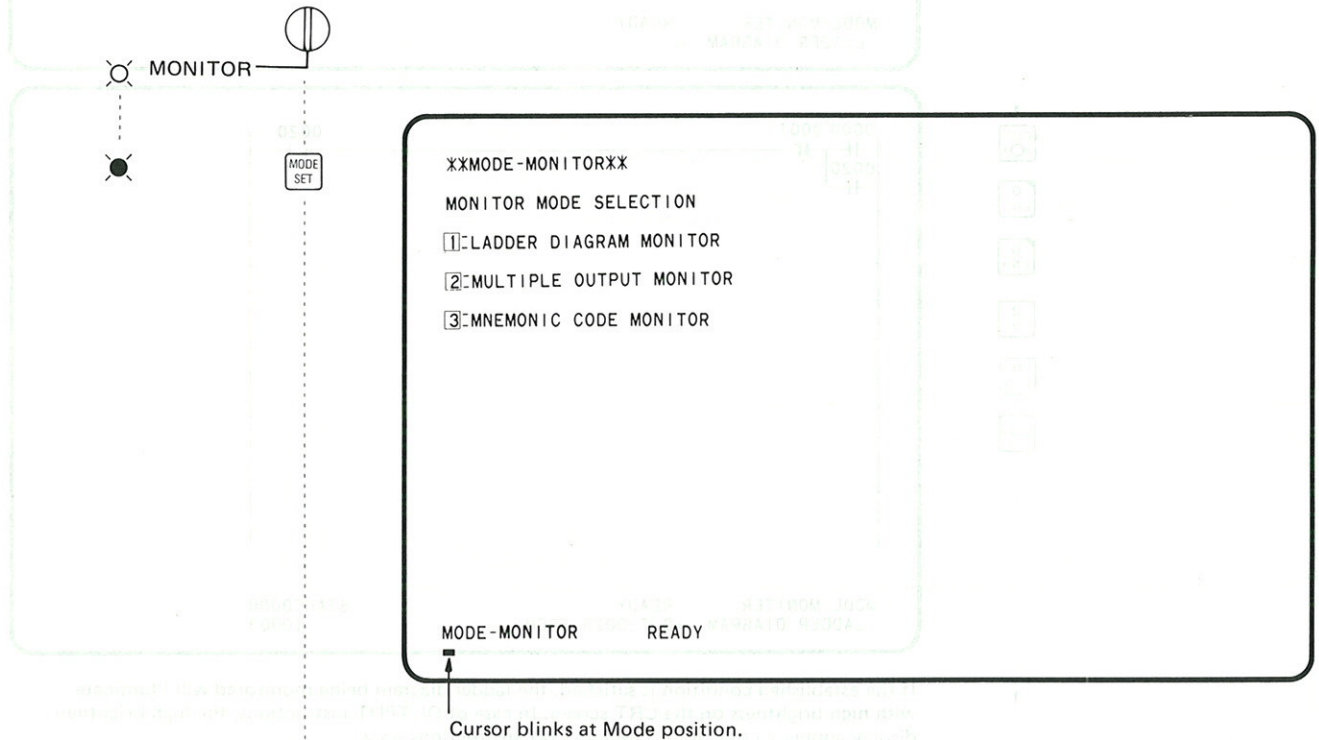


NOTES:

1. Program read operation will be executed upon depression of PLAY key and will be completed instantaneously.
2. Program read operation can be judged as completed when the message in the Status Area changes from "BUSY" to "READY" again.
3. Before this operation, be sure that the Mode Selector switch of the SCY-M1R/-M5R is set to the "PROGRAM" position.

3.6 Monitor

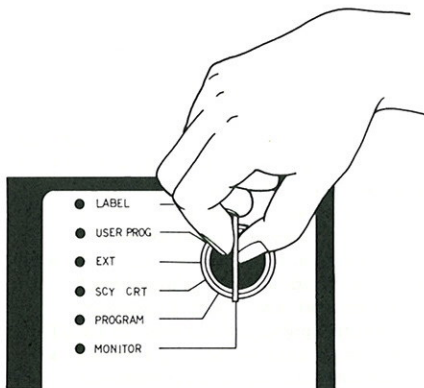
This mode allows the monitoring of the operating state of a program in the CRT program memory area.



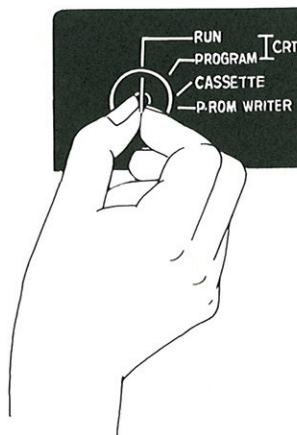
- 1 ILC → Monitors the operating state of a program in the CRT program memory area in the form of a ladder diagram.
- 2 CMP → Monitors the operating states of multiple outputs in a program in the CRT program memory area.
- 3 JME → Monitors the operating state of a program in the CRT program memory area in mnemonic code.

NOTE:
In each monitor mode operation, the same program contents in the CRT program memory as those in the SCY-M1R/-M5R program memory can be monitored.

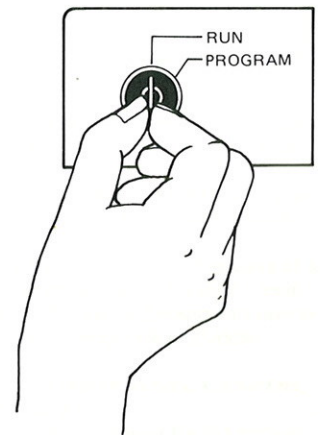
SCY-CRT10-82E



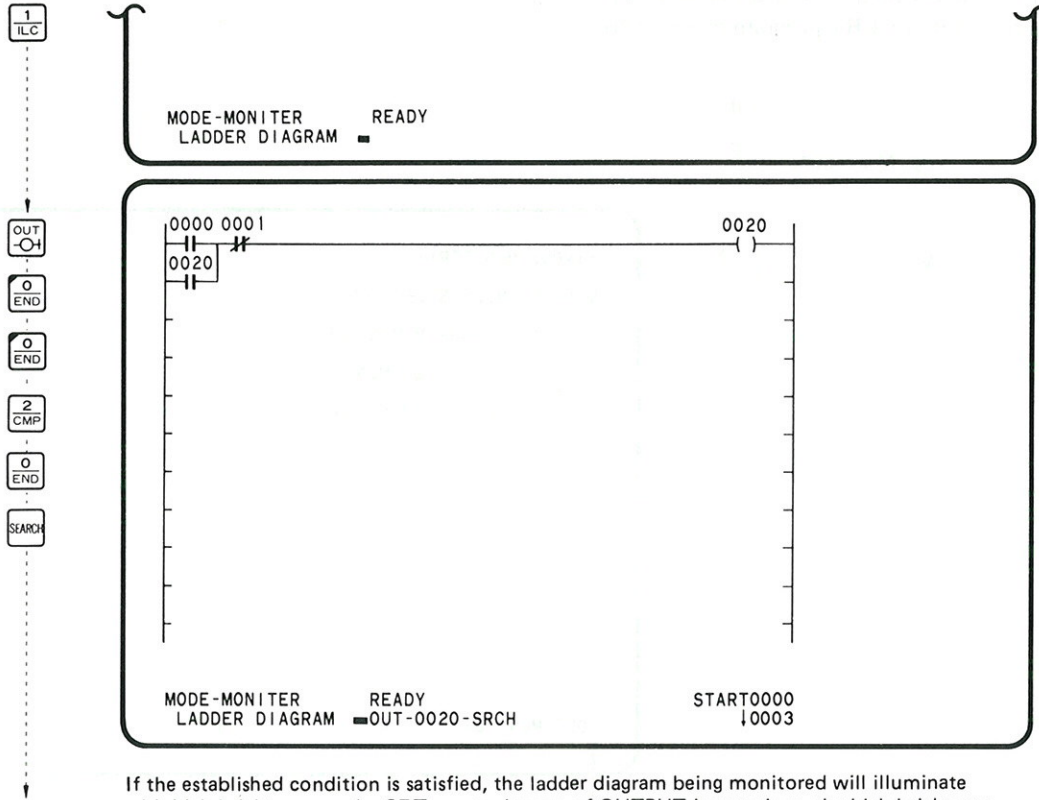
SCY-M1R CPU86E



SCY-M5R interface card



1 LADDER DIAGRAM MONITOR

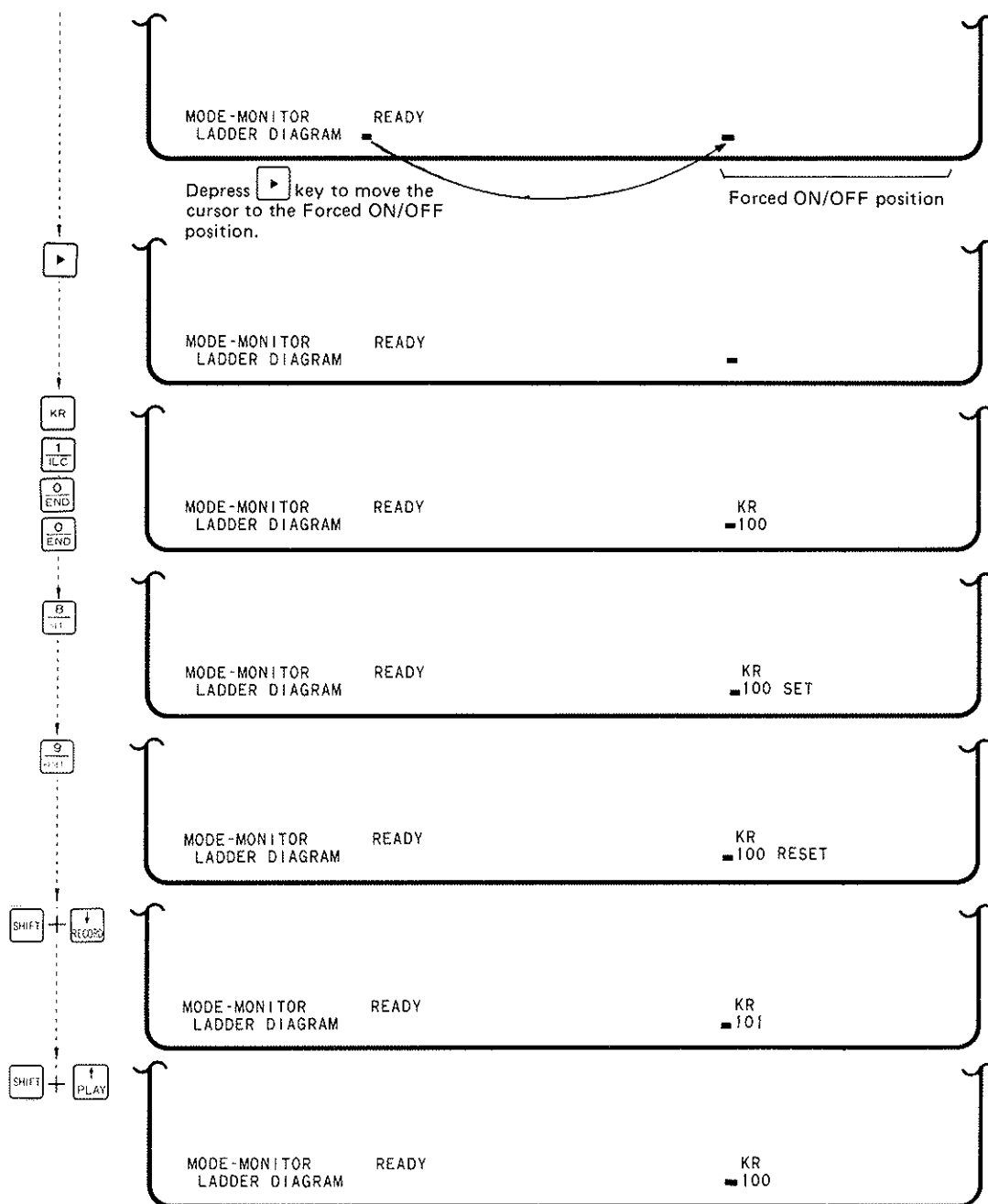


If the established condition is satisfied, the ladder diagram being monitored will illuminate with high brightness on the CRT screen. In case of OUTPUT instructions, the high brightness display applies to the OUT, TIM and CNT instructions only.

- NOTES:**
1. When the output instruction (TIM, CNT or OUT), relay No. and SEARCH key are entered consecutively, the display screen will change.
 2. By operating **RECORD** key, ladder diagram monitor operation can be performed from the beginning of the CRT program memory area.
 3. Ladder diagram monitor operation can be performed by specifying an address. (**ADD/SET** → Address → **SEARCH**).
 4. Ladder diagram monitor operation can be performed by specifying a relay contact. (**IF** → Relay No. → **SEARCH**).
 5. When **←** key is depressed during the monitor operation, the stop motion function is activated, causing the operating state of a relay to be held as is. To release the operating state from the hold state, depress **→** key.

■ FORCED SET/RESET

In the MONITOR mode, a timer, counter, latching relay or shift register can be set or reset by force.

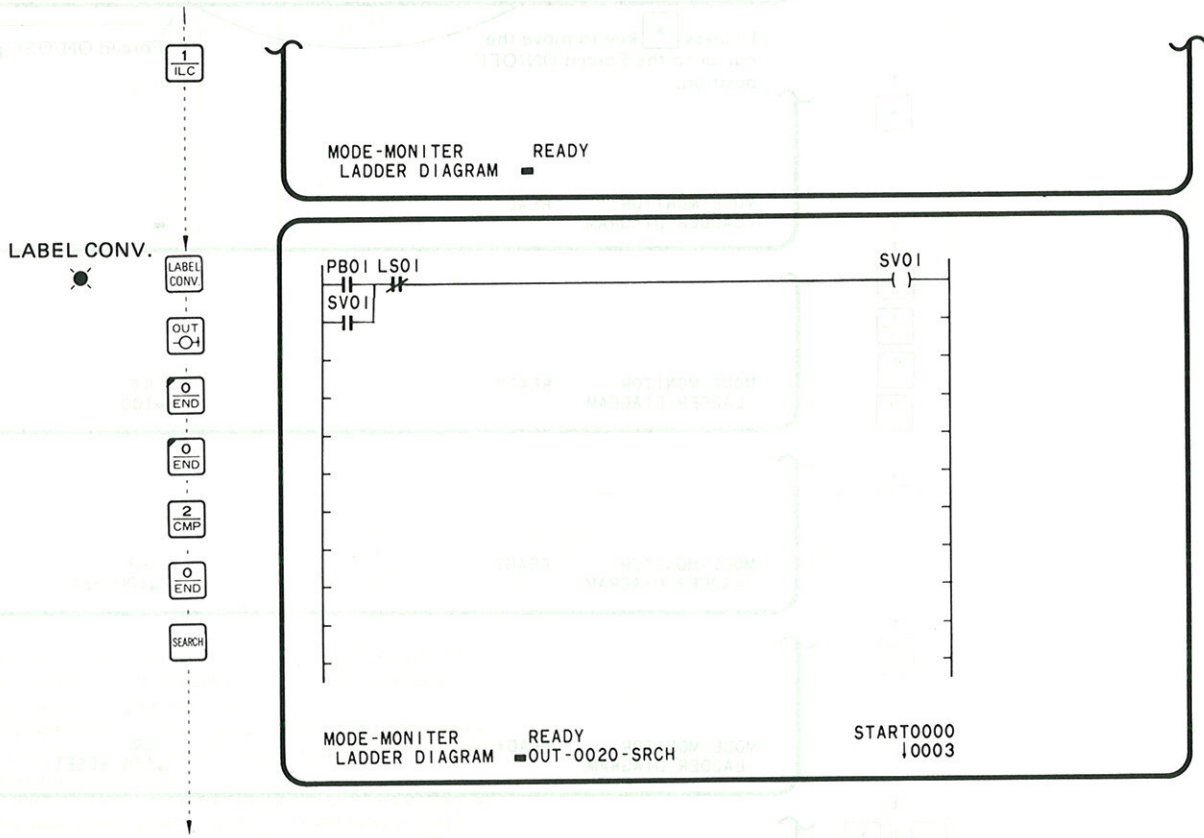


NOTES:

- To set or reset the operating state of a latching relay by force.
 - Depress **0** key and the operating state of the specified latching relay No. will be forced to turn ON and the message "SET" will be displayed.
 - Depress **9** key and the operating state of the specified latching relay No. will be forced to turn OFF and the message "RESET" will be displayed.
- To set or reset the operating state of a timer or counter by force.
 - Depress **0** key and the present (time or count) value of the specified timer or counter No. will be forced to be up and the message "SET" will be displayed.
 - Depress **9** key and the present (time or count) value of the timer or counter No. will be forced to return to the set value and the message "RESET" will be displayed.
- To set or reset the operating state of a shift register bit.
 - Depress **0** key and the operating state of the specified SR bit No. will be forced to turn ON and the message "SET" will be displayed.
 - Depress **9** key and the operating state of the specified SR bit No. will be forced to turn OFF and the message "RESET" will be displayed.
 - Depression of **RECORD** or **PLAY** key will cause the starting address of the shift register being monitored to be incremented or decremented by 1.
- The forced set/reset operation will cause the operating state of a timer, counter, latching relay or shift register to be set or reset only the instant **0** or **9** key is depressed. Subsequent operation will be as programmed in the sequence circuit (ladder diagram).
- The forced set/reset operation is applicable to timers, counters, latching relays and shift registers only.
- The SET and RESET messages will be displayed for 0.1 second.
- The forced set/reset function will not work unless the cursor is at the Forced ON/OFF position.
- Depress of **SHIFT** and **RECORD** keys or **SHIFT** and **PLAY** keys will cause the specified relay No. to be incremented or decremented by 1.

■ LABEL CONVERSION

The LABEL CONV. key is used when the programmed ladder diagram is to be displayed on the CRT screen by the system label numbers (e.g., PB01) which have been stored in program memory in place of relay numbers in the LABEL mode. The LABEL CONV. indicator will illuminate when the LABEL CONV. key is depressed and will go off when the key is depressed again.



NOTES:

1. A ladder diagram will appear on the CRT screen as shown above if system label numbers have been registered. (Refer to ■ LABEL WRITE in 3.9, Label.)
2. The label conversion function is useful in the ladder diagram monitor operation (in the MONITOR mode) or when a programmed ladder diagram is to be output on printer (in the EXT mode).
3. The LABEL CONV. indicator will illuminate when the LABEL CONV. key is depressed and will go off when the LABEL CONV. key is depressed again. To discontinue the label conversion operation under execution, depress CLEAR key.

2 MULTIPLE OUTPUT MONITOR

MNEMONIC CODE MONITOR

2
CMP

MODE-MONITER READY
MULTIPLE OUTPUT

OUT
O

0
END

0
END

2
CMP

0
END

SEARCH



003-OUT 0020
| |
Address Output
 instruction

MODE-MONITER READY
MULTIPLE OUTPUT OUT-0020-SRCH

START0003
↓0003

If the established condition is satisfied, the output instruction being monitored will illuminate with high brightness on the CRT screen.

NOTES:

1. The multiple output monitor operation is applicable to output instructions (OUT, TIM and CNT) only.
2. A maximum of 16 outputs can be monitored consecutively.
3. When  key is depressed during the monitor operation, the stop motion function is activated, causing the operating state of the output being monitored to be held as is. To release the operating state from the hold state, depress the  key.

3 JME MNEMONIC CODE MONITOR

3
JME

MODE-MONITOR READY
 MNEMONIC CODE ■

OUT
O

0
END

0
END

2
CMP

0
END

SEARCH

```








0000
00-LD - -0000      20-
01-OR - -0020      21-
02-AND NOT-0001    22-
03-OUT -0020       23-
04-END -           24-
05-                25-
06-                26-
07-                27-
08-                28-
09-                29-
10-                30-
11-                31-
12-                32-
13-                33-
14-                34-
15-                35-
16-                36-
17-                37-
18-                38-
19-                39-
                40-
                41-
                42-
                43-
                44-
                45-
                46-
                47-
                48-
                49-
                0-
                1-
                2-
                3-
                4-
                5-
                6-
                7-
                8-
                9-
  
```

MODE-MONITOR READY
 MNEMONIC CODE ■ OUT-0020 SRCH

START0000
 10049

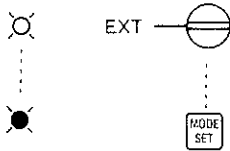
If the established condition is satisfied, the data being monitored will illuminate with high brightness. In case of OUTPUT instructions, high brightness display applies to the TIM, CNT and OUT instructions only.

NOTES:

1. When the output instruction (TIM, CNT or OUT), relay No. and SEARCH key are entered consecutively, the display screen will change.
2. By operating  key, mnemonic code monitor operation can be performed from the beginning of the user program.
3. Mnemonic code monitor operation can be performed by specifying an address in the program ( → Address → ).
4. Mnemonic code monitor operation can be performed by specifying a relay contact in the program ( → Relay No. → ).
5. When  key is depressed during the monitor operation, the stop motion function is activated, causing the operating state of a relay to be held as is. To release the operating state from the hold state, depress  key.

3.7 EXT

This mode allows data transfer between the SCY-CRT10 and an external RS-232C compatible device such as a printer.



```

XXMODE-EXTXX
EXT MODE SELECTION
[1]: PROGRAM (LADDER DIAGRAM)  --PRINTER
[2]: PROGRAM (MNEMONIC CODE)  --PRINTER
[3]: LISTING                    --PRINTER
[4]: LABEL                      --PRINTER
[5]: USER PROGRAM              --PRINTER
[6]: PROGRAM (LADDER DIAGRAM)  --X-Y PLOTTER *

MODE-EXT      READY
    
```

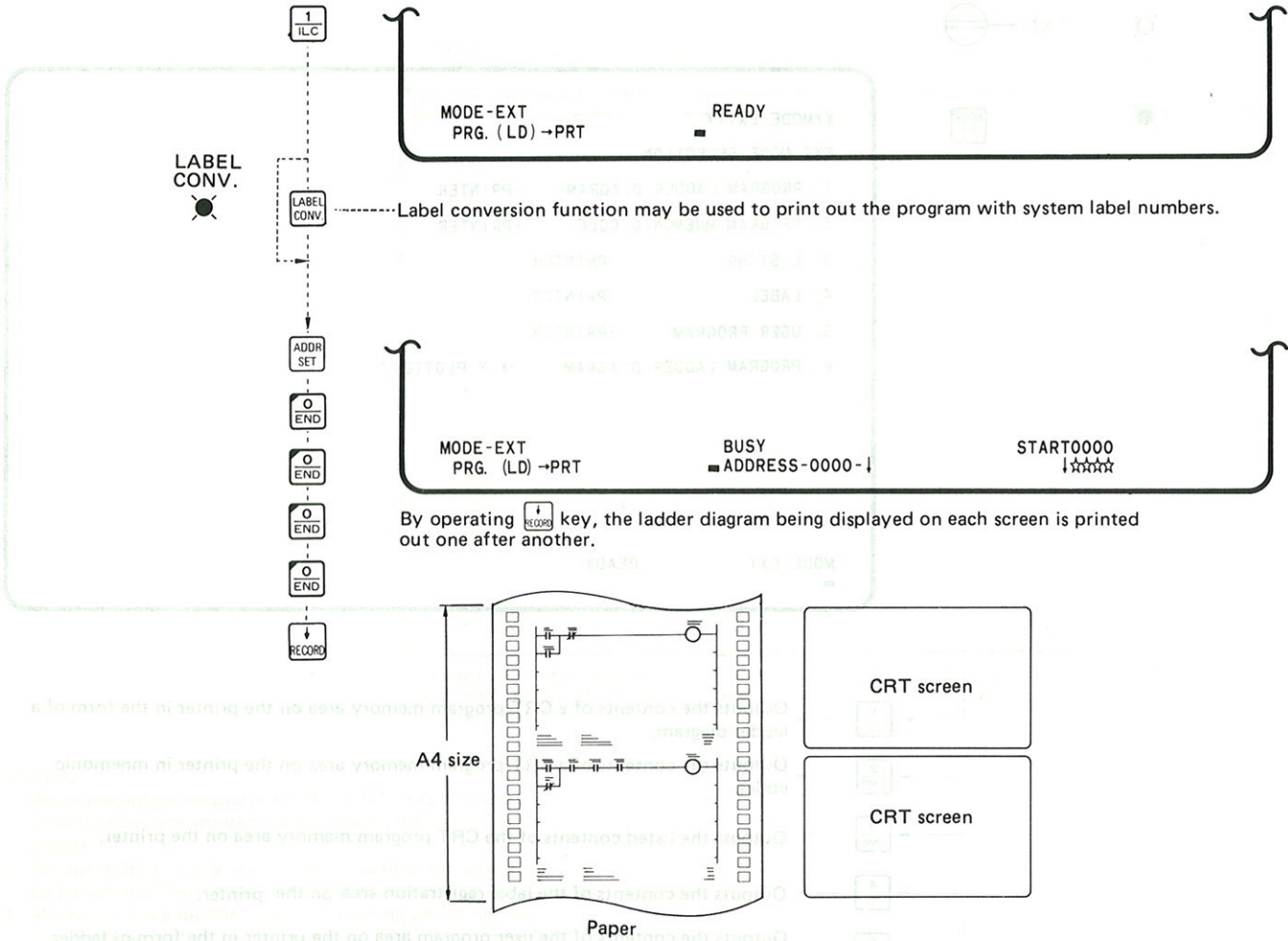
- [1] ILC → Outputs the contents of a CRT program memory area on the printer in the form of a ladder diagram.
- [2] CMP → Outputs the contents of a CRT program memory area on the printer in mnemonic codes.
- [3] JME → Outputs the listed contents of the CRT program memory area on the printer.
- [4] IL → Outputs the contents of the label registration area on the printer.
- [5] MOV → Outputs the contents of the user program area on the printer in the form of ladder diagram.
- [6] JMP → Outputs the contents of a CRT program on the X-Y plotter in the form of a ladder diagram.*

NOTE:

* This function is available only for the version destined for the Japanese market.

PROGRAM (LADDER DIAGRAM) → PRINTER

In this operation, the contents of a program in the CRT program area are output on the printer in the form of a ladder diagram.



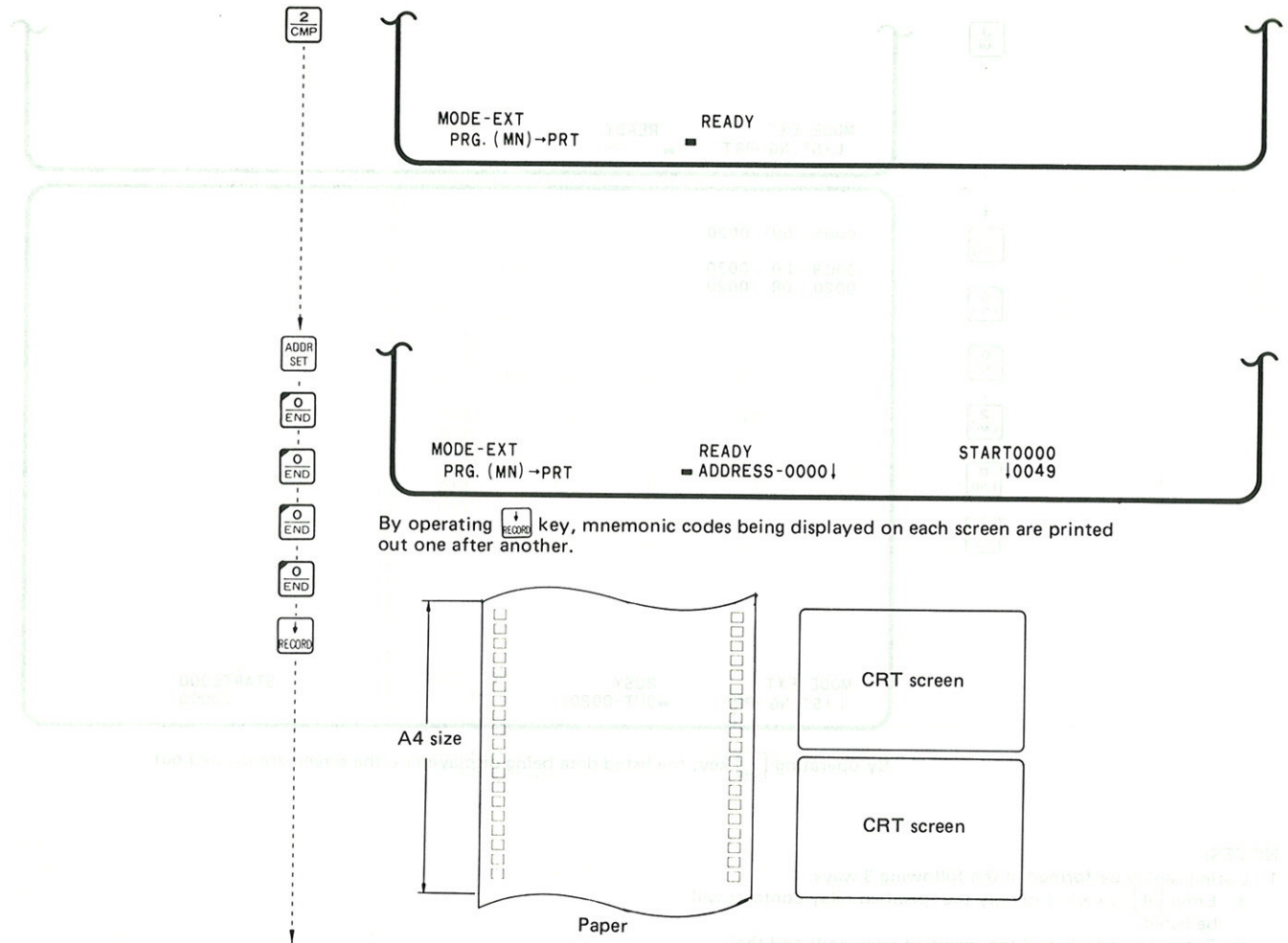
By operating **RECORDS** key, the ladder diagram being displayed on each screen is printed out one after another.

NOTES:

1. Operate **RECORDS** key to print out ladder diagrams continuously until the end of the program.
2. If the printing is to be discontinued, depress **CLEAR** key and the printer will stop upon completion of printing the data being displayed on the screen when **CLEAR** key is depressed.

PROGRAM (MNEMONIC CODE) → PRINTER

In this operation, the contents of a program in the CRT program area are output on the printer in mnemonic codes.

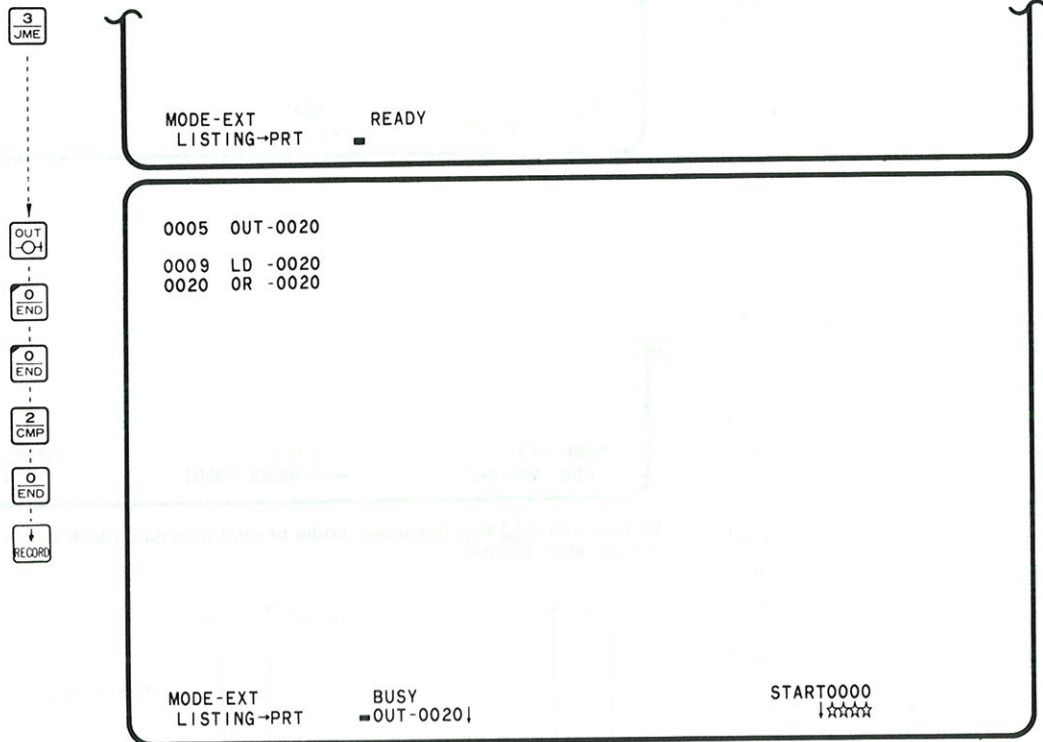


NOTES:

1. Operate **RECORD** key to print out mnemonic codes continuously until the end of the program.
2. If the printing is to be discontinued, depress **CLEAR** key and the printer will stop upon completion of printing the data being displayed on the screen when **CLEAR** key is depressed.

3 LISTING → PRINTER

In this operation, the listed contents of programs in the CRT program area are output on the printer.



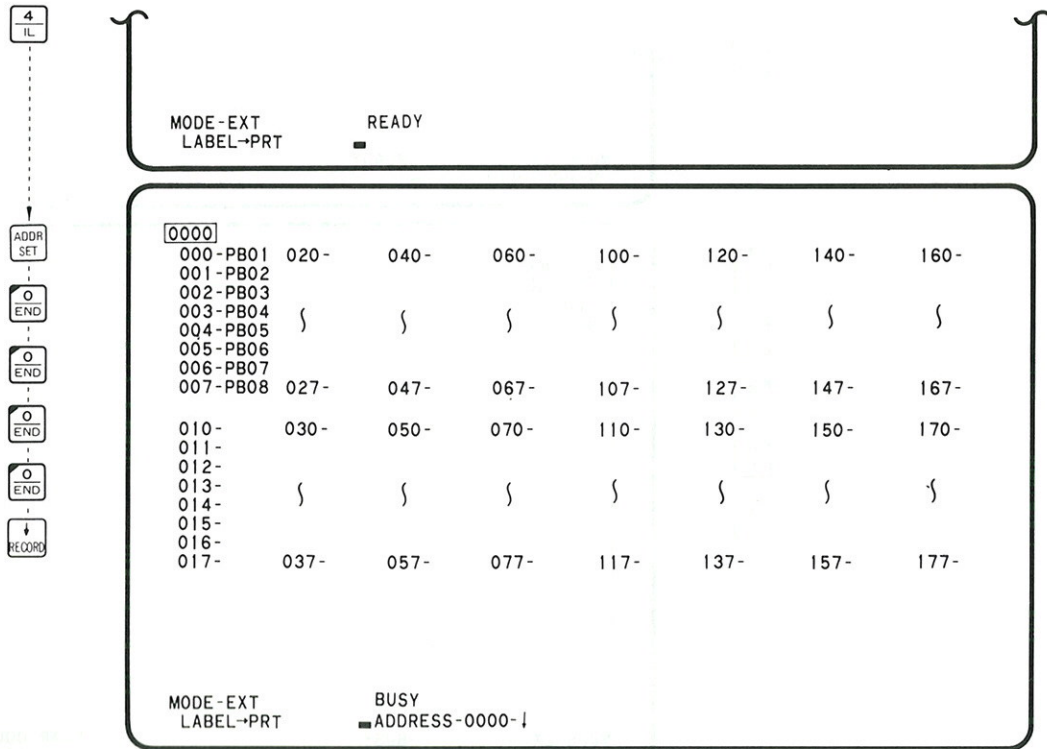
By operating **RECORD** key, the listed data being displayed on the screen are printed out.

NOTES:

1. Listing can be performed in the following 3 ways.
 - Enter **←H** XXXX and only the specified relay contacts will be listed.
 - Enter **OUT** XXXX and the specified relay coils and their corresponding relay contacts will be listed. (The similar listing will be provided for TIM, CNT, KR and SR.)
 - Enter **OUT** and all the relay coils will be listed. (The similar listing will be provided for TIM, CNT, KR and SR.)
2. Operate **RECORD** key and the listed data will be printed out continuously until the end of the listing.
3. If the printing is to be discontinued, depress **CLEAR** key and the printer will stop upon completion of printing the data being displayed on the screen when **CLEAR** is depressed.

4 LABEL → PRINTER

In this operation, the contents of the label registration area are printed out.



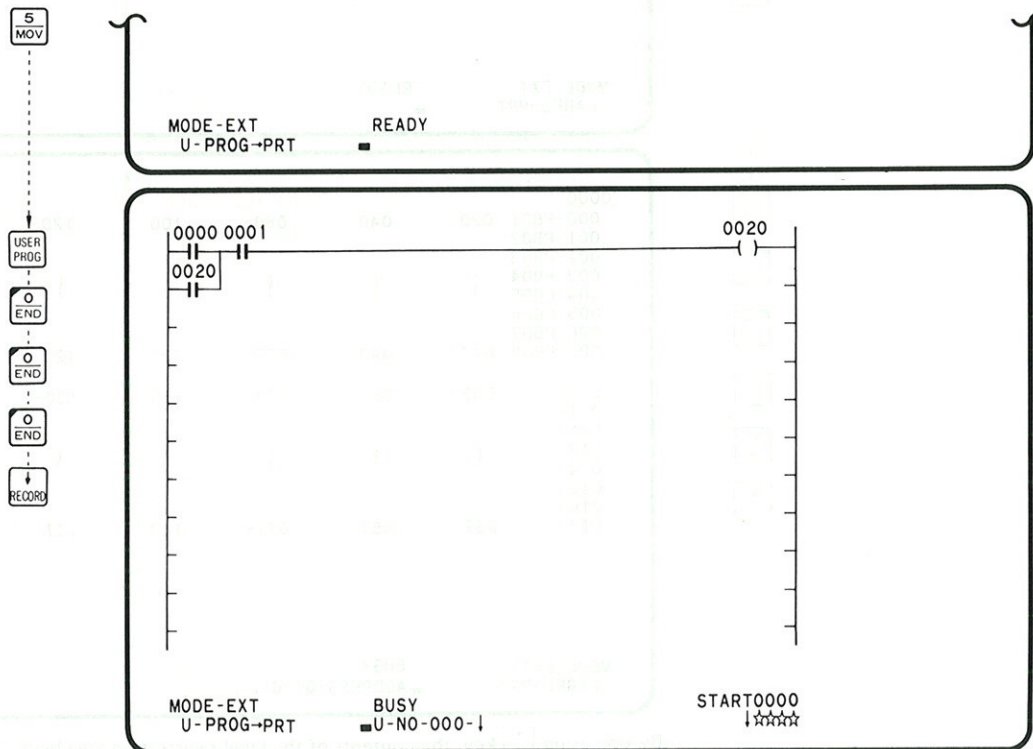
By operating **RECORD** key, the contents of the label registration area being displayed on the screen are printed out.

NOTES:

1. If no system label number is defined, only relay numbers will be printed out.
2. Operate **RECORD** key and the contents of the label registration area will be printed out continuously up to the last relay number in the memory for which a system label number has been registered.
3. If the printing is to be discontinued, depress **CLEAR** key and the printer will stop upon completion of printing the data being displayed on the screen when **CLEAR** key is depressed.

5 MOV USER PROGRAM → PRINTER

In this operation, the contents of the user program (standard circuit) area will be printed out in the form of a ladder diagram.



By operating **RECORD** key, the user program (standard circuit) being displayed on the screen is printed out.

NOTES:

1. Operate **RECORD** key and the contents of the user program area will be printed out continuously.
2. If the printing is to be discontinued, depress **CLEAR** key and the printer will stop upon completion of printing the data being displayed on the screen when **CLEAR** is depressed.

MEMORY CLEAR

3.8 User Program

This mode allows the generation of a user program (standard circuit) in the form of a ladder diagram.



MEMORY CLEAR

MODE-USER PROGRAM READY

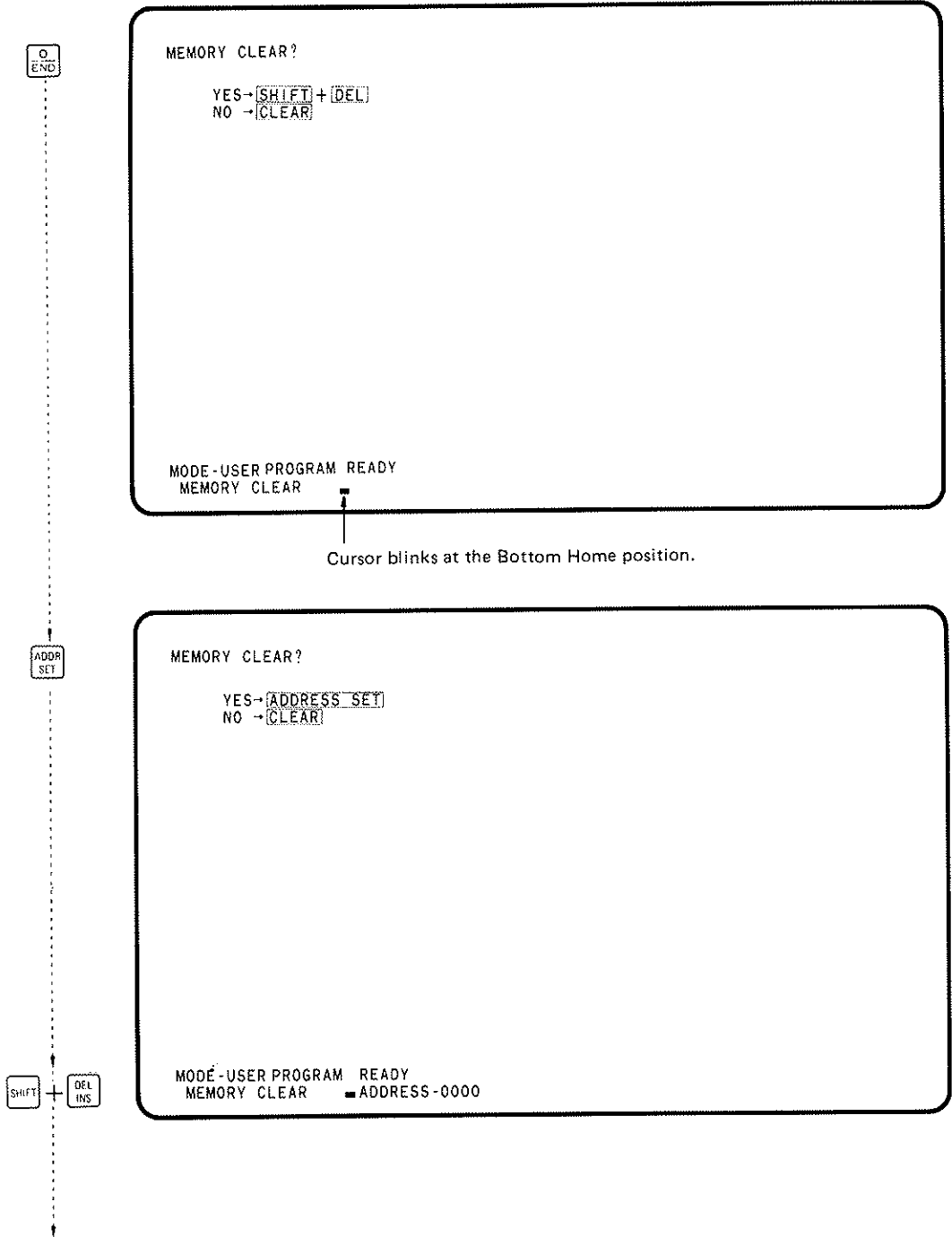
Cursor blinks at the Mode position.

```

** MODE-USER PROGRAM **
USER PROGRAM MODE SELECTION
[0] MEMORY CLEAR
[1] LADEER DIAGRAM PROGRAM
[2] USER PROGRAM-CASSETTE
[3] USER PROGRAM-EPROM CHIP
[4] EPROM ERASE CHECK
    
```

- [0] END → Clears all the contents of the user program area.
- [1] ILC → Generates a user program in the form of a ladder diagram.
- [2] CMP → Executes the data write, data verify or data read between the user program area and the cassette tape recorder.
- [3] JME → Executes the data write, data verify, or data read between the user program area and the EPROM chip (2716).
- [4] IL → Executes the EPROM erasure check.

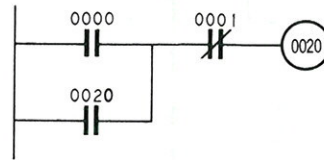
 MEMORY CLEAR



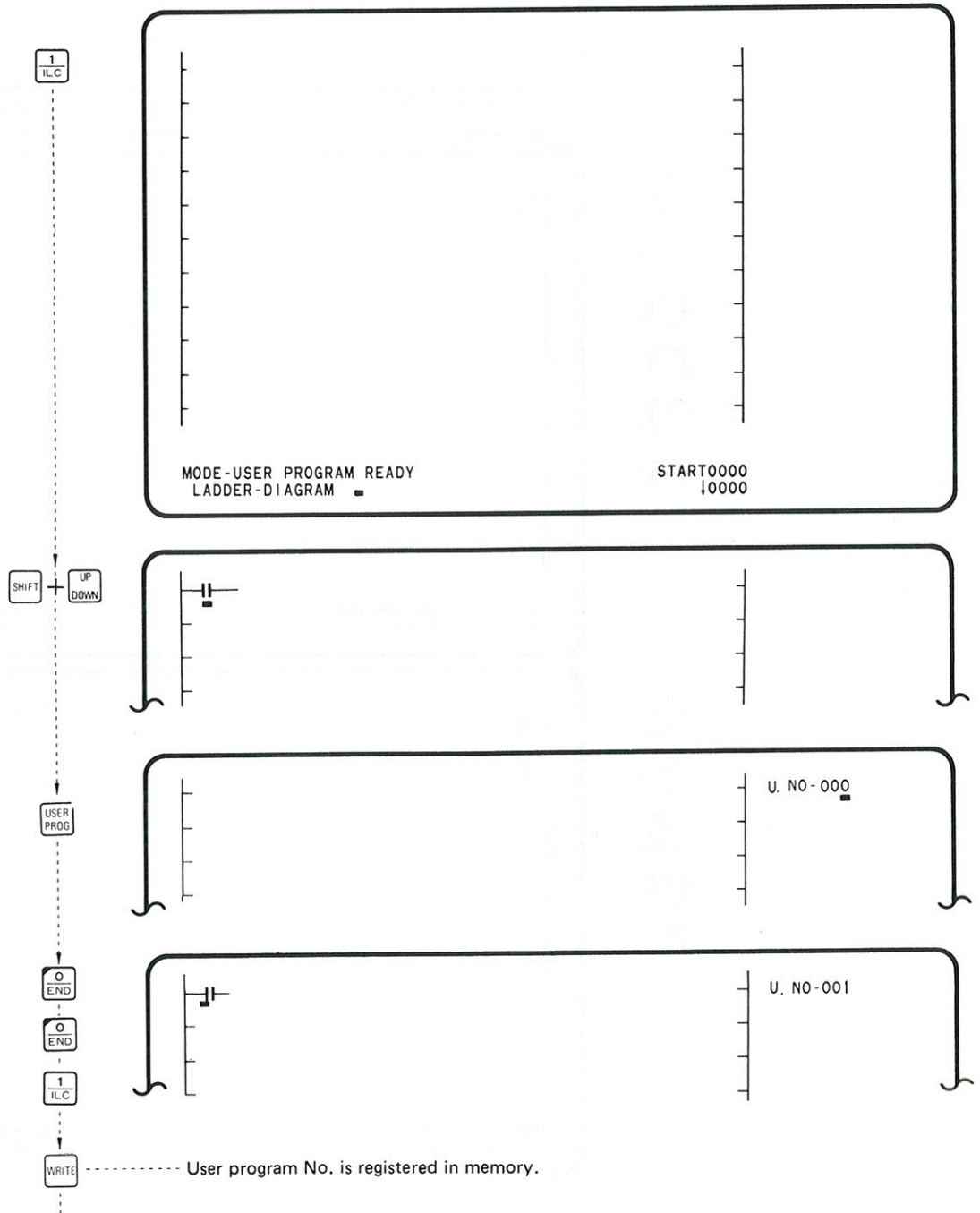
After the memory clear operation, the CRT display will return to the initial display in the USER PROGRAM mode.

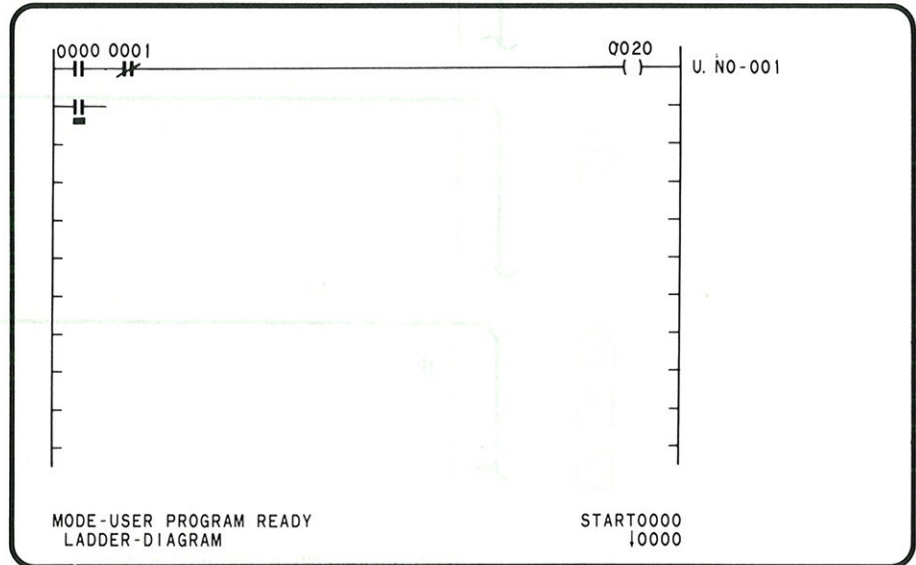
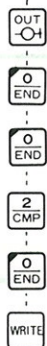
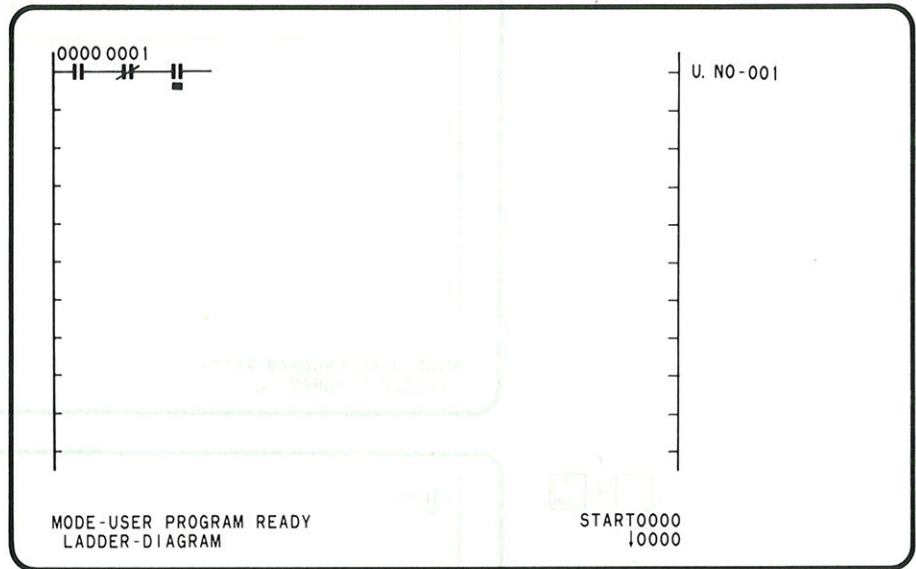
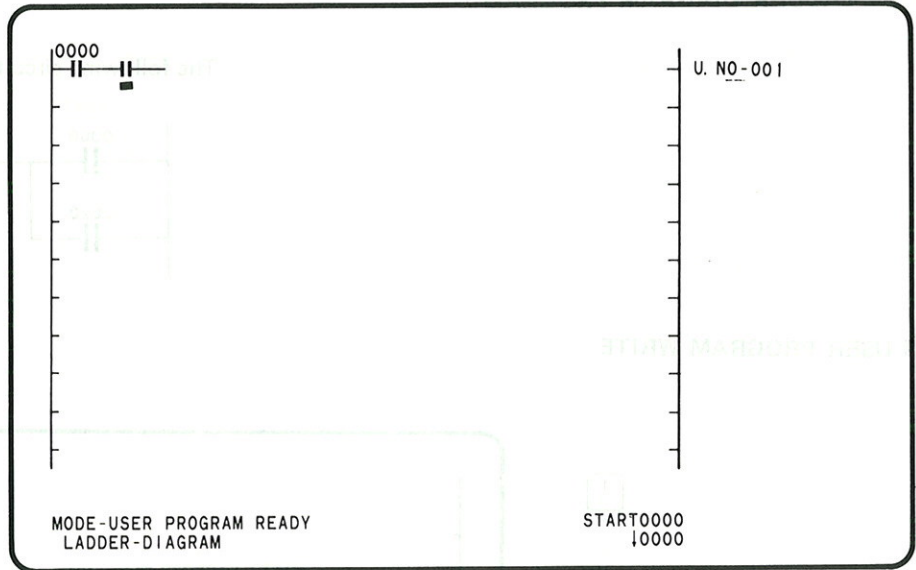
1 ILC LADDER DIAGRAM PROGRAM

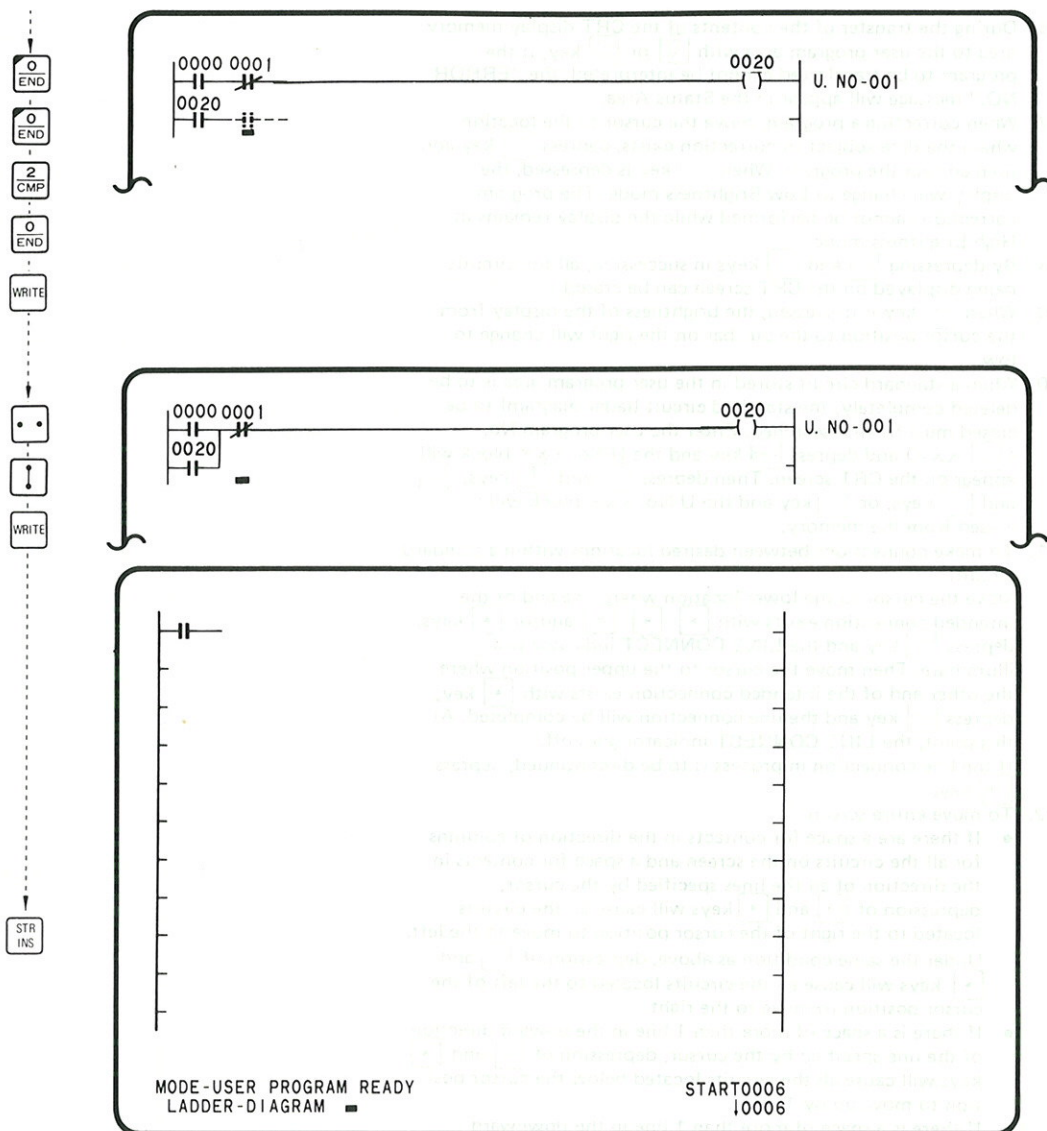
The following circuit diagram will be programmed.



■ USER PROGRAM WRITE





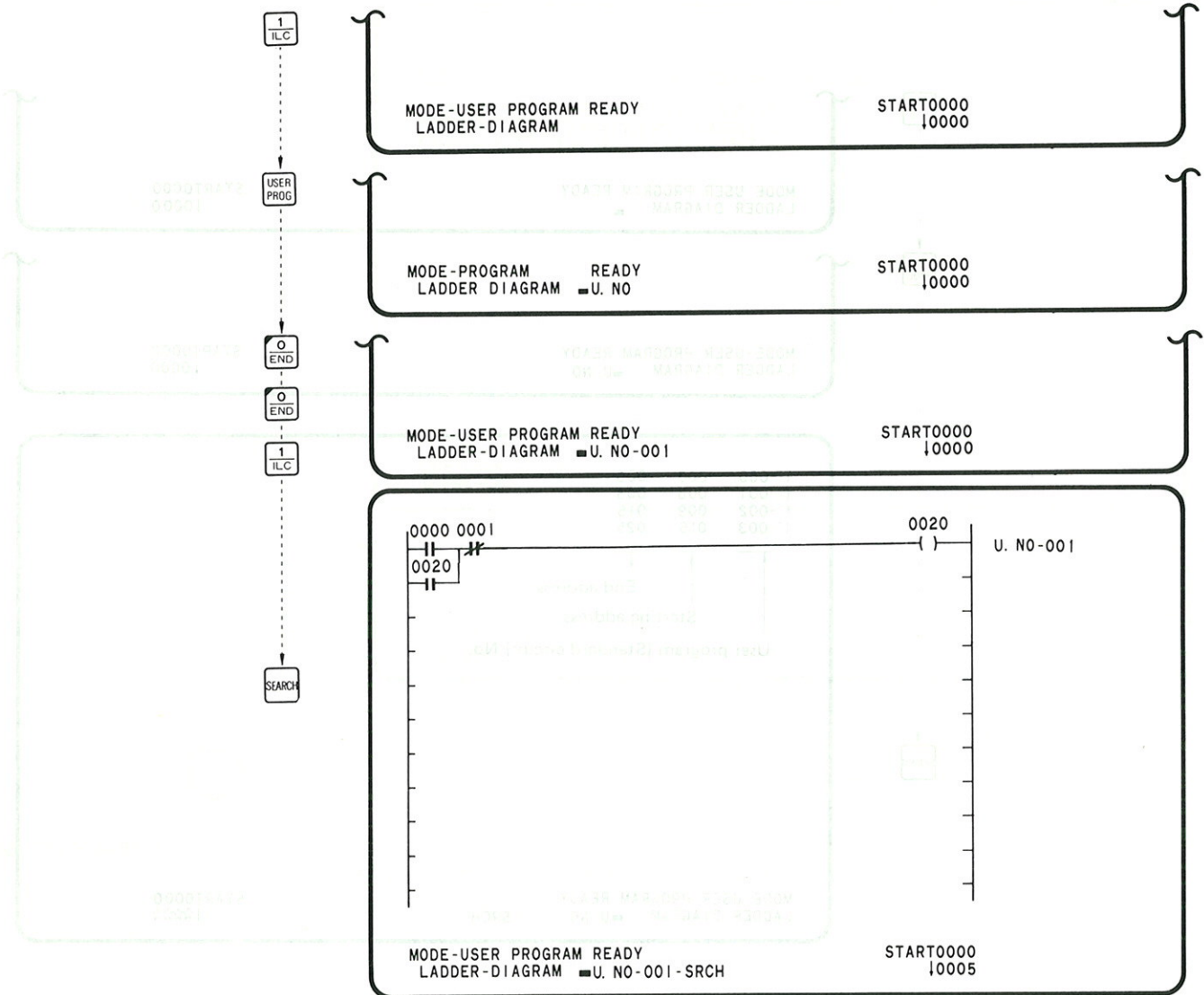


NOTES:

1. Entry or correction of data can be performed only at the location where the cursor will appear.
2. Use , , and keys to move the cursor.
3. To enter a relay number, use ~ keys. The digits of the number will shift to the left at each digit entry.
4. In the data write operation, the display is at low brightness before depressing key but will change to High Brightness mode upon depression of key and the cursor will automatically move to the next character position.
5. If the relay number entered is found to be incorrect when key is depressed, the buzzer issues a pip sound three times, the display remains in Low Brightness mode and the cursor will not move, thus inhibiting the data write.
6. key is used for branch point connection and is effective only for connection in the upward direction. However, if the key is used on the uppermost line of the screen, the buzzer issues a pip sound three times, thus inhibiting the data write.
7. key is used for branch point opening and is effective only for opening in the upward direction. However, if the key is used on the uppermost line of the screen, the buzzer issues a pip sound three times, thus inhibiting the data write.
8. key is used to short-circuit (or remove) a contact.
9. key is used to open a line.
10. The maximum number of circuits that can be written on a screen is 11 contacts + 1 output coil x 11 lines.
11. 11 contacts can be written horizontally (per line). However, if any output instruction key is depressed before entering all the 11 contacts, the output coil automatically moves to the output position. At this position, depression of key causes the display to change to high brightness mode and the cursor moves to the beginning of the next row.
12. TR instruction will be automatically added when or key is depressed after writing or correcting a program for one screen.
13. and keys function to transfer the contents of the CRT display memory area to the user program area. During the data transfer, the operation control instruction message in the Status Area will change from "READY" to "WAIT" and then return to "READY" again. Upon completion of the data transfer, a circuit programmed at the next address will be shown on the CRT screen. In the absence of any written program at the next address, a bus bar will be displayed on the CRT screen.
14. When the contents of the CRT display memory area are to be transferred to the user program area, key is used to add program(s) by inserting them from the address XXXX shown on the address display "START XXXX → ΔΔΔΔ" in the Status Area.
15. When the contents of the CRT display memory area are to be transferred to the user program area, key is used to correct the program(s) stored previously by writing correct program(s) from the address XXXX shown on the address display "START XXXX → ΔΔΔΔ" in the Status Area.

16. During the transfer of the contents of the CRT display memory area to the user program area with **STR MS** or **STR COR** key, if the program to be transferred cannot be interpreted, the "ERROR NO." message will appear in the Status Area.
17. When correcting a program, move the cursor to the location where the data subject to correction exists, depress **DISP HALT** key and then correct the program. When **DISP HALT** key is depressed, the display will change to Low Brightness mode. The program correction cannot be performed while the display remains in High Brightness mode.
18. By depressing **SHIFT** and **DEL** keys in succession, all the circuits being displayed on the CRT screen can be erased.
19. When **LINE DIM** key is depressed, the brightness of the display from the cursor position to the bus bar on the right will change to low.
20. When a standard circuit stored in the user program area is to be deleted completely, the standard circuit (ladder diagram) to be erased must be first searched. Enter the user program No. (**USER PRG** XXX) and depress **SEARCH** key and the U No. XXX block will appear on the CRT screen. Then depress **SHIFT** and **UP DOWN** keys, **SHIFT** and **DEL** keys, or **STR COR** key and the U No. XXX block will be erased from the memory.
21. To make connections between desired locations within a standard circuit:
 Move the cursor to the lower location where one end of the intended connection exists with **▶**, **◀**, **▼** and/or **▲** keys, depress **LINE CON** key and the LINE CONNECT indicator will illuminate. Then move the cursor to the upper position where the other end of the intended connection exists with **▲** key, depress **WRITE** key and the line connection will be completed. At this point, the LINE CONNECT indicator goes off.
 If the line connection in process is to be discontinued, depress **CLEAR** key.
22. To move entire screen:
 - If there are a space for contacts in the direction of columns for all the circuits on the screen and a space for contacts in the direction of all the lines specified by the cursor, depression of **SHIFT** and **◀** keys will cause all the circuits located to the right of the cursor position to move to the left.
 Under the same condition as above, depression of **SHIFT** and **▶** keys will cause all the circuits located to the left of the cursor position to move to the right.
 - If there is a space of more than 1 line in the upward direction of the line specified by the cursor, depression of **SHIFT** and **▲** keys will cause all the circuits located below the cursor position to move up by 1 line.
 - If there is a space of more than 1 line in the downward direction of the line specified by the cursor, depression of **SHIFT** and **▼** keys will cause all the circuits located above the cursor position to move down by 1 line.

■ USER PROGRAM READ

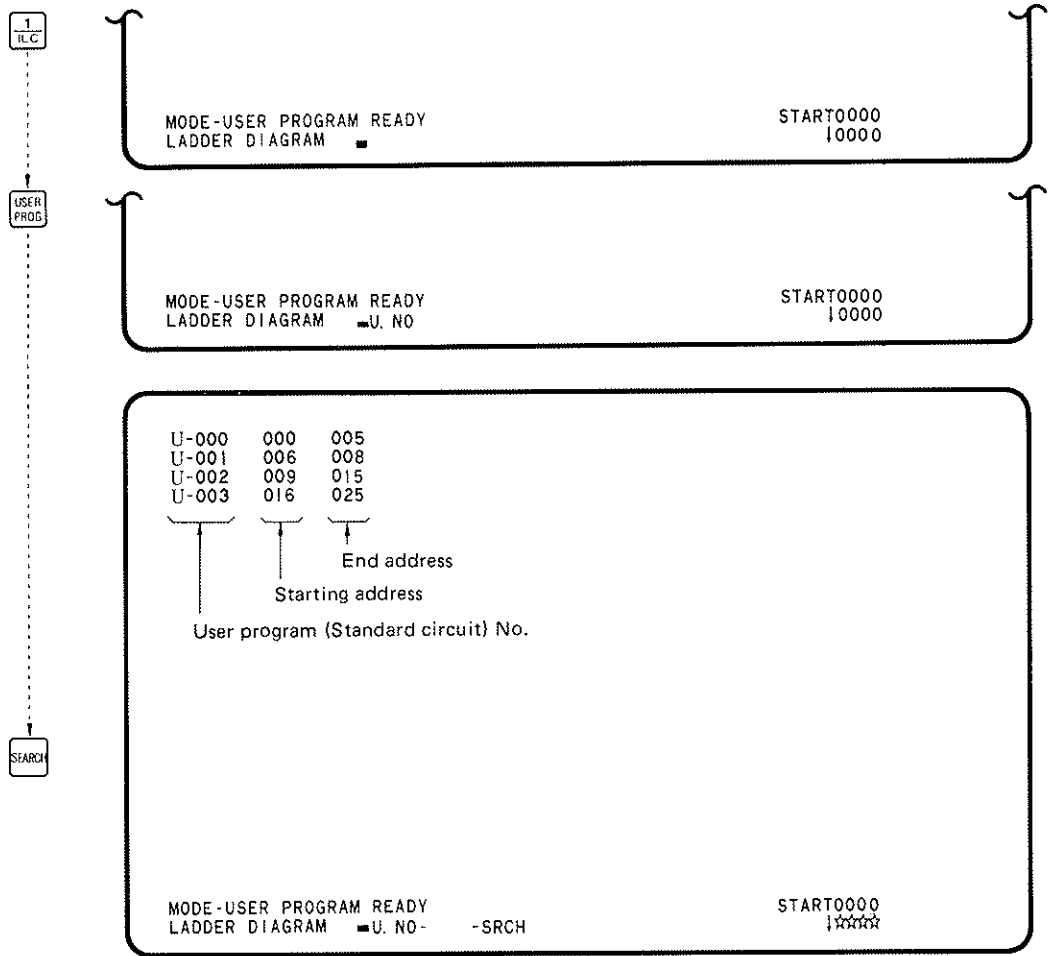


NOTES:

1. If the USER PROGRAM read operation is attempted by specifying the user program (standard circuit) No. not stored in memory, the error message "ERROR-06" indicating Block No. Error will appear on the CRT screen.
2. Only one user program No. can be read at any one time.
3. USER PROGRAM read operation is valid only when the cursor is at the Bottom Home position.
4. User programs (standard circuits) that cannot be interpreted by the CRT CPU will be displayed in mnemonic language. A maximum of 50 steps can be displayed per screen.
5. Should any instructions that cannot be interpreted by the CRT CPU exist, such instructions will be displayed in machine language (i.e., hexadecimal).

■ LISTING OF USER PROGRAM NUMBERS

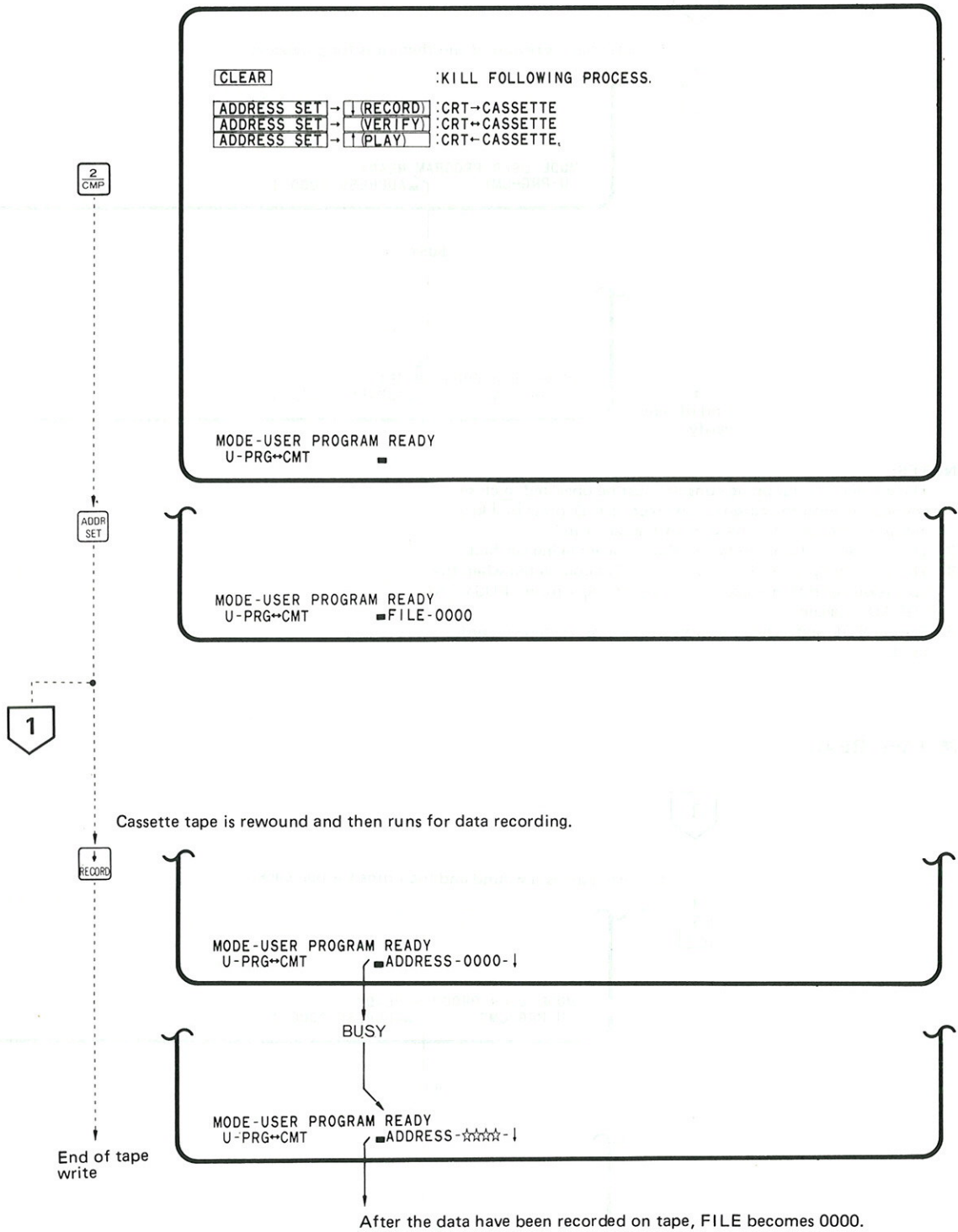
All the addresses of user program (standard circuit) numbers can be listed as follows.



NOTES:


- 1,000 user program (standard circuit) numbers can be used from 000 to 999.
- If the number of listed data to be displayed per screen exceeds 50, the next 50 listed numbers will be displayed on the CRT screen upon depression of **SHIFT** and **END** keys, or **SEARCH** key.
- U. in the U. No. stands for "User Program" (namely, standard circuit).

2 CMP USER PROGRAM ↔ CASSETTE

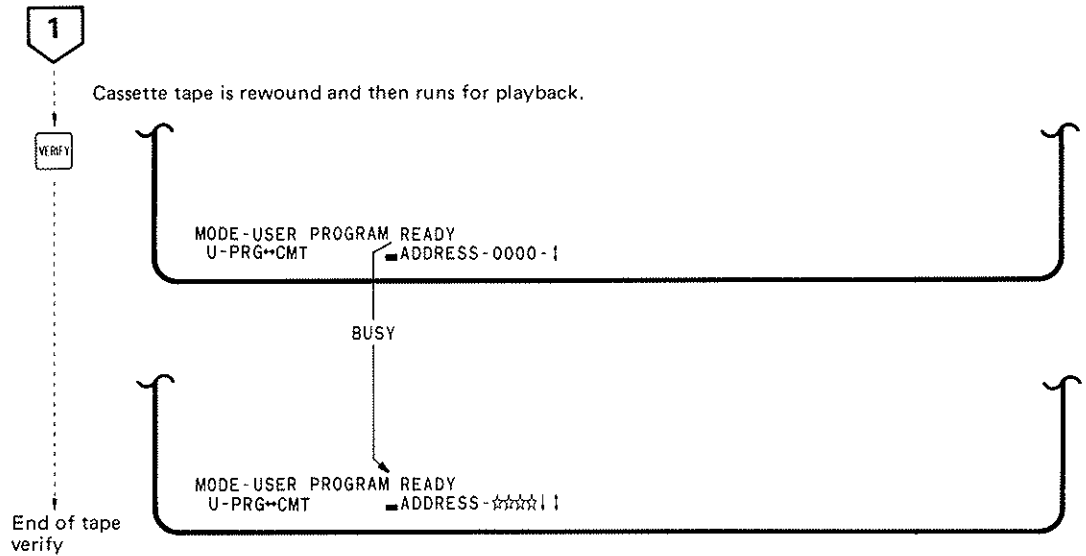


■ TAPE WRITE

NOTES:

1. The graphic programming console must be operated in close connection with the cassette tape recorder. Depress  key within 5 seconds after the start of the tape run.
2. The message "BUSY" indicates that data is being recorded on the tape.
3. The tape write operation can be judged as completed when the operation control instruction message changes from "BUSY" to "READY" again.

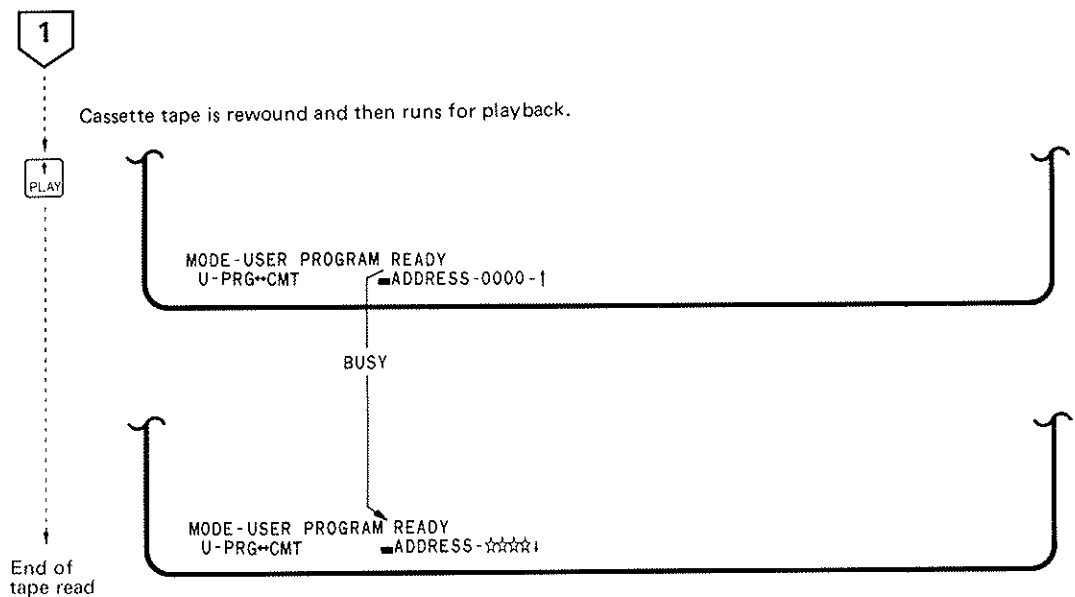
■ TAPE VERIFY



NOTES:

1. The graphic programming console must be operated in close connection with the cassette tape recorder. Depress **VERIFY** key within 5 seconds after the start of the tape run.
2. The message "BUSY" indicates that data are being verified.
3. The tape verify operation can be judged as completed when the operation control instruction message changes from "BUSY" to "READY" again.
4. Set the VOL and TONE controls of the cassette tape recorder to MAX.

■ TAPE READ

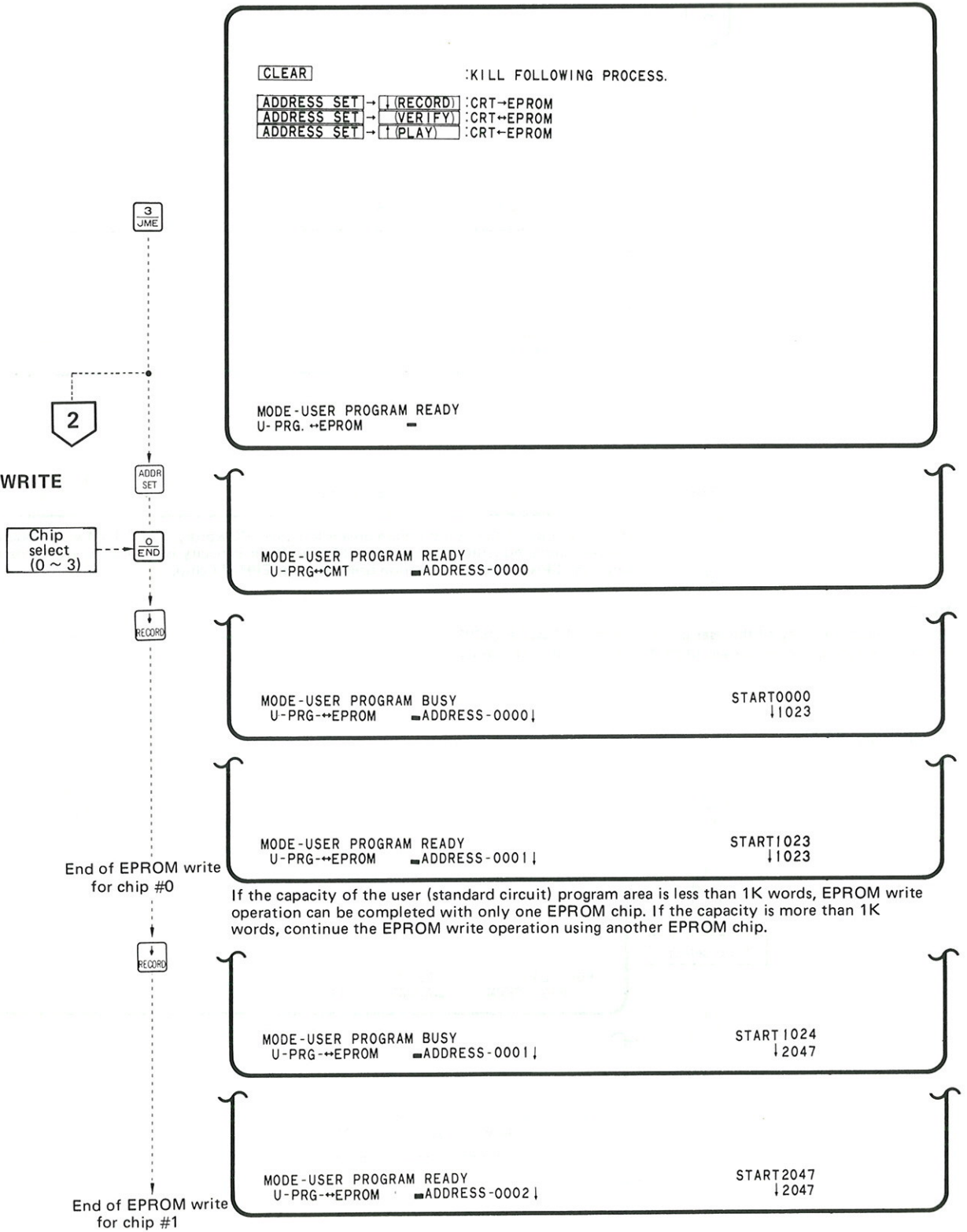


NOTES:

1. The graphic programming console must be operated in close connection with the cassette tape recorder. Depress **PLAY** key within 5 seconds after the start of the tape run.
2. The message "BUSY" indicates that data is being read.
3. The tape read operation can be judged as completed when the operation control instruction message changes from "BUSY" to "READY" again.
4. Set the VOL and TONE controls of the cassette tape reader to MAX.

3 JME USER PROGRAM ↔ EPROM CHIP

■ EPROM WRITE

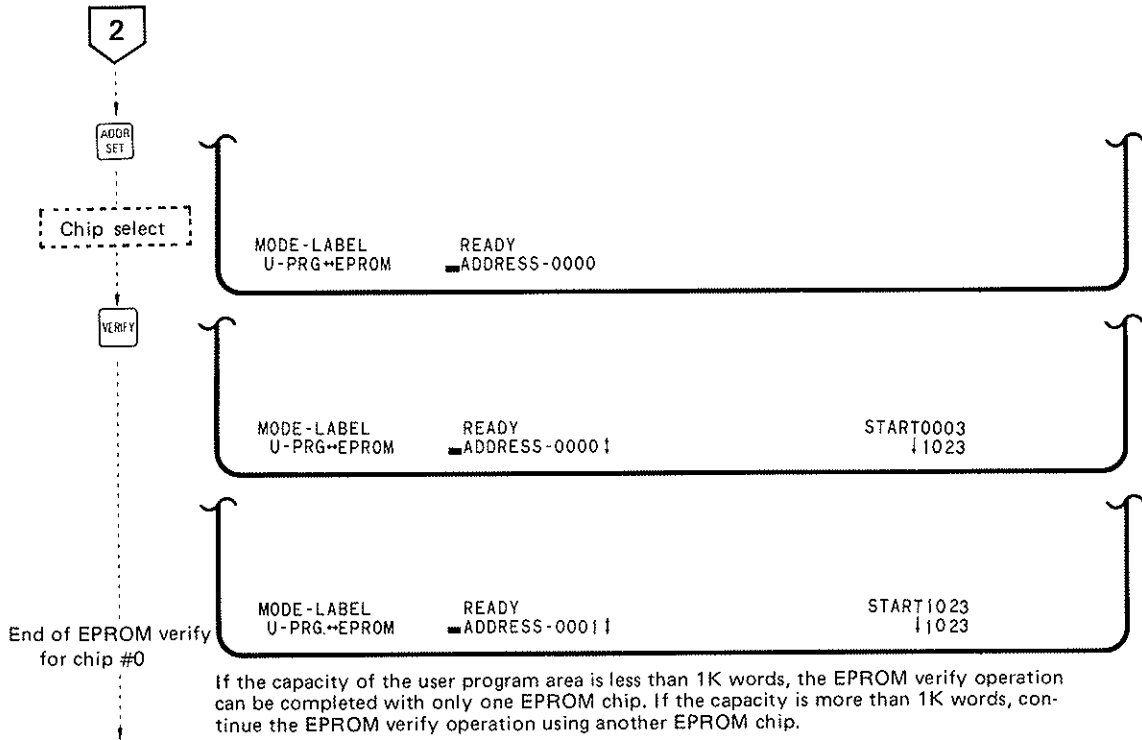


If the capacity of the user (standard circuit) program area is less than 1K words, EPROM write operation can be completed with only one EPROM chip. If the capacity is more than 1K words, continue the EPROM write operation using another EPROM chip.

NOTES:

1. The maximum capacity of the user program area is 4K words and the capacity of each EPROM chip (2716) is 1K words.
2. Be sure to perform the EPROM verify operation after writing the program data into the EPROM chip.

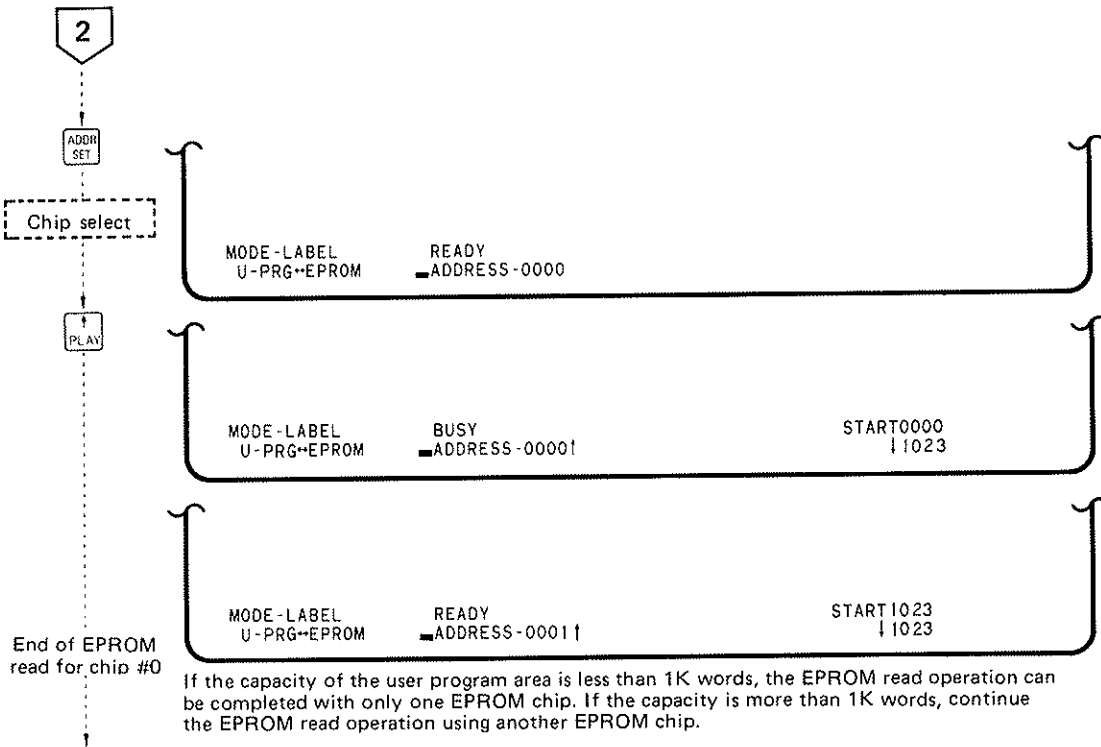
■ EPROM VERIFY



NOTE:


The maximum capacity of the user program area is 4K words (0000 ~ 4095) and the capacity of each EPROM chip (2716) is 1K words.

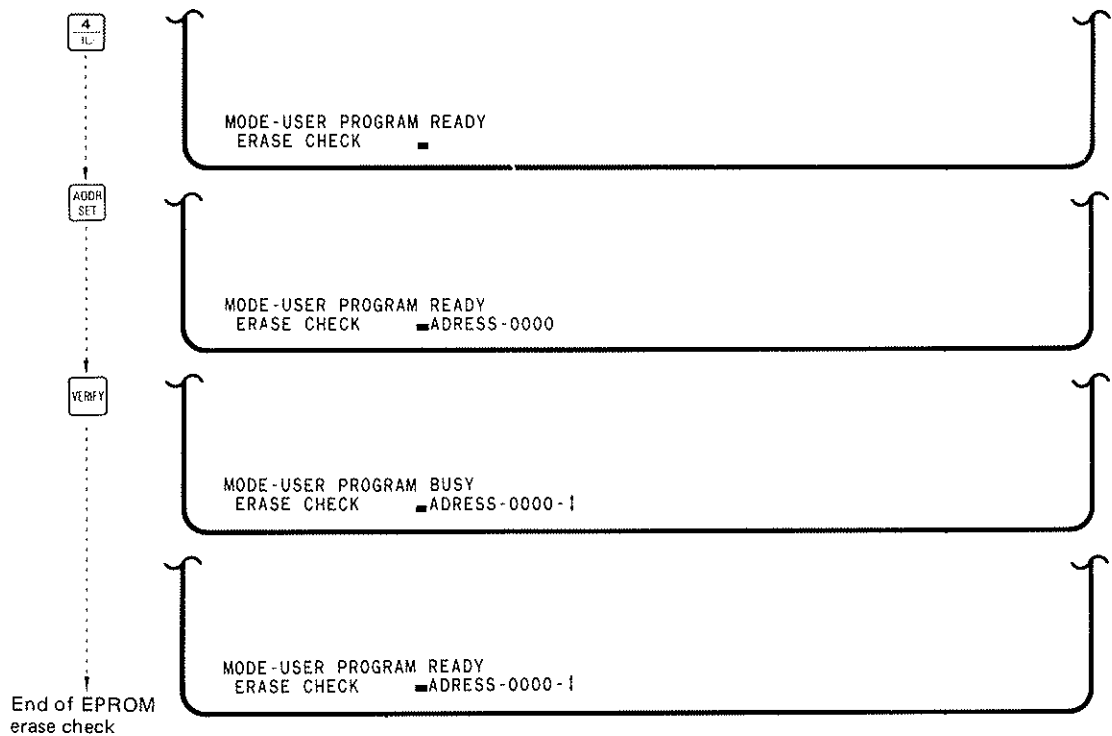
■ EPROM READ








NOTE:

The maximum capacity of the user program area is 4K words (0000 ~ 4095) and the capacity of each EPROM chip (2716) is 1K words.

 EPROM ERASE CHECK

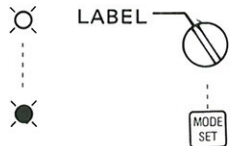


NOTES:

1. The EPROM erase check is executed and completed almost instantaneously. When the EPROM erase check has been completed, the operation control instruction message changes from "BUSY" to "READY" again. If the EPROM has not been erased completely, the erase error will be indicated by the ERROR No. message.
2. To discontinue the EPROM erase check under execution, move the cursor to the Mode position and then depress  key.
  The display changes to the initial display in the "USER PROGRAM" mode.
  The display changes to the initial display for mode selection at the time of power application.

3.9 Label

This mode allows relay numbers to be changed into system label numbers which are for registration in memory in 4-digit alphanumeric code (e.g., PB01). This function is conveniently used in the MONITOR and EXT modes.



```

XXMODE - LABELXX
LABEL MODE SELECTION
0: MEMORY CLEAR
1: LABEL PREPARATION1 (8 I/O POINTS)
2: LABEL PREPARATION2 (16 I/O POINTS)*
3: LABEL ↔ CASSETTE
4: LABEL ↔ EPROM CHIP

MODE - LABEL      READY
  
```

- 0 END → Clears all the contents of the label registration memory area.
- 1 ILC → Generates a label in units of 8 I/O points.
- 2 CMP → Generates a label in units of 16 I/O points.*
- 3 JME → Executes the data write, data verify or data read between the label registration memory area and the cassette tape recorder.
- 4 IL → Executes the data write, data verify or data read between the label registration memory area and the EPROM chip.

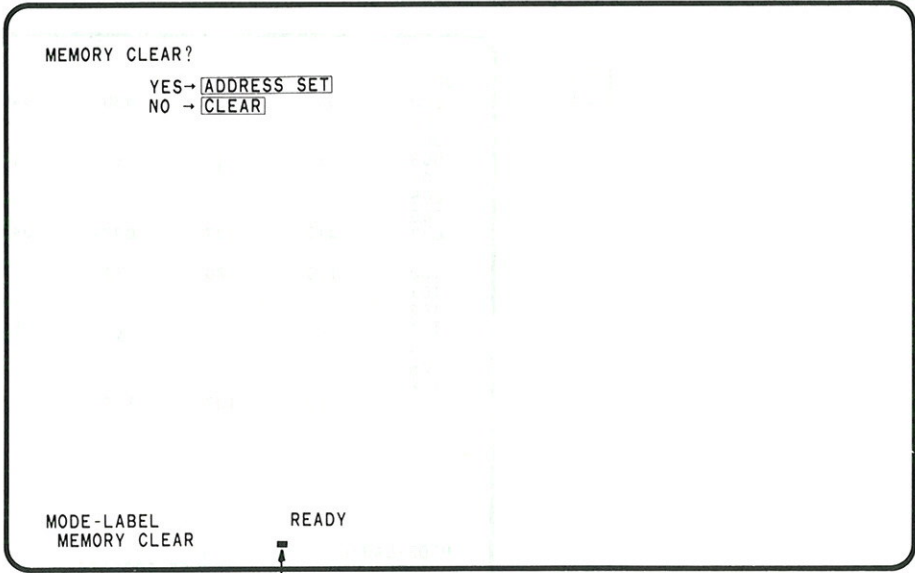
NOTES:

1. * This function is available only for the version destined for the Japanese market.
2. For the label conversion after the label registration, refer to
 - LABEL CONVERSION in 3.6. Monitor.

MEMORY CLEAR

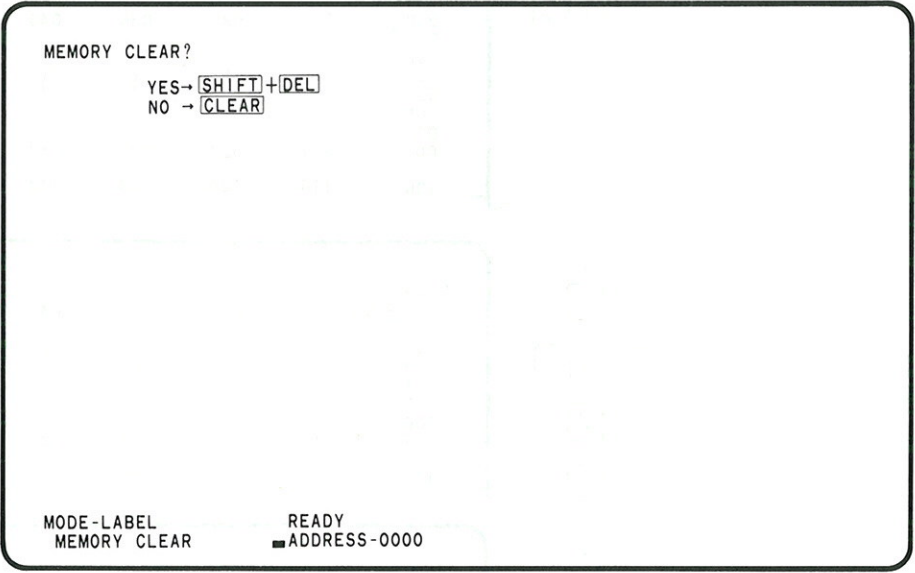
In this operation, all the contents of the label registration memory area are cleared.

END



Cursor blinks at the Bottom Home position.

ADDR SET



SHIFT + DEL INS

After the memory clear operation, the CRT display will return to the initial display in the LABEL mode.

LABEL PREPARATION 1

In this operation, relay numbers (0000 to 1377) are changed to system label numbers (4-digit alphanumeric code) in units of 8 I/O points.

■ LABEL WRITE


 ILC

0000	010-	020-	030-	040-	050-	060-	070-
000-							
001-							
002-)))))))
003-)))))))
004-)))))))
005-)))))))
006-)))))))
007-	017-	027-	037-	047-	057-	067-	077-
100-	110-	120-	130-	140-	150-	160-	170-
101-							
102-)))))))
103-)))))))
104-)))))))
105-)))))))
106-)))))))
107-	117-	127-	137-	147-	157-	167-	177-

MODE - LABEL READY
 LABEL ADDRESS - 0000SRCH

SHIFT + 

0000	010-	020-	030-	040-	050-
000-					
001-					
002-)))))
003-)))))
004-)))))
005-)))))
006-)))))
007-	017-	027-	037-	047-	
100-	110-	120-	130-	140-	

SHIFT +  OR

0000	010-	020-	030-	040-	050-
000-PB01-					
001-					
002-)))))
003-)))))
004-)))))
005-)))))
006-)))))
007-	017-	027-	037-	047-	
100-	110-	120-	130-	140-	

SHIFT + 

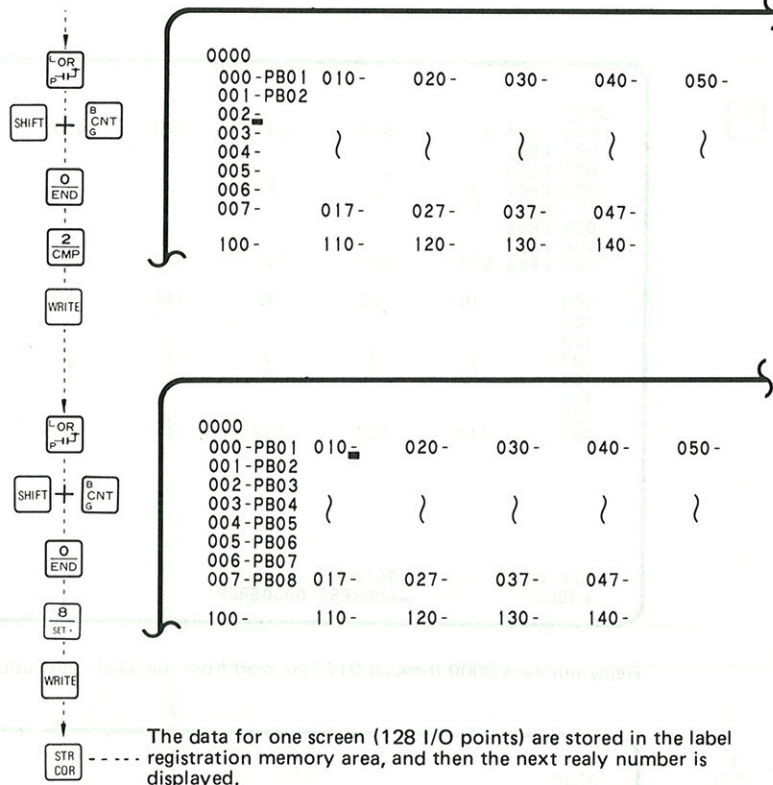
END

 ILC

WRITE

0000	010-	020-	030-	040-	050-
000-PB01-					
001-					
002-)))))
003-)))))
004-)))))
005-)))))
006-)))))
007-	017-	027-	037-	047-	058
100-	110-	120-	130-	140-	

The data written illuminates with high brightness on the CRT screen.



NOTES:

1. Any number not used in the sequence circuit should be ignored.
2. Two alphabetic codes are hot stamped at the upper and lower left corners on the top of each mnemonic key on the operation panel.
 - To input any of the alphabetic codes at the upper left corner, **SHIFT** key must be used.
 - Any of these letter keys at the lower left corner may be input without **SHIFT** key.

For example, with **TM** key, **SHIFT** key is required to enter letter "A" and is not required to enter letter "F".
3. The label preparation 1 function is employed when an I/O unit consists of 8 I/O points.
4. The same system label number cannot be used in duplication.

■ LABEL READ

1
ILC

```

0000
000-PB01 010-   020-   030-   040-   050-   060-   070-
001-PB02
002-PB03
003-PB04  }     }     }     }     }     }     }
004-PB05
005-PB06
006-PB07
007-PB08 017-   027-   037-   047-   057-   067-   077-
100-   110-   120-   130-   140-   150-   160-   170-
101-
102-
103-   }     }     }     }     }     }     }
104-
105-
106-
107-   117-   127-   137-   147-   157-   167-   177-
    
```

MODE-LABEL READY
 LABEL ADDRESS-0000SRCH

Relay numbers 0000 through 0177 are read from the label registration memory area.

ADDR
SET

0
END

2
CMP

0
END

0
END

SEARCH

```

0200
200-   210-   220-   230-   240-   250-   260-   270-
201-
202-
203-   }     }     }     }     }     }     }
204-
205-
206-
207-   217-   227-   237-   247-   257-   267-   277-
300-   310-   320-   330-   340-   350-   360-   370-
301-
302-
303-   }     }     }     }     }     }     }
304-
305-
306-
307-   317-   327-   337-   347-   357-   367-   377-
    
```

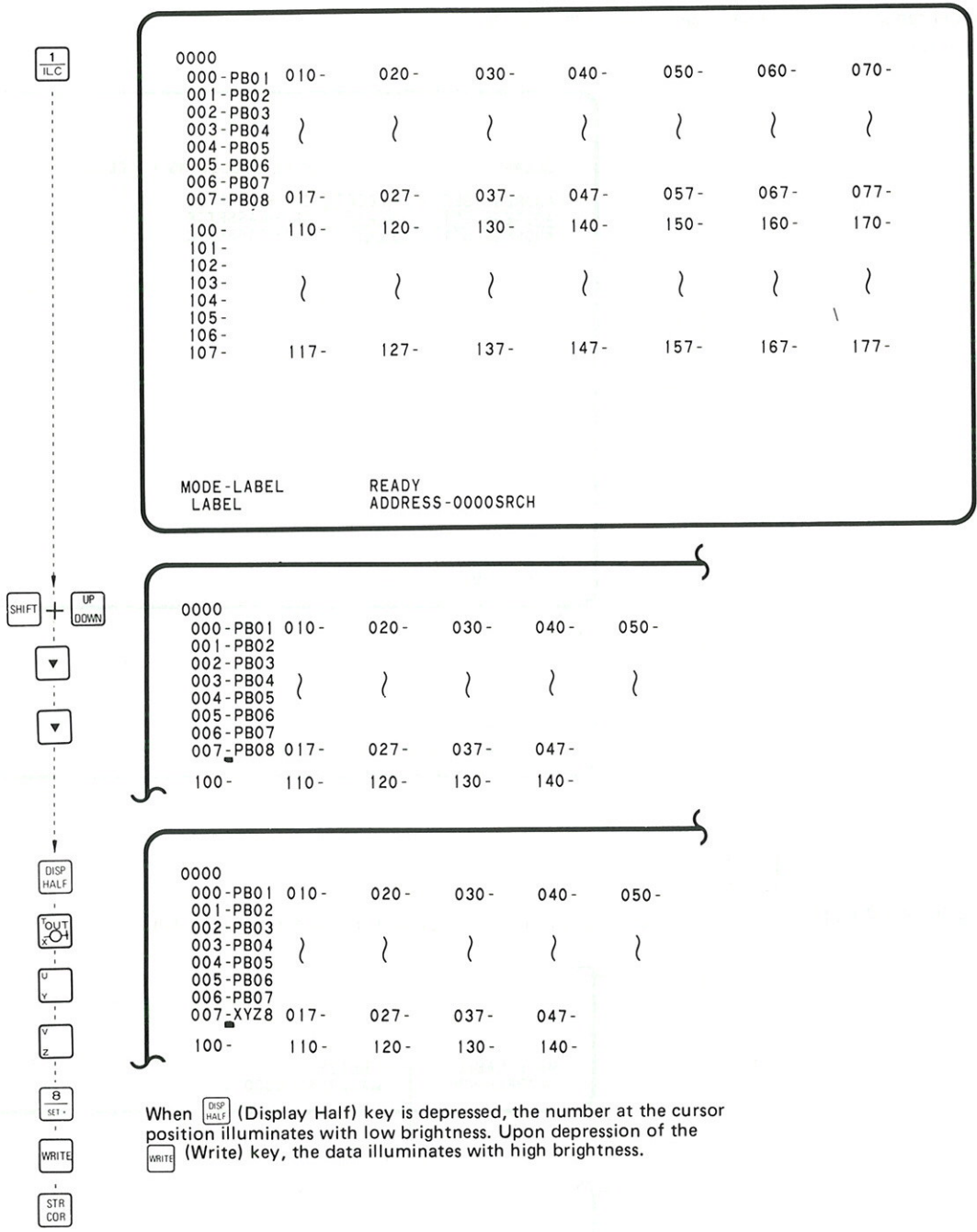
MODE-LABEL READY
 LABEL ADDRESS-0200SRCH

Relay numbers 0200 through 0377 are read from the label registration memory area.

NOTES:

1. ADDRESS SET refers to the relay number designation.
2. The relay numbers that may be assigned for use are from 0000 to 1377.

■ LABEL CORRECTION



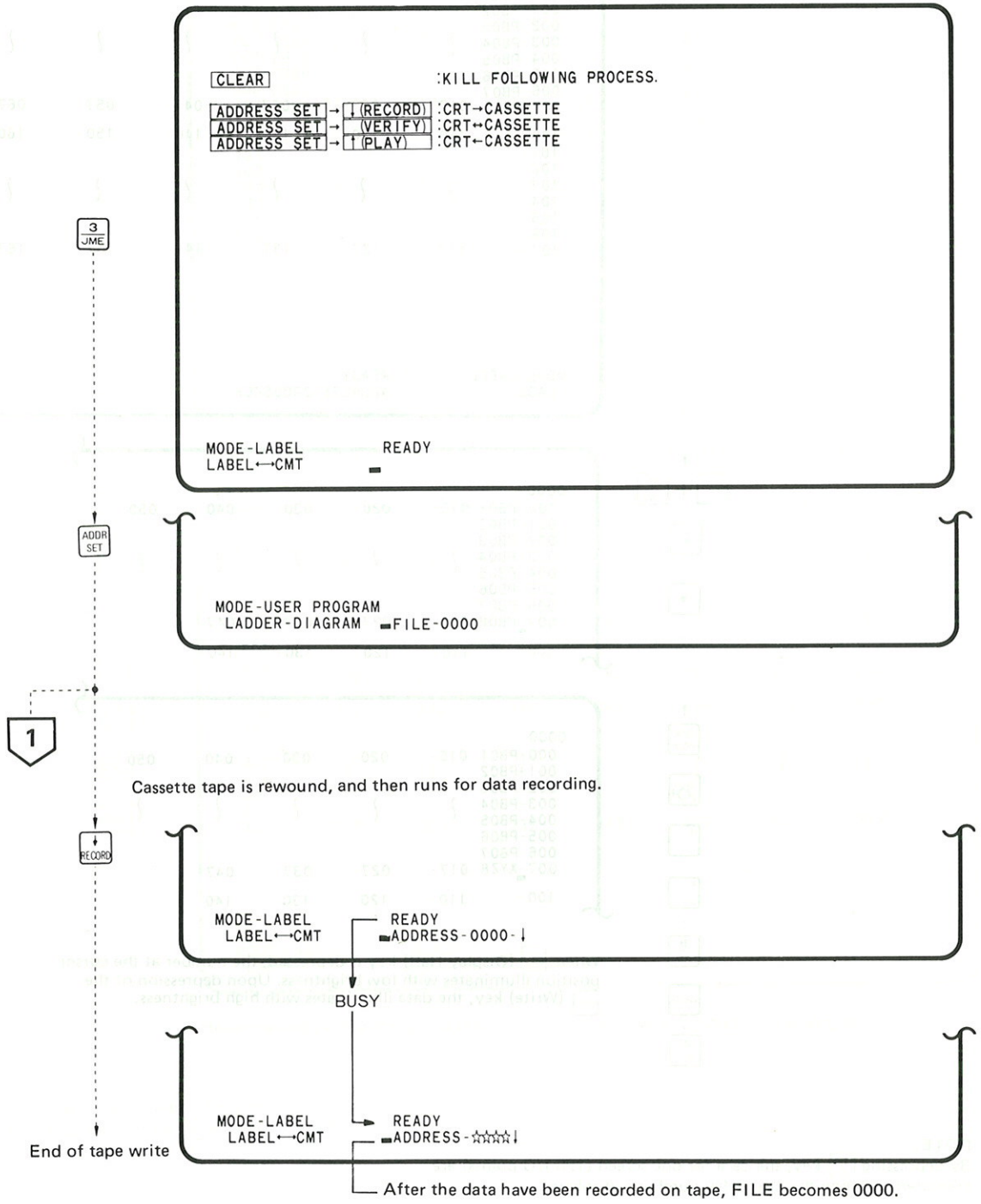
When **DISP HALF** (Display Half) key is depressed, the number at the cursor position illuminates with low brightness. Upon depression of the **WRITE** (Write) key, the data illuminates with high brightness.

NOTE:

By depressing **STR COR** key, the data for one screen (128 I/O points) are corrected and then the next relay number is displayed.

3 JME LABEL ↔ CASSETTE

In this operation, data transfer is executed between the label registration memory area and the cassette tape recorder.

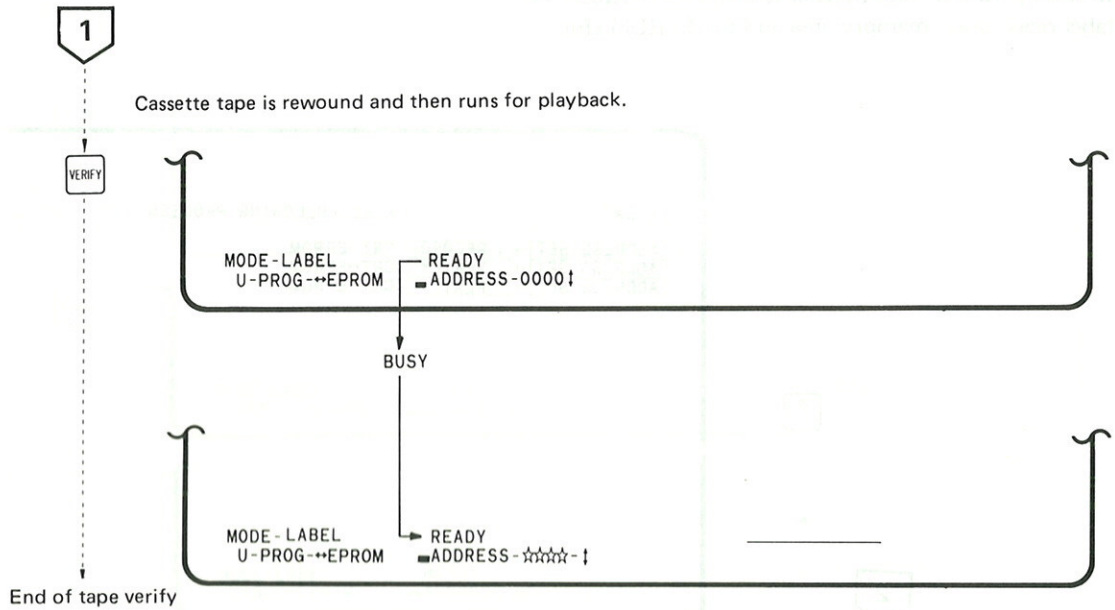


■ TAPE WRITE

NOTES:

1. Operate the graphic program console in close connection with the cassette tape recorder. Be sure to depress the **RECORD** key within 5 seconds after the start of the tape run for recording.
2. The "BUSY" message indicates that the data are being recorded on the tape.
3. The tape write operation can be judged as completed when the operation control instruction message changes from BUSY to READY again.

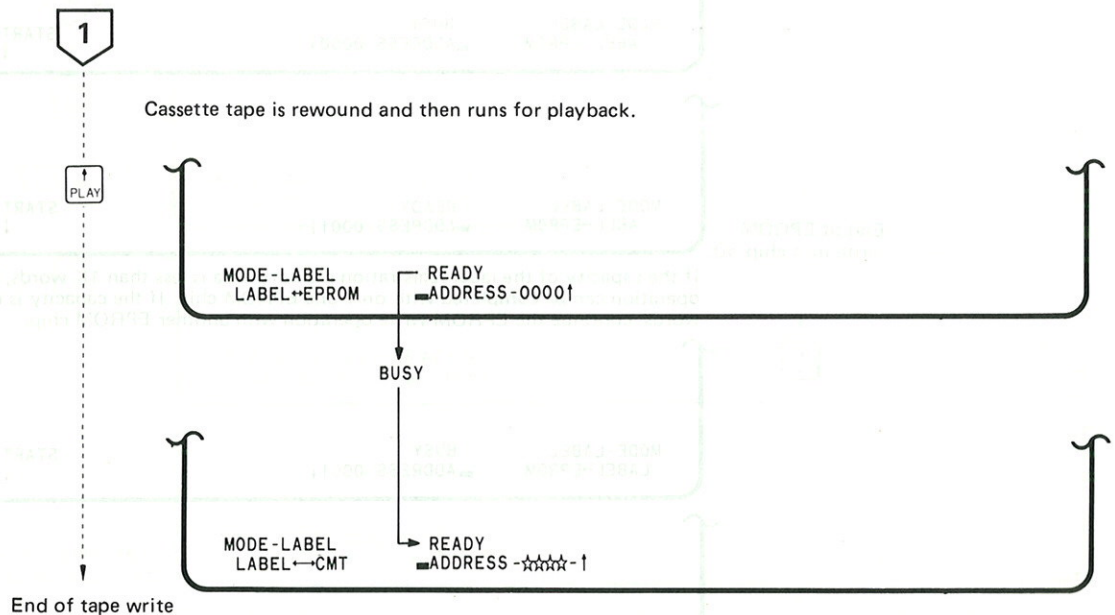
■ TAPE VERIFY



NOTES:

1. Operate the graphic program console in close connection with the cassette tape recorder. Be sure to depress the **VERIFY** key within 5 seconds after the start of the tape run for playback.
2. The "BUSY" message indicates that the data on the tape are being verified.
3. The tape verify operation can be judged as completed when the operation control instruction message changes from "BUSY" to "READY" again.

■ TAPE READ



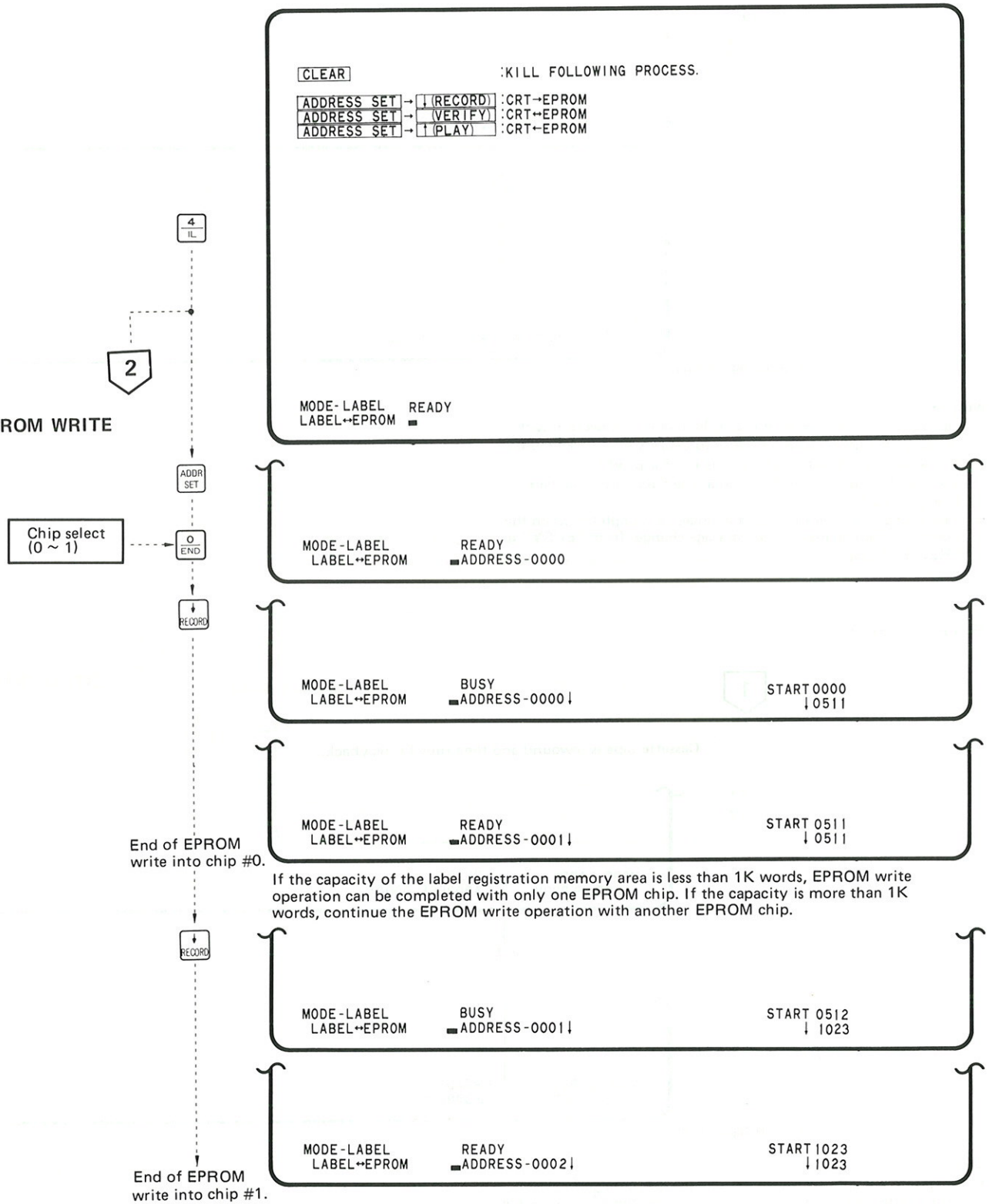
NOTES:

1. Operate the graphic program console in close connection with the cassette tape recorder. Be sure to depress the **PLAY** key within 5 seconds after the start of the tape run for playback.
2. The "BUSY" message indicates that the data on the tape are being read.
3. The tape read operation can be judged as completed when the operation control instruction message changes from BUSY to READY again.
4. Set the VOL and TONE controls of the cassette tape recorder to MAX.

4 IL LABEL ↔ EPROM CHIP

In this operation, data transfer is executed between the label registration memory area and the EPROM chip.

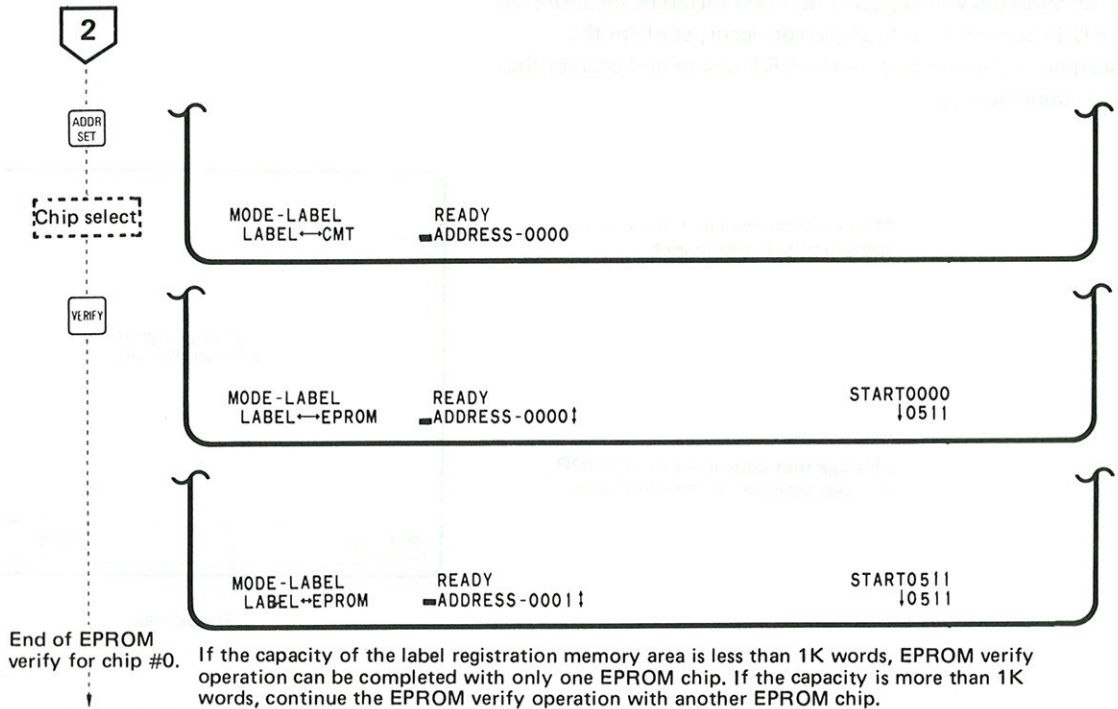
■ EPROM WRITE



NOTES:

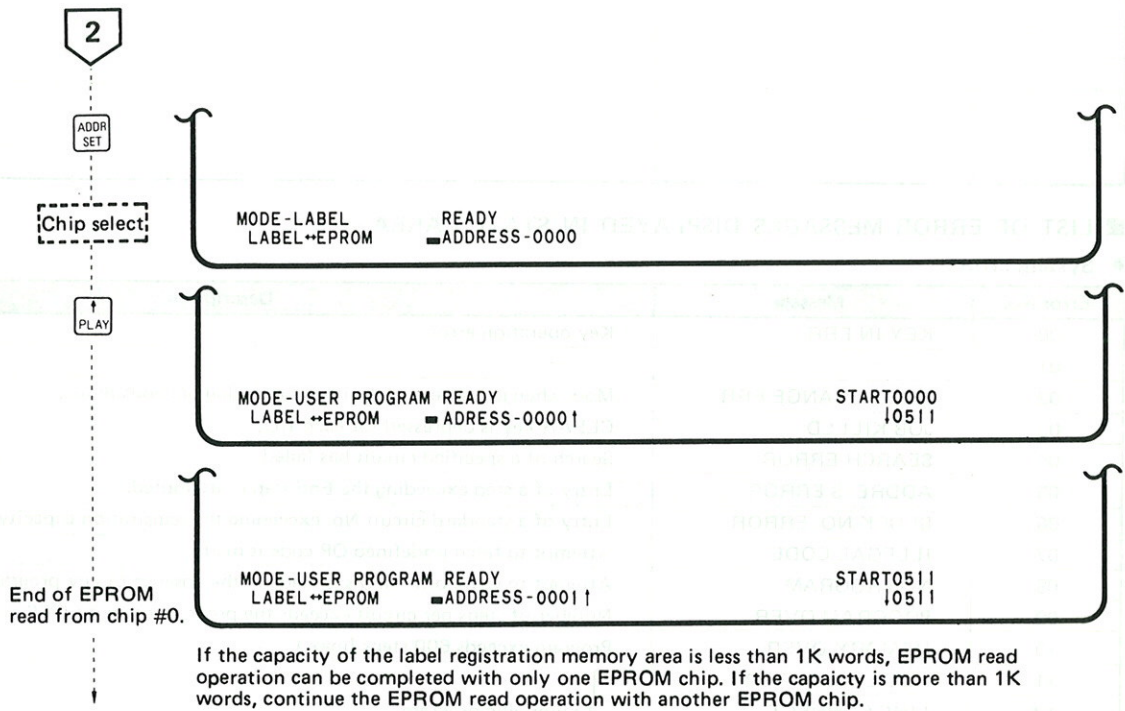
1. The maximum program capacity of the label registration memory area is 2K words, and the capacity of each EPROM chip is 1K words.
2. Be sure to perform the EPROM verify operation after writing data into the EPROM chip(s).

■ EPROM VERIFY



NOTE:
The maximum capacity of the label registration memory area is 2K words, and the capacity of each EPROM chip is 1K words.

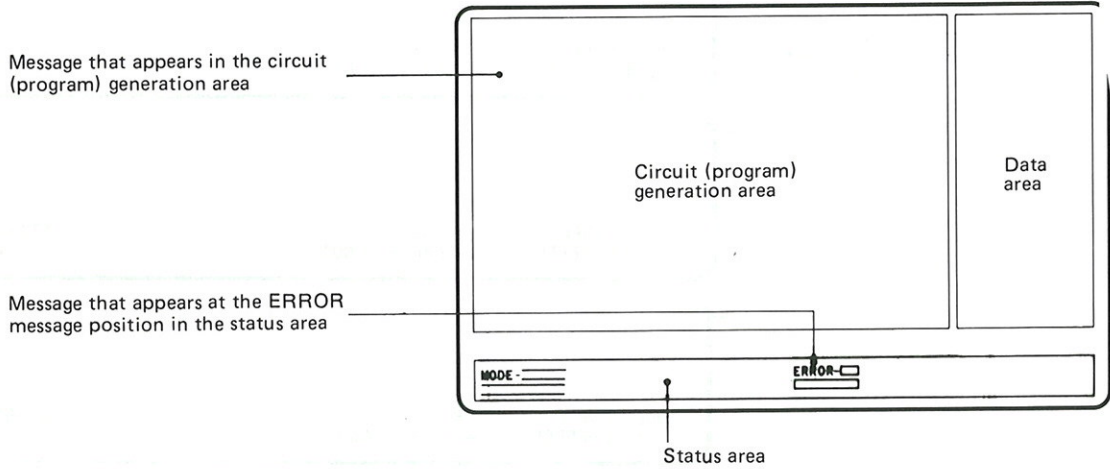
■ EPROM READ



NOTES:
1. The maximum capacity of the label registration memory area is 2K words, and the capacity of each EPROM chip is 1K words.
2. Be sure to perform the EPROM verify operation after reading data from the EPROM chip(s).

3.10 Error Message Lists

Error messages will appear in the two different locations on the CRT screen. Should any error occur, confirm the meaning of the message on the CRT screen and correct the error immediately.



■ LIST OF ERROR MESSAGES DISPLAYED IN CIRCUIT (PROGRAM) GENERATION AREA

- In PROGRAM mode (Program check)

Error No.	Message	Description
10	ERR10	END instruction missing error
31	ERR31	I/O duplication error
44	ERR44	JMP-JME error
54	ERR54	IL-ILC error

■ LIST OF ERROR MESSAGES DISPLAYED IN STATUS AREA

- System errors

Error No.	Message	Description
00	KEY-IN ERR	Key operation error
01	—	—
02	MODE CHANGE ERR	Mode change is attempted without releasing previous mode.
03	JOB KILLED	CLEAR key is depressed for each I/O.
04	SEARCH ERROR	Search of a specified circuit has failed.
05	ADDRESS ERROR	Entry of a step exceeding the End step is attempted.
06	BLOCK NO. ERROR	Entry of a standard circuit No. exceeding the registration capacity is attempted.
07	ILLEGAL CODE	Attempt to fetch undefined OP code is made.
08	NO PROGRAM	Attempt to write other I/O's is made in the absence of any program.
09	PROGRAM OVER	Number of steps per circuit exceeds the program capacity (256 steps).
10	MEMORY OVER	Program exceeds 600 steps (max.)
11	HOT LINE ERROR	} Symbollic program
12	LINE CONNECT	
13	HIGH INTENSITY	
14	BLOCK NO. MULT	Duplicate user program (standard circuit) No. is used.
15	DISPLAY OVER	Display area overflow

● I/O related errors

Error No.	Message	Description	
16	IRG ERROR	} Cassette tape related errors	
17	DATA NOTHING		
18	HEADER 1 ERROR		
19	HEADER 2 ERROR		
20	INITIAL ERROR		
21	CRCC ERROR		
22	SEPARATE ERROR		
23	—	—	
24	—	—	
25	TIME OVER	OK or NG. signal exceeds 300ms.	
26	COMPARE ERROR	Compare error	
27	ERASE ERROR	EPROM erase check error	
28	EPROM WRITE ERR	EPROM write is impossible.	
29	—	—	
30	—	—	
31	—	—	
32	—	—	
33	BATTERY ERROR	Battery is abnormal.	
34	EPROM NOTHING	EPROM chip is not mounted.	
35	WRITE DATA NONE	No write data exists in chip no. 1	
36	LABEL ERR	Label duplication error	
37	MACHINE	8180	Cassette model name error
		8181	Cassette model name error (user program)
		8182	Cassette model name error (label)
		CTA20	Errors other than above
38	FILE NO 0000	File number error	
39	PRINTER BUSY	Printer is busy (time out)	
71	CONTACT ERROR	} Errors in data transfer between SCY-M1R/-M5R and SCY-CRT10	
72	—		
73	MODE ERROR		
74	PROGRAM ERR		
75	UNDEF COMMAND		

● Program check error

Error No.	Message	Description
40	END NOT FIND	END instruction miss is found during program check.
41	—	—
42	—	—
43	I/O NO ERROR	I/O No. error
44	—	—
45	—	—
46	—	—

● Assemble, disassemble error

Error No.	Message	Description
47	CHAIN ERROR	(ASM) Connection error
48	SOFT ERRNRO	(ASM) Short symbol error
49	—	—
50	TR ERROR	(ASM) Branch No. error
51	LOGIC ERROR	(DIS, ASM) LOGIC error
52	OBJECT ERROR	(DIS, ASM) OBJECT code error
53	TABLE OVERFLOW	(DIS, ASM) Ladder diagram generation table overflow
54	LADDER OVERFLOW	(DIS, ASM) Ladder diagram screen overflow
55	ASM - ???	(ASM) Assembly is impossible.
56	DIS ASM - ???	(DIS, ASM) Disassembly is impossible.

Item No.	Description	Unit	Quantity	Price	Total
1
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Item No.	Description	Unit	Quantity	Price	Total
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Item No.	Description	Unit	Quantity	Price	Total
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NOTE: Specifications subject to change without notice.