

# ***YASNAC*<sup>™</sup> 2000G**

## **WITH CRT CHARACTER DISPLAY**

### **OPERATOR'S MANUAL**



**YASKAWA Electric Mfg. Co., Ltd.**

## **INTRODUCTION**

YASNAC 2000G with CRT character display (henceforth called CRT display) is the latest CNC specifically designed for lathe applications. The CRT display prominently shows commands, positions, tool offset data, etc. In addition, several blocks of these data can be collectively

displayed. This facilitates recognition and operator convenience in writing, modifying the data, as well as checking. The adoption of flat type keyboard combines modern styling with more touch surface, and simplifies the operation, resulting in increased reliability.

## **PREFACE**

This manual describes the instructions for handling YASNAC 2000G with CRT character display. Descriptions of NC operator's panel are enumerated in Chapter 4 for easy cross-reference to YASNAC 2000G OPERATOR'S

MANUAL provided separately.

For instructions other than the descriptions in this manual, refer to YASNAC 2000G OPERATOR'S MANUAL (TOE-C843-5-20).

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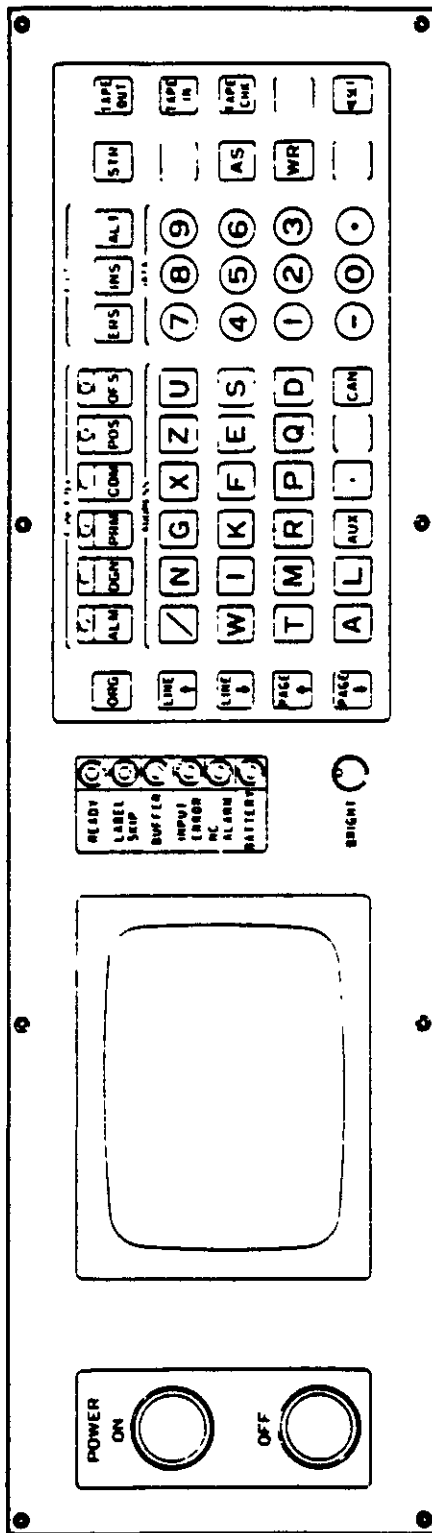


Fig. 4.1 NC Operator's Panel with CRT Display

**4. NC OPERATOR'S PANEL WITH CRT CHARACTER DISPLAY**

**4.1 PUSHBUTTONS, KEYS, AND LAMPS**

Fig. 4.1 shows an overall view of NC operator's panel with CRT display. The names and functions of operator devices are as follows.

**4.1.1 POWER ON/OFF PUSHBUTTONS**

**POWER ON pushbutton**

To turn on the power for the control: Depress the pushbutton first to turn on the control power and depress it again to turn on the servo power. Push this button to recover the servo power after an emergency stop.

**POWER OFF pushbutton**

To turn off the power for the control: Depress it to turn off both the servo and control powers.

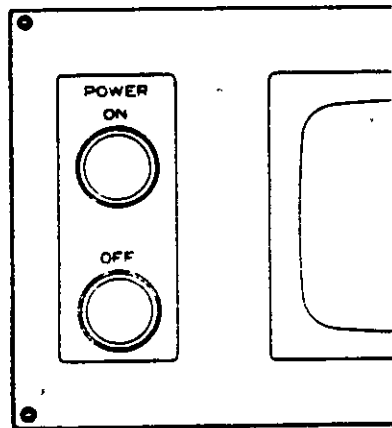


Fig. 4.1.1

**4.1.2 CRT CHARACTER DISPLAY**

According to each operation, this display indicates the alpha-numerical data in a regular size, double-size and quadruple-size of the regular size.

Braun tube size: 6 inches

Maximum number of characters: 32 characters x 16 lines = 512 characters (at regular size)

Indicating characters:

Numerals - [0] through [9], [ ], [ ], [ ]

Alphabetic characters - [A] through [Z]

Special code - [ ] (EOB), [ ] (slash), etc.

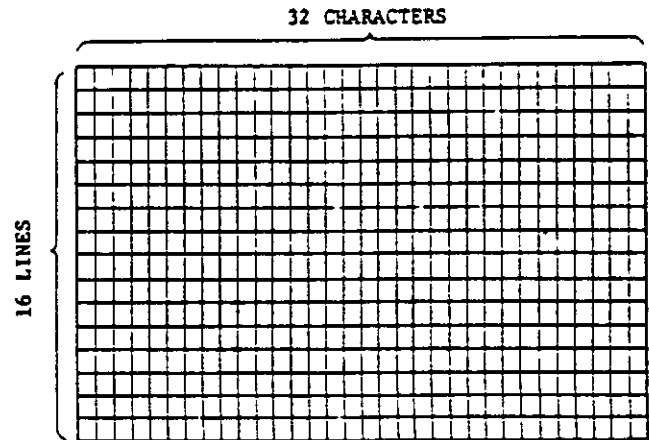


Fig. 4.1.2 Braun Tube

**4.1.3 BRIGHT CONTROL KNOB**

This is a control knob to adjust the brightness of the CRT display so as to get the displayed characters easily readable.

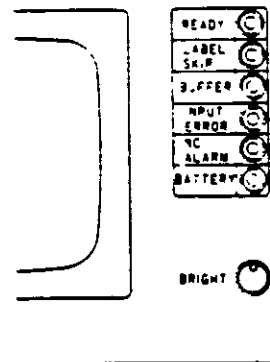


Fig. 4.1.3

#### 4.1.4 INDICATING LAMPS

##### · READY lamp

This lights up when both the control and servo powers have normally been supplied to the control and thus the control is ready for operation. While this lamp remains off, the control cannot be operated, either manually or automatically.

##### · LABEL SKIP lamp

It is on when the Label Skip function is effective when power has been turned on or the control has been reset. The Label Skip is the function that makes tape setting easy by ignoring all tape information until the first EOB is encountered. It goes off when EOB has been read.

In the MEM or EDT mode, the illuminated lamp indicates that memory or tape is rewind.

This lamp will not affect the data writing from MDI.

##### · BUFFER lamp

This is on when data in the next block is held in the buffer register. This is off when the buffer has been evacuated by depressing the CYCLE START or RESET pushbutton. During an automatic operation<sup>#</sup>, one or three blocks ahead of data is usually read in advance, and the lamp goes on and off according to the buffer storing conditions.

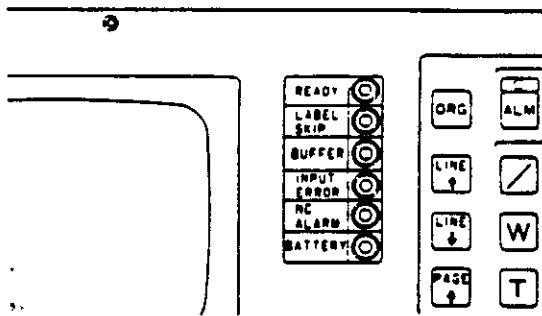


Fig. 4.1.4

<sup>#</sup> Automatic operation is defined as the operation in auto-mode(TAPE, MDI, or MEM) and manual operation, as the operation in HANDLE, JOG, or RAPID mode in this manual.

##### · INPUT ERROR lamp

The lamp will flicker when error is detected in an input information. At this time, the automatic operation is suspended immediately after the current block has been completed, and the subsequent Cycle Start is then prevented. Possible causes for the lamp to go on are:

- Tape format error
- Use of wrong characters
- Mispunched information on paper tape
- Dirty tape
- Misreading of paper tape reader
- Destroyed memory contents

If the FUNCTION select key is set at ALM, the detailed information of error can be found via the alarm code display.

The lamp goes off when the control has been reset.

##### · NC ALARM lamp

The lamp will flicker when any error other than the above input error is detected in the NC system. At this time, the automatic operation is suspended immediately or at the end of a block, depending upon the error, and the subsequent Cycle Start is then prevented.

The lamp goes off when the control is in automatic operation, it stops immediately or at the end of a block, depending on the error. See 4.3 12 Alarm and Status Code Display for details.

##### · BATTERY lamp

A battery is used for protection of various parameters, tool offset values and stored part program in the control. This lamp is on when the battery output voltage is below a given level. The battery must then be replaced with a new one within a month. Promptly contact the maintenance personnel for the battery change.

#### 4.1.5 FUNCTION SELECT KEYS WITH INDICATING LAMPS

The key selects one of six functions for the operation of the display and MDI. Pushing a key makes it light up.

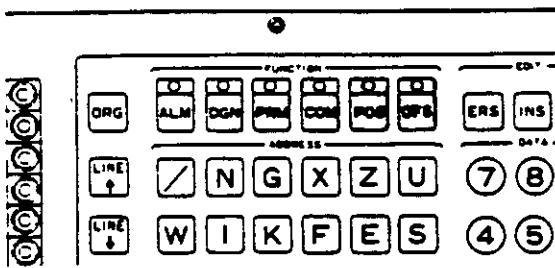


Fig. 4.1.5

- **ALM** (Alarm)key:  
To select this key for display of alarm and status codes.
- **DGN** (Diagnosis)key:  
To select this key for display of input/output signal status.
- **PRM** (Parameter)key:  
To select this key for display or writing-in of parameters.
- **COM** (Command)key:  
To select this key for display or writing-in (MDI) of the command data for automatic operation.
- **POS** (Position)key:  
To select this key for display of various current positions.
- **OFS** (Offset)key:  
To select this key for display or writing-in of tool offset values.

Re-pushing of DGN, PRM, OFS keys or COM key in the EDT mode makes them function as the alternate switches changing the display as follows.

- (1) Normal-display -- A designated line or block can be displayed using large size characters (line-display).
- (2) Wide-display ----- A whole page containing designated line or block can widely be displayed (page-display).

Pushing any one of these four keys can then facilitate the normal-display operation. Another pushing of it makes the display change to the wide-display.

#### 4.1.6 ADDRESS KEYS

These keys are to designate an address character when writing in various data.

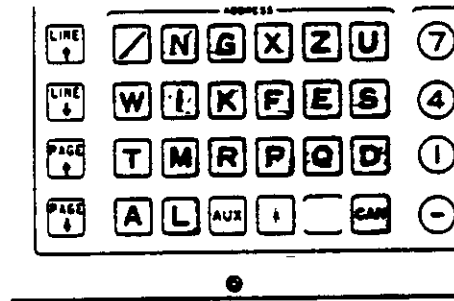


Fig. 4.1.6

Note: Special characters

- /** (Slash) key: For an optional block skip command.
- CAN** (Cancellation) key: For cancellation of the numeric value or address data erroneously keyed.
- AUX** (Auxiliary) key: Not used for a usual system operation.
- |** EOB key: Not used for a usual system operation.

#### 4.1.7 DATA KEYS

These keys consist of twelve keys in total, such as 0 through 9, - (minus) and . (a decimal point), and can be used for writing-in of such all numeral values as tool offset value, parameter values, and so on, in addition to command value.

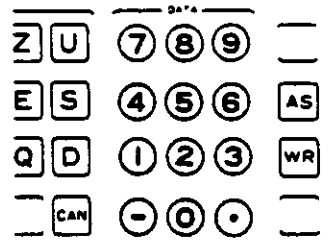


Fig. 4.1.7



NOTES. Use of decimal point key (.)

- By depressing the decimal point key when writing-in a distance data (X, Z, U, W, I, K, or R), a feedrate data (F or E) or a time data (U), keying the trailing zero can be omitted.

EXAMPLE: In case of 0.01 mm least input increment.

- ①, ②, ⑤, ., WR means 125.00 mm
  - ①, ②, ③, ., ④, WR means 125.40 mm
- (in case of INCH input †, a decimal point denotes an inch.)

- When writing in M, S and/or T codes, never use the decimal point key. The decimal point will generally be disregarded, but sometimes concurrence may not be obtained during an address search.

See APPENDIX-1

4.1.8 PAGE SELECT KEYS

- After selecting the display (and writing-in) function using FUNCTION select keys, contents desired can be selected for display by depressing the PAGE select keys, which just looks like opening the pages of a book. The page selected by these keys will be displayed at the right bottom corner of the displayed picture by "P□□."

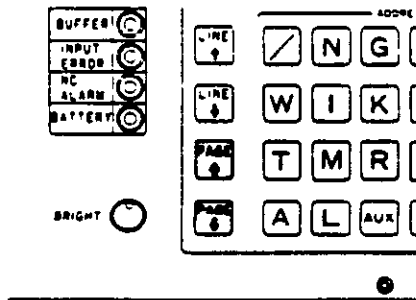


Fig. 4.1.8.1

- The contents displayed on each PAGE according to function select keys will be tabulated in Table 4.1.8 List of PAGE Display.

- Every time the PAGE key with a downward arrow is depressed, the page to be displayed will step forward by one. On the contrary, every time the PAGE key with an upward arrow is depressed, the page to be displayed will step backward by one.

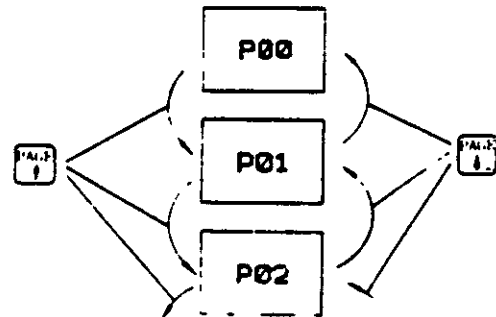









Fig. 4.1.8.2

Table 4.1.8 List of PAGE Display

Function	Page	Displayed contents	Remarks
 POSITION	P00	Current position display A	· When the FUNCTION key is depressed first, it displays P00.
	P01	Current position display B	
	P02	Incremental position display	· The displayed contents can be changed by depressing a PAGE key.
	P03	Current position collective display	
	(P04)	Servo lag value display (Note 3)	
 COMMAND (Except EDT mode)	P00	Command data display (Modal)	
	P01	Input data display	
	P02 (Note 1)	Stored part program wide-display (9 lines/picture)	
 (EDT mode)	P03 (Note 2)	Editing part program wide-display (9 lines/picture)	The FUNCTION key, when depressed first, functions as the alternate switch, and pushing it again executes the "wide-display."  At this time, a page containing a designated line (or block) can be displayed.
 OFFSET	P00 to P□□	Tool offset value wide-display (10 sets/page)	
 PARAMETER	P00 to P□□	Parameter wide-display (5 sets/page)	
 DIAGNOSIS	P00 to P□□	INPUT/OUTPUT signal wide-display (8 sets/page)	
 ALARM	P00	Alarm code display (with a status code and alarm messages)	

Note 1: The display will be blank in other than the MEM mode.

Note 2: Although the displayed picture can be renewed by depressing a PAGE key, P00 remains unchanged.

Note 3: No display can be made with the SYSTEM NO. at "0."

NOTES

- If the **PAGE** key is depressed during the last page display, it returns to P00, while with the **PAGE** key, the opposite operation can be executed.
- In case of a wide-display, "o" mark will flickeringly be displayed at the head of the designated "line" or "block."
- When the normal-display (line-display) is selected by depressing DGN, PRM, or OFS key, or COM key in the EDT mode, if the PAGE key is depressed, the head line (the first line of data to be displayed) of the page or the displayed picture renewed will be displayed.

The display contents of each LINE with a function key selected will be tabulated in Table 4.1.9 List of LINE Display. For the normal-display (line-display), the already designated line or block will be displayed.

- Every time the **LINE** key is depressed, a line or block to be displayed will step forward by one, while when the **LINE** key is depressed, backward. Keeping the LINE key depressed makes the line pointer step automatically.

4.1.9 LINE SELECT KEYS

LINE select keys are to designate an object "line" or "block" in order to display and write-in. "The number of line" designated using the LINE keys (or all other operations) will be displayed at the bottom right of the displayed picture by a 2-digit number "□□."

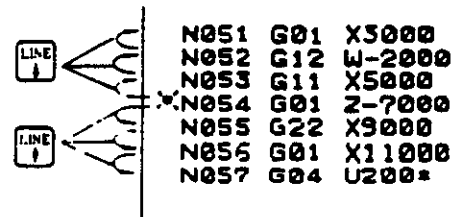


Fig. 4.1.9.2

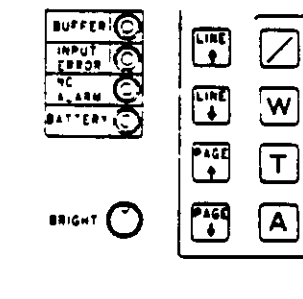









Fig. 4.1.9.1

NOTE A "line" stated herein has a serial number over the pages. Because of this, once a "line" is designated, the "page" to which it belongs will be automatically determined.

Table 4.1.9 List of LINE Display

Function	Line	Display contents	Remarks
 POSITION		---	<ul style="list-style-type: none"> <li>The LINE key operation won't affect the display.</li> </ul>
 COMMAND (Except in EDT mode)		---	<ul style="list-style-type: none"> <li>In the MEM mode, the LINE key operation is possible when AS key is held depressed.</li> </ul>
 COMMAND (in EDT mode)	00 (Note 1)	Editing part program display (1 block)	When this FUNCTION key is depressed first, 1 block that the pointer points out will be displayed.
 OFFSET	T00 to T16 (T32)	Tool offset value display (To display a set of T□□.)	<ul style="list-style-type: none"> <li>When this FUNCTION key is depressed first, already assigned line data will be displayed.</li> </ul>
 PARAMETER	N00 to N99	Parameter display (To display a set of Parameter No. □□.)	<ul style="list-style-type: none"> <li>A line desired to display can be designated by an operation of a LINE key or keying-in.</li> </ul>
 DIAGNOSTICS	X00 to X99  Z00 to Z99	INPUT/OUTPUT signal display (To display a set of Diagnostics No. X or Z□□.)	
 ALARM		---	The line key operation won't affect the display.

Normal-display (Line-display)

Note 1. Although the displayed block is renewed by depressing the LINE key, the line number will not be renewed.

NOTES:

- When a LINE key is depressed beyond the "page" which the displayed line belongs to, the page as well as the line will be renewed.
- When a display goes to the wide-display (page-display) by depressing again (consecutively twice) DGN, PRM, or OFS key or COM key in the EDT mode, a "page" containing a designated "line"(or "block") will be displayed. "o" mark will flickeringly be displayed at the head of the designated line (or block).
- Designation of a line can be made through the following operations in addition to the operations of LINE or PAGE keys.
  - ADDRESS SEARCH: Point out the pointer on a stored part program.
  - Line number designation: By directly keying in a line number, the line for OFS, PRM or DGN will be designated.

- A "line" moves by operating the PAGE key. A "page" may happen to be renewed via the LINE key operation.
- In the MEM mode, the LINE key is effective while the AS key is depressed.
- Depressing the both LINE keys, simultaneously makes line number "00" forcibly.

#### 4.1.10 ORG (ORIGIN) KEYS

ORG key is used when a position display of X- or Z- axis will be set at "0" on the current position display B. See 4.3.4 Current Position Display for the details.

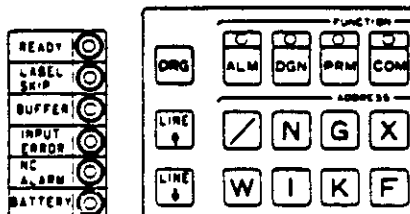


Fig. 4.1.10

#### 4.1.11 WT (WRITE) KEYS

WR key is to store the address data keyed in using the ADDRESS and DATA keys into the buffer register.

#### 4.1.12 AS (ADDRESS SEARCH) KEYS

AS key is to start searching of address data in a tape or part program memory. See 4.3.13 "Address Search" for further details.

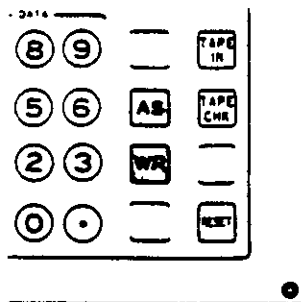


Fig. 4.1.12

#### 4.1.13 EDITING KEYS (ERS, INS, ALT, STR)

These keys are for editing a stored part program and storing a part program into the memory and effective only in the EDT mode.

- **ERS** (ERASE) key

It is to delete a block of data in the memory in the EDT mode.

- **INS** (INSERT) key

It is to store a block of data into the memory.

- **ALT** (ALTER) key

It is to modify or change a block data in the memory.

- **STR** (STORE) key

It is used to store a block data written in the buffer register into the memory.

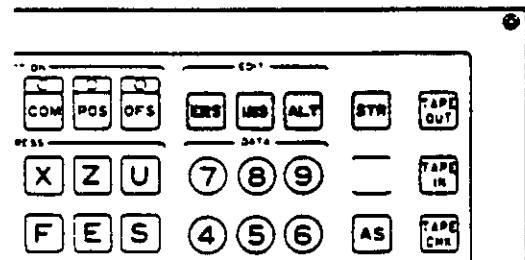


Fig. 4.1.13

#### 4.1.14 TAPE KEYS (TAPE OUT, TAPE IN, TAPE CHECK)

Keys are to start the tape operation except in the automatic operation mode. They are effective only in the EDT mode.

- **TAPE OUT** (TAPE-OUT) key

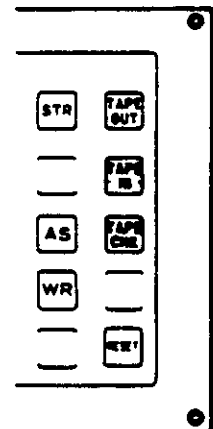
This key is to start the punching-out of the stored part program.

- **TAPE IN** (TAPE-IN) key

This key is to start the storing of the part program into the memory.

- **TAPE CHK** (TAPE CHECK) key

This key is to start the collation between the part program tape and the stored part program.



#### 4.1.15 RESET KEY

This key resets the control. Operations to be executed by this RESET key are:

- Move command cancel
- Buffer register clear
- Alarm code release if the cause is eliminated
- Tool offset cancel
- Auxiliary function cancel
- Label skip function ON
- Memory pointer rewind
- Sequence number reset
- RST signal transmission
- S2-digit command cancel
- T-code tool select cancel
- B-group G-code to "G40"

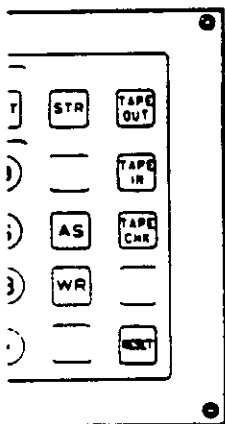


Fig. 4.1.15

The following will not be affected by operating the RESET key.

- Current position values of each axis
- Modal G codes (except for B group)
- F commands
- S4-digit commands
- Memory contents, such as tool offset values, parameter data, etc.

**NOTE:** Depressing the RESET key or the remote reset pushbutton is defined as "Reset operation" in this manual.

#### 4.1.16 TAPE FEED AND SYSTEM NO. SWITCHES

These switches are mounted above the tape reader.

- TAPE FEED switch

This is a switch to feed and rewind the tape manually. Setting the switch to F (forward) causes the tape to feed. To rewind the tape, set the switch to R (reverse). This switch is effective during the operation, either by manually or automatically.

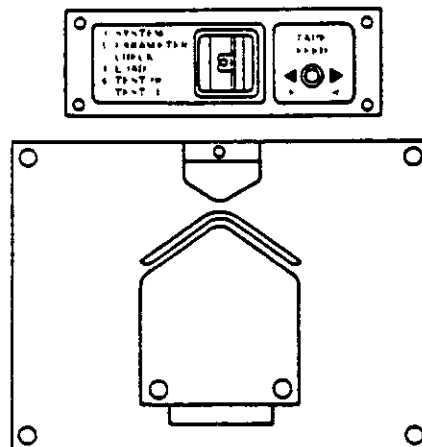


Fig. 4.1.16

- SYSTEM NO. switch

Set the switch at "0" during the usual operation. Functions of its each setting are as follows

"0": SYSTEM

For usual operation. Writing parameters is prevented.

"1": PARAMETER

To write parameters. At this position, the Cycle Start is prevented.

"2": CHECK

To collate the system program stored in the control with the source tape.

"3": LOAD

To store the maintenance tape into the control.

"4": TEST (0)

The usual operation is permitted similarly in case of "0" SYSTEM. Self-diagnostics of the memory contents and checking of zero return position are omitted.

"5": TEST (1)

Writing of parameters is effective likewise in case of "1" PARAMETER. Self-diagnostics of the memory contents and checking of zero return position are omitted.

4.2 POWER ON/OFF OPERATION

4.2.1 TURNING ON POWER

Check the machine before turning on power, referring to the machine tool builder's manual for details. Operations after completion of pre-inspections are as follows.

- Depress the POWER ON pushbutton to turn on the control power. The internal timer will be read in about two seconds. Then the servo power is ready for turning on, which can be shown by alarm code "31."
- Depress the POWER ON pushbutton again to turn on the servo power. The NRD (NC READY) signal is sent out when the NC power is normally supplied

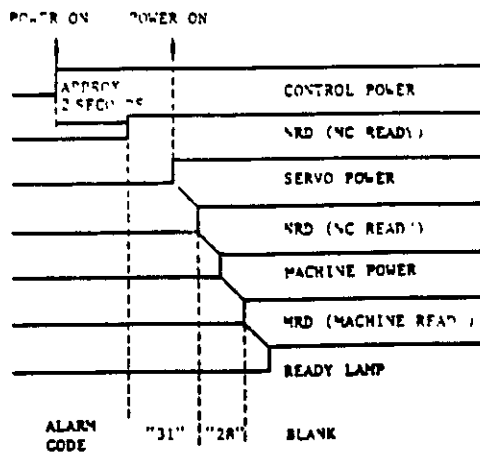


Fig. 4.2.1 Sequence of Turning on Operation

- When the NRD signal turns on the machine power, and the MRD(MACHINE READY) signal returns back to the control, the READY lamp will be lit.

4.2.2 TURNING OFF POWER

Depressing the POWER OFF pushbutton causes both the servo and control powers to be turned off simultaneously. However, for stabler system operation, take the following procedure.

- First depress the EMERGENCY STOP pushbutton to cut off the servo power. The NRD (NC READY) signal is interrupted, which usually results in turning off the machine power, too.
- Depress the POWER OFF pushbutton to cut off the control power.

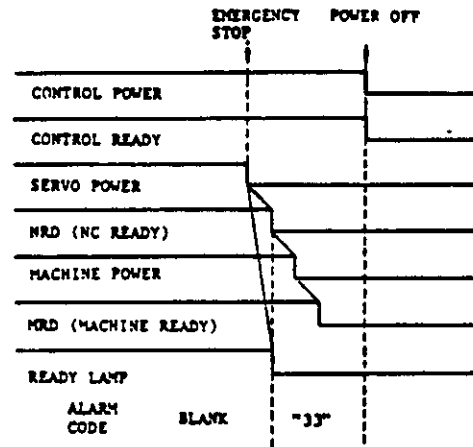


Fig. 4.2.2 Sequence of Turning off Operation

4.2.3 REMOTE TURNING ON/OFF PUSHBUTTON

Connect the power ON/OFF pushbuttons to EON, EOF and COM terminals on the control panel as shown below. Then the remote turning ON/OFF operation can be made exactly the same as with the POWER ON/OFF pushbuttons.

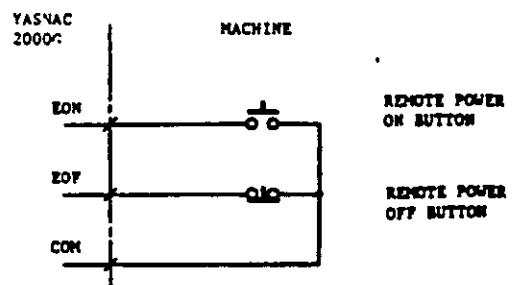


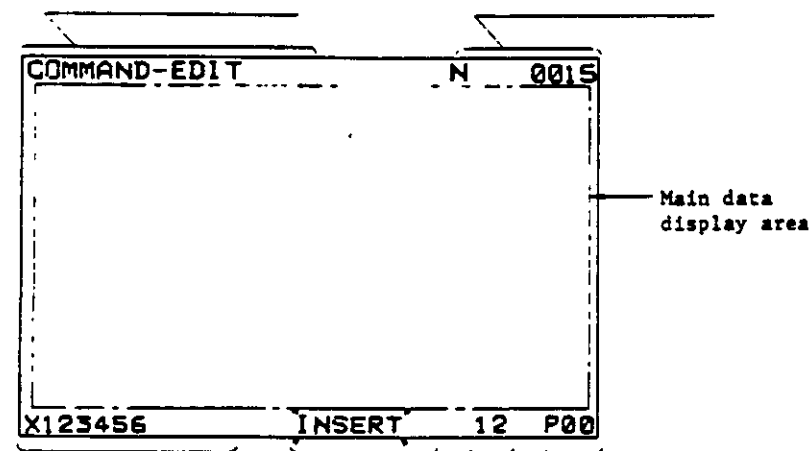
Fig. 4.2.3 Connections of Remote ON/OFF Pushbuttons

### 4.3 DISPLAY AND WRITING OPERATION

#### 4.3.1 GENERAL DISPLAY

The following display is made on both the top and bottom on the displayed picture of CRT, irrespective of the FUNCTION key selected.

- 1) Function message  
 POSITION  
 COMMAND-MODAL  
 COMMAND-EDIT  
 OFFSET  
 :
- 2) Sequence number (See NOTE.)  
 a) Without the work No. control.  
 N       
 b) With the work No. control.  
 N



3) Keying-in data

Depressing the WR key causes only the address characters to be remained, which is being designated.

4) Status message

ALARM-   ... Note: ALARM-31  
 TAPE OUT is not displayed  
 TAPE IN in the EDT mode.  
 INSERT  
 :  
 :

NOTE: During an automatic operation (including the feedhold condition), the sequence number of the current block will be displayed. When the control is stopped at the end of a block, the sequence number of the block just executed will be displayed.



### 4.3.2 DISPLAY OF COMMAND DATA

Command data can be always displayed in any mode. The procedure of displaying command data except in any mode is as follows. (See 4.6 "EDIT" for the command data display in the EDT mode.)

1. Set the MODE SELECT switch to a mode other than the EDT mode.
2. Depress the COM key, and then the lamp lights up. → P00

First depressing of the COM key causes the page number to make P00, which displays the command data of one block. The conditions of the data to be displayed as follows.

- a. The data shows the contents of the active register during an automatic operation or a feed hold.
- b. While the control is stopped at a block end, displayed is the contents of the buffer register. If the buffer register is blank (when the BUFFER lamp is off), displayed is the contents of the just executed block.
- c. The coordinate command values displayed are the modified values with the tool offset value but not the input values.

P00 Command Value Display (including modal command)

COMMAND-MODAL				N01. 0400	
/	G02	X	0400	P	M
	G40	Z-	100.000		0000
	G97	U	200.000	D	0000
	G99	W-	100.000	D	0
			0	L	0
		K-	100.000	*	0
			2.00		
			350	GSOS	1000
			0202	SUBL	0
F					10 P00

Fig. 4.3.2.1

- d. All modal commands can be displayed. The display includes the modal commands which have been already effective at a previous command or operation. Therefore, P00 shows the data which can be really executed.

3. Depress the 

PAGE
↓

 key. — P01

The page can be shifted to P01, likewise displaying the command data of similar one block. The conditions of the data to be displayed differ from those on P00 in the following points.

- a. No previous modal command can be displayed. The address data only instructed by the block can be displayed.

P01: Input Value Display (modal command not included)

COMMAND-INPUT				N01. 0400	
/	G02	X	0400	P	M
		Z-	200.000		0000
			100.000	D	0000
		U	200.000	D	0
		W-	100.000	L	0
			0	*	0
		K-	100.000		
			2.00		
			350	GSOS	1000
			0202	SUBL	0
F					10 P01

Fig. 4.3.2.2

4. Depress the 

PAGE
↓

 key again. — P02

Then, the page can be shifted to P02 and the display becomes blank except in the MEM (memory operation) mode.

In the MEM mode, the command data containing several blocks with the current block at the top can be widely displayed. The stored part program containing about nine lines can be collectively displayed with the current block at the top which the pointer "O" points out in the memory.

P02: Memory Program Wide Display

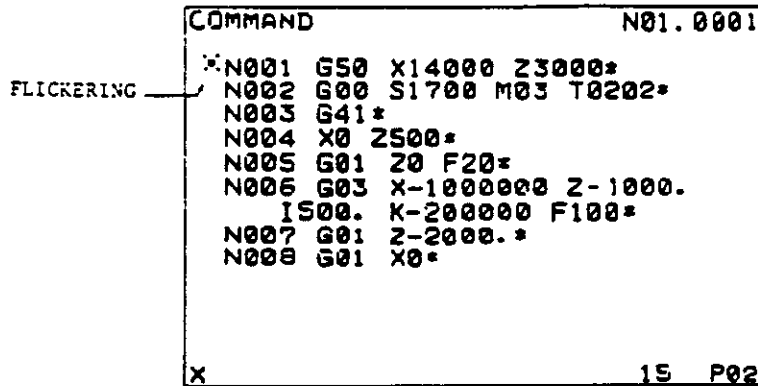


Fig. 4.3.2.3

These displayed data show the address data as they were input. No modification is made with the tool offset values.

As the automatic operation goes on, the displayed picture will be automatically renewed and then the next command group can be displayed, while the page number remains P02. The displayed picture cannot be renewed by depressing the PAGE key. In the MEM mode, LINE key operation is possible while the AS key is held depressed.

5. Depress the PAGE key again. → P00

The page returns to the initial page number of P00.

#### 4.3.3 WRITING COMMAND DATA BY MDI

The command data of a block can be written manually in the MDI mode and while the control is stopped at the block end. Writing operation cannot be allowed if the data remains in the active register during automatic operation or after a temporary stop by FEED HOLD push-button.

1. Set the MODE SELECT switch to MDI.
2. Depress the COM key, and the lamp lights up. → P00

The page P00 contains the modal command data which have been already executed and remains effective at a previous command or operation.

3. Key in the desired address data by use of the ADDRESS and the DATA keys. The keyed-in data will be displayed at the bottom left corner of the display. To correct the data just keyed in, depress CAN (cancel) key first and the key in the correct number again.
4. Depress the WR key.

The address data just keyed in is stored in the buffer register, being displayed at a specified location on the display as a new command data. The coordinate values displayed are the modified values with the tool offset value.

## Writing Command Value

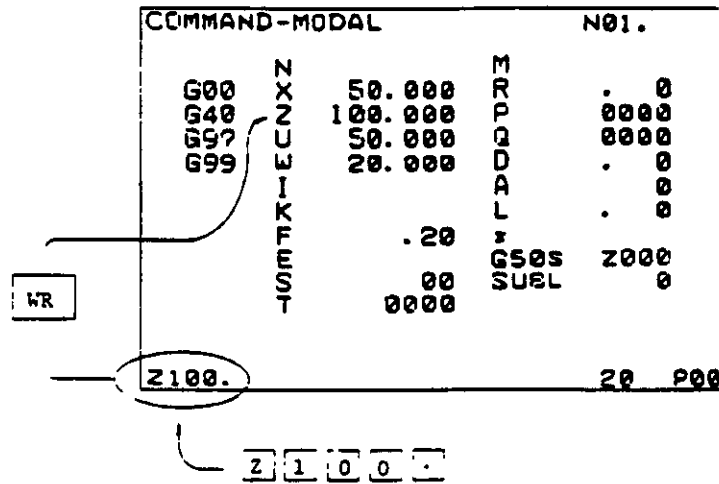


Fig. 4.3.3

NOTE: The WR key operation will erase the address data except address character at the bottom left corner. The remaining address character will be called "currently designated address."

5. Repeat the steps 3 and 4 until the command data of a block have been written in.
6. Depress the CYCLE START pushbutton, then the input commands will be executed.

### NOTES:

- a. If the RESET key depressed during the writing operation by MDI, all the command data already written can be cancelled out.
- b. While the Tip Nose Radius Compensation (G41 to G44) or the Multiple Repetitive Cycles (G70 to G76) is being executed, MDI operation cannot be accepted. The DATA key operation can be accepted, but the storing operation by the WR key is disregarded.
- c. The data to be executed will be checked by displaying P00. To read out only the written-in data, depress the PAGE  
↓ key to turn the page to P01.
- d. For writing-in "/" for the optional-block-skip, first key in like "/", "1" and then depress the WR key. To cancel the "/" already written in, first key in like "/", "0" and then depress the WR key.

### 4.3.4 DISPLAY OF CURRENT POSITION

The current position can be always displayed at any mode. The operating procedure is as follows.

1. Depress the POS key, and then the lamp lights up. — P00

When this key is depressed first, the page turns to P00, thus resulting in the display mode of current position display A.

One of the following will be selected by setting parameter "72."

- A. Where parameter No. "72" = "0".
  - The current position to be displayed is the same as that on the CURRENT POSITION DISPLAY UNIT +. (See NOTE.)
  - The current position display shows the accumulated amount of machine movement by both manual and automatic operation, which cannot be changed even by initiating the G50 command.
  - The display is updated even if the LOCK MODE switch is set to MACHINE LOCK position.
  - To reset the displayed data designate an axis using the ADDRESS key, then depress the POS and CAN keys simultaneously.

- B. Where parameter No. "72" = "1":
- The displayed current position is automatically set up by G50 command. The display shows the accumulated amount of machine movement by both the manual and automatic operation.
  - The display shows always the current position based on the programmed coordinate system, as far as the manual operation does not interrupt.
  - Only the display is updated if the LOCK MODE switch is set to MACHINE LOCK position.
  - The setting up of a current position display can possibly be made only by the G50 command, while no reset can be made operating any pushbutton.

- C. Where parameter No. "72" = "2":
- Setting up of a current position display can be made by the G50 command and the resetting also possible by designating an axis and operating POS and CAN keys.

NOTE: The DISPLAY LOCK switch  $\tau$  does not influence the P00 display. For the CURRENT POSITION DISPLAY UNIT, this switch is effective.

P00: Current Position Display A

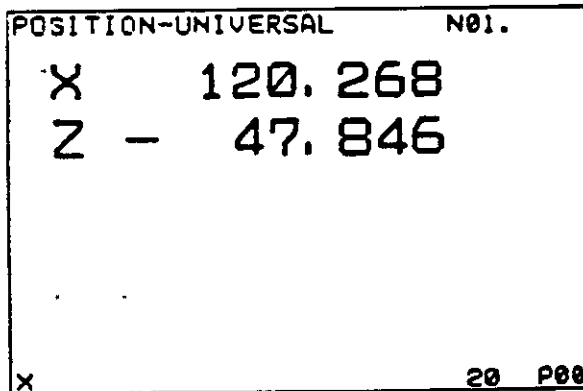


Fig. 4.3.4.1

2. Depress the **PAGE** key. — P01

The page turns to P01, showing the current position display B.

- A. The display shows the same current position as that of the CURRENT POSITION DISPLAY UNIT.

- B. To reset this display, depress the POS key, and depress ORG key and ADDRESS key for the axis to be reset. (X or Z axis)

P01: Current Position Display B

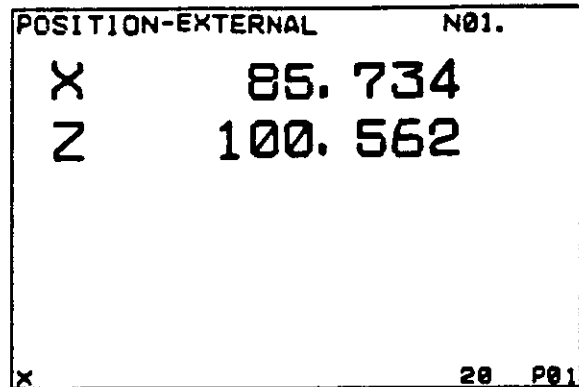


Fig. 4.3.4.2

3. Depress the **PAGE** key again. → P02

The page turns to P02, showing an incremental movement value of both X- and Z-axis in execution.

The display shows:

- A. Updated distance to the end of the block being executed under the automatic operation.
- B. Updated distance to the manual operation starting point in the manual operation. Once the mode is turned to automatic operation mode, the displayed incremental value in the manual operation can be cancelled.

P02: Incremental Value Display

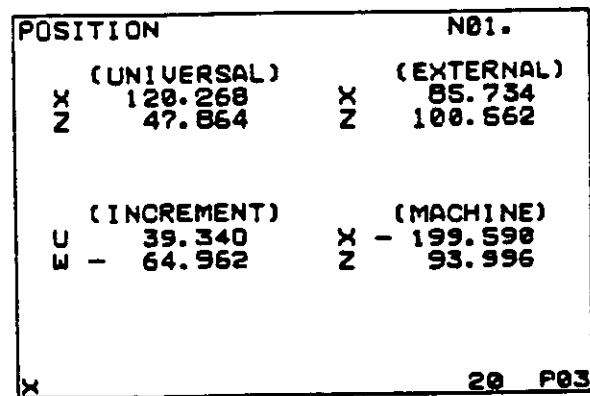


Fig. 4.3.4.3

4. Depress the **PAGE** key again. → P03

The page turns to P03, collectively showing positions.

The "MACHINE" position display shows the current positions in the coordinate system which has its "0" coordinate just on the reference-zero-point. (Reference-zero-point is the position returned by ZERO RETURN operation.)

POSITION		N01.	
	(UNIVERSAL)		(EXTERNAL)
X	120.268	X	85.734
Z	47.864	Z	100.562
	(INCREMENT)		(MACHINE)
U	39.340	NX	199.590
W	64.962		93.996
X		20 P03	

Fig. 4.3.4.4

5. Depress the **PAGE** key again. → P04

The display on this page will become blank (see the NOTE).

6. Depress the **PAGE** key again. → P00

The page returns to the initial page of P00.

**NOTE:**

With the SYSTEM NO. to be at "4" or "5", the following data will be displayed on P04.

**P04: Servo lag value display**

A lag value between the updated command positions and the current tool positions is displayed (in 0.001 mm unit).

**4.3.5 DISPLAY OF TOOL OFFSET VALUE**

The tool offset values are kept in the tool offset memory of the control. The display of a value can be made at any time in any mode even during the automatic operation.

The operating procedure is as follows.

1. Depress the OFS key, and then the lamp lights up.

When this key is depressed first, the display shows the tool offset data of an offset number corresponding to a "line number" already designated in previous operation (see NOTES).

2. Key in 2-digit number following a character "T." The WR key operation is not needed. A set of data for an offset value corresponding to the keyed-in value is displayed. If "T," "1," "0" are keyed in, the display shows the contents of an offset number "10."

**Note:**

If "1" key depressed following the above, a numeral value "01" at the lowest 2-digit is designated. This shows an offset number "01."

3. Depress the **LINE** key.

The data of an offset number plus one is displayed.

OFFSET		N01.	
T10	X-	50.584	
	Z	250.196	
	R	.	0
POS (UNIVERSAL)	X	97.280	
	Z	184.700	
		.	0
		.	0
Z		10 P02	

Fig. 4.3.5.1

Note: On the lower half of the display, current position A and increment value is shown.

4. Depress the **LINE** key.

The data of an offset number minus one is displayed.

- Wide-Display -

5. Depress the OFS key again.

The display turns to the wide-display mode collectively showing the data of a page including the offset number designated (10 sets of data/page).

OFFSET		N01.		
T	X	Z	R	
00				
01	- 120.196	- 55.576	1.004	
02	- 9.878	10.482	.598	
03	- 34.556	6.372	.604	
04	- 7.340	2.496	.0	
05	- 94.399	50.114	.909	
06	. 0	. 0	. 0	
07	. 0	. 0	. 0	
08	- 40.060	12.308	.800	
09	- 3.452	41.092	. 0	
			08	P00

When an offset number "08" is designated, (The number indicated by flickering "0.")

Fig. 4.3.5.2

6. Depress the PAGE  
↓ key.

The page turns to the page number plus one.

7. Depress the PAGE  
↑ key.

The page returns back to the page number minus one.

8. Depress the OFS key again.

Cancelling the wide-display, the mode returns back to the normal-display. The display shows the line designated by the previous operation.

NOTES:

- A "line number" designated by the previous operation is always kept displayed at the bottom right by a 2-digit number, " [ ] ."
- In displaying and writing by OFS, PRM or DGN key, the respective data of an offset number, parameter number or diagnostic number corresponding to the above displayed number " [ ] . " will become an object for such display and writing-in.

- This displayed number can be renewed by the LINE key in the OFS, PRM and DGN modes, but not be affected by the LINE key operation in the display modes of POS, COM and ALM.

4.3.6 WRITING OF TOOL OFFSET VALUE

Writing or modification of the tool offset value in the memory can be made at any time in any mode even during the automatic operation.

The operation procedure is as follows.

1. Depress the OFS key, and then the lamp lights up.

A set of data for an offset number designated is displayed (normal-display mode).

2. Key in an offset number desired following a character "T." The WR key need not be operated.

A set of tool offset values corresponding to the keyed-in offset number is displayed. Simultaneously, the "line number" display (at the bottom right) is also substituted for the keyed-in number.

3. Key in a tool offset value (an axial address plus a number) desired to be written in. The characters of X, Z and R can be used for the address.

The keyed-in data will be displayed at the bottom left corner of the display. If the number is mis-keyed, depress the CAN key first and then key in the correct number again.

4. Depress the WR key.

The keyed-in data will be stored into the tool offset memory and displayed as a new tool offset value. The address data except the number displayed at the bottom left section will be erased.

5. Repeat the steps 2 through 4 until the necessary tool offset values have been stored into the memory.

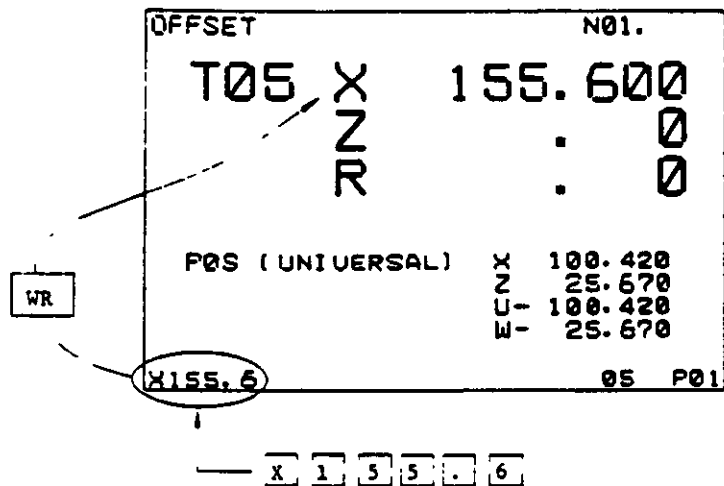


Fig. 4.3.6

NOTES:

- The tool offset values stored into the memory will not be erased by turning off the power.
- Writing and modification of a tool offset value can be always made in any mode even during the automatic operation.
- A tool offset value modified during the automatic operation will become effective right after the next block command is read into the buffer register.
- As for the tool offset values applicable to the blocks already being executed or stored into the buffer register, the values before modification will be used.
- Current radius value cannot be modified during Tip Nose Radius Compensation until it is cancelled by G40 or T00.
- When zero is specified for the radius value, however, the compensation will be cancelled even in the tip nose radius compensation mode.

4.3.7 WRITING OF INCREMENTAL VALUE OF TOOL OFFSET

For writing the tool offset value, input the tool offset value as an absolute value or input the increment to be added to or deducted from a stored value.

To write in the incremental value, select the address U or W. The written value just keyed in using DATA keys is added algebraically to the stored offset value as a new offset value.

Address

- U --- To write an increment value of X-axis tool offset
- W --- To write an increment value of Z-axis tool offset

4.3.8 PARAMETER DISPLAY

Various parameters have been stored in the parameter storage of the control. According to their contents, operating conditions such as tape code and rapid traverse rate, will be determined. See the parameter table for the details. The parameter display can be always possible in any mode even during the automatic operation.

The operating procedure is as follows.

1. Depress the PRM key, and then the lamp lights up. A set of parameters for a designated number will be displayed.
2. Key in a 2-digit number following a character "N", and the parameter data of the keyed-in number will be displayed. The WR key operation is not needed. Key in N, 9, 0, for example, and the parameter "90" will be shown.

Note: If "1" key is depressed following the above, the smallest 2-digit number "01" is designated, to show the parameter "01."

- Depress the LINE key.

The data of a parameter number plus one is displayed.

- Depress the LINE key.

The data of a parameter number minus one is displayed.

PARAMETER		N01.	
N90	X		26
	Z	-	100
	I		00
	K		00
[ POS (MACHINE)		NX	32.142
			250.450
N		90	P18

Fig. 4.3.8.1

Note: For a special parameter display, the current position display of the "MACHINE" coordinate system will be displayed at the lower section. (Special parameter no. N00 to N39)

- Wide- Display -

- Depress the PRM key again.

The display turns to the wide-display mode, collectively showing the data of a page including the parameter number designated (5 sets of data/page).

PARAMETER		N01.			
N90	X	26	N93	X	50
	Z	100		Z	100
	I	00		I	00
	K	00		K	00
N91	X	00	N94	X	640
	Z	00		Z	1280
	I	00		I	00
	K	00		K	00
N92	X	00			
	Z	00			
	I	00			
	K	00			
N		90		P18	

Fig. 4.3.8.2

- Depress the PAGE key.

The page turns over by one.

- Depress the PAGE key.

The page turns back by one.

- Depress the PRM key again.

Cancelling the wide-display, the mode returns to the normal-display.

NOTES:

- For all parameters not requiring designation of axis the data will be displayed right following the address "X."
- During the wide-display mode, the line (indicated by "o" mark) can be moved by the LINE key operation.

4.3.9 WRITING PARAMETERS

Except for the setting function, the optimum parameter data have been set corresponding to the machine performance and application. Whenever a modification is desired for the parameter data, therefore, consult the machine manufacturer.

The parameters are interlocked by setting SYSTEM NO. switch at "0" so that the data are not accidentally erased or changed. Where it is desired to modify the data of parameters, consult the machine tool builder. The operating procedure for the parameter writing is as follows.

- Set the SYSTEM NO. switch at "1."
- Depress the PRM key, and then the lamp lights up.  
The parameter data of a designated number will be displayed.
- Key in a parameter number desired, following the "N." The WR key operation is not needed.  
The parameter data of the keyed-in number will be displayed.



4. Key in a data (an axial address plus a number) desired to be written in.

For all parameters not requiring designation of axis, key in a number following the address "X" (any address characters other than N can be effective).

The keyed-in data will be displayed at the bottom left corner of the display. To correct the number, depress the CAN key first and then key in the correct number.

5. Depress the WR key.

The keyed-in data will be stored into the parameter storage and displayed as a new parameter data. The address data except the address character at the left bottom corner will be erased.

6. Repeat the steps 3 through 5 above until all the necessary parameters have been set.
7. Return the SYSTEM NO. switch to "0."
8. Depress the RESET key.

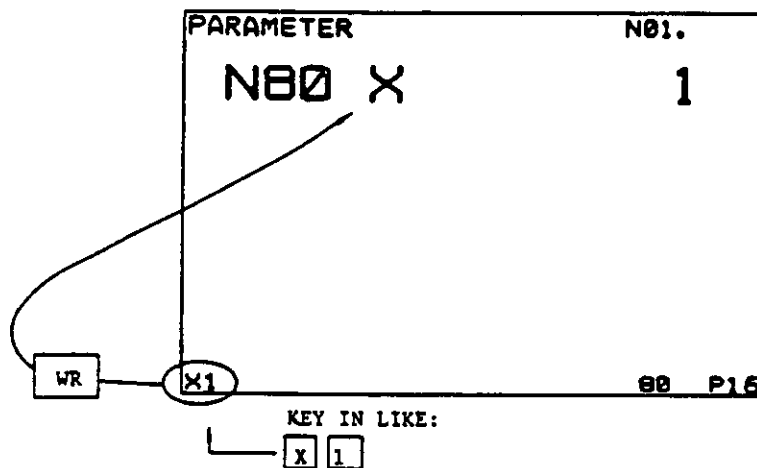


Fig. 4.3.9

**NOTES:**

- Data of parameters, once stored in the storage, are retained even if the power supply is switched off.
- With parameter No. at 00, totalized time of automatic operation will be displayed. For details, refer to 4.3.10 Operation Time Display.
- Data of parameter numbers 01 to 09 can be changed without setting the SYSTEM NO. switch at "1." For details, refer to 4.3.11 Setting Function.
- Setting parameter number at 99 displays active address of the tape memory with number of characters on the display. See 4.5.4 Address Display of Tape Memory.
- Data of parameter numbers 10 to 98 can be displayed at any time. They cannot be changed unless SYSTEM NO. switch is set at "1."
- If any of parameter data is accidentally destroyed, alarm code "17" will be displayed.
- SYSTEM NO. switch is provided above the tape reader.

第4.3.9表 パラメーター一覧 (1/3)  
Table 4.3.9 List of Parameters

NO.	ADD-RESS	意味 MEANING	NO.	ADD-RESS	意味 MEANING	NO.	ADD-RESS	意味 MEANING
00	/	稼働時間表示 Operation Time Display 9999. 時 (H) 59. 分 (M) 59. 秒 (S)	※30	X Z I K	第1ストロークチェック座標 (最大値) First Stroke Check Point (Max) : 1' = 0.001 mm  未使用 Not Used	※35	X Z I K	第4ストロークチェック座標 (最小値) 4th Stroke Check Point (Min) : 1' = 0.001 mm  未使用 Not Used
01	/	早送りの速度レンジ Rapid Traverse Rate Range : 0' = Hi, : 1' = Lo						
02	/	ドライラン時早送りの速度 Rapid Traverse Rate for Dry Run : 0' = Hi/Lo, : 1' = JOG		X Z I K	第1ストロークチェック座標 (最小値) First Stroke Check Point (Min) : 1' = 0.001 mm	36	X Z I K	オーバーライド時の早送り速度 Rapid Traverse for Override 1' = 7.5 mm/min
※03	/	ストロークチェック入切 Stroke Check ON-OFF : 0' = OFF, : 1' = ON	※31					SMC 制御定数 Constant for SMC Control
※04	/	マシンロック時、ストロークチェック入切 Stroke Check ON-OFF for Machine Lock : 0' = OFF, : 1' = ON		X Z I K	第2ストロークチェック座標 (最大値) Second Stroke Check Point (Max) : 1' = 0.001 mm	37	X Z I K	
※05	/	周速制御時、工具補正値キャンセル Tool Offset Cancel for Surface Speed Control : 0' = OFF, : 1' = ON	※32					
06	/	ワーク番付指定 Work Number Designation 0: 未指定 Not designated 1~99: Work NO.		X Z I K	第2ストロークチェック座標 (最小値) Second Stroke Check Point (Min) : 1' = 0.001 mm	38	X Z I K	仕様指定用パラメータ Designation of Optional Features
07	/	未使用 Not Used	※33					
08	/	未使用 Not Used		X Z I K	第4ストロークチェック座標 (最大値) 4th Stroke Check Point (Max) : 1' = 0.001 mm	39	X Z I K	
09	/	RESET時のAグループGコード状態 G code of A group When Resetting : 0' = G00, : 1' = 保存 Hold	※34		第4領域指定データ Data for 4th Stroke Check			

セッティング機能  
Setting Storage (備考1)  
Notice 1)

第 4-3-9 表 パラメータ一覧 (2/3)

Table 4.3.9 List of Parameters (Cont'd)

NO.	ADD-RESS	意 味 MEANING	NO.	ADD-RESS	意 味 MEANING	NO.	ADD-RESS	意 味 MEANING
※41	}	※ シーケンス制御用パラメータ Parameter for Optional Machine Interface '0' = OFF, '1' = ON	60	X	バックラッシュ補正開始方向 Backlash Comp. Starting Direction '0' = from (+), '1' = from (-)	※70		直径/半径指定 Diameter/Radius Designation '0' = 直径, '1' = 半径 Diameter
			61	X	原点復帰方向 Zero Return Direction '0' = to (+), '1' = to (-)	71		G99/G98 イニシャルセット Initial Set '0' = G99, '1' = G98
※47	}		62	X	原点復帰最終速度 Zero Return Final Speed '1' = 7.5 mm/min	72		G50 表示プリセット入切 Display - Preset ON - OFF '0' = OFF, '1' = ON
			63	X	ポジションエラー領域 Position Error Zone '1' = 最小移動単位 Least Command Increment	※73		GR0 主軸DA出力値 Spindle DA Output '2047' = 10V
49	X	システム番号 System Number	64	X	サーボエラー領域 Servo Error Zone '1' = 最小移動単位 Least Command Increment	※74		G74 引戻し量 (一定量) Retracting Value '1' = 0.001 mm or 0.0001 inch
			65	X	未使用 Not Used	※75		G75 引戻し量 (一定量) Retracting Value '1' = 0.001 mm or 0.0001 inch
※51 ※57	}	※ シーケンス制御用タイム定数 Timer Constant for Optional Machine Interface '1' = 16/80 msec Hi/Lo	66	X	サイクルスタート時の原点復帰 Zero Return before Cycle Start '0' = 不要, '1' = 要 Not Required Required	※76		G76 仕上げ代 (一定量 a) Finishing Value (a) '1' = 0.001 mm or 0.0001 inch
			67	X	手動ハンドル送り最大速度 Max. Feedrate for Handle '1' = 7.5 mm/min	77		G92, G76 チャンファ幅 (γ) Chamfering Width '1' = 0.1 リード Lead
※58	X	ワーク番号指定等 Switching for Work No. Designation '0' = 外部入力: by Remote, '1' = by Parameter 06	68	X	切削送り定数 Time Constant for Feed '1' = 32 msec	※78		GR3 主軸最大回転数 Spindle Max. RPM '1' = 1RPM
			69	Z	切削送り速度/バイアス Velocity Bias for Feed '1' = 2 Kpps	※79		GR4 主軸最大回転数 Spindle Max. RPM '1' = 1RPM

第 4.3.9 表 パラメーター一覧 (3/3)

Table 4.3.9 List of Parameters (Cont'd)

NO.	ADD-RESS	意 味 MEANING	NO.	ADD-RESS	意 味 MEANING	備 考 NOTICE
80	/	EIA/ISOの自動判別入切 - Auto Select :0' = OFF, :1' = ON	90	X Z	バックラッシュ補正量 Backlash Value :1' = 最小移動単位 Least Command Increment	1) No. 01 ~ 09 は SYSTEM No. スイッチのイン タロックなしに替込み可能です。 No. 01 to 09 can be changed without in- terlocking of SYSTEM No. switch.
81	/	TV チェック入切 TV Check ON - OFF :0' = OFF, :1' = ON	91	X Z	未使用 Not Used	2) No. 00 および 99 は表示専用であり, 替込みは できません。 No. 00 and 99 are for display only. These cannot be written.
82	/	EIA/ISO コード指定 Code Designation :0' = EIA, :1' = ISO	92	X Z		
※83	/	MM/INCH 指定 Designation :0' = MM, :1' = INCH	93	X Z	早送り速度 (Lo) Rapid Traverse Rate (Lo) :1' = 7.5 mm/min	
84	/	タッチブザー入切 Touch Buzzer ON - OFF :0' = OFF, :1' = ON	94	X Z	早送り速度 (Hi) Rapid Traverse Rate (Hi) :1' = 7.5 mm/min	3) No. 30 ~ 98 は SYSTEM No. スイッチによっ てインタロックされており, 同スイッチを :1' の位置にして替込みを行います。 No. 30 to 98 are interlocked by SYSTEM No. switch, and can be changed only when the po- sition of SYSTEM No. switch is :1'.
85	/	未使用 Not Used	95	X Z	早送り加速定数 Accel./Decel. Time Const. for RT :1' = 125/8 mm/sec <sup>2</sup>	4) ※ 印の付されたパラメータはオプションです。 Parameters with ※ Mark are optional.
※86	/	GR1 主軸最大回転数 Spindle Max. RPM :1' = 1RPM	96	X Z	原点復帰クリーブ速度 Zero Return Approaching Speed :1' = 7.5 mm/min	
※87	/	GR2 主軸最大回転数 Spindle Max. RPM :1' = 1RPM	97	X Z	原点復帰最終距離 Zero Return Final Stroke :1' = 0.001 mm	
88	/	入力指令 10 倍入切 Command data X 10 ON - OFF :0' = OFF, :1' = ON	98	/	MF, SF, TF 送出遅れ時間 Delay. Time for MF, SF, TF :1' = 1 msec	
※89	/	G00 刃先 R 補正入切 Tip Nose R Comp ON - OFF :0' = OFF, :1' = ON	※99	/	メモリポインタ表示 Memory Pointer Display :1' = 1 ch	

備考 2)

Notice 2)

#### 4.3.10 OPERATION TIME DISPLAY

Operation time display shows the totalized time of automatic operation of machine. It may be used to know the working time to finish a workpiece or total operation time of the system.

1. Depress the PRM key, and then the lamp lights up.
2. Key in likely as "N," "0," "0." The WR key operation is not needed.

The CRT display shows operation time in hours, minutes and seconds. This display represents an accumulated time of the automatic operation while CYCLE START lamp is on. It is not cleared by turning off power.

3. To reset the display, depress the PRM and CAN keys simultaneously.

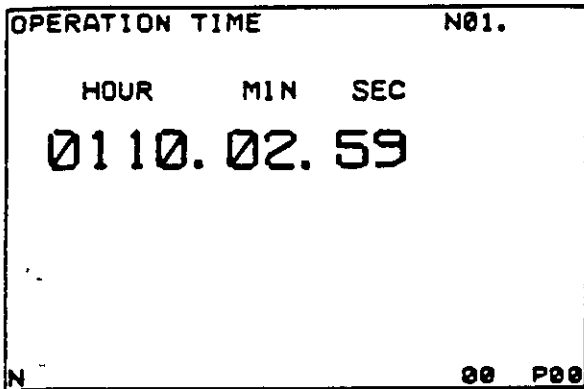


Fig. 4.3.10

#### 4.3.11 SETTING FUNCTION

Parameter numbers 01 to 09 assume switching function and can be written without operation of SYSTEM NO. switch. This function can discriminatingly be called the setting function from those of all other parameters. For their meanings, see Table 4.3.9 List of Parameters.

The operating procedure is as follows.

1. Depress the PRM key, and then the lamp lights up.

2. Key in any one of parameter numbers 01 through 09 following the N key.  
The data already stored in will be displayed.

3. Key in "1" or "0" following the X key (acceptable any except N).

The keyed-in data will be displayed at the left bottom corner. If a number mis-keyed, first depress the CAN key and then key the right number in again.

4. Depress the WR key.

The keyed-in data will be stored into the parameter storage and displayed as a new parameter.

#### NOTES:

- This operation can be made at any time even during the automatic operation.
- Depending upon a type of machine, there may happen to have a case of preventing the setting function. In such a case, the data can also be changed on the parameters 01 through 09 as well as on all other parameters, by setting the SYSTEM NO. switch to "1." Refer to the machine tool builder's manual.

#### 4.3.12 ALARM AND STATUS CODE DISPLAY

The control is always diagnosing even during machining. When the control detects an error, INPUT ERROR or NC ALARM lamp lights up and it stops operation. The corresponding alarm code and alarm message will be displayed on the CRT display when the ALM key is pushed and the lamp lights up.

1. If the control detects an error, a message, expressed in "ALARM-□□," will flicker at the bottom of the CRT display, disregarding the FUNCTION select key.

2. Depress the ALM key.

The status and alarm codes as well as the alarm message will be displayed. See the List of Alarm Codes and Status Codes for the detailed meanings.

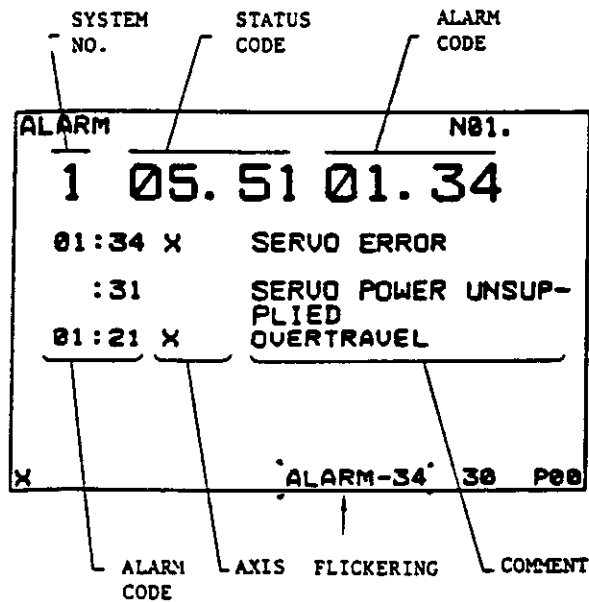


Fig. 4.3.12

NOTES:

- The alarm codes "81" and "82" will be displayed without operating the FUNCTION select keys.
- When more than one error occurs at the same time, up to five alarm codes will be shown on the display.
- Errors on axis are displayed by three digits, first of which shows the axis whose error is detected.
- The alarm code is cleared by depressing the RESET key, after eliminating the cause of the alarm.
- The SYSTEM NO. switch number will be displayed at the extreme left of the display top.
- In case an alarm code is displayed, correct the cause according to 8.5 Trouble Causes and Remedies of the YASNAC 2000G operator's manual. (TOE-C843-5.20)

#### 4.3.10 OPERATION TIME DISPLAY

Operation time display shows the totalized time of automatic operation of machine. It may be used to know the working time to finish a workpiece or total operation time of the system.

1. Depress the PRM key, and then the lamp lights up.
2. Key in likely as "N," "0," "0." The WR key operation is not needed.

The CRT display shows operation time in hours, minutes and seconds. This display represents an accumulated time of the automatic operation while CYCLE START lamp is on. It is not cleared by turning off power.

3. To reset the display, depress the PRM and CAN keys simultaneously.

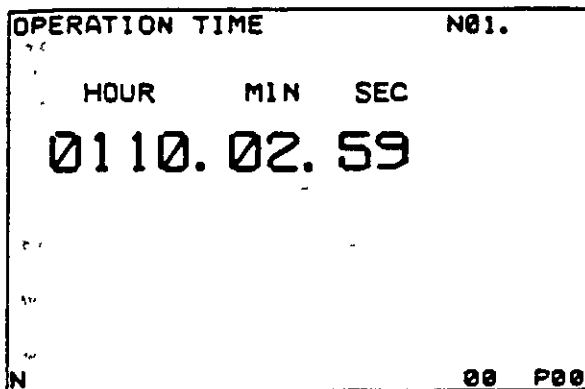


Fig. 4.3.10

#### 4.3.11 SETTING FUNCTION

Parameter numbers 01 to 09 assume switching function and can be written without operation of SYSTEM NO. switch. This function can discriminatingly be called the setting function from those of all other parameters. For their meanings, see Table 4.3.9 List of Parameters.

The operating procedure is as follows.

1. Depress the PRM key, and then the lamp lights up.

2. Key in any one of parameter numbers 01 through 09 following the N key.

The data already stored in will be displayed.

3. Key in "1" or "0" following the X key (acceptable any except N).

The keyed-in data will be displayed at the left bottom corner. If a number mis-keyed, first depress the CAN key and then key the right number in again.

4. Depress the WR key.

The keyed-in data will be stored into the parameter storage and displayed as a new parameter.

#### NOTES:

- This operation can be made at any time even during the automatic operation.
- Depending upon a type of machine, there may happen to have a case of preventing the setting function. In such a case, the data can also be changed on the parameters 01 through 09 as well as on all other parameters, by setting the SYSTEM NO. switch to "1." Refer to the machine tool builder's manual.

#### 4.3.12 ALARM AND STATUS CODE DISPLAY

The control is always diagnosing even during machining. When the control detects an error, INPUT ERROR or NC ALARM lamp lights up and it stops operation. The corresponding alarm code and alarm message will be displayed on the CRT display when the ALM key is pushed and the lamp lights up.

1. If the control detects an error, a message, expressed in "ALARM-□□," will flicker at the bottom of the CRT display, disregarding the FUNCTION select key.

2. Depress the ALM key.

The status and alarm codes as well as the alarm message will be displayed. See the List of Alarm Codes and Status Codes for the detailed meanings.

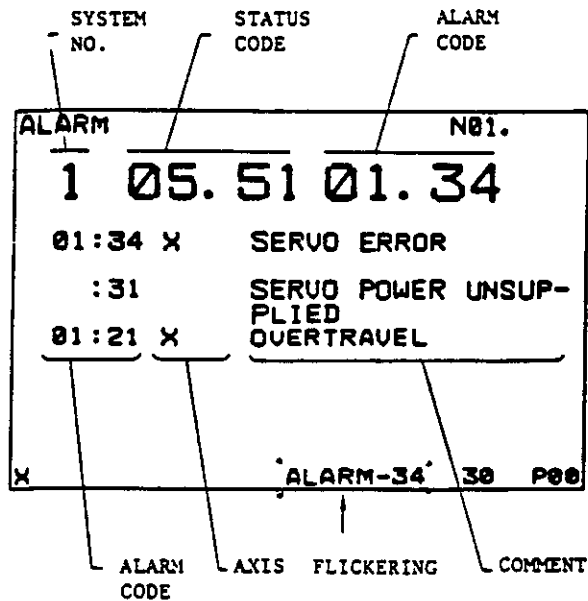


Fig. 4.3.12

NOTES:

- The alarm codes "81" and "82" will be displayed without operating the FUNCTION select keys.
- When more than one error occurs at the same time, up to five alarm codes will be shown on the display.
- Errors on axis are displayed by three digits, first of which shows the axis whose error is detected.
- The alarm code is cleared by depressing the RESET key, after eliminating the cause of the alarm.
- The SYSTEM NO. switch number will be displayed at the extreme left of the display top.
- In case an alarm code is displayed, correct the cause according to 8.5 Trouble Causes and Remedies of the YASNAC 2000G operator's manual. (TOE-C843-5-20)



List of Alarm Messages

:11		TEMPERATURE RISE ALARM IN THE PANEL
20:12		TAPE/MEMORY HORI- ZONTAL PARITY ERROR
:13		TAPE VERTICAL PARI- TY ERROR
02:14		FORMAT ERROR
15:15		DATA ERROR
:16		TOOL OFFSET AREA ERROR
:17		PARAMETER AREA ERROR
:18		TAPE MEMORY ERROR
02:21	Z	OVERTRAVEL
01:22	X	REFERENCE ZERO RE- TURN AREA ERROR
02:23	Z	REFERENCE ZERO RE- TURN UNREADY
01:24	X	REFERENCE ZERO RE- TURN POSITION ERROR
:25		SEQUENCE ERROR
:26		SPINDLE ERROR
03:27	XZ	POSITIONING ERROR
:28		MACHINE UNREADY
:31		SERVO POWER UNSUP- PLIED
01:32		CONTROL UNIT UNREADY
:33		EMERGENCY STOP
01:34	X	SERVO ERROR
:35		OVERLOAD
02:36	Z	FEEDBACK ERROR
:37		HARDWARE ERROR (FG)
:38		HARDWARE ERROR (RPG)
12A6:81		SYSTEM CPU ERROR
15:82		MEMORY COLLATING ERROR

Table 4.3.12.1 List of Alarm Code and Status Codes

Alarm Code	Causes	Alarm Code	Causes
11	Excessive temperature rise in the panel.	<input type="checkbox"/> 27	Positioning error.
<input type="checkbox"/> 12	Tape/Memory horizontal parity error.	28	Machine unready.
13	Tape vertical parity error.	31	Servo power unsupplied.
<input type="checkbox"/> 14	Format error.	<input type="checkbox"/> 32	Control unit unready.
<input type="checkbox"/> 15	Data error.	33	Emergency stop.
16	Offset error.	<input type="checkbox"/> 34	Servo error.
17	Parameter error.	<input type="checkbox"/> 35	Overload.
18	Tape memory error.	36	Feedback error.
<input type="checkbox"/> 21	Overtravel.	37	Hardware error (FG).
<input type="checkbox"/> 22	Zero return area error.	38	Hardware error (RPG).
<input type="checkbox"/> 23	Zero return unready.	81	CPU error.
<input type="checkbox"/> 24	Zero return position error.	82	Memory collating error.
25	Sequence error.	91	Contents disagreement between tape and memory. (For off-line only.)
26	Spindle error.	92	Tape reading error. (For off-line only.)

Status Code	Status	Remarks
<input type="checkbox"/> 51	Performing M-, S-, and/or T-function.	-
52	Distributing pulses. Dwelling.	-
<input type="checkbox"/> 53	Performing M-, S-, and/or T-function, and distributing pulses.	51 + 52
54	Reading tape.	-
<input type="checkbox"/> 55	Performing M-, S-, and/or T-function, and reading tape.	51 + 54
56	Distributing pulses and reading tape.	52 + 54
<input type="checkbox"/> 57	Performing M-, S-, and/or T-function, and distributing pulses and reading tape.	51 + 52 + 54

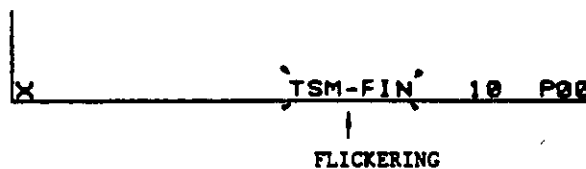
Notes:

- of alarm code is filled with a digit indicating the axis whose error is detected. 1: X-axis, 2: Z-axis.
- of status code is filled with a digit indicating either M, S, or T function which is being executed. 1: M, 2: S, 4: T.
- For alarm code "12," additional two digits indicate the memory IC number.
- of alarm code "14," "15" shows the detailed error causes.

Table 4.3.12.2 Display Examples of Alarm Codes Combined with Status Codes

Alarm and Status Code	Meaning
1.55 .12	A horizontal parity error (alarm code: "12" occurs while simultaneously executing the M-function (code: "1") and the tape reading (status code: "55" = "51" + "54") in the TAPE mode.
.54 20.12	A horizontal parity error (alarm code: "12") occurs while reading a memory (status code: "54") in the MEM mode. The defective IC number is 20.
.52 01.21	An overtravel (alarm code: "21") of X-axis (additional alarm code: "1") occurs during the automatic operation.
.1C 36.81	The operation cannot be continued due to a mal-operation of the CPU (alarm code: "81"). The active address is 1C36.
09.82	A total error (alarm code: "82") is resulted from the self-diagnostics of the memory. The defective ROM number is "09."

Note: During execution of M-, S- and/or T-function, the following message will flicker at the bottom of the CRT display.



### 4.3.13 DISPLAY OF INPUT/OUTPUT SIGNALS

All the input/output signals can be checked on the operator's panel at any time even during automatic operation.

The operating procedure is as follows.

1. Depress the DGN key.

The INPUT/OUTPUT signal status of the designated diagnostic number will be displayed.

2. Key in a diagnostic number desired to be displayed.

In case of an input diagnostic number: Key in a 2-digit number following X.

In case of an output diagnostic number: Key in a 2-digit number following Z.

The ON/OFF status of a group of signals designated by the diagnostic number will be displayed by "1" or "0."

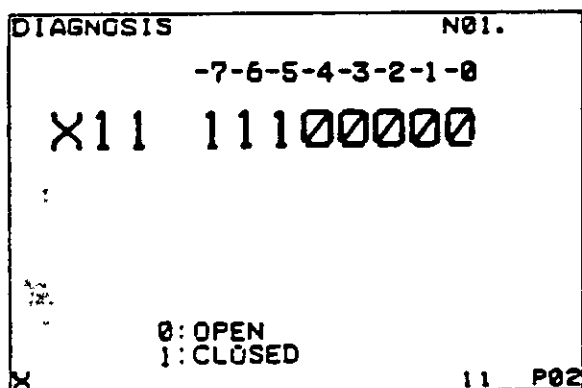


Fig. 4.3.13.1

Note: Keying in "1" after "X," "1," and "0" designates the diagnostic number "01" and shows the status of the group of signals designated.

3. Depress the  key.

The group of signals designated by the diagnostic number plus one will be displayed.

4. Depress the  key.

The group of signals designated by the diagnostic number minus one will be displayed.

- Wide-Display -

5. Depress the DGN key again.

The display will replace the wide-display mode, in which a page containing the currently designated diagnostic number will be displayed.

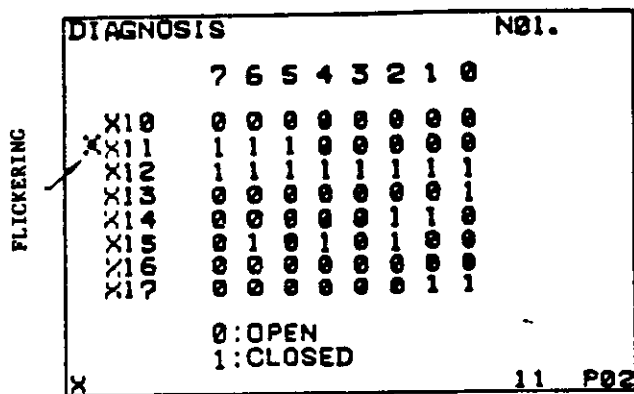


Fig. 4.3.13.2

6. Depress the  key.

The page turns to the page plus one.

7. Depress the  key.

The page returns back to the page minus one.

8. Depress the DGN key.

Cancelling the wide-display mode, the display returns back to the normal-display mode.

NOTE: The line designation ("o" mark) can be moved by operating the LINE key during the wide display.

### 4.3.14 ADDRESS SEARCH

A specific block on the part program can be searched not only by the sequence number "N," but also by all address character such as G, X, Z, S and T, according to the following operation. A part program to be searched is a taped part program in the TAPE mode, while a stored part program in the MEM or EDT mode.

Further, attention should be taken, because the searched block won't enter into the buffer register in the EDT mode.

1. Set the MODE SELECT switch to TAPE, MEM or EDT.
2. Depress the COM key, and then the lamp lights up. → P00
3. Depress the RESET key.  
Then, the LABEL SKIP lamp lights up and the stored part program is rewound.
4. Key in an address data (or only an address) desired to be searched.

EXAMPLE 1: In case that "M," "0," "1" are keyed in, "M01" is to be searched: If a number mis-keyed, first depress the CAN key and then key in the correct number again.

EXAMPLE 2: "M," "-": When the initially detected "M" code is to be searched, regardless of the number of M.

5. Depress the AS (address search) key.  
When the address search starts and the address data concurs with the instructed data, the BUFFER lamp lights up and the operation stops.
6. To suspend the search operation, depress the RESET key.

#### NOTES:

- A block searched in the TAPE or MEM mode enters the buffer register. If a tool offset is instructed in the same block, coordinate values are modified with tool offset values.
- In the EDT mode, the searched block will enter the edit buffer register without being modified with tool offset value and so on. But BUFFER lamp is on likewise in tape and MEM mode.
- Leading zeros may be suppressed for all address characters including N in address search operation. For example, N12 means N012.
- All commands in the searched blocks including modal one are not recognized, and only update data enters in the buffer register.
- Operation begins with the searched block, if the CYCLE START key is depressed after a search is operated in the TAPE or MEM mode.
- Reset the control before Cycle Start after address search in the EDT mode. Failure to do so causes format error (alarm code: "14") in any operating mode.
- But, after address search in the MEM and TAPE modes, Cycle Start can be made without reset operation.

#### 4.3.15 TV CHECK (VERTICAL PARITY CHECK)

TV check is used to make the vertical parity check in each block during tape reading operation in TAPE mode. TV check ON or OFF can be selected with parameter No. 81. For parameter setting, see 4.3.9 Writing Parameters.

With No. "81" at "0" . . . TV Check OFF

With No. "81" at "1" . . . TV Check ON

With TV Check ON, if the number of characters including EOB code in the block is odd, INPUT ERROR lamp lights up during tape reading operation in the TAPE mode. Alarm code "13" (TV parity error) is displayed. To adjust the number of characters in a block to be even, use a space code as additional character.

#### 4.3.16 CURRENT POSITION DISPLAY UNIT†

The movement of the tool is summed up and the current position of each axis is displayed on the current position display unit. The display unit is installed separately from the NC operator's panel as external current position display unit or incorporated into the panel as internal current position display unit.

1. Depress the display reset pushbutton at each axis to reset the current position of the axis.
2. The display cannot be affected by the G50 command.
3. The display can be updated even in case of the MACHINE LOCK switch on.
4. The display cannot be changed in case of the DISPLAY LOCK - switch on.
5. Even if the servo power supply is off, the display follows the machine movement.

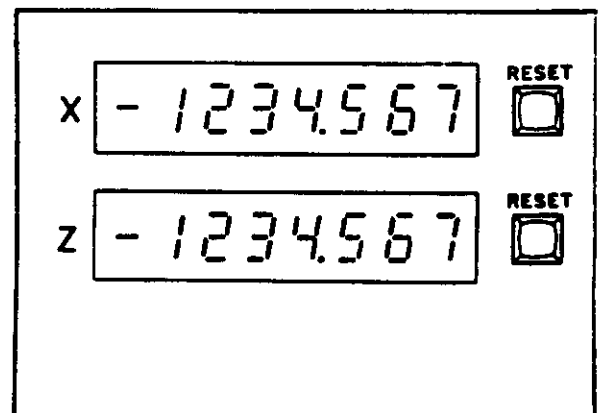


Fig. 4.3.16

#### 4.4 STORING TOOL OFFSET VALUES FROM NC TAPE†

Tool offset values are usually written through the DATA keyboard. They can be input also in the form of punched tape.

Tape format for tool offset values is:

LABEL \*

T1 X ... Z ... R ... \*

T2 X ... Z ... R ... \*

T3 X ... Z ... R ... \*

·  
·  
·

ER (or %) ..... Rewind stop code

The operating procedure for storing the tool offset values from the punched tape is as follows.

1. Set the MODE SELECT switch to EDT.
2. Depress the RESET key. The LABEL SKIP lamp lights up.
3. Depress the OFS key. Then, the lamp lights up.
4. Set punched tape of the tool offset values on the tape reader. At this time, the Label Skip function is effective using the operation as stated in step 2.
5. Depress the TAPE IN key with OFS key held in.

The tape reading starts and the tool offset values enter into the tool offset memory. Once a rewind stop code is read, the operation stops automatically. During the storing operation, "TAPE IN" message will be kept flickering at the bottom of the CRT display.

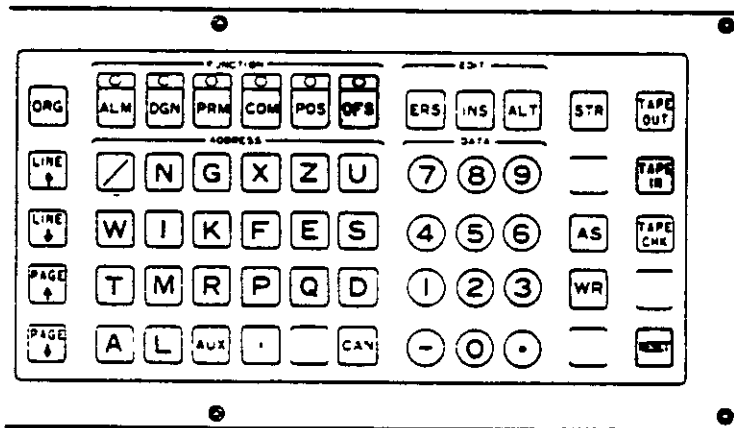


Fig. 4.4

Table 4.5.1

Specifi- cation	Memory Capacity	Tape Length
A	4000 characters	Approx. 10 m
B	8000 chatacters	Approx. 20 m
C	12000 characters	Approx. 30 m
D	16000 characters	Approx. 40 m
E	32000 characters	Approx. 80 m

#### 4.5 PART PROGRAM STORAGE†

##### 4.5.1 STORING PART PROGRAM FROM NC TAPE

The NC tape data are stored into the memory. Maximum capacity of the memory is shown in Table 4.5: 1.

Part program punched should be sandwiched with rewind stop code (EIA: "ER," ISO: "1"). M02 or M30 command must be programmed in the final block of the program.

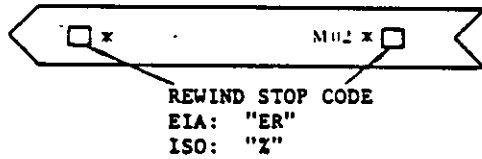


Fig. 4.5.1.1

Tape code is specified by parameter No. 82. Where automatic selection of tape code is effective with parameter No. 80 = "1," the control will automatically adjust to read tape with either EIA or ISO character format.

Follow the procedure below to store the punched tape data.

1. Set MODE SELECT switch to EDIT.

2. Depress the RESET key.

The memory is rewound and the LABEL SKIP lamp lights up, being ready to store the part program orderly from the first address of the memory.

3. Depress the COM key. Then, the lamp lights up. Any FUNCTION key except OFS is allowed to be set. However, use COM key in principle.

4. Set the punched tape onto the tape reader unit. Be sure that the Label Skip function is effective.

5. Depress the **TAPE IN** key.

The tape reading starts and the part programs in the tape enter into the memory. Once the rewind stop code is read, the operation stops automatically.

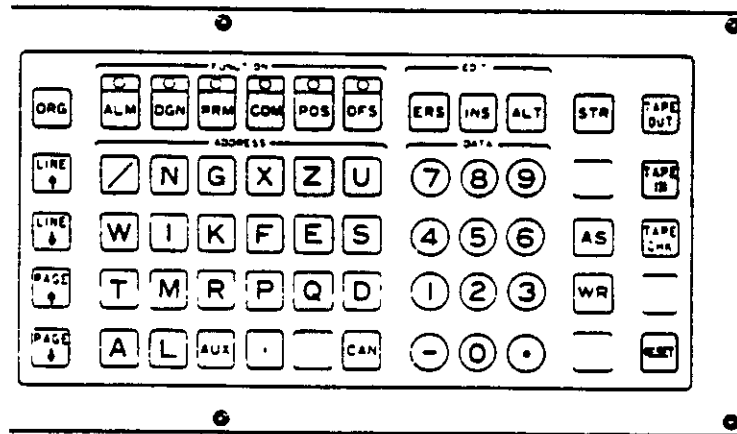


Fig. 4.5.1.2

#### 4.5.2 PART PROGRAM MODIFICATION FROM NC TAPE

To modify the part program already stored in the middle of a block of data, use the following procedure. The part programs already stored will be erased off by storing the new part program.

1. Set the MODE SELECT switch to EDT.
2. Depress the COM key. Then, the lamp lights up.

3. Search the block in which the new program will be stored.

4. Set a punched tape onto the tape reader. Be sure that, the Label Skip function is effective.

5. Depress the **TAPE IN** key.

The new tape data will be stored into the memory, beginning from the block whose address is searched.

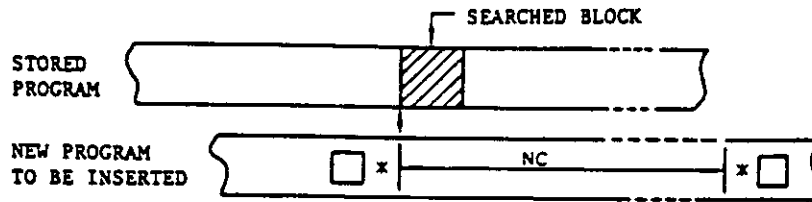


Fig. 4.5.2

NOTES:

- If the storing operation is interrupted due to a parity error, or depressing the RESET key, restore the new data.
- During the tape storing operation via the **TAPE IN** key, "TAPE IN" message will be kept flickering at the bottom of the CRT display.

Depressing the COM key in the EDT mode makes the display turn to the editing part program display mode of a block. In this display mode, the displayed characters vertically double the regular size.

4. Key in an address data desired.

EXAMPLE: **N 0 0 1**

The keyed-in data will be displayed at the bottom left corner of the display. If the number is mis-keyed, depress the CAN key first and key in the correct number.

5. Depress the WR key.

The keyed-in data is stored into the edit buffer register, and then the BUFFER lamp lights up.

6. Repeat steps 4 and 5 to write the command values of a block into the edit buffer register.

7. Check the command values stored, and then, depress the STR key.

A block of data will be collectively stored into the memory, and then the BUFFER lamp turns off. All data stored in the edit buffer register will be deleted, leaving only an asterisk mark (\*) displayed.

4.5.3 STORING PART PROGRAM FROM MDI

When storing the part program into the memory through the keyboard on the operating panel, use the following procedure.

1. Set the MODE SELECT switch to EDT.
2. Depress the RESET key.  
The memory is rewound and the LABEL SKIP lamp lights up, being ready to store the program orderly from the first address of the memory.
3. Depress the COM key. Then, the lamp lights up.

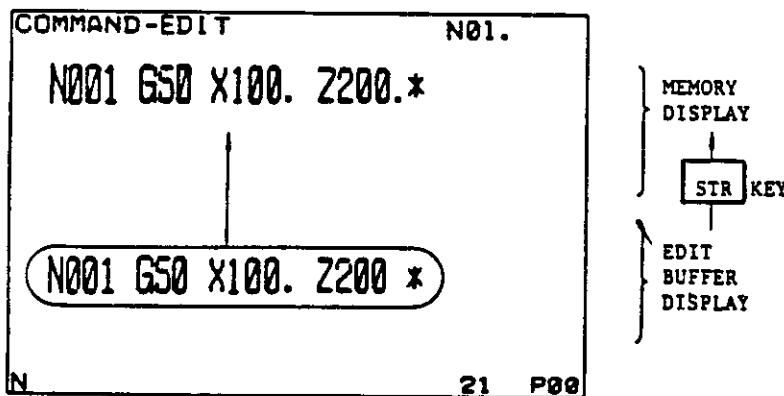


Fig. 4.5.3.1



8. Repeat steps 4 through 7 until all necessary blocks are stored into the memory.  
Be sure to instruct M02 or M30 command at the final block of the program.
9. After depressing the RESET key, check the input data by displaying.  
See 4.6.1 Display of Stored Part Program.
10. Correct the data, if a mistake is found.  
See 4.6.2 Editing Stored Part Program.
11. Depress the RESET key to rewind the part program after completion of the

operation. Then, the LABEL SKIP lamp lights up.

- In case of the wide-display -

Depress the COM key twice in step 3.

By doing so in the EDT mode, the display turns to the wide-display mode of the editing part program. In this display mode, the displayed characters are of the regular size, and the display covers over about nine lines. For this reason, the new blocks can be stored, always referring to a several number of blocks which have been stored by the previous operation.

Follow all the steps mentioned above except for the step 3.

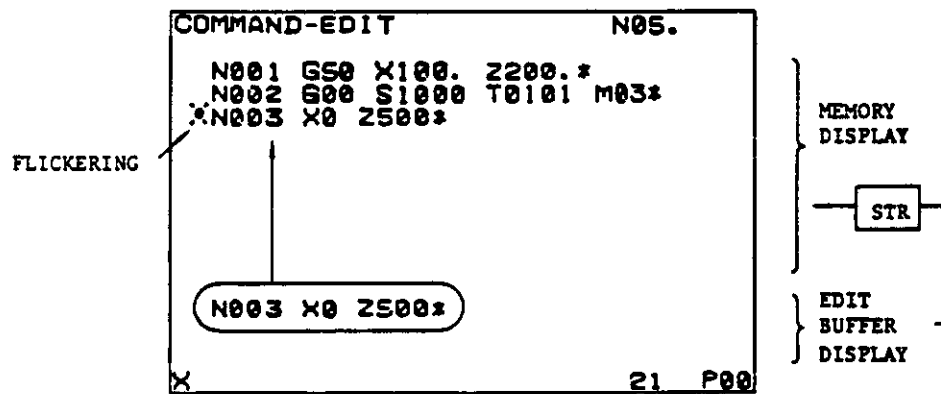


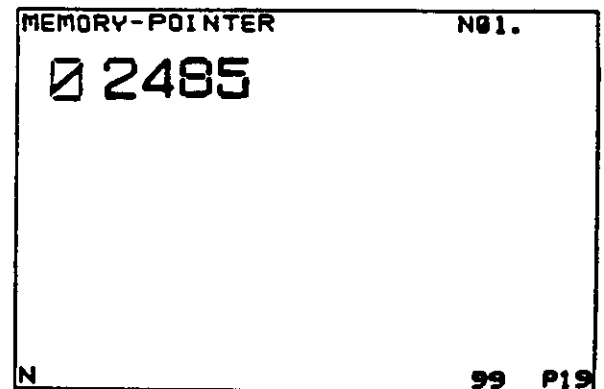
Fig. 4.5.3.2

#### 4.5.4 ADDRESS DISPLAY OF TAPE MEMORY

Parameter No. 99 is used to display the address of part program in memory which is being executed. With the parameter No. 99, the number of characters from first address to the address which the pointer in the control indicates is shown on the display.

##### EXAMPLE:

- Set the parameter No. at 99 after storing the tape data in the EDT mode, and the total number of characters in the tape is displayed on the display.
- If the parameter No. 99 is designated during operation in the MEM mode, the position display of active address on the tape memory can be updated. The display shows the number of characters from the head of part program to the block preceding the latest block stored into the buffer register.



The pointer points out the 2485 th character.

Fig. 4.5.4

## 4.6 EDIT †

### 4.6.1 DISPLAY OF STORED PART PROGRAM

This is an operation to display a part program stored in the memory on the CRT character display in order to check the data. The operating procedure is as follows.


1. Set the MODE SELECT switch to EDT.

2. Depress the COM key.

The data of a block pointed out by the pointer will be displayed. (The block data is also displayed in edit buffer display.)


3. Depress the RESET key.

The stored part program is rewound and the pointer points out the head address of the memory. Then, the LABEL SKIP lamp lights up.

4. Depress the  key.

The first block of the stored part program will be displayed. Check the command value. See the Fig. 4.6.1.1. The same data are displayed in memory display and edit buffer display.

5. Repeat step 4 to check all command values of each block.

6. The display can be returned to the previous block by depressing the  key.

7. A block can be designated and be confirmed by the use of address search function (see 4.3.14).

8. After completion of this displaying and checking operation, depress the RESET key to rewind the memory.

- Check on the wide-display -

Described above is the procedure of checking the blocks by one. Collectively displaying a several number of blocks in a group, the block correlation between two blocks can be confirmed.


1. Set the MODE SELECT switch to EDT.

2. Depress the COM key twice.

By doing so, the display turns to wide-display mode of the editing part program. In the mode the block data of about nine lines are displayed collectively with a block pointed out by the pointer at the head.

3. Depress the RESET key.


The stored part program is rewound and the pointer points out the head address of the memory. Then, the LABEL SKIP lamp lights up.

4. Depress the  key.

A several number of block data consisting of about nine lines are displayed taking the lead of the first block of the stored part program (see the figure below).

Check all command values.

5. Repeat step 4 to check each display.

6. By depressing the  key, the previous display can be checked again and/or the display can be jumped back to a page containing a specified block using the address search function.

7. Similarly, after completion of the checking operation, depress the RESET key to rewind the stored part program.

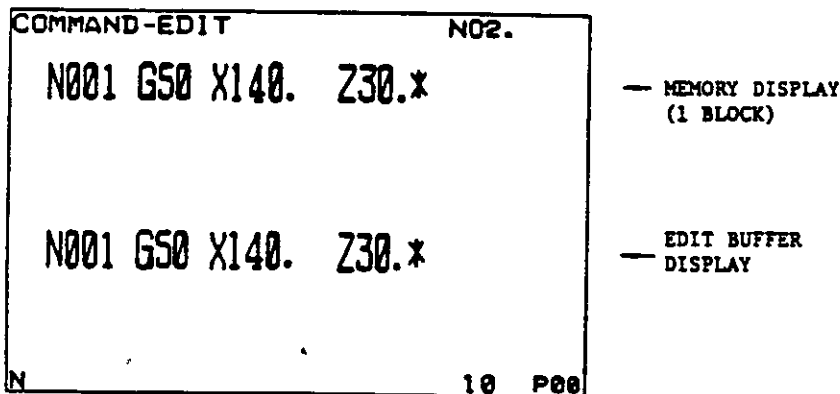


Fig. 4.6.1.1

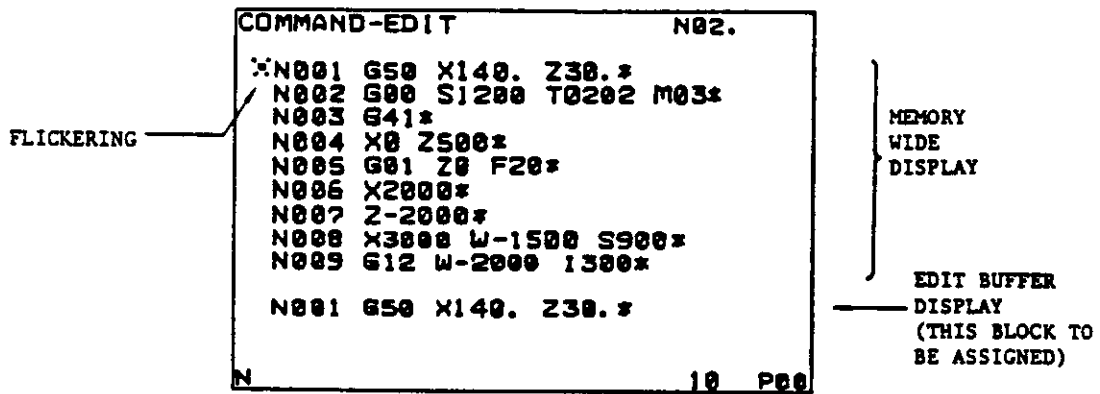


Fig. 4.6.1.2

NOTES:

- The block displayed using the COM key in the EDT mode greatly differs from that except in the EDT mode. Namely, the coordinate command is displayed values as that have been input in the EDT mode, without being modified by a tool offset value of others. No modal command instructed except in the block to be displayed is included.
- During the display with the COM key in the EDT mode, the displayed picture can be renewed by the LINE or PAGE key operation, while the number of "page" or "line" remains unchanged at the extreme right bottom of the display.

4.6.2 EDITING STORED PART PROGRAM†

Stored part program can be edited and modified in the EDT mode using the following keys.

- |         |   |                    |   |
|---------|---|--------------------|---|
| Editing | [ | ERS (erase) . . .  | To delete block   |
|         |   | INS (insert) . . . | To insert block   |
|         |   | ALT (alter) . . .  | To modify block: erasing, inserting, and modifying address data in a block. |

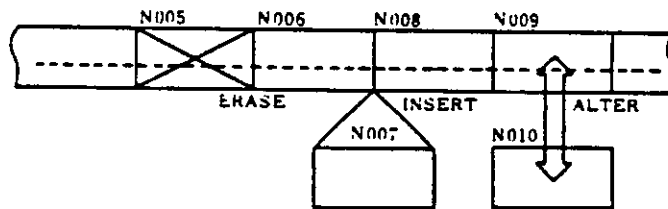


Fig. 4.6.2.1

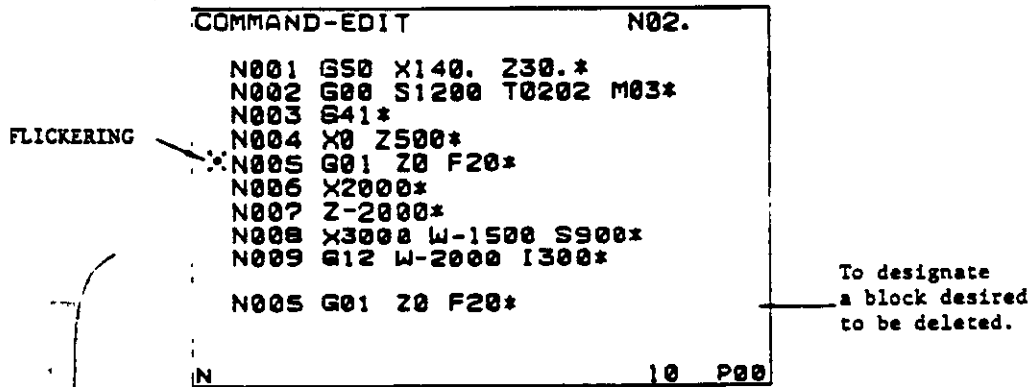
The editing operation below is carried out using the COM key in the EDT mode. Editing can be made both in the normal-display mode or in the wide-display mode.

- Deleting part program block (ERASE: ERS key)
1. A block to be deleted is designated by depressing ,  or AS (ADDRESS SEARCH) key.

Check the data referring to the procedure described in 4.6.1 Display of Stored Part Program. With this operation, the BUFFER lamp lights up.

2. Depress the ERS key to delete the searched block from the memory.

The next block is read out and its data is automatically displayed on the display. BUFFER lamp remains on.



ERS KEY: N005 block is deleted and N006 is designated via the ERS key.

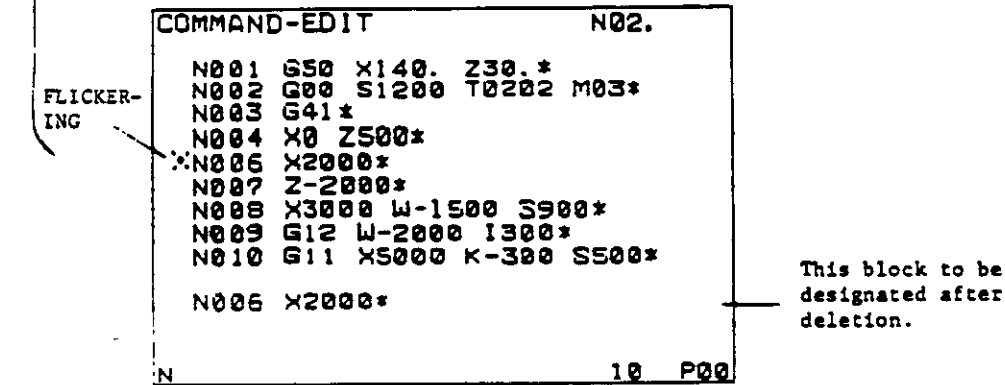


Fig. 4.6.2.2

- To delete a serval consecutive number of blocks, the block can be deleted every time the ERS key is depressed.
- If the block is accidentally erased, insert the deleted data again according to the procedure of "Inserting a block" given below.

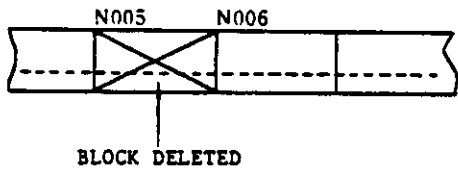


Fig. 4.6.2.3

Inserting a block (INSERT: INS key)

- A block desired to be inserted is designated using **LINE** ↓, **LINE** ↑ or AS (ADDRESS SEARCH) key. Check the data. A new block will be inserted right after the selected block.

To insert the first block of the program, depress the RESET key.

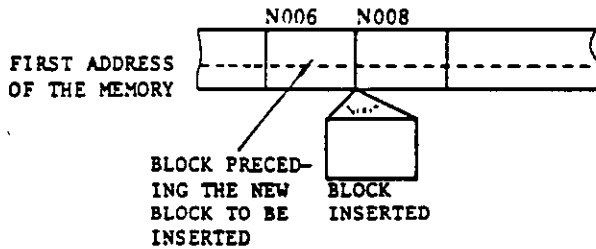


Fig. 4.6.2.4

- Depress the INS key.

The BUFFER lamp turns off, leaving only an asterisk mark(\*) displayed. "INSERT" message will be kept flickering at the bottom of the CRT display.

- Insert the data of a block according to 4.3.2 Writing Command Data by MDI. Differing from the display in the MDI mode, the keyed-in data will be displayed as it has been stored without any modification.

Once even one of the address data is written by using the WR key, the BUFFER lamp lights up.

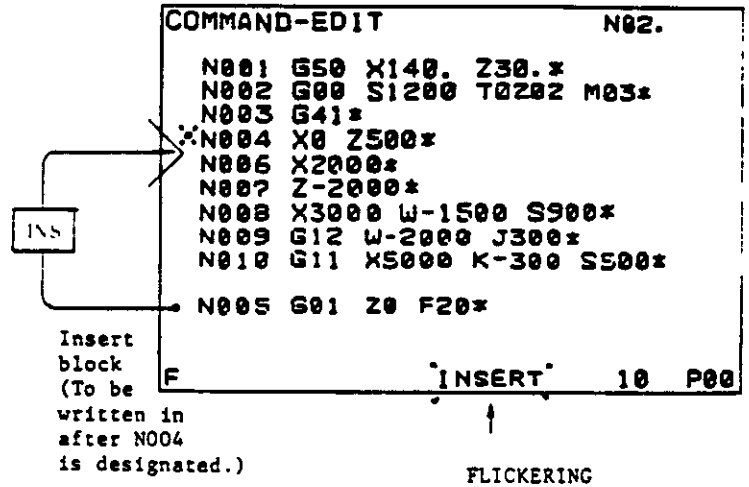


Fig. 4.6.2.5

- Depress the INS key again.

Block insertion is executed and the flickering display of the message "INSERT" turns off. The display shows the data of the inserted block and then the BUFFER lamp turns off.

- Repeat steps 2 through 4 to insert new blocks in sequence.

Modifying part program block (ALTER: ALT key)

- Designate the block to be altered using the `LINE` `LINE` `+` `,` `+` or AS (address search) key and check the data. Then, the BUFFER lamp lights up and the designated block is displayed at the edit buffer register.

- Key in an address data desired to be modified, for example, "F", "3", "5". The keyed-in data will be displayed at the left bottom corner of the display.

- Depress the WR key.

Data in the edit buffer register replace the keyed-in data. Only the address code remains at the left bottom corner. If the

- Input new command data by repeating steps 2 and 3 until desired data of a block are built. Check the new data.

- Depress the ALT key.

New block is stored into memory after the old block is deleted.

- Check the new data by displaying the inserted block and its preceding and following block.

To facilitate checking shift the display from the normal-display mode to the wide-display mode by depressing the COM key again.

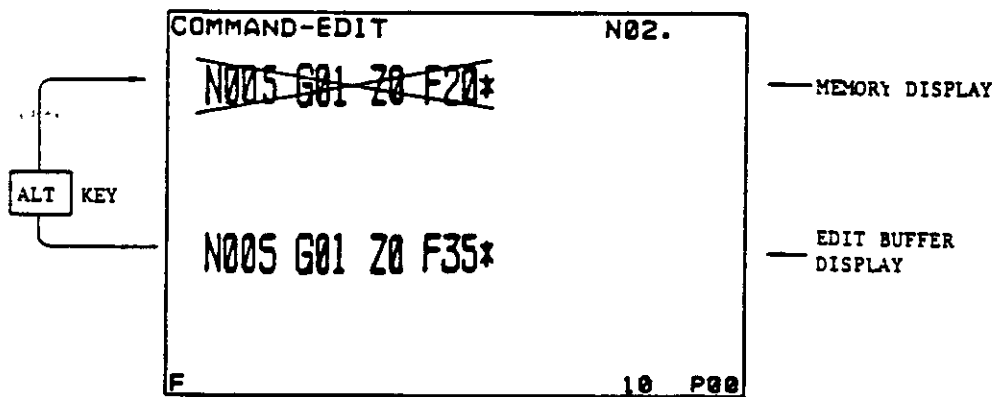
NOTES:

- To write the character "/" for the optional block skip in the edit buffer register, key in "/" and "1" first and then depress the WR key.

To delete "/" character already written-in out of the edit buffer register, key in first "/" and then depress the CAN key.

- While the message "INSERT" is displayed flickeringly, PAGE and LINE keys do not function, if depressed.

- While the control executes "ALTER," "ERASE," "INSERT" or "STORE," the message is displayed flickeringly in the bottom right corner of the display. Edit operation should be stopped while the message is displayed.



When "F20" in N005 block is modified to "F35":

Fig. 4.6.2.6

4.6.3 SUMMARY OF EDITING OPERATION†

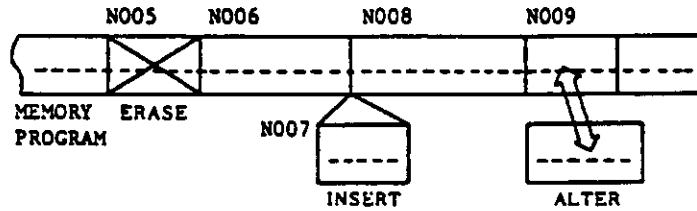


Fig. 4.6.3

Table 4.6.3

Operation		ERASE	INSERT	ALTER
Display before edit operation		○ Block to be deleted (ex. N005)	○ Block preceding new data to be inserted (ex. N006)	○ Block to be corrected (ex. N009)
Operation procedure	1	○ ERS key	X INS key (light ON)	○ Data modification by MDI operation
	2	—	○ Writing command data by MDI operation	ALT key
	3	—	X INS key (light OFF)	—
Display after edit operation		○ Block immediately following the deleted block (ex. N006)	X Inserted new block (ex. N007)	X Modified block (ex. N010)
Status of BUFFER lamp after edit operation		ON	OFF	OFF

Notes:

1. Operate in the EDT mode.
2. ALTER = ERASE & INSERT
3. "o" and "x" mark in each column shows "on" and "off" conditions of BUFFER lamp, respectively: "o" = ON, "x" = OFF.
4. For operating procedure, see 4.6.2 Editing Stored Part Program.

## 4.7 PUNCHOUT OPERATION †

### 4.7.1 TAPE PUNCHER†

The part program and/or the tool offset values stored in the memory can be punched out in tapes. The tape puncher should be separately provided.

Tape puncher

Type FACIT 4070

Punching Speed: 75 ch/sec

Dimensions: 432(W) x 220(D) x 198(H) mm

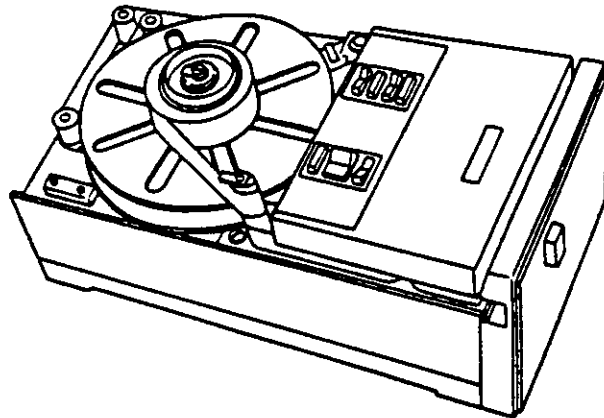
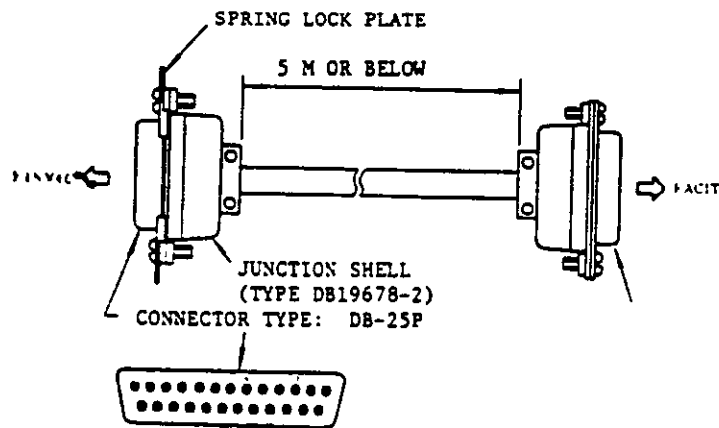


Fig. 4.7.1.1



### CONNECTIONS BETWEEN THE CONTROL AND THE PUNCHER

YASNAC PIN NO.		FACIT PIN NO.
1	Ch1	1
2	Ch2	2
3	Ch3	3
4	Ch4	4
5	Ch5	5
6	Ch6	6
7	Ch7	7
8	Ch8	8
9	Ch9	9
10	SD	10
11	PI	11
12	PR	12
20	Err. 1	20
21	TL	21
25	OV	25

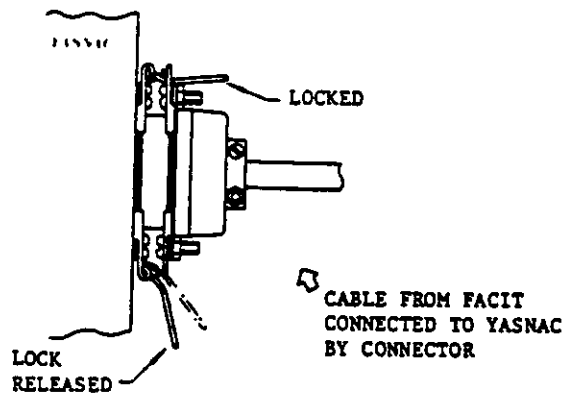


Fig. 4.7.1.2



### Operation of FACIT Punchers

Before punching NC tape, take the following procedure. For details, refer to the instructions for FACIT 4070 punchers.

1. Set the supply voltage selecting switch to the AC voltage applied.



Switch is set with position indicator placed with A.

Fig. 4.7.1.3

2. Adjust the tape width setter to eight-channel tape width.
3. Set the eight-channel paper tape to the tape puncher.

Applicable paper tape: Eight-channel paper tape, black or grey for computer use in accordance with JIS C 6243.

4. Turn off the control.  
Connect the FACIT 4070 to the control using the cable provided. Receptacles for the puncher cable are provided in the tape reader box.
5. Connect AC power supply to FACIT 4070.
6. Turn on the FACIT power switch, and READY lamp will light up.
7. Feed the tape by depressing FEED HOLES SWITCH on the FACIT.
8. Turn on the control.  
The FACIT puncher is ready to operate.

### 4.7.2 PUNCHOUT OPERATION OF NC TAPE

1. Set the MODE SELECT switch to EDT.
2. Depress the RESET key, and LABEL SKIP lamp lights up.
3. Depress the COM key, and the lamp lights up.  
Any FUNCTION key is available except the OFS key. However, select the COM key in principle.
4. Check to see the puncher is ready to operate.
5. Depress the **TAPE OUT** key.  
Tape puncher starts punching operation and automatically stops, when memory contents have been punched out on the tape.
6. To interrupt punchout operation, depress the RESET key.  
To resume the operation, take the steps from 1.

#### NOTES:

- Tape is punched out according to the coding selected by parameter No. 82.  
Where parameter 82 is "0," . . . EIA code,  
parameter 82 is "1," . . . ISO code.
- If the number of punched out characters in a block is odd, a space code for TV check is automatically punched.
- Each end of the NC tape is provided with feed holes. See Fig. 4.7.2.

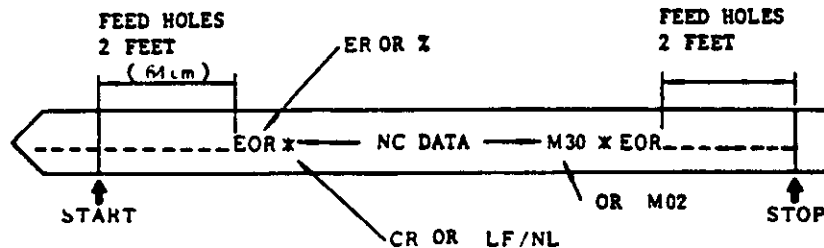


Fig. 4.7.2

- If the Error lamp on the control panel of the FACIT lights up due to the trouble in the FACIT 4070, the control automatically stops punching operation. After elimination of the trouble cause such as excessive tape tension and tape over, start punching operation from the first step following procedures described above.
- During punch out operation using **TAPE OUT** key, message "TAPE OUT" flickers.

#### 4.7.3 PUNCHOUT OF TOOL OFFSET VALUE †

1. Set the MODE SELECT switch to EDT.
2. Depress the RESET key, and LABEL SKIP lamp lights up.
3. Depress the OFS key, and the lamp lights up.  
If the other FUNCTION key than the OFS key is selected, part program is punched out.
4. Check to see that the tape puncher is ready to operate.
5. Depress the **TAPE IN** key with OFS key held in.  
The puncher starts and automatically stops when the offset value has been punched off.
6. To suspend the punch operation, depress the RESET key.  
To resume the operation, take the step from 1.

#### NOTES:

- Tape is punched out according to the coding selected by parameter No. "82."  
Where parameter No. "82" is set at "0," EIA code is selected and "1," ISO code.
- If the number of punched out characters in a block is odd, a space character for TV check is automatically punched. Each end of the NC tape is provided with feed holes, Fig. 4.7.2.

- If the Error lamp on the FACIT control panel lights up due to the trouble in the FACIT 4070, the control automatically stops punching operation. After elimination of the trouble cause such as excessive tape tension and tape over, start punching operation from the first stop following procedures in 4.7.2 Punchout Operation of NC Tape.
- During punch out operation using **TAPE OUT** key, message "TAPE OUT" flickers.

#### 4.7.4 OUTLINE OF TAPE DATA STORING AND PUNCHING OPERATION†

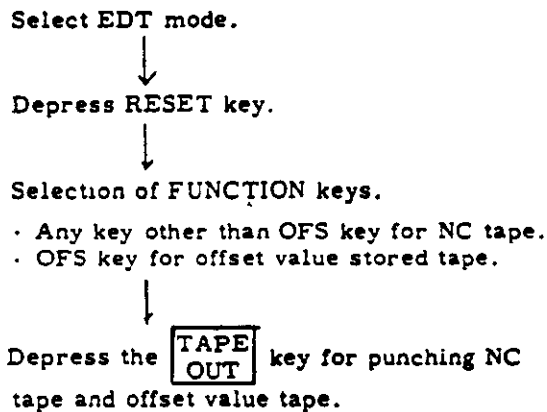


Fig 4.7.4

#### 4.8 COLLATING OF STORED PART PROGRAM AND OFFSET VALUE

##### 4.8.1 COLLATING OF STORED PART PROGRAM†

To check whether the memory contents agree with NC tape contents, proceed as follows:

1. Set the MODE SELECT switch to the EDT.
2. Depress the RESET key.  
Memory is rewound and LABEL SKIP lamp is illuminated.

3. Depress the COM key, and the lamp will light up.
4. Set the NC tape to the tape reader.  
Be sure that LABEL SKIP lamp remains on.
5. Depress TAPE  
CHK key with OFS key held in.  
The tape reader starts reading, the memory contents are collated with the tape data. When it reads rewind stop code, it automatically stops.
6. If disagreement with NC tape is detected, INPUT ERROR lamp lights up and tape reader stops. Alarm code "18" is displayed.

NOTES:

- Collation is made only on significant information. Disregarded characters such as space, tab, and ALL MARK are ignored during collating operation.
- If the stored data is different from programmed data because of omitted leading zero, INPUT ERROR lamp lights up.
- During collating of the NC tape using TAPE  
CHK key, "TAPE CHK" message will be kept flickering at the bottom of the CRT display.

#### 4.8.2 COLLATING OF TOOL OFFSET VALUE

To check whether the memory contents agree with offset value stored in tape, proceed as follows:

1. Set the MODE SELECT switch to the EDT.
2. Depress the RESET key, and LABEL SKIP lamp will go on.
3. Depress the OFS key, and it will be on.
4. Set the source tape to the tape reader.  
Be sure that LABEL SKIP lamp remains on.
5. Depress TAPE  
CHK key with OFS key held in.  
Tape reader starts reading, and memory contents are collated with the tape data. If automatically stops when rewind stop code is encountered.
6. If disagreement with the tape data is detected, INPUT ERROR lamp lights up and tape reader stops. Alarm code "16" is displayed.

NOTES: Tool offset number not effective in the control is ignored, if commanded in tape.

4.9 OUTLINE OF OPERATION IN THE EDT MODE †

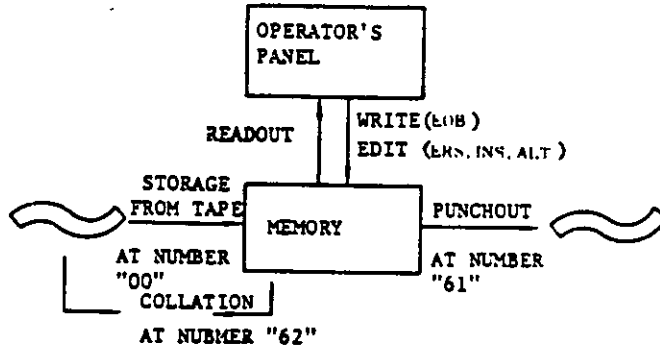


Fig. 4.9.1

Table 4.9.1

	Function key	Key for starting
Storing NC data from tape	COM	<div style="border: 1px solid black; padding: 2px; display: inline-block;">TAPE IN</div> key
Storing offset value from tape	OFS	
Punchout of stored program	COM	<div style="border: 1px solid black; padding: 2px; display: inline-block;">TAPE OUT</div> key
Punchout of tool offset value	OFS	
Collating of stored program	COM	<div style="border: 1px solid black; padding: 2px; display: inline-block;">TAPE CHK</div> key
Collating of stored offset values	OFS	
Readout of stored part program	COM	
Storing part program through DATA keyboard	COM	—
Editing stored part program	COM	

**APPENDIX-1**

**Handling of Decimal Point Input**

**1. Decimal point input**

With the control equipped with the CRT character display, a number having a decimal point can be input.

Shown below is the address data capable of using a decimal point and the position of a decimal point.

Unit	Address characters	Decimal point position
Distance	X, Z, U, W I, K, R	At a position of "mm" or "inch."
Feedrate	F, E	At a position of "mm/rev," "mm/min," "inch/rev" or "inch/min."
Time	(G04) U	At a position of "sec."

**NOTE:** A distance unit as currently designated by a parameter is effective. A decimal point data will be handled in terms of a feedrate unit which becomes effective by means of a designation of G98 or G99.

**EXAMPLE:**

	(MM)	(INCH)
X15.	X 15.000 mm	or X15.0000 in
Z20.5	Z 20.500 mm	or Z 20.500 in.
G99F.2	F 0.20 mm/rev	or F 0.2000 in./rev
E 3.54	E 3.5400 mm/rev	or E 3.540000 in./rev
G04U1.	Dwell 1.000 sec.	

• A number with a decimal point can be input via a punched tape and/or the NC operator's panel.

• Input from a punched tape: TAPE (or MEM) operation

• Input from the NC operator's panel: MDI or EDIT writing-in

**NOTES:**

• The trailing zeros (zeros to be suffixed) can be omitted by use of decimal point. Sufficient attention should be given, as it causes great mistake, so far as the data concerns, if a decimal point happens to be keyed in or not by mistake.

• When keying in a decimal point data by MDI writing operation, the trailing zeros will be suffixed corresponding to the least input increment currently designated, and displayed on the CRT display.

While, with the writing operation for editing, no trailing zeros will be displayed, and the decimal point data will be stored into the memory as it has been keyed in. During the MEM operation, the trailing zeros will be properly by processed throughout the operation.

• Combination of the decimal point data and the no decimal point data can be made.

Example: X125.4 Z 1000 +

• Whenever a number containing the numerals smaller than the least input increment is instructed, the numerals smaller than the least input increment designated will be disregarded.

**EXAMPLE**

<u>Input</u>	<u>Least input increment designated</u>	<u>Effective data</u>
X 12.3486	0.01 mm	→ X 12.34 mm
	0.001 inch	→ X 12.348 inch

• Be sure never to use a decimal point to all address data such as M, S and T codes, except for the ones specified. Generally, it will be disregarded, however, concurrence may not be made during an address search operation.

**APPENDIX-2**

**Detailed Display of Alarm Code  
"14" and "15"**

For the format error "14" and the data error "15," the detailed error codes will be display-

ed at the 3rd and 4th digits. According to the said meanings, correct the program and/or the punched tape data.

For all other alarm codes, observe the remedies as specified in 8.5.2 of the YASNAC 2000G operator's manual.

Table 4.2

FORMAT ERROR	CAUSES
"01 . 14" Buffer register overflow	More than 96 characters are instructed to a block.
"02 . 14" Commanding of unusable G code	G code of A, B or * group which is not in the specifications or an unusable G code is instructed.
"03 . 14" Address search error	There is no address data to be searched by an address search operation (including Work No. search).
"04 . 14" Commanding of unusable characters	Unusable address or function character is instructed. An unspecified character is read during the storing part program from tape.
"05 . 14" Tool offset tape input error	A data not meeting the "T_X_Z_R_*" format is instructed during the storing tool offset data (e.g. there is not "T" or a character other than the above characters).
"06 . 14" Stroke check designation error	A character other than U, W, I and K is instructed and tried to execute the operation G36 and G37.
"07 . 14" CRT display error	A command of a block exceeds three lines. A number having more than 25 characters is instructed.
"15 . 14" Reset unready	After editing in the EDT mode, the CYCLE START key is depressed in the automatic operation mode, without depressing the RESET key.

Table 4.2 (Continued)

DATA ERROR	CAUSES
<p>"01 . 15" F code undesignated</p>	<p>When a G code requiring an F designation is to be executed after turning on power supply, no F designation is instructed.</p> <p>With the feedrate command remains instructed by E code, the operation tried to be executed, except for the threading operation.</p>
<p>"02 . 15" Erroneous programming of G code</p>	<p>In a finishing program instruction multiple repetitive cycle, there is a G code other than G00 through G03, G11, G12, G22 and G23.</p> <p>During the Tip Nose Radius Compensation, either G34 or G35 is instructed.</p>
<p>"03 . 15" No data for operation</p>	<p>The program pointer comes into a memory area where no operational data exists during MEM operation, due to a forgetting program M02 or M30, etc.</p>
<p>"04 . 15" Subprogram error</p>	<p>A multi-call of a sub-program is instructed.</p> <p>There is no destinating sequence number to jump over in the part program memory when a subprogram or a program jump command is executed.</p>
<p>"05 . 15" Circular arc programming error</p>	<p>With G22 or G23, an R-value from which the center point cannot be obtained is instructed.</p> <p>With G22 or G23, the completely closed circle is instructed.</p>
<p>"06 . 15" Tip nose radius compensation error</p>	<p>A shift is made between "G41" and "G42" during the Tip Nose Radius Compensation.</p> <p>Point of intersection does not exist on the offset locus.</p> <p>Even having a point of intersection, the point is away by 10R (ten times the value R) from an instructed intersecting point.</p> <p>When getting into a tip nose radius compensation mode, it is tried to enter with G02 or G03.</p>
<p>"07 . 15" Computing error</p>	<p>When calculating an intersecting point, it results in an incapable calculation, such as a data overflow, etc.</p>

Table 4.2 (Continued)

DATA ERROR	CAUSES
<p>"08 . 15" Cornering error</p>	<p>With G11 or G12 command, either I- or K-value exceeding a limit is instructed.</p> <p>With G11 or G12 command, no movement command is given to either axis.</p>
<p>"09 . 15" M, S or T code designation error</p>	<p>M-, S- or T-code is instructed in the canned cycle mode (G90, G92 or G94).</p>
<p>"10 . 15" Tape memory capacity over</p>	<p>As a result of an editing operation, the written data exceeds a specified capacity of the tape memory (part program storage).</p>
<p>"11 . 15" Multiple repetitive cycle error</p>	<p>More than 26 blocks are instructed to a finishing program.</p> <p>There is an error in a finishing program command, e. g., there is no finishing program right after the G71 block.</p>
<p>"12 . 15" Threading error</p>	<p>A threading lead is instructed to exceed the maximum allowable value.</p> <p>Upon chamfering ON, a thread length shorter than the chamfering length is instructed.</p> <p>A threading execution is instructed under the G98 (mm/min.) designation.</p>
<p>"13 . 15" Special compensation error</p>	<p>—</p>
<p>"14 . 15" Special compensation error</p>	<p>—</p>





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