YASNAC® 3000G
CRT CHARACTER DISPLAY
OPERATOR'S MANUAL

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

INTRODUCTION

YASNAC 3000G with CRT character display (henceforth called CRT display) is the latest CNC specifically designed for machining centers to direct a three- or four-motion machine tool. The CRT display prominently shows commands, positions, and 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 touching keyboard provides more finger space and modern visual feel, and simplifies the operation, resulting in increased reliability.

PREFACE

This manual describes the instructions for handling YASNAC 3000G with CRT character display. Descriptions of NC operator's panel are numbered as Chapter 4 for your easy cross-reference to YASNAC 3000G OPERATOR'S MANUAL separately provided.

For the instructions other than the descriptions in this manual, refer to YASNAC 3000G OPERATOR'S MANUAL (TOE-C843-5.30).

Fig. 4.1   NC Operator's Panel with CRT Display

4. NC OPERATOR'S PANEL WITH CRT CHARACTER DISPLAY

4.1 PUSHBUTTONS, LAMPS AND KEYS

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.
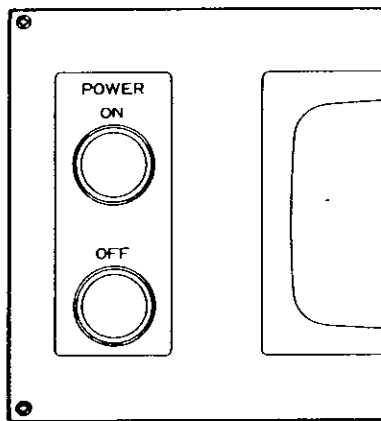
Fig. 4.1.1

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.
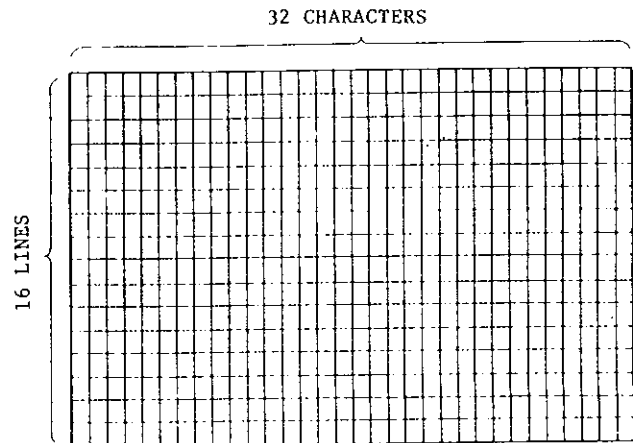
Fig. 4.1.2 Braun Tube

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.
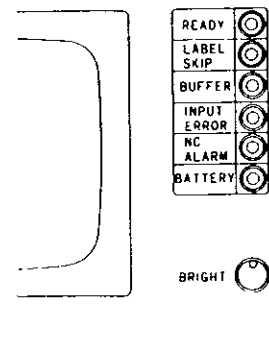
Fig. 4.1.3

4.1.4 INDICATING LAMPS

. READY lamp

This lights up when both the control and servo power 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 rewound.

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#, 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.
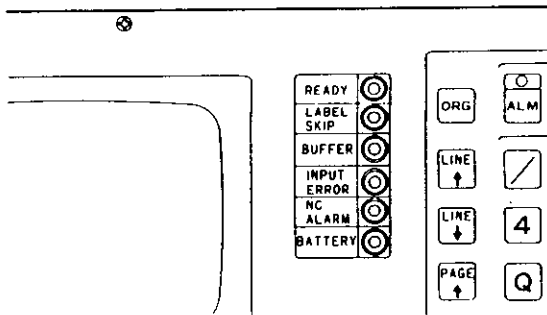
Fig. 4.1.4

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.
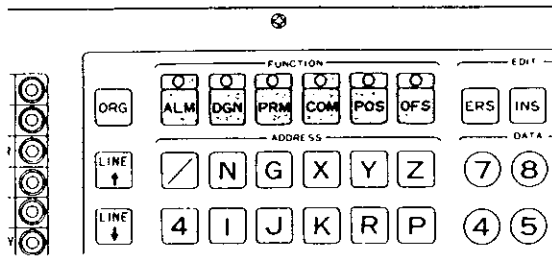
Fig. 4.1.5

· |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 cur-
   rent 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 fol-
lows.

(1) Normal-display --- A designated line or
                        block can be displayed
                        using large size cha-
                        racters (line-display).

(2) Wide-display ----- A whole page contain-
                        ing 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 charac-
ter when writing in various data.
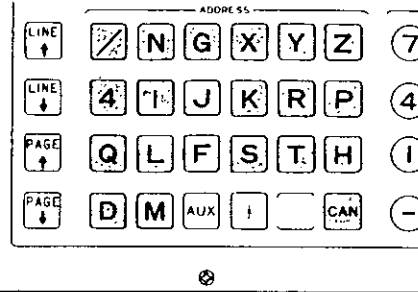
Fig. 4.1.6

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 ⑩ through ⑨, ⊖ (minus) and ⊙ (a decimal
point), and can be used for writing-in of such
all numeral values as tool offset value, para-
meter data, and so on, in addition to command
value.
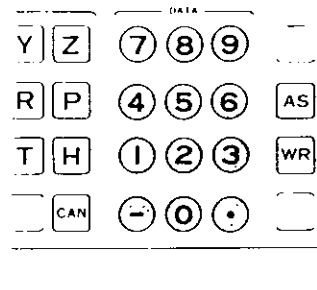
Fig. 4.1.7

NOTES: Use of decimal point key $\odot$

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

EXAMPLE: In case of 0.01 mm least input increment.

①, ②, ⑤, $\odot$, [WR] means 125.00 mm

①, ②, ⑤, $\odot$, ④, [WR] means 125.40 mm

(in case of INCH input †, a decimal point denotes an inch.)

· When writing in M, S, T and/or B 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-i.

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□□."
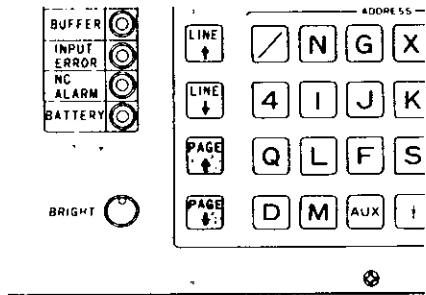
Fig. 4.1.8.1

· 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 $\boxed{\begin{array}{c} \text{PAGE} \\ \downarrow \end{array}}$ key is depressed, the page to be displayed will step forward by one. On the contrary, every time the $\boxed{\begin{array}{c} \text{PAGE} \\ \uparrow \end{array}}$ key is depressed, the page to be displayed will step backward by one.
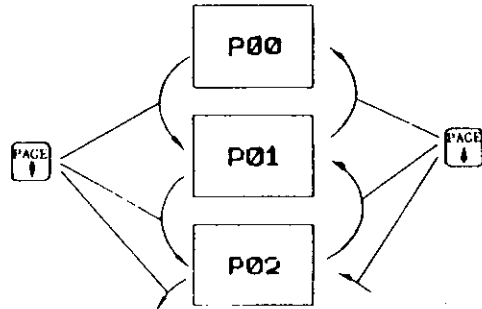
Fig. 4.1.8.2

Table 4.1.8   List of PAGE Display

Function	Page	Displayed contents	Remarks
POS 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	
	P03	Current position collective display	· The displayed contents can be changed by depressing a PAGE key.
	(P04)	(Servo lag value display) (Note 3)	
	P05	Display of remaining number of repetitions of subprogram	
COM COMMAND (Except EDT mode)	P00	Command data display (Modal)	
	P01	Input data display	
	P02 (Note 1)	Stored part program wide-display (9 lines/picture)	
COM (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."
OFS OFFSET	P00 to P☐☐	Tool offset value wide-display (20 sets/page)	
PRM PARAMETER	P00 to P☐☐	Parameter wide-display (5 sets/page)	At this time, a page containing a designated line (or block) can be displayed.
DGN DIAGNOSIS	P00 to P☐☐	INPUT/OUTPUT signal wide-display (8 sets/page)	
ALM ALARM	P00	Alarm code display (with a status code and alarm messages)	For multi-alarming, up to 5 types of alarms can be displayed.

⎫ Wide-display (Page-display) ⎬

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 $\boxed{\text{PAGE} \downarrow}$ key is depressed during the last page display, it returns to P00, while with the $\boxed{\text{PAGE} \uparrow}$ 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.

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. 4.1.9.1

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.

- 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 $\boxed{\text{LINE} \downarrow}$ key is depressed, a line or block to be displayed will step forward by one, while when the $\boxed{\text{LINE} \uparrow}$ key is depressed, backward. Keeping the LINE key depressed makes the line pointer step automatically.

Fig. 4.1.9.2

Table 4.1.9 List of LINE Display

Function	Line	Display contents	Remarks
⟨POS⟩ POSITION		——	The LINE key operation won't affect the display.
⟨COM⟩ COMMAND (Except in EDT mode)		——	
⟨COM⟩ COMMAND (in EDT mode)	□□ (Note 1)	Editing part program display (1 block).	When the FUNCTION key is depressed first, 1 block that the pointer points out will be displayed.
⟨OFS⟩ OFFSET	T00 to T99	Tool offset value display (To display a set of T□□)	· When this FUNCTION key is depressed first, already assigned line data will be displayed.
⟨PRM⟩ PARAMETER	N00 to N99	Parameter display (To display a set of Parameter No.□□.)	· A line desired to display can be designated by an operation of a LINE key or keying-in.
⟨DGN⟩ DIAGNOSTICS	X00 to X99 Z00 to Z99	INPUT/OUTPUT signal display (To display a set of Diagnostics No. X or Z□□.)	
⟨ALM⟩ 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 operation 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.

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- 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, simultane-
  ously makes line number "00" forcibly.

4.1.10 ORG (ORIGIN) KEYS

ORG key is used when a position display on the
absolute coordinate system by G92 is set at "0."
See 4.3.4 Current Position Display for the de-
tails.
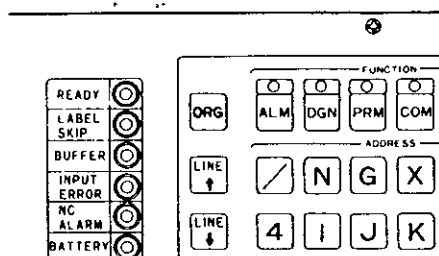
Fig. 4.1.10

4.1.11 WR (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 4.3.14
"Address Search" for further details.
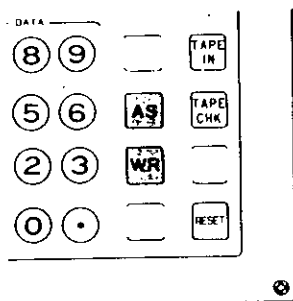
Fig. 4.1.12

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.
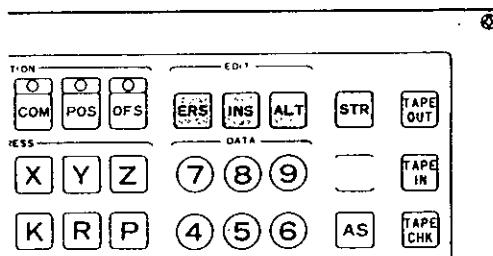
Fig. 4.1.13

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

TAPE 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 punch-
  ing-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.

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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

· G code of A group → "G00"
(When the contents of parameter No. 09 is "0."

· G code of C group → "G40"

· G code of D group → "G80"
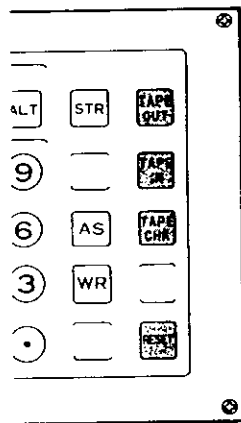
Fig. 4.1.15

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

· Current position values of each axis

· Modal G codes (except for C and D groups)
When the contents of parameter No. 09 is "1,"
G code of A group is not affected.

· F commands

· S, T and B 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.
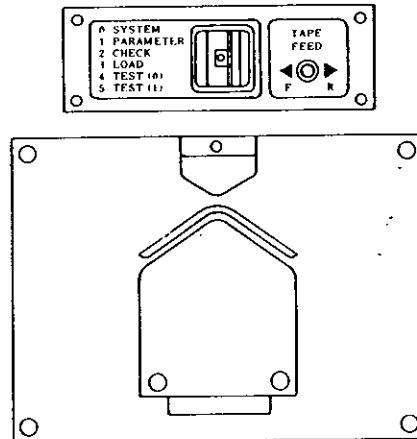
Fig. 4.1.16

. 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 simularly 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.

· 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.
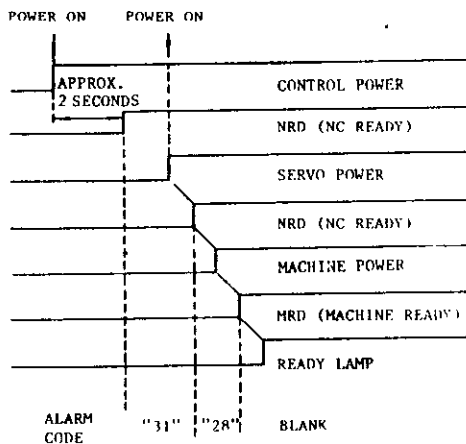
Fig. 4.2.1 Sequence of Turning on Operation

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 the machine power, too.

· Depress the POWER OFF pushbutton to cut off the control power.
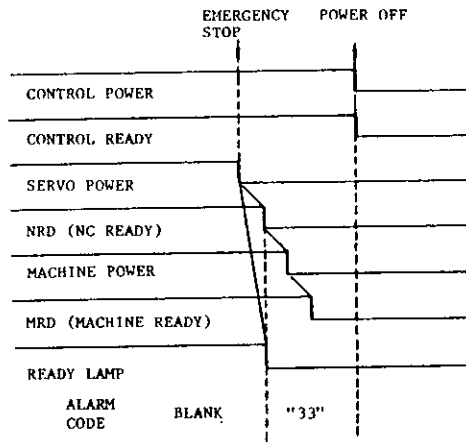
Fig. 4.2.2 Sequence of Turning off Operation

4.2.3 REMOTE TURNING ON/OFF PUSHBUTTONS

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.
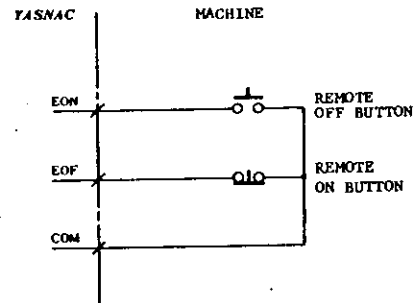
Fig. 4.2.3 Connections of Remote ON/OFF Pushbuttons

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 1.

a) Without the work No. control.
N⎵⎵⎵□□□□

b) With the work No. control.
N□□.□□□□

COMMAND-EDIT   N   001S

Main data display area

(3) Keying-in data

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

X123456   INSERT   12   P00

(6) PAGE number

(5) LINE number

(4) Status message

ALARM-   ... (Note) ALARM-31
TAPE OUT   is not displayed in
TAPE 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.

Fig. 4.3.1

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 "EDT +" 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 to one block. The conditions of the data to be displayed is 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 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)

G CODE IN EXECUTION (Note)

G CODES OF EACH GROUP

```
COMMAND-MODAL              N01.0100
       /        N        100    F       200
     ⟨G04⟩       X     50.000    S       500
                Y-    10.000    T        06
      G00       Z    125.000    H        11
      G17       A        .0    D        11
      G40       I        .0    M
      G80       J        .0    *
      G90       K        .0
      G94       R        .0
      G98       P     1.000·
      G04       Q      0000
                L          0
     P                              10    P00
```

Fig. 4.3.2.1

Note: This G code is currently in execution. While the control is stopped at a block end the display shows the G code which is effective immediately before the block.

d. All modal commands can be displayed. The display includes the modal commands which have been already effective at at 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              N01.0100
       /        N        100    F
                X                S
                Y                T
                Z                H
                A                D
                I                M
                J                *
                K
                R
                P     1.000
     G04        Q
                L
     P                              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.

FLICKERING

```
COMMAND                          N01.0100
→ X N100  G04  P1000*
  N101  G91  G01  Z-2500  F150*
  N102  G46  X4000  Y4000  D10  F300*
  N103  X5000*
  N104  G45  Y7000*
  N105  G45  G02  X3000  Y3000  I4000
        J-1000*
  N106  G45  G01  X3000*
  N107  Y-5000*


X                                    10   P02
```
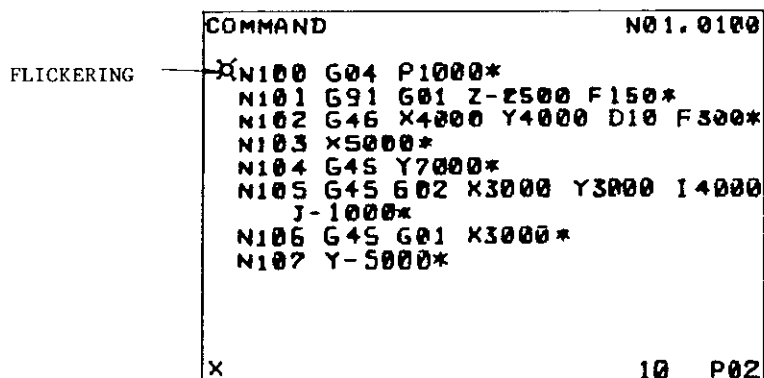
Fig. 4.3.2.3

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

Ad 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. But the LINE key can turn pages while the AS key is held depressed.

5. Depress the $\boxed{\text{PAGE} \atop \downarrow}$ 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 pushbutton.

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 remain effective at a previous command or operation.

3. Key in the desired address data by use of the ADDRESS and the DATA key. 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 then 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.

- 14 -

```
COMMAND-MODAL                    N01.0205

       N        206     F        400
G01    X     40.000     S       1000
       Y     30.000     T         01
G01    Z     50.000     H         10
G17    A         .0     D         10
G40    I         .0     M
G80    J         .0     *
G90    K         .0
G94    R         .0
G98    P         .0
       Q       0000
       L
                                  10   P00
Y30.
```

KEY IN

Ⓨ, ③, ⓪, ⦁
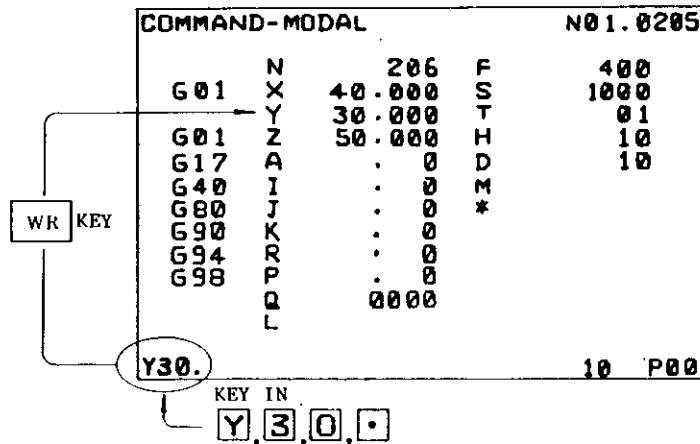
WR KEY

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 thr writing operation by MDI, all the command data already written can be cancelled out.

b. The data of codes except F, M, S, T and B† cannot be changed by MDI operation as far as as Cutter Radius Compensation C is executed by G41 or G42. (Refer to 2.4.13 TOOL COMPENSATION C of TOE-C843-5·30.)

c. The data to be executed will be checked by display 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 "79."

A. Where parameter No. "79" = "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, either manually or automatically, which cannot be changed even by initiating the G92 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. "79" = "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.

·· To reset the display, depress ORG key after designating the axis with the ADDRESS key and the displayed coordinate values will be "0."

Reset operation must be made in manual operation modes. (RAPID, JOG, STEP or HANDLE) ORG key is not effective during operation or while BUFFER lamp is on or the blocks are read ahead.

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

P00: Current Position Display A (UNIVERSAL)

```
POSITION-UNIVERSAL        N01.
  X    1250.469
  Y  -  435.775
  Z     50.008
  A         .    0


                          1S    P00
X
```
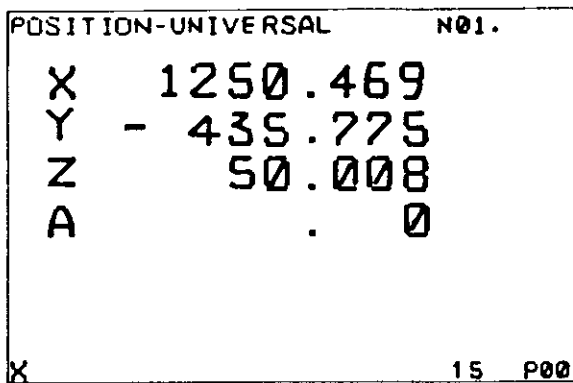
Fig. 4.3.4.1

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 the displayed data, designate an axis using ADDRESS key and simultaneously depress CAN key. The axis is reset to "0" irrespectively of mode selection and page selection.

P02: Current Position Display B (EXTERNAL)

```
POSITION-EXTERNAL         N01.
  X      50.469
  Y  -    4.775
  Z     30.008
  A  -   10.000


                          1S    P01
X
```
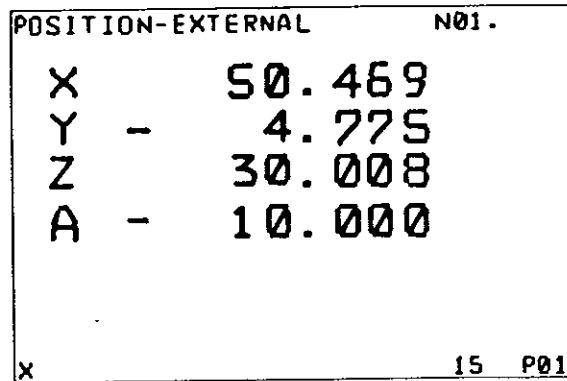
Fig. 4.3.4.2

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

```
POSITION-INCREMENT        N01.
  X      50.000
  Y         .    0
  Z     15.000
  A         .    0


                          1S    P02
X
```

Fig. 4.3.4.3

- 16 -
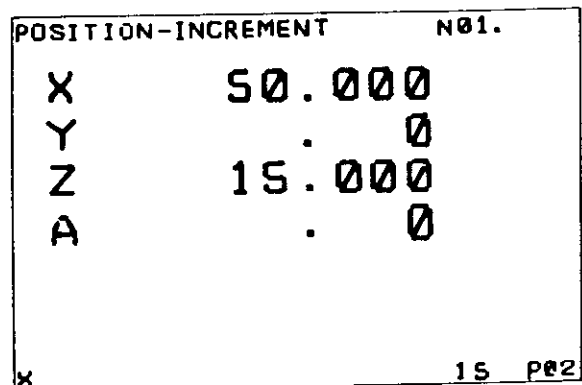
4. Depress the |PAGE ↓| key again. → P03

The page turns to P00, 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                          NO1.
        (UNIVERSAL)          (EXTERNAL)
    X   1250.469       X      50.469
    Y  - 435.775       Y       4.775
    Z     50.008       Z      30.008
    A        .0        A      10.000

        (INCREMENT)          (MACHINE)
    X    50.000        X     185.332
    Y        .0        Y  -  247.056
    Z    16.000        Z  -   60.751
    A        .0        A  -   40.167
X                                15    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. → P05

The remaining number of repetitions of subprogram is displayed. For the details, refer to APPENDIX-3 DISPLAY OF REMAINING NUMBER OF REPETITIONS OF SUBPROGRAM.

7. 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).

· The coordinate value of the current position display B is reset also by the reset operation of the CURRENT POSITION DISPLAY 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 "H" (or "D"). The WR key operation is not needed. A set of data for an offset value corresponding to the keyed-in value is displayed. If "H," "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                            NO1.

  H10  X-    45.764



  POS (UNIVERSAL)     X    1250.469
                      Y-    435.775
                      Z     30.251
                      A      1.306
X                                10    P00
```

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 (20 sets of data/page).

```
┌─────────────────────────────────────┐
│OFFSET                         N01.   │
│                                      │
│  H00           H10 X-    45.764      │
│  H01 X-  25.168  H11 X     4.998     │
│  H02 X    4.705  H12 X    89.987     │
│  H03 X   10.887  H13 X- 200.469      │
│  H04 X-  30.216  H14 X    21.564     │
│  H05 X   45.764  H15 X       .0      │
│  H06 X-   9.447  H16 X       .0      │
│  H07 X   77.293  H17 X       .0      │
│  H08 X  125.030  H18 X       .0      │
│ oH09 X- 150.003  H19 X       .0      │
│                                      │
│ H                           09  P01  │
└─────────────────────────────────────┘
```

When an offset number "09" is designated. (o Mark flickers)

Note: "H" is displayed as an address character of the offset number and "D" is not displayed.

Fig. 4.3.5.2

6. Depress the ┌─────┐
│PAGE │
│ ↓ │ key.
└─────┘

The page turns to the page number plus one. o Mark flickers at the head line of the renewed page. (The first line of displayed data.)

7. Depress the ┌─────┐
│PAGE │
│ ↑ │ key.
└─────┘

The page returns back to the page number minus one. o Mark flickers at the head line of the renewed page. (The first line of displayed data.)

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 diagostic number corre-

sponding 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 is always possible independently at operation mode. Writing tool offset value is completed by writing the incremental value. The written value just keyed in is added algebraically to the stored offset value and displayed as a new offset.

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 "H" or "D." The WR key need not be operated.

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

3. Key in a tool offset value (an axial address plus a number) desired to be written in. The character of X, is used for the address (in case of writing an absolute value).

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.

Depress the WR key. Then the displayed data will be added algebraically to the stored value. The summed value is a new tool offset value.

The data displayed at the left bottom section will be erased off, leaving the address character unerased.

5. Repeat the steps 3 through 4 until the necessary tool offset values have been stored into the memory.

```
OFFSET                    NO1.

    H08  X      15.927


  WR  KEY    POS (UNIVERSAL)    X   250.341
                                Y   100.500
                                Z    66.033
                                A    30.000
        XS.04                                P01
```

```
KEY IN
    X  S  ·  0  4
```

Fig. 4.3.6


```
OFFSET                         NO1.

  (A)  OFFSET-A      X-    15.522
                     Y     15.522
                     Z      . 0
                     A      . 0

  (B)  OFFSET-B  G43  X   200.657  H31
                 G49  Y     . 0    H00
                 G44  Z    53.044  H06
                 G49  A     . 0    H00

  (C)  CUT.CMP.  G40  X     . 0    D00
  H                               80   P05
```
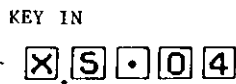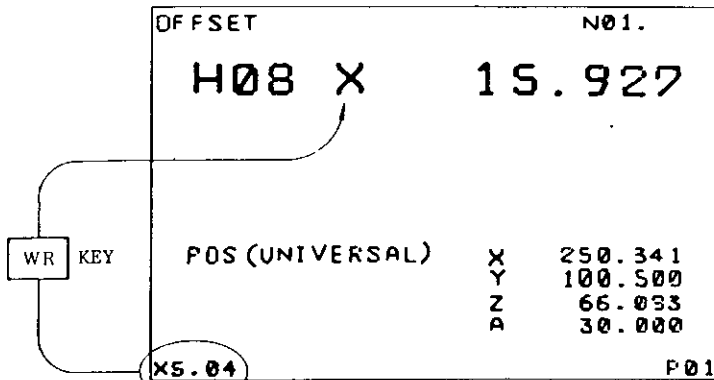
NOTES:

· To enter the new offset data instead of incremental value, depress CAN key before handling DATA keyboard. The offset value stored will be cancelled and the display shows 0.

· Tool offset values stored in memory will not be erased by turning off the power.

· Writing and modifcation of tool offset values can be always possible in any mode including automatic operation mode.

· When the offset value is changed during automatic operation, the blocks in buffer register and active register are executed with an old one. The new offset value is effective in the next block.

4.3.7 DISPLAY OF CURRENT TOOL OFFSET VALUES

The current tool offset values and the related data of each compensation function are displayed. Procedure is as follows.

1. Depress the OFS key and then the lamp lights up. When this key is depressed, the display shows the tool offset data already designated in previous operation. The page including the tool offset number designated, are displayed in "P□□" at the bottom right corner of the display.

2. Select "P05" using $\boxed{\text{PAGE} \downarrow}$ key or $\boxed{\text{PAGE} \uparrow}$ key and the current tool offset values are displayed as shown below.
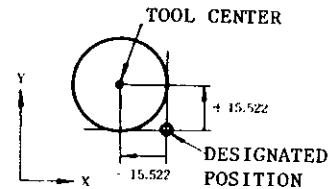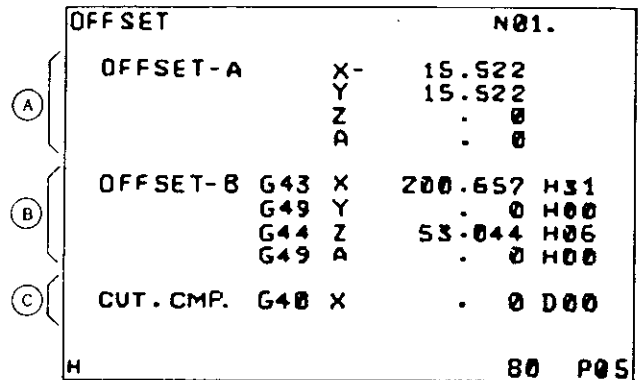
EXAMPLE

A   Tool position offset A:
Tool center is compensated from the designated position by "-15.522 mm" in the X direction and "+15.522 mm in the Y direction.

B   Tool position offset B:
Tool center is compensated by +200.657 mm (the contents of H31) in the X direction and by +53.044 mm (the contents of H06) in the Z direction. No offset is applied to the X and Y axes.

C   Tool position offset C:
G40 (tool radius compensation cancel) is in effect.

NOTES:
"P05" page in OFS mode can be selected only by PAGE key operation.

Depressing LINE keys cannot select the P05 page and change the display between P04 and P00. However, when LINE key is operated during displaying P05 page, the display may be changed to P04 or P00.

4.3.8 PARAMETER DISPLAY

Various parameter have been stored in the parameter storage of the control. According to their contents, operation 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 parameter 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."

3. Depress the ⎡LINE ↓⎤ key.

   The data of parameter number plus one to displayed.

4. Depress the ⎡LINE ↑⎤ key.

   The data of a parameter number minus one is displayed.

```
┌─────────────────────────────────┐
│PARAMETER              N01.      │
│                                 │
│  N90  X           25            │
│       Y           18            │
│       Z           35            │
│       A -         16            │
│ ⎛P-OS (MACHINE)    X    32.645⎞  │
│ ⎜                  Y   750.416⎟  │
│ ⎜                  Z-  200.552⎟  │
│ ⎝                  A   110.443⎠  │
│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 -

5. 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).

   o Mark will flicker at the parameter number designated.

```
┌─────────────────────────────────┐
│PARAMETER                   N01. │
│ oN90  X      25    N93  X      0│
│       Y      18         Y      0│
│       Z      35         Z      0│
│       A-     16         A      0│
│  N91  X       0    N94  X   1600│
│       Y       0         Y   1600│
│       Z       0         Z    800│
│       A       0         A    800│
│  N92  X       0                 │
│       Y       0                 │
│       Z       0                 │
│       A       0                 │
│N                         90  P18│
└─────────────────────────────────┘
```
FLICKER- ING

Fig. 4.3.8.2

6. Depress the ⎡PAGE ↓⎤ key.

   The page turns over by one.

7. Depress the ⎡PAGE ↑⎤ key.

   The page turns back by one.

8. 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.

1. Set the SYSTEM NO. switch at "1."

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

    The parameter data of a designated number will be displayed.

3. 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.
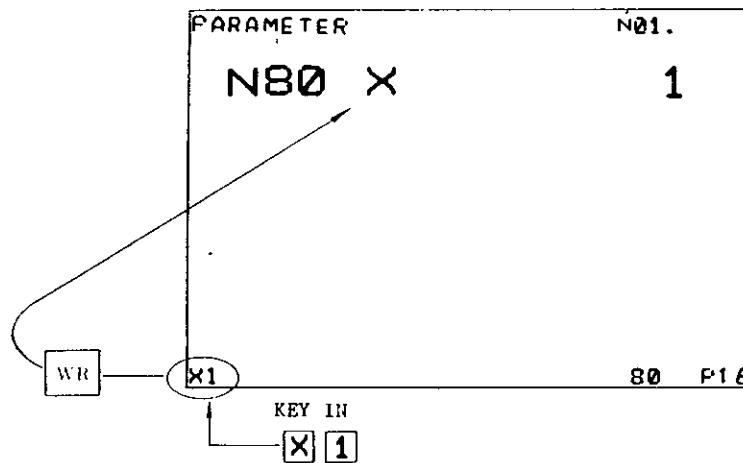
Fig. 4.3.9

NOTES:

· Data of parameters, once stored in memory, are not erased by turning off the power.

· With parameter No. at 00, totalized time of automatic operation will be displayed. For details, refer to 4.3.10 Operation Time Display.

· Setting parameter number at 99 displays active address of the tape memory with number of characters on the universal display. See 4.5.4 Address Display of Tape Memory.

· Data of parameter numbers 01 to 98 can be displayed at anytime. 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.

· Where the SYSTEM NO. switch is set at other than "0" and "4," CYCLE START button cannot start the operation. On completion of writing parameter data, never fail to set back the SYSTEM NO. switch to 0. The switch is not usually set at 4 which is for test.

第 4・3・9 表　パラメータ一覧 (1/3)

Table 4・3・9　PARAMETER TABLE (1/3)

NO.	ADD-RESS	意味 MEANING	NO.	ADD-RESS	意味 MEANING	NO.	ADD-RESS	意味 MEANING
00		稼動時間表示 Operation Time Display 9999. 時(H) 59. 分(M) 59. 秒(S)	*10	○	ピッチエラー補正量 Leadscrew Error Compen. Values ⌈1⌉=0.001 mm	*30	○	ピッチエラー補正量倍率 Multiply for Leadscrew Error Compen. ⌈1⌉=1倍
01	○	早送りオーバライド設定速度 Rapid Traverse Rate Override Setting ⌈1⌉=7.5 mm/min	*11	○		*31	○	ピッチエラー補正原点番号 Reference Point No. for L. E. C. ⌈20⌉=Parameter No. 20
02		ドライラン時早送り速度 Rapid Traverse Rate for Dry Run ⌈0⌉=RAPID, ⌈1⌉=JOG	*12	○		*32	○	ピッチエラー補正の補正ピッチ Compensational Pitch for L. E. C ⌈1⌉=0.001 mm
*03		ストロークチェック入切 Stroke Check ON-OFF	*13	○		*33	○	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
*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	*14	○		*34	○	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
*05		ピッチエラー補正入切 Leadscrew Error Compen. ON-OFF ⌈0⌉=OFF, ⌈1⌉=ON	*15	○		*35	○	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
*06		サイクルスタート前の原点復帰 Reference Zero Return before Cycle Start ⌈0⌉=不要, ⌈1⌉=要 Not Required　Required	*16	○		*36	○	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
07		未使用 Not Used	*17	○		37	○	未使用 Not Used
08			*18	○		38	○	
09		RESET時のAグループGコード状態 A Group G code When Resetting ⌈0⌉=G00, ⌈1⌉=保存 Held	*19	○		*39	○	ストロークチェック領域指定 Area Select for Stroke Check (第4・11項領域チェック機能を参照) (Refer to 4・11 Stroke Check)
			*20	○				
			*21	○				
			*22	○				
			*23	○				
			*24	○				
			*25	○				
			*26	○				
			*27	○				
			*28	○				
			*29	○				

第 4·3·9 表　パラメーター覧 (2/3)

Table 4·3·9　PARAMETER TABLE (2/3)

NO.	ADD-RESS	意味 MEANING
*40		
*41		
*42		※シーケンス制御用パラメータ Parameter for Optional
*43		
*44		Machine Interface 『0』= OFF, 『1』= ON
45		
*46		
*47		
*48	○	
*49	X	システム番号　System Number
50		
51		
*52		
*53		※シーケンス制御用タイマ定数 Timer Constant for Optional / Machine Interface 『N』=(16n～16) msec
*54		
55		
*56		
*57		
*58	○	未使用　Not Used
*59	○	FACIT / ASR33 切換え
60	○	バックラッシュ補正開始方向 Backlash Comp. Starting Direction 『0』= from(+), 『1』= from(-)
*61	○	原点復帰方向 Reference Zero Return Direction 『0』= to(+), 『1』= to(-)
*62	○	原点復帰最終速度 Reference Zero Return Final Speed 『1』= 7.5 mm/min
63	○	ポジションエラー領域 Position Error Zone 『1』= 0.001 mm
64	○	サーボエラー領域　Servo Error Zone 『1』= 2ª/パルス (Pulses) または 2ª/パルス (Pulses) (装置による) Depend on the Control (Binary)
65	○	仕様指定用パラメータ (バイナリー) Designation of Optional Features (Binary)
*66	○	G12～G15 R指定区間送りの速度 R Zone Feedrate 『1』= 1/16 mm/min
*67	○	手動ハンドル送り最大速度 Max. Feedrate for Handle 『1』= 7.5 mm/min
68		切削送り時定数 Time Constant for Feed 『N』= (32 n + 32) msec
69		切削送り速度バイアス Velocity Bias for Feed 『1』= 2 Kpps
*70		GR0　主軸DA出力値 Spindle DA Output 『2047』= 10 V
*71	○	GR1, GR1'　主軸最大回転数 Spindle Max. RPM 『1』= 1 RPM
*72	○	GR2, GR2'　主軸最大回転数 Spindle Max. RPM 『1』= 1 RPM
*73	○	GR3, GR3'　主軸最大回転数 Spindle Max. RPM 『1』= 1 RPM
*74	○	GR4, GR4'　主軸最大回転数 Spindle Max. RPM 『1』= 1 RPM
75	○	切削送りの最高速度 Max. Feedrate 『1』= 1/16 mm/min
*76	○	G76シフト方向 Shifting Direction 『1』= X+, 『2』= X-, 『4』= Y+, 『8』= Y-
*77		補正Cコーナ円弧廻りスキップ値 『1』= 最小設定単位 (1倍) Least Input Increment (×1)
78		G90/G91　イニシャルセット Initial Set 『0』= G90, 『1』= G91
79		G92　表示プリセット入切 Display - preset ON - OFF 『0』= OFF, 『1』= ON

第4・3・9表 パラメータ一覧 (3/3)
Table 4·3·9 PARAMETER TABLE (3/3)

NO.	ADDRESS	意味 / MEANING	NO.	ADDRESS	意味 / MEANING	備考 / NOTICE
80		EIA/ISOの自動判別入切 - Auto Select "0"=OFF, "1"=ON	90	○	バックラッシュ自動補正量 Backlash Value "1"=0.001 mm	1) No. 00 および 99 は表示専用であり、書込みはできません。表示は常時可能です。 No. 00 and 99 are for display only. These cannot be written, but can be displayed at anytime.
81		TVチェック入切 TV Check ON-OFF "0"=OFF, "1"=ON	91	○	ミラーイメージ軸指定 Mirror Image Axis ON-OFF "0"=OFF, "1"=ON	
82		EIA/ISOコード指定 Code Designation "0"=EIA, "1"=ISO	*92	○	外部減速速度 (RPG) Traverse Rate Clamp Speed (RPG) "1"=7.5 mm/min	2) No. 01～98 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"の位置にして書込みを行ないます。 No. 01 to 98 are interlocked by SYSTEM No. switch, and can be changed only when the position of SYSTEM No. switch is "1".
*83		MM/INCH指定 Designation "0"=MM, "1"=INCH	*93	○	外部減速速度 (FG) Traverse Rate Clamp Speed (FG) "1"=1/16 mm/min	
84		タッチブザー入切 Touch Buzzer ON-OFF "0"=OFF, "1"=ON	94	○	早送り速度 Rapid Traverse Rate "1"=7.5 mm/min	
85		未使用 Not Used	95	○	早送り加減速定数 Accel./Decel. Time Const. for RT "1"=125/8 mm/sec^2	3) ※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		高速原点復帰入切 Rapid Reference Return ON-OFF "0"=OFF, "1"=ON	*96	○	原点復帰クリープ速度 Reference Zero Return Approaching Speed "1"=7.5 mm/min	
87		送り指令単位 Feedrate Designation "0"= F4.0, "15"= F4.1 mm//min	*97	○	原点復帰最終距離 Reference Zero Return Final Stroke "1"=0.001 mm	4) ADDRESS 部の○は軸の指定を要するパラメータです。 Parameter with ○ Mark in ADDRESS are required the selection of axis.
88		入力指令10倍入切 Command Data×10 ON-OFF "0"=OFF, "1"=ON	98	○	MF, SF, TF, BF 送出遅れ時間 SFb Delay, Time for MF, SF, TF, BF, and SFb "1"=1 msec	
89		未使用 Not Used	*99		メモリポインタ表示 Memory Pointer Display "1"=1ch	

備考 1)
Notice 1)

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4.3.10 OPERATION TIME DISPLAY

Operation time display shows the totalized time of automatuc 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.

```
OPERATION TIME           N01.

  HOUR     MIN    SEC

 0110.02.59




N                        00  P00
```
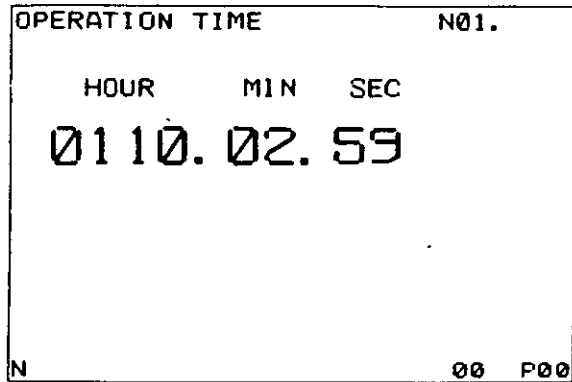
Fig. 4.3.10

4.3.11 PARAMETER WRITING FOR MIRROR-IMAGE AXIS

The mirror-image axis is designated by parameter. The Mirror-Image function on the designated axis is effective when M95 (Mirror-Image ON) command is given. The procedure for designation of mirror-image axis is as follows.

1. Display the data of parameter No. 91 by using the procedure in 4.3.8 Parameter Display. Never fail to select the address of the axis to be displayed.

Parameter No. 91	Meanings
"0"	Mirror-image axis OFF
"1"	Mirror-image axis ON

2. Write "1" in order to specify the displayed axis as the mirror-image axis, following the operation procedure in 4.3.9 Parameter Writing. The Mirror-Image function is on when M95 command is given and off at M94 command.

NOTES:

· Mirror-image axis can be specified for X, Y, Z, or (α†) axis.

· For setting the MIRROR IMAGE AXIS selector switch †, refer to the table below for the combined results of setting parameter No. 91 and the selector switch.

Table 4.9.11

Parameter No. 91	MIRROR IMAGE AXIS Selector Switch	Resultant ON/ OFF State of Mirror-Image Axis
"0" = OFF	OFF	OFF
"0" = OFF	ON	ON
"1" = ON	OFF	ON
"1" = ON	ON	ON

Note: Resultant ON/OFF state cannot be displayed on the display.

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.

```
      SYSTEM    STATUS        ALARM
      NUMBER    ┌CODE         ┌CODE
┌ALARM              /              /         N01.┐
│    └1      /          /              │
│      1  05. 51 01.34             │
│    01:34 X    SERVO ERROR           │
│      :31      SERVO POWER           │
│               UNSUPPLIED            │
│    01:21 X    OVERTRAVEL            │
│                                     │
│X           ALARM-34   30   P00      │
└─────────────────────────────────────┘

     ALARM      AXIS    FLICKERING    COMMENT
     CODE
```
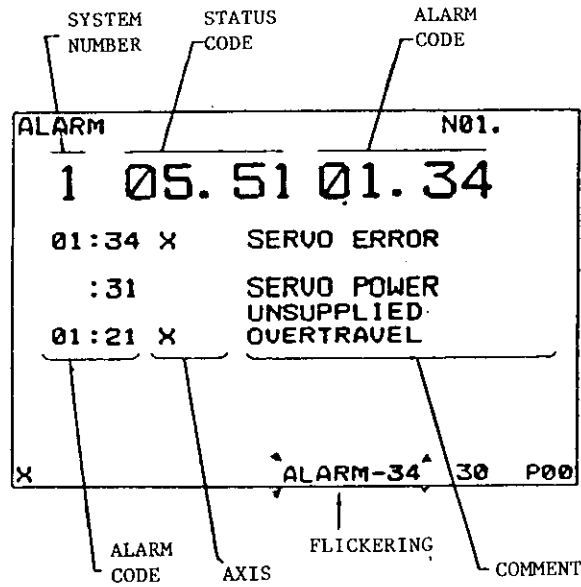
Fig. 4.3.12

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.

· The alarm code is usually show... ...wo digits, but for those to have an axial division or an error detail division, another two-digits is added ahead of them.

· 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 3000G OPERATOR'S MANUAL. (TOE-C843-5-30)

Table 4.3.12.1   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
:14		FORMAT ERROR
:15		DATA ERROR,
:16		TOOL OFFSET AREA ERROR
:17		PARAMETER AREA ERROR
:18		TAPE MEMORY ERROR
04:21	Z	OVERTRAVEL
01:22	X	REFERENCE ZERO RE-TURN AREA ERROR
02:23	Y	REFERENCE ZERO RE-TURN UNREADY
01:24	X	REFERENCE ZERO RE-TURN POSITION ERROR
:25		SEQUENCE ERROR
:26		SPINDLE ERROR
01:27	Y A	POSITIONING ERROR
:28		MACHINE UNREADY
:31		SERVO POWER UNSUP-PLIED
01:32		CONTROL UNIT UNREADY
:33		ENERGENCY STOP
13:34	XY A	SERVO ERROR
:35		OVERLOAD
02:36	Y	FEEDBACK ERROR
04:37	Z	HARDWARE ERROR (FG)
:38		HARDWARE ERROR (RPG)
12A6:81		CPU ERROR
15:82		MEMORY COLLATING ERROR

Table 4.3.12.2　List of Alarm Codes and Status Codes

Alarm Code	Causes	Alarm Code	Causes
11	Excessive temperature rise in the panel.	▢ 27	Positioning error.
▢ 12	Tape/Memory horizontal parity error.	28	Machine unready.
13	Tape vertical parity error.	31	Servo power unsupplied.
▢ 14	Format error.	32	Control unit unready.
▢ 15	Data error.	33	Emergency stop.
16	Offset error.	▢ 34	Servo error.
17	Parameter error.	35	Overload.
18	Tape memory error.	▢ 36	Feedback error.
▢ 21	Overtravel.	37	Hardware error (FG).
▢ 22	Reference zero return area error.	38	Hardware error (RPG).
▢ 23	Reference zero return unready.	81	CPU error.
▢ 24	Reference 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
▢ 51	Performing M-, S-, T-, and/or B†-function.	-
52	Distributing pulses.　Dwelling.	-
▢ 53	Performing M-, S-, T-, and/or B†-function and distributing pulses.	51 + 52
54	Reading tape.	-
▢ 55	Performing M-, S-, T-, and/or B†-function and reading tape.	51 + 54
56	Distributing pulses and reading tape.	52 + 54
▢ 57	Performing M-, S-, T-, and/or B†-function distributing pulses and reading tape.	51 + 52 + 54
58	Waiting for canned cycle's FIN signal.	-

Notes:

1. ▢▢ of alarm code is filled with a digit indicating the axis whose error is detected. 1: X-axis, 2: Y-axis, 4: Z-axis, (8: α† -axis)
Where the error is detected in more than one axis, total of axis codes is shown.

2. For alarm code "12," additional two-digits indicate the memory IC number.

3. ▢▢ of alarm code "14," "15" shows the detailed error causes.

4. ▢▢ of status code is filled with a digit indicating M, S, T, or B function which is being executed.
1: M, 2: S, 4: T, (10: B†)
Where the error is detected in more than one function, total of function codes is shown.

Table 4.3.12.3 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 IC36.
09.82	A total error (alarm code: "82") is resulted from the self-diagnostics of the memory. The defective ROM number is "09."

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

BTSM-FIN 10 P00

Flickering
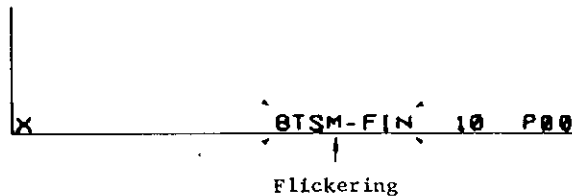
4.3.13 DISPLAY OF INPUT/OUTPUT SIGNALS

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."
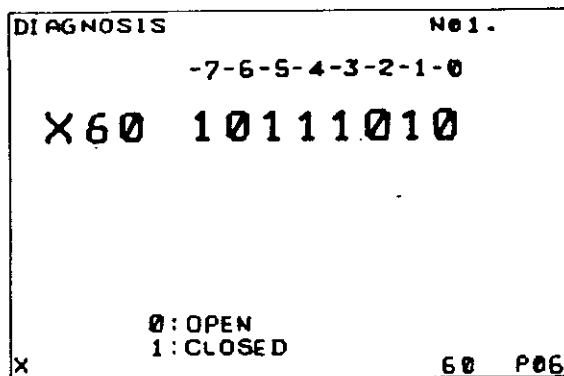
Fig. 4.3.13.1

Note: Keying in "1" after "X," "6," and "0" designates the diagnostic number "01" and shows the status of the group of signals designated.

3. Depress the ⌊LINE ↓⌋ key.

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

4. Depress the ⌊LINE ↑⌋ 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.
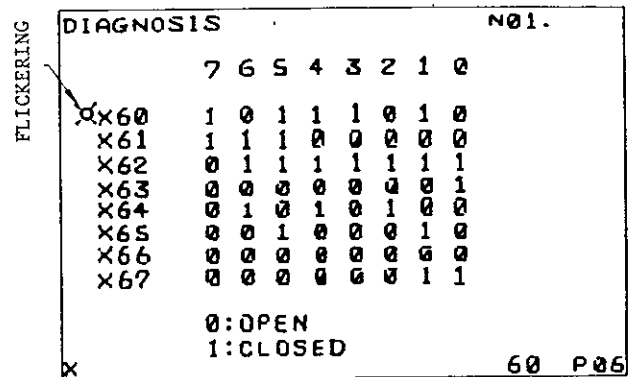
Fig. 4.3.13.2

6. Depress the ⌊PAGE ↓⌋ key.

   The page turns to the page plus one.

7. Depress the ⌊PAGE ↑⌋ 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 C, X, Y, 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.

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 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.

The operation starts from the first address of the memory.

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 control may be provided with a current position display unit for three axes (X, Y, Z) or for four axes (X, Y, Z, α). The unit may be mounted on the panel front or separately as remote 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.

1. Depress the RESET button causes the display to be zero.

2. The indication is not affected by the G92 command.

3. The indication is updated even with the MACHINE LOCK switch on, but not changed with the DISPLAY LOCK [†] switch on.

4. Even if servopower is off by pressing the EMERGENCY STOP button, the indication follows tool movement.
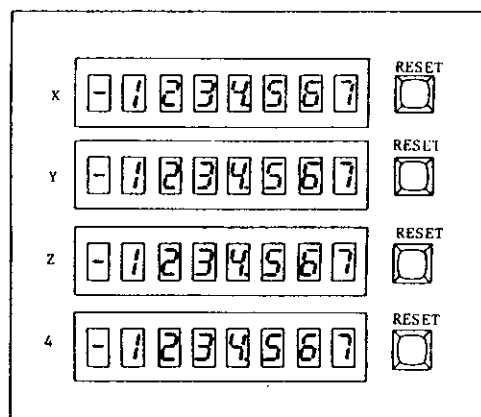
Fig. 4.3.16

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 *   Notes:

H1 X... *   1. Both address H and D can be
                used for the format of tool
H2 X... *   offset values.

H3 X... *   2. Tool offset values are placed
                after X.
D4 X... *

D5 X... *
:
ER (or %) · · · · · Rewind stop code

The operating procedure for storing the tool off-
set 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 $\boxed{\begin{array}{c}\text{TAPE}\\\text{IN}\end{array}}$ key with the 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.
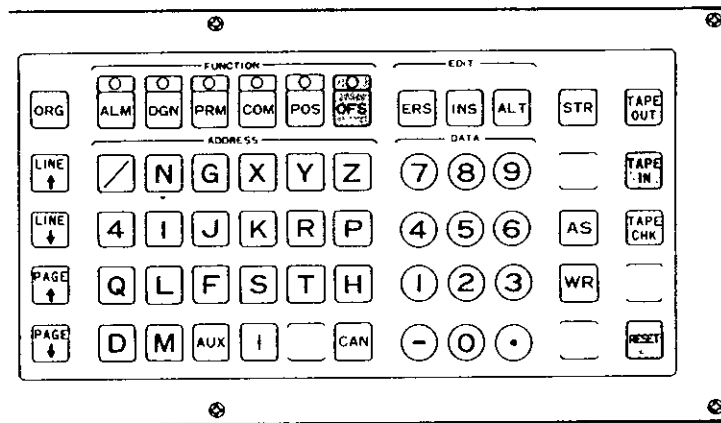
Fig. 4.4

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.

Table 4.5.1

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

Part program punched should be sandwiched with rewind stop code (EIA: "ER," ISO: "%"). M02 or M30 command must be programmed in the final block of the program.
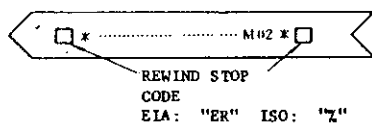
Fig. 4.5.1.1

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.
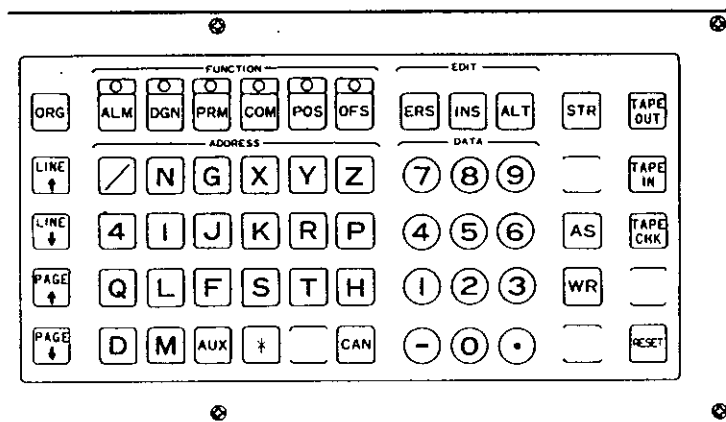
Fig. 4.5.1.2

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

3. Depress the COM key. Then, the lamp lights up.

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.

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 $\boxed{\begin{array}{c} \text{LINE} \\ \downarrow \end{array}}$ 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 $\boxed{\begin{array}{c} \text{LINE} \\ \uparrow \end{array}}$ 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 $\boxed{\begin{array}{c} \text{PAGE} \\ \downarrow \end{array}}$ 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 Fig. 4.6.1.2).

    Check all command values.

5. Repeat step 4 to check each display.

6. By depressing the $\boxed{\begin{array}{c} \text{PAGE} \\ \uparrow \end{array}}$ 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.

```
COMMAND-EDIT                  N02.

  N001 G92 X0 Y0 Z20000*                    }— MEMORY DISPLAY
                                               (1 BLOCK)



  N001 G92 X0 Y0 Z20000*                    } EDIT BUFFER
                                            }— DISPLAY
                                               (THE BLOCK DESIG-
                                               NATED)

N                          10   P00
```

Fig. 4.6.1.1

```
COMMAND-EDIT                    N01.

 XN001  G92  X0  Y0  Z20000*
  N002  T10  M06*
  N003  G90  G00  Z4000  S1600  M03*
  N004  G91  G01  Z-2500  F150*
  N005  G46  X4000  Y4000  D15  F300*
  N006  G45  Y5000*
  N007  G45  G02  X3000  Y3000  I4000
     J-1000*
  N008  G45  G01  K3000*

  N001  G92  X0  Y0  Z20000*

N                              10   P00
```

FLICKERING

MEMORY
WIDE
DISPLAY

DESIGNATED
BLOCK IN
EDIT BUFFER

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.
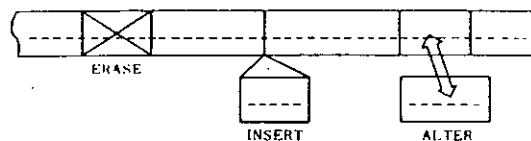
Fig. 4.6.2.1

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 $\boxed{\begin{array}{c}\text{LINE}\\\downarrow\end{array}}$, $\boxed{\begin{array}{c}\text{LINE}\\\uparrow\end{array}}$ or AD (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.

```
COMMAND-EDIT                    N01.

 N001 G92  X0  Y0 Z20000*
 N002 T10  M06*
 N003 G90  G00  Z4000  S1600  M03*
 N004 G91  G01  Z-2500  F150*
XN005 G46  X4000  Y4000  D15  F300*
 N006 G45  YS000*
 N007 G45  G02  X3000  Y3000  I4000
    J-1000*
 N008 G45  G01  X3000*

 N005 G46  X4000  Y4000  D15  F300*

                         10   P00
N
```

FLICKERING

Designate the
block to be
deleted.

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

FLIKER-
ING

```
COMMAND-EDIT                    N01.

 N001 G92  X0  Y0 Z20000*
 N002 T10  M06*
 N003 G90  G00  Z4000  S1600  M03*
 N004 G91  G01  Z-2500  F150*
XN006 G45  YS000*
 N007 G45  G02  X3000  Y3000  I4000
    J-1000*
 N008 G45  G01  X3000*
 N009 Y-5000*

 N006 G45  YS000*

                         10   P00
N
```

The block to be
designated after
deletion.

Fig. 4.6.2.2

3. To delete a several consecutive number of blocks, the block can be deleted every time the ERS key is depressed.

4. If the block is accidentally erased, insert the deleted data again according to the procedure of "Inserting a block" given below.
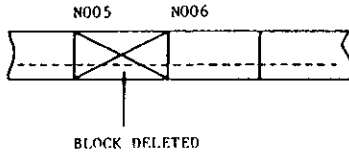
Fig. 4.6.2.3

· Inserting a block (INSERT: INS key)

1. A block desired to be inserted is designated using $\boxed{\begin{array}{c}\text{LINE}\\\downarrow\end{array}}$, $\boxed{\begin{array}{c}\text{LINE}\\\uparrow\end{array}}$ 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.
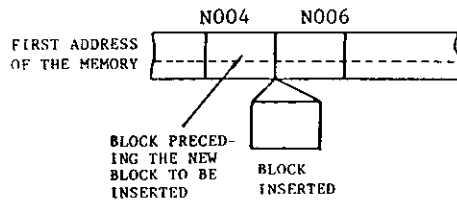
Fig. 4.6.2.4

2. 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.

3. 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.

FLICKERING
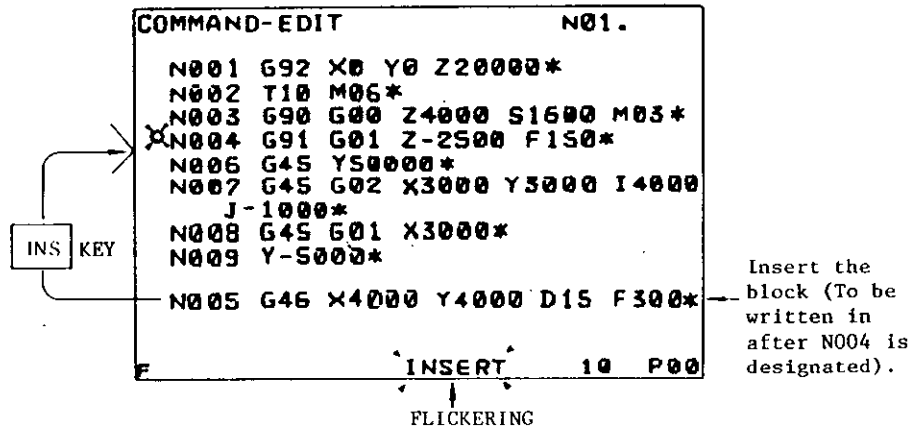
Fig. 4.6.2.5

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
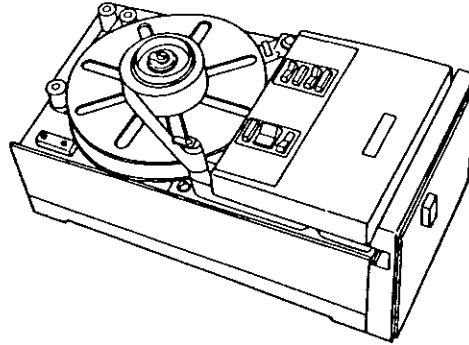
Fig. 4.7.1.1
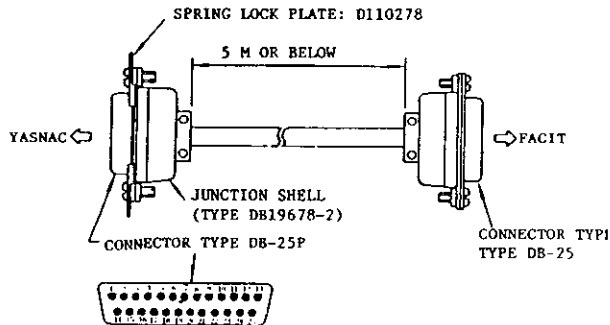
CONNECTIONS BETWEEN THE
CONTROL AND THE PUNCHER

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	0V	25
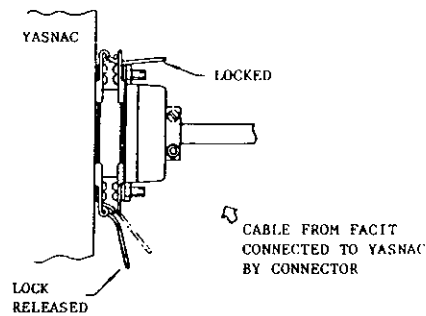
Fig. 4.7.1.2

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 at ▲.

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 pucnher.

   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 $\boxed{\begin{array}{c} \text{TAPE} \\ \text{OUT} \end{array}}$ 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.
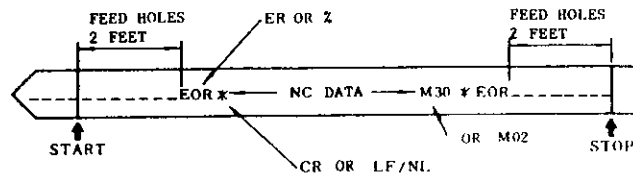
Fig. 4.7.2

• 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 $\boxed{\begin{array}{c}\text{TAPE}\\\text{OUT}\end{array}}$ key, message "TAPE OUT" flickers.

• 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 $\boxed{\begin{array}{c}\text{TAPE}\\\text{OUT}\end{array}}$ 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 $\boxed{\begin{array}{c}\text{TAPE}\\\text{OUT}\end{array}}$ 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."

   When 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.

4.7.4 OUTLINE OF TAPE DATA STORING AND PUNCHING OPERATION[†]

Select EDT mode.

$\downarrow$

Depress RESET key.

$\downarrow$

Selection of FUNCTION keys.

• Any key other than OFS key for NC Tape.

• OFS key for offset value stored tape.

$\downarrow$

Depress the $\boxed{\begin{array}{c}\text{TAPE}\\\text{OUT}\end{array}}$ key for punching NC tape and offset value stored tape.

Fig. 4.7.4

4.8 COLLATING OF STORED PROGRAM AND OFFSET VALUE'

4.8.1 COLLATING OF STORED 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 the $\boxed{\begin{array}{c}\text{TAPE}\\\text{CHK}\end{array}}$ key.

   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 $\boxed{\begin{array}{c}\text{TAPE}\\\text{CHK}\end{array}}$ key, "TAPE CHK" message will be kept flickering at the bottom of the CRT display.

4.8.2 COLLATING OF TOOL OFFSET VALUES

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 the $\boxed{\begin{array}{c}\text{TAPE}\\\text{CHK}\end{array}}$ 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.

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

4.9 SUMMARY OF OPERATION IN EDT MODE'
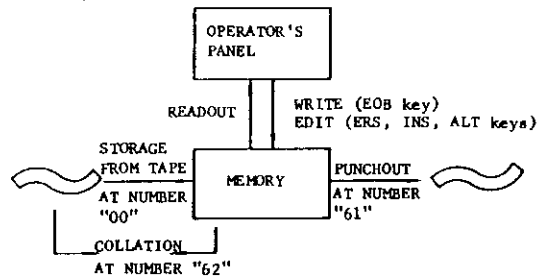
Fig. 4.9.1

Table 4.9.1

	Function Key	Keys for Starting
Storing NC data from tape	COM	TAPE IN key
Storing offset value from tape	OFS	
Punchout of stored program	COM	TPAE OUT key
Punchout of tool offset value	OFS	
Collating of stored program	COM	TAPE CHK 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	

4.10 LEADSCREW ERROR COMPENSATION'

See "YASNAC 3000G OPERATOR'S MANUAL" (TOE-C843-5·30) separately provided.

4.11 STROKE CHECK'

See "YASNAC 3000G OPERATOR'S MANUAL" (TOE-C843-5·30) separately provided.

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, Y, Z, α I, J, K, R	At a position of "mm" or "inch."
Feedrate	F	At a position of "mm/min," or "inch/min," (mm/rev or inch/rev).†
Time	(G04)P	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 G94 or G95.†

EXAMPLE:

	(MM)	(INCH)
X15.	— X 15.000 mm	or X 15.0000 inch
Y20.5	— Y 20.500 mm	or Y 20.5000 inch
(G94) F25.6	— F 25.0 mm/min (in the case of F 4.0)	or F 25.6 inch/min (in the case of F 3.1)
G95F.2†	— F 0.20 mm/rev (in the case of F 2.2)	or F 0.200 inch/rev (in the case of F 1.3)
G04P1.	— 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 Y 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:

Input	Least input increment designated	Effective data
X 12.3456	0.01 mm →	X 12.34 mm
	0.001 inch →	X 12.345 inch

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

Depress the WRITE & RETRACT button stores the value of tool length measured, -95.446 in the offset memory of H05 and then specifies the next offset number H06.

```
OFFSET                          N0 1.

    H00                  H10 X        .   0
    H01  X -   55.075    H11 X        .   0
    H02  X -  122.394    H12 X        .   0
    H03  X -   76.436    H13 X        .   0
    H04  X -  245.837    H14 X        .   0
    H05  X -   95.446    H15 X        .   0
    H06  X        .  0   H16 X        .   0
    H07  X        .  0   H17 X        .   0
    H08  X        .  0   H18 X        .   0
    H09  X        .  0   H19 X        .   0

    TLM  Z( -   95.446 )

H                                   05  P00
                                     ↑
                                    06
```

WRITE &
RETRACT PUSHBUTTON

Fig. 2-5

APPENDIX-3

Display of Remaining Number of Repetitions of Subprogram

The remaining number of repetitions of a subprogram is collectively displayed when POS is depressed and "P05" page is selected.

When the following program is executed:

Main Program	Subprogram		
	1st level	2nd level	3rd level
N001 ... *	N100 ... *	N200 ... *	N300 ... *
P100 L3 M98 *	P200 L5 M98 *	P300 L10 M98 *	○ (Executing block)
N070 M30 *	N150 M99 *	N260 M99 *	N340 M99 *

(The subprogram has executed
the 3rd level twice and enter
into the execution of 3rd time.)

- 50 -

The remaining number of repetitions will be displayed as follows.

```
SUB PRO. NESTING          N01.

  NEST    SEQ. NO  LOOP COUNT.

   01      0100          3
   02      0200          5
   03      0300          8  ──────  Means the remaining
                                     number of repetitions
                                     is 8 including the
                                     current executing one.



 N                        28 POS
```

Remaining number of repetitions

Sequence number of subprogram start

Subprogram level (The limit is 8.)

Fig. 3-1

Precautions

· The remaining number of repetition "1" means that the current execution is final.

· When the repetitions on a level is completed, the data display on the level is deleted.

· When the program copy G25 is used or G25 and M98 are mixedly used, the remaining number will be displayed by the same means. It cannot be said from the display of "P05" whether the remaining number is due to G25 or M98.

APPENDIX-4

Others

The control with CRT character display is improved in the following functions.

1. The restriction of R of circular cutting (G12, G13) and helix cutting (G14, G15). (See pages 30 and 31 of "YASNAC 3000G OPERATOR'S MANUAL" TOE-C843-5·30.)

· LED numeral display:

An input error occurs when the following restrictions of R (rapid traverse section) are neglected.

G12, G13 $0 < |R - (D)| < |I - (D)|$

G14, G15 $0 < |R - (D)| < |K - (D)|$

· CRT character display:

R designation is disregarded and an input error does not occur even if the above restrictions are neglected.

2. Subprogram designation in canned cycles (G73, G76, G80 to G89). (See pages 75 and 76 of "YASNAC 3000G OPERATOR'S MANUAL" TOE-C843-5·30.)

· LED numeral display:

The address P must be reprogrammed when M98 P...L... ＊ is given, because the address P with M98 destroys the contents of address P for designation of dwell time. (See the EXAMPLE of page 76 of "YASNAC 3000G OPERATOR'S MANUAL" TOE-C843-5·30.)

· CRT character display:

The address P for dwell is not required to be reprogrammed. (Address P for dwell in the canned cycles is retained.)

3. Compensation cancel on programming of absolute zero point (G92). (See pages 77 and 78 of "YASNAC 3000G OPERATOR'S MANUAL" TOE-C843-5·30.)

· LED numeral display:

When G92 is executed in the mode of tool position offset A or B, the absolute zero point is set by adding tool offset value. Therefore, G92 must be commanded after each tool offset is cancelled.
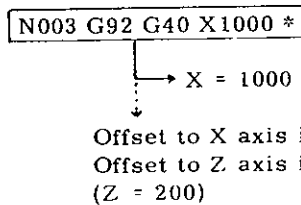
Example

N001 G43 X0 H01 *   --- (H01 = 100)

┌─────────────────────┐
│ N002 G92 X1000 * │
└─────────────────────┘
        └───→ X = 1100

The offset is still effective.
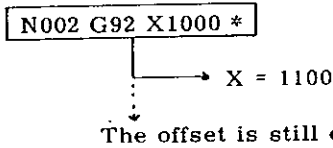
· CRT character display:

Cancel the tool position offsets A and B only to the specified axis by the command of G92 G40 X... Y... * and then set the absolute zero point.

Example

N001 G43 X0 H01 *   --- (H01 = 100)

N002 G43 Z0 H02 *   --- (H02 = 200)

┌─────────────────────────┐
│ N003 G92 G40 X1000 * │
└─────────────────────────┘
        └───→ X = 1000

Offset to X axis is cancelled.
Offset to Z axis is effective.
(Z = 200)

(When G92 is commanded without G40, the execution is the same with that of LED numeral display.)

4. Axis interlock in tapping (G84)

· LED numeral display:

Axis interlock is not in effect during tapping.

· CRT character display:

When interlock input is on, even during tapping, the feed is stopped and is restarted with the interlock released.

5. Rapid traverse rate override. (See page 128 of "YASNAC 3000G OPERATOR'S MANUAL" TOE-C843-5·30.)

· LED numeral display:

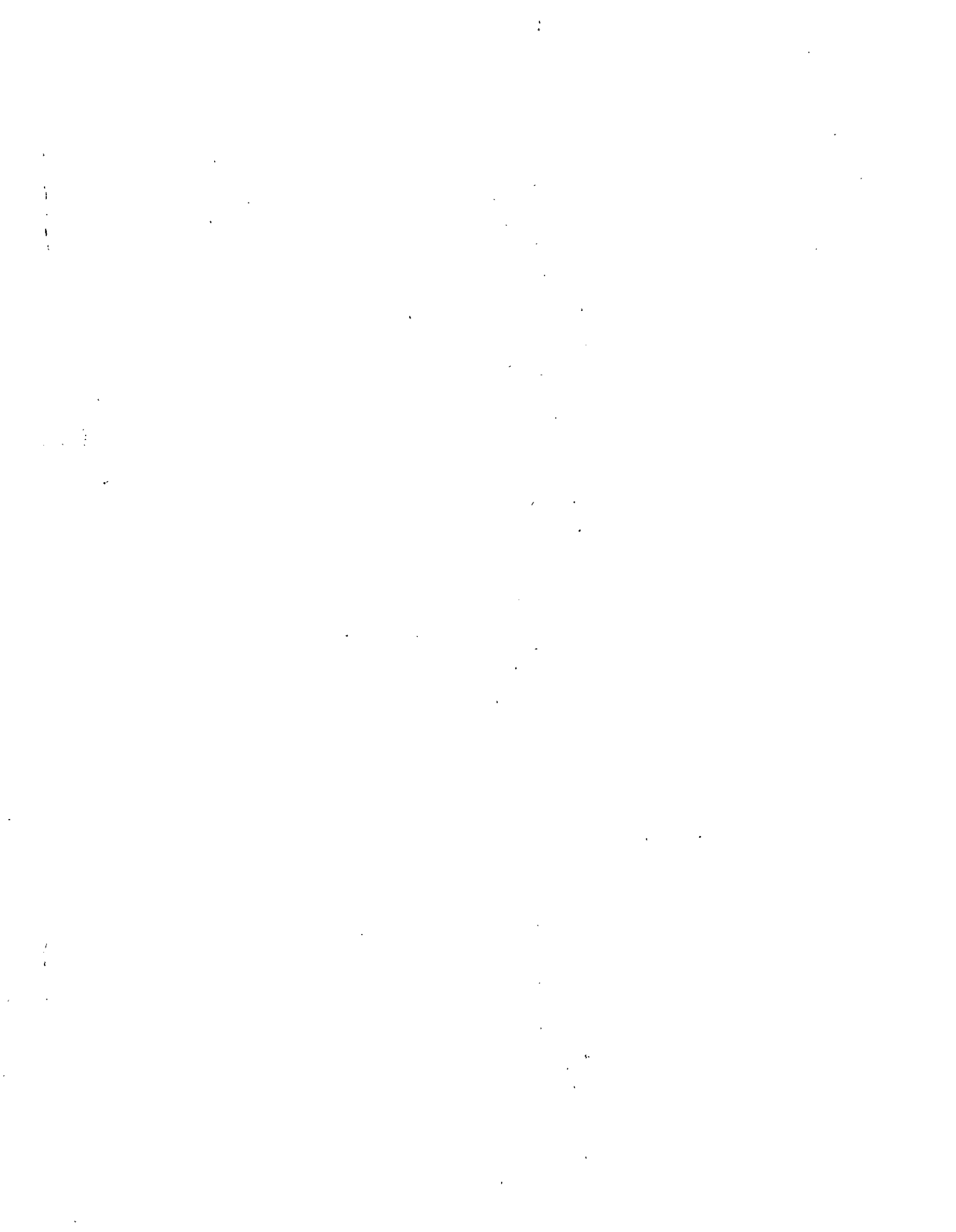Override of 100%, 50%, 25% and 0% of the rapid traverse rate can be set.

· CRT character display:

0% cannot be used. Instead of it, the feed-rate set by the parameter 01 is used.

Setting unit: "1" = 7.5 mm/min

6. Optional block skip B (option)

Respectively independent optional block skip can be set up to 8 other than ordinal optional block skip "/" or "/1." Use "/2" to "/9" in programming and when the corresponding input signal is on, the specified block is skipped. The precautions are the same with those of ordinal optional block skip. For the usable number of optional block skips, see the machine tool builder's manual.

YASKAWA Electric Mfg. Co., Ltd.