

CNC SYSTEMS  
**OSP7000L** Model U  
**OSP700L** Model U

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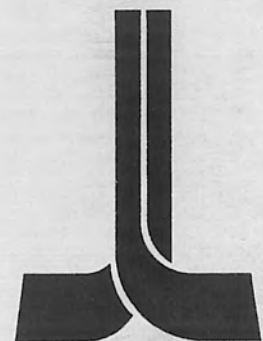
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**TAPE DATA INPUT/OUTPUT FUNCTION**

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**INSTRUCTION MANUAL (1st Edition)**

**Pub. No. 4035-E (EEL1-013-01) Apr. 1996**



## REVISION HISTORY

**Manual Name:** OSP7000L/700L MODEL U TAPE  
DATA INPUT/OUTPUT FUNCTION  
INSTRUCTION MANUAL

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Edition	Date	Revision
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## SAFETY PRECAUTIONS

The machine is equipped with safety devices which serve to protect personnel and the machine itself from hazards arising from unforeseen accidents. However, operators must not rely exclusively on these safety devices: they must also become fully familiar with the safety guidelines presented below to ensure accident-free operation.

This instruction manual and the warning signs attached to the machine cover only those hazards which Okuma can predict. Be aware that they do not cover all possible hazards.

### 1. PRECAUTIONS RELATING TO MACHINE INSTALLATION

- (1) Install the machine at a site where the following conditions (the conditions for achievement of the guaranteed accuracy) apply.
  - Ambient temperature: 17 to 25° C
  - Factory humidity: 40% to 75% at 20° C (no condensation)
  - Site not subject to direct sunlight or excessive vibration; environment as free of dust, acid, corrosive gases, and salt spray as possible.
- (2) Prepare a primary power supply that complies with the following requirements.
  - Voltage: 200 V
  - Voltage fluctuation: ± 10% max.
  - Power supply frequency: 50/60 Hz
  - Do not draw the primary power supply from a distribution panel that also supplies a major noise source (for example an electric welder or electric discharge machine) since this could cause malfunction of the NC unit.
  - If possible connect the machine to a ground not used by any other equipment. If there is no choice but to use a common ground, the other equipment must not generate a large amount of noise (such as an electric welder or electric discharge machine).
- (3) Installation Environment

Observe the following points when installing the electrical control cabinet.

  - Make sure that the NC unit will not be subject to direct sunlight.
  - Make sure that the electrical control cabinet will not be splashed with chips, water, or oil.
  - Make sure that the electrical control cabinet and operation panel are not subject to excessive vibrations or shock.
  - The permissible ambient temperature range for the electrical control cabinet is 0 to 40° C.
  - The permissible ambient humidity range for the electrical control cabinet is 30 to 95% (no condensation).
  - The maximum altitude at which the electrical control cabinet can be used is 1000 m (3281 ft.).



## **2. POINTS TO CHECK BEFORE TURNING ON THE POWER**

- (1) Close all the doors of the electrical control cabinet and operation panel to prevent the entry of water, chips, and dust.
- (2) Make absolutely sure that there is nobody near the moving parts of the machine, and that there are no obstacles around the machine, before starting machine operation.
- (3) When turning on the power, turn on the main power disconnect switch first, then the CONTROL ON switch on the operation panel.

## **3. PRECAUTIONS RELATING TO MANUAL AND CONTINUOUS OPERATION**

- (1) Always follow the instructions in the operating manual.
- (2) Do not operate the machine with any of the safety covers (front shield, chuck cover, etc.) removed.
- (3) Always close the front shield before starting operation.
- (4) Never run a new program without checking its operation. Run the program with no workpiece in the chuck and make sure that there is no interference, then cut a workpiece in the single block mode. If no problems are discovered, automatic operation may be started.
- (5) Confirm safety before performing operations involving spindle rotation or axis movement.
- (6) Never touch chips or the workpiece while the spindle is rotating.
- (7) Do not attempt to stop rotating parts with your hand or any object.
- (8) Check the jaw mounting conditions, hydraulic pressure, and maximum allowable spindle speed for the power chuck.
- (9) Check the mounting and arrangement of the tools.
- (10) Check the tool offset settings.
- (11) Check the zero offset settings.
- (12) Make sure that the spindle speed and feedrate override settings set on the NC operation panel are 100%.
- (13) Before moving the turret, check the software limit setting and the emergency limit LS (limit switch) dog positions for both the X- and Z-axes to ensure that it will not interfere with the chuck or tailstock.
- (14) Check the turret index/rotation position.
- (15) Check the tailstock body position.
- (16) Make sure the cutting operation is within the allowable transmission power and torque ranges.
- (17) Make sure the workpiece is securely clamped in the chuck or fixture.
- (18) Check that the coolant nozzles are positioned correctly.



#### **4. ON FINISHING WORK**

- (1) On finishing work, clean the vicinity of the machine.
- (2) Move the turret to the predetermined retraction position.
- (3) Always turn off the power to the machine before leaving it.
- (4) To turn off the power, turn off the CONTROL ON switch on the operation panel first, then the main power disconnect switch.

#### **5. PRECAUTIONS APPLICABLE DURING MAINTENANCE INSPECTION AND WHEN TROUBLE OCCURS**

In order to prevent unforeseen accidents, damage to the machine, etc., it is essential to observe the following points when performing maintenance inspections or during checking when trouble has occurred.

- (1) When trouble occurs, press the emergency stop button on the operation panel to stop the machine.
- (2) Consult the person responsible for maintenance to determine what corrective measures need to be taken.
- (3) If two or more persons must work together, establish signals so that they can communicate to confirm safety before proceeding to each new step.
- (4) Use only the specified replacement parts and fuses.
- (5) Always turn the power off before starting inspection or changing parts.
- (6) When parts are removed during inspection or repair work, always replace them as they were and secure them properly with their screws, etc.
- (7) When carrying out inspections in which measuring instruments are used – for example voltage checks – make sure the instrument is properly calibrated.
- (8) Do not keep combustible materials or metals inside the electrical control cabinet or terminal box.
- (9) Check that cables and wires are free of damage: damaged cables and wires will cause current leakage and electric shocks.



(10) Maintenance inside the electrical control cabinet

- a) Switch the main power disconnect switch OFF before opening the electrical control cabinet door.
- b) Even when the main power disconnect switch is OFF, there may be some residual charge in the servo amplifier and spindle drive unit, and for this reason only service personnel are permitted to perform any work on these units. Even then, they must observe the following precautions.
  - Servo amplifier  
Discharge the residual voltage one minute after turning off the breaker inside the unit.
  - Spindle drive unit  
Discharge the residual voltage one minute after turning off the main power disconnect switch.
- c) The electrical control cabinet contains the NC unit, and the NC unit has a printed circuit board whose memory stores the machining programs, parameters, etc. In order to ensure that the contents of this memory will be retained even when the power is switched off, the memory is supplied with power by a battery. Depending on how the printed circuit boards are handled, the contents of the memory may be destroyed and for this reason only service personnel should handle these boards.

(11) Periodic inspection of the electrical control cabinet

a) Cleaning the cooling unit

The cooling unit in the door of the electrical control cabinet serves to prevent excessive temperature rise inside the electrical control cabinet and increase the reliability of the NC unit. Inspect the following points every three months.

- Is the fan motor inside the cooling unit working?

The motor is normal if there is a strong draft from the unit.

- Is the external air inlet blocked?

If it is blocked, clean it with compressed air.





## 6. GENERAL PRECAUTIONS


- (1) Keep the machine and area around it clean and tidy.
- (2) Wear appropriate clothing while working, and follow the instructions of someone with sufficient training.
- (3) Make sure that your clothes and hair cannot become entangled in the machine. Machine operators must wear safety gear such as safety shoes and safety goggles.
- (4) Machine operators must read the instruction manual carefully and make sure of the correct procedure before operating the machine.
- (5) Memorize the position of the emergency stop button so that you can press it immediately at any time and from any position.
- (6) Do not access the inside of the control panel, transformer, motor, etc., since they contain high-voltage terminals and other components which are extremely dangerous.
- (7) If two or more persons must work together, establish signals so that they can communicate to confirm safety before proceeding to each new step.


## 7. SYMBOLS USED IN THIS MANUAL

The following warning indications are used in this manual to draw attention to information of particular importance. Read the instructions marked with these symbols carefully and follow them.

 **DANGER** : Indicates an imminent hazard which, if not avoided, will result in death or serious injury.

 **WARNING** : Indicates hazards which, if not avoided, could result in death or serious injury.

 **CAUTION** : Indicates hazards which, if not avoided, could result in minor injuries or damage to devices or equipment.

 **NOTICE** : Indicates precautions relating to operation or use.



## GENERAL PRECAUTIONS

- (1) Keep the machine and test stand clean and dry.
- (2) Wear appropriate clothing while working, and follow the instructions of someone with sufficient training.
- (3) Make sure that your clothes and hair cannot become entangled in the machine. Machine operators must wear safety glasses or safety goggles.
- (4) Machine operators must read the instruction manual carefully and make sure of the correct procedure before operating the machine.
- (5) Mark the position of the emergency stop button so that you can press it immediately, at any time and from any position.
- (6) Do not access the inside of the control panel, transformer, motor, etc., since they contain high-voltage terminals and other components which are extremely dangerous.
- (7) If two or more persons must work together, establish signals so that they can communicate to confirm safety before proceeding to each new step.

## SYMBOLS USED IN THIS MANUAL

The following warning indications are used in this manual to draw attention to information of particular importance. Read the instructions marked with these symbols carefully and follow them.

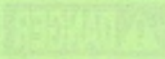
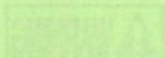
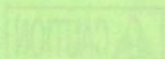
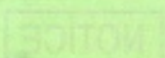
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|--|---|
| Indicates an imminent hazard which, if not avoided, will result in death or serious injury.                |  |
| Indicates hazards which, if not avoided, could result in death or serious injury.                          |  |
| Indicates hazards which, if not avoided, could result in minor injuries or damage to devices or equipment. |  |
| Indicates precautions relating to operation or use.  |  |



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## INTRODUCTION

This instruction manual contains the operating procedure to be followed for making the most of machine performance and maintaining the accuracy over a long period, and also the maintenance procedure.

You are encouraged to study this instruction manual carefully to use the function correctly.





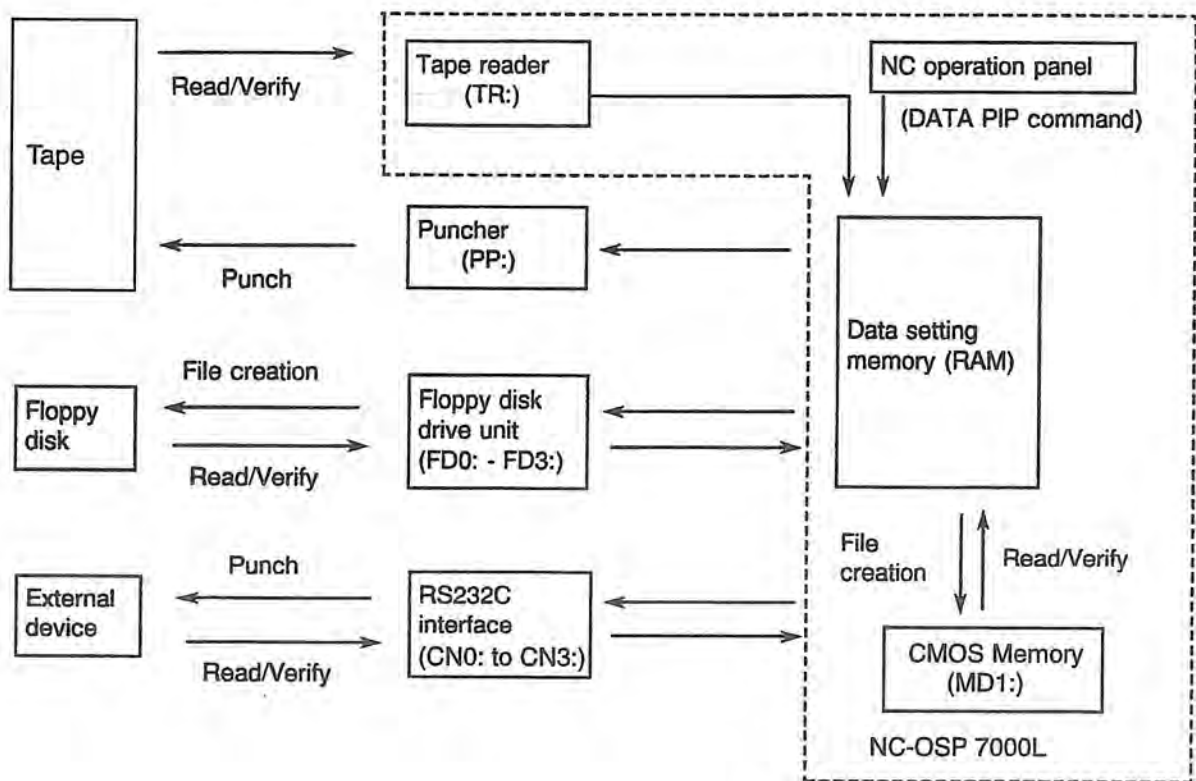
## SECTION 1 OVERVIEW

In the PROG OPERATION mode, the D-PIP (data transmission) function permits the transmission of the tool data, zero point and parameters.

### Data Transmit Function:

- Data Input (READ) ..... The setting data tape, or the data file is read and stored in the NC.
- Data Output (PUNCH) ..... Data stored in the NC is punched out on a tape. Also used to create a memory or floppy disk data file.
- Data Verify (VERIFY) ..... The data content of the tape, memory, or floppy disk data file is checked against the NC memory data.
- Transfer Complete (QUIT) ..... End of data transmit function

### Data Transmit Function Layout:





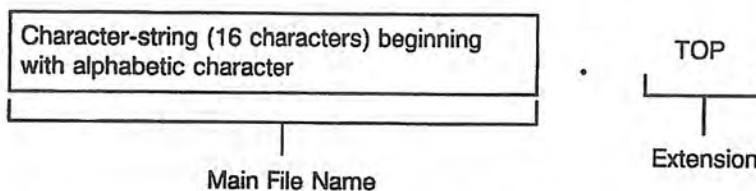
## **SECTION 2      FUNCTION APPLICATION**

The primary purpose of the data transmit function is to permit the tool data, zero point, and parameter setting data in the NC memory to be punched and stored on paper tape.

## SECTION 3 INPUT/OUTPUT TAPE FORMAT OF SETTING DATA

### 1. FILE NAMES

File names that can be processed by the D-PIP function are as follows:



When the file name is omitted, the system adopts the file name A.TOP.



## 2. TAPE FORMAT TABLE

Setting Mode	Data Type	Data ID	Data No. (N)	Description	Remarks
TOOL DATA SET	Tool offset	T1	1 to 32 (96)	X (axis), Z (axis)	
	Nose R compensation	T2	1 to 32 (96)	X (axis), Z (axis), Q (nose radius pattern)	
	Tool interference	T3	1 to 12 (96)	A (pattern), B (Z minus), C (Z plus), D (X minus), E (X plus)	Effective only for 2-saddle specification, with no graphics
	Tool life management tool table	T4	1 to 12 (96)	G (group number), A (set workpiece quantity), B (actual machined quantity), C (set machining time), D (actual machining time), E (set wear amount), F (actual wear amount), I (offset No. 1), J (offset No. 2), K (offset No. 3), H (tool NG flag), L (tool life flag)	
	Tool life management group table	T5	1 to 12 (96)	S (selected tool No.), L (tool group life flag)	
	Post-process gauging auto compensation data	T6	1 to 8	I (input data No.), C (compensation amount), Q (tool offset No.), G (tool group No.), F (tool offset group No.), A (axis), S (skip counter), D (compensation ignore counter)	
	CEJ matic gauging compensation data	T7	1 to 12	Q (tool offset No.), F (tool offset group No.)	

In the Data No. column, the numeric value in ( ) applies for the ATC specification.

## SECTION 3 INPUT/OUTPUT TAPE FORMAT OF SETTING DATA

Setting Mode	Data Type	Data ID	Data No. (N)	Description	Remarks
TOOL DATA SET	Tool form select	T10	1 to 12 (96)	A (tool angle), B (edge angle), C (sticking out), D (drill diameter), E (tool width), I (offset No. 1), J (offset No. 2), K (offset No. 3), S (classification code), L (form code)	Effective with graphic specification
	ATC tool form	T11	1 to 96	I (1st position tool's offset No. 1), J (1st position tool's offset No. 2), K (1st position tool's offset No. 3), A (2nd position tool's offset No. 1), B (2nd position tool's offset No. 2), C (2nd position tool's offset No. 3), S (2nd position tool's tool classification code), L (2nd position tool's tool form code)	Effective for the ATC specification with color graphics
	Load monitor base	T12	1 to 64	X (axis), Z (axis), C (axis), S (spindle), M (M-tool spindle), W (axis), B (sub spindle)	M can be designated for the B-turret.
	Load monitor first limit	T13	1 to 64	X (axis), Z (axis), C (axis), S (spindle), M (M-tool spindle), W (axis), B (sub spindle)	M can be designated for the B-turret.
	Load monitor second limit	T14	1 to 64	X (axis), Z (axis), C (axis), S (spindle), M (M-tool spindle), W (axis), B (sub spindle)	M can be designated for the B-turret.
	Post-process gauging, RS232C method	T15	1 to 12	I (gauging point), C (turret), Q (axis), G (G flag), F (group No./offset No.), A (offset group No.), S (base)	

In the Data No. column, the numeric value in ( ) applies for the ATC specification.



SECTION 3 INPUT/OUTPUT TAPE FORMAT OF SETTING DATA

Setting Mode	Data Type	Data ID	Data No. (N)	Description	Remarks
ZERO SET	Zero point	01	1 to 2	X (axis), Z (axis), W (axis), C (axis)	N1: ZERO OFFSET, N2: ZERO SHIFT
	Pitch	02	1	X (axis), Z (axis)	
	Screw pitch compensation	03	1 to 120	X (axis), Z (axis), C (axis)	
	2nd spindle zero point	04	1 to 2	X (axis), Z (axis), C (axis)	N1: ZERO OFFSET, N2: ZERO SHIFT
PARAMETER SET	User parameter	P1	1 to 4, 9	X (axis), Z (axis), W (axis), C (axis)	N1: + VARI. LIMIT P N2: - VARI. LIMIT P N3: + VARI. LIMIT M N4: - VARI. LIMIT M N9: DROOP DAT
	Common variable	P2	1 to 64	R (data)	
	System parameter	P3	1 to 15	X (axis), Z (axis), W (axis), C (axis)	N1: + STROKE END LIMIT N2: - STROKE END LIMIT N3: BACKLASH N4: PR CONNECT CMP N5: + SENSOR POSITION (PROG) N6: - SENSOR POSITION (PROG) N7: + SENSOR POSITION (MACH) N8: - SENSOR POSITION (MACH) N9: STANDARD RING

## SECTION 3 INPUT/OUTPUT TAPE FORMAT OF SETTING DATA

Setting Mode	Data Type	Data ID	Data No. (N)	Description	Remarks
PARAMETER SET	System parameter	P3	1 to 15	X (axis), Z (axis), W (axis), C (axis)	N10: ATC TOOL CHANGE POS. N11: Position encoder offset N12: Rapid feedrate unit amount N13: Rapid feedrate acceleration/ deceleration unit amount N14: Manual feedrate unit amount N15: Manual feedrate acceleration/ deceleration unit amount N16: Machine zero offset N17: Torque setting value N18: Positive stroke offset value N19: Negative stroke offset value
	Turret position compensation	P4	1 to 12 (20)	X (axis), Z (axis)	
	Optional parameter long word	P5	1 to 96	R (data)	
	Optional parameter word	P6	1 to 96	R (data)	
	Optional parameter bit	P7	1 to 48	R (data)	

In the Data No. column, the numerical value in ( ) is effective for double-tooling turret specification.

## SECTION 3 INPUT/OUTPUT TAPE FORMAT OF SETTING DATA

Setting Mode	Data Type	Data ID	Data No. (N)	Description	Remarks
PARAMETER SET	Spindle orientation parameter	P8	1 to 32	R (data)	
	Measure counter	P9	1 to 32	R (data)	
	NC work counter	P10	1 to 4	Q (actual), R (full count)	
	NC hour meter	P11	1 to 5	Q (actual), R (full count)	N1: POWER ON TIME N2: NC RUNNING TIME N3: SPINDLE REVOLUTION TIME N4: CUTTING TIME N5: EXTERNAL INPUT TIME
	Tool interference parameter	P12	1 to 80	A (pattern), B (Z minus), C (Z plus), D (X minus), E (X plus)	Effective with graphic specification and 2-saddle specification
	Chuck/tailstock barrier	P13	1 to 2	A (jaw dimension L1), B (jaw dimension D1), C (jaw position CX), D (jaw position CZ), E (center dimension L2), F (center dimension D2), I (center position D3), J (workpiece end-face WR)	A (jaw dimension L), B (jaw dimension D), C (center dimension L), D (center dimension), E (center dimension L1), F (center dimension D1)
	Home position	P14	1 to 9	X (axis), Z (axis)	
	2nd spindle chuck barrier	P15	1	A (jaw dimension L1), B (jaw dimension D1), C (jaw position CX), D (jaw position CZ), E (graphic zero offset ZOF)	



## SECTION 3 INPUT/OUTPUT TAPE FORMAT OF SETTING DATA

Setting Mode	Data Type	Data ID	Data No. (N)	Description	Remarks
PARAMETER SET	2nd spindle user parameter	P16	1 to 4, 9	X (axis), Z (axis), C (axis)	N1: + VARI. LIMIT P N2: - VARI. LIMIT P N3: + VARI. LIMIT M N4: - VARI. LIMIT M N9: DROOP DAT
	2nd spindle system parameter	P17	1 to 8	X (axis), Z (axis)	N1: + STROKE END LIMIT N2: - STROKE END LIMIT N3: BACKLASH N4: PR CONNECT CMP N5: + SENSOR POSITION (PROG) N6: - SENSOR POSITION (PROG) N7: + SENSOR POSITION (MACH) N8: - SENSOR POSITION (MACH)

*Note: The data in the above table is for all system specifications. Therefore, all data cannot always be handled by the tape data input/output function.*

## SECTION 3 INPUT/OUTPUT TAPE FORMAT OF SETTING DATA

Setting Mode	Data Type	Data ID	Data No. (N)	Description	Remarks
PARAMETER SET	Spindle Control Parameter (with high-precision VAC motor specification)	P18	1 to 32	A (M41) B (M42) C (M43) D (M44)	N1 Spindle control acceleration/ deceleration unit amount N2 Spindle index starting angle ( $\theta 1$ ) N3 Spindle deceleration starting angle ( $\theta 2$ ) N4 Spindle creep starting angle ( $\theta 3$ ) N5 Spindle index finishing angle ( $\theta 4$ ) N6 Spindle position loop gain setting angle ( $\theta 5$ ) N7 Spindle index starting speed (V2) N8 Spindle creeping speed (V3) N9, N10 Not used N11 Backlash offset amount N12 Lost motion offset amount N13 Ftp maximum N14 Ft1 maximum N15 Ft1 minimum N16, N17, N18 and N19 Not used N20 Attachment backlash offset amount N21 KV value N22 Torque feed forward N23 Tp maximum N24 T1 maximum N25 T1 minimum N26 T2 maximum N27 T2 minimum

## SECTION 3 INPUT/OUTPUT TAPE FORMAT OF SETTING DATA

Setting Mode	Data Type	Data ID	Data No. (N)	Description	Remarks
PARAMETER SET	Spindle Control Parameter (with high-precision VAC motor specification)	P18	1 to 32	A (M41) B (M42) C (M43) D (M44)	N28 T1 N29 T2 N30 Not used N31 CH1 number N32 CH2 number
	M-tool Spindle Control Parameter (with high-precision VAC motor specification)	P19	1 to 32	A (M41) B (M42) C (M43) D (M44)	N1 Spindle control acceleration/ deceleration unit amount N2 Spindle index starting angle ( $\theta_1$ ) N3 Spindle deceleration starting angle ( $\theta_2$ ) N4 Spindle creep starting angle ( $\theta_3$ ) N5 Spindle index finishing angle ( $\theta_4$ ) N6 Spindle position loop gain setting angle ( $\theta_5$ ) N7 Spindle index starting speed (V2) N8 Spindle creeping speed (V3) N9, N10 Not used N11 Backlash offset amount N12 Lost motion offset amount N13 Ftp maximum N14 Ft1 maximum N15 Ft1 minimum N16, N17, N18 and N19 Not used N20 Attachment backlash offset amount N21 KV value

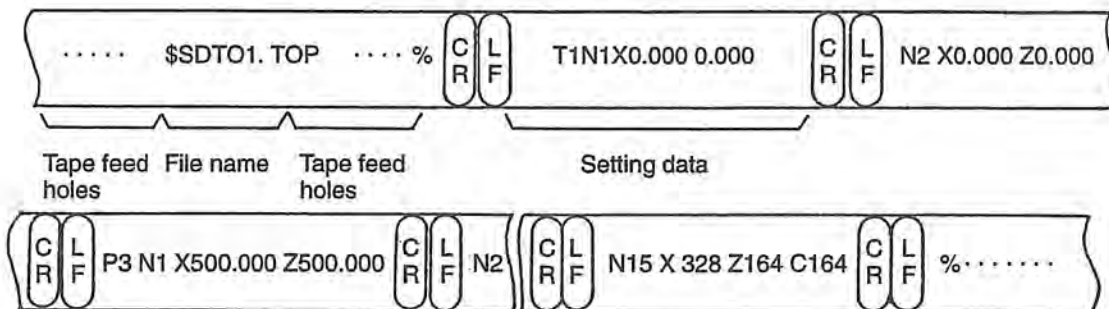


## SECTION 3 INPUT/OUTPUT TAPE FORMAT OF SETTING DATA

Setting Mode	Data Type	Data ID	Data No. (N)	Description	Remarks
PARAMETER SET	M-tool Spindle Control Parameter (with high-precision VAC motor specification)	P19	1 to 32	A (M41) B (M42) C (M43) D (M44)	N22 Torque feed forward N23 Tp maximum N24 T1 maximum N25 T1 minimum N26 T2 maximum N27 T2 minimum N28 T1 N29 T2 N30 Not used N31 CH1 number N32 CH2 number
	M-tool Spindle Control Parameter	P20	1 to 9	R (data)	N1 M-tool spindle acceleration/ deceleration unit amount N2 M-tool spindle backlash N3 M-tool spindle droop amount N4 M-tool spindle zero offset N5 M-tool spindle index angle for synchronized tapping N6 M-tool spindle jog speed N7 M-tool spindle oscillating speed N8 M-tool spindle servo processor constant time at 1st step N9 M-tool spindle servo processor constant time at 2nd step
	NC Turret Index Angle	P22	1 to 12	R (data)	

*Note: The data in the above table is for all system specifications. Therefore, all data cannot always be handled by the tape data input/output function.*

### 3. ACTUAL TAPE FORMAT



- T1N1X0. 000Z0. 000  
N2X0. 000Z0. 000  
N3X0. 000Z0. 000  
: :  
: :  
T2N1X0. 000Z0. 000Q0  
N2X0. 000Z0. 000Q0  
N3X0. 000Z0. 000Q0  
: :  
: :  
T4N1G0A0B0C0:0D0:0E0. 000F0. 000I0J0K0H0L0  
N2G0A0B0C0:0D0:0E0. 000F0. 000I0J0K0H0L0  
N3G0A0B0C0:0D0:0E0. 000F0. 000I0J0K0H0L0  
: :  
: :  
01N1X12563. 256Z8965.235C0. 000  
N2X0. 000Z0. 000C0. 000  
: :  
: :  
P3N1X13063. 256Z9465. 235  
N2X12463. 256Z8865.235  
N3X0. 010Z0. 010C0. 100  
: :  
: :  
P2N1R0  
N2R0  
N3R0  
: :  
: :  
P1N1X500. 000Z500.000  
N2X-100. 000Z-100. 000  
N3X13063. 256Z9465. 235  
: :  
: :  
P4N1X0. 000Z0. 000  
N2X0. 000Z0. 000  
N3X0. 000Z0. 000  
: :  
: :
- Tool offset
  - Nose radius compensation
  - Tool life management data table
  - Zero point
  - User parameters
  - Common variables
  - User parameters
  - Turret position compensation

**Supplement:**

On 2-saddle models, the A/B turrets are distinguished by the following G codes:

G13 . . . . . Turret A or R-spindle

G14 . . . . . Turret B or L-spindle

If this G code is not designated, the system will select the G13 code.

G13

T1 N1 X0.000 Z0.000 CR

:

:

G14

T1 N1 X0.000 Z0.000 CR

:

:



Turret A or R-spindle data

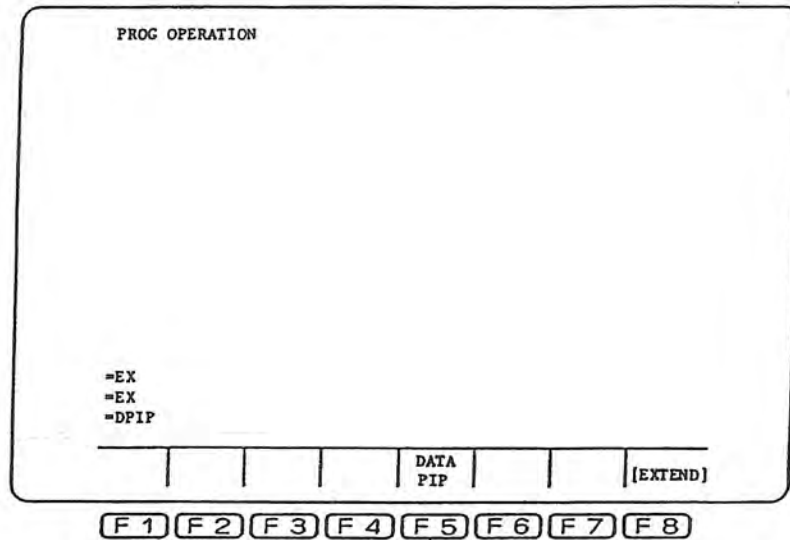


Turret B or L-spindle data



## SECTION 4 OPERATION PROCEDURES

- (1) Select the PROG. OPERATION mode.
- (2) Press function key [F8] (EXTEND). The function DATA PIP will appear above [F5] as shown below.

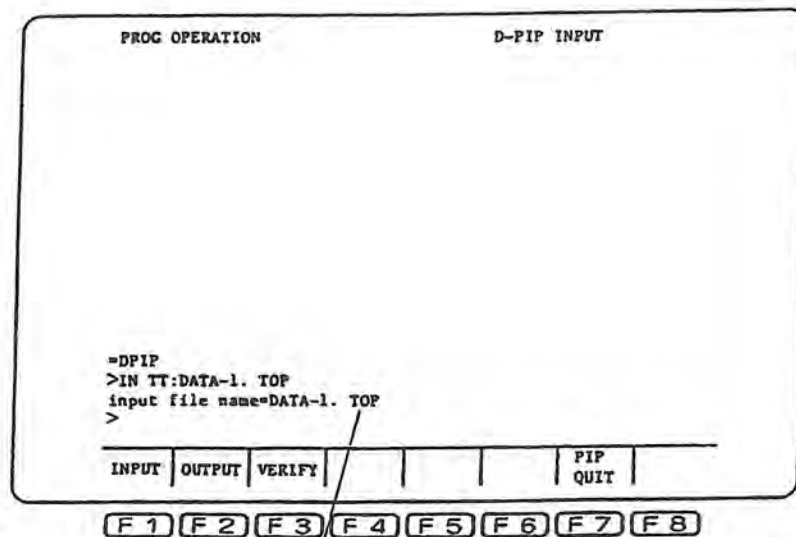


Pressing [F5] (DATA PIP) establishes the DPIP mode.

- (3) Press function key [F5] (DATA PIP).

## 1. DATA INPUT (READ)

- (1) Press the function key [F1] (READ), and use the panel to designate the data input device, input file name, and option.



If the device name is MD1: or FD0: through FD3:, device name is not displayed.

- (2) If the device name is omitted, the system will select the tape input device designated by parameter (word) No. 54.
- (3) The following device names can be designated:
- TR:, CN0:, (or TT:), CN1:, CN2:, CN3:, MD1:, FD0:, FD1:, FD2:, FD3:
- TR: ..... Tape reader (optional)
- CN0: ..... RS232C interface channel 0  
"TT" can also be used.
- CN1: ..... RS232C interface channel 1 (optional)
- CN2:, CN3: ..... RS232C interface channel 2, 3 (optional)
- MD1: ..... User memory  
Standard : 60 m (200 ft)  
Optional : 160 m, 320 m, 640 m, 1280 m, 2560 m, 3840 m, 5120 m  
(525 ft, 1050 ft, 2100 ft, 4200 ft, 8400 ft, 12600 ft, 16800 ft)
- FD0: ..... Floppy disk drive unit channel 0
- FD1: to FD3: .... Floppy disk drive unit channel 1 to 3 (optional)
- (4) If the file name is omitted when using device names MD1:, FD0: to FD3:, the system will adopt and input "A.TOP" as the file.

- (5) For tape input devices (TR:, CN0: to CN3:), the file name on the tape will be displayed on the console line.
- (6) When using tape input devices, if the designated file name does not match the tape file name, the "5304 Tape file name not same ERROR" message will be displayed on the console line, and data input will end.

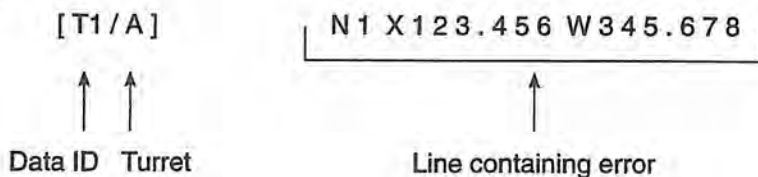
(7) Option Designations

- ;V ..... When reading is complete, the tape returns to the beginning and re-reads the data, comparing the tape or file contents with the data which was input. This option is not effective for the RS232C (with device names TT:, CN0: to CN3:).
- ;E ..... Effective for tape, RS232C input  
Indicates that the tape is using EIA code.
- ;I ..... Effective for tape, RS232C input  
Indicates that the tape is using ISO code.

*Note: ";E" and ";I" designation cannot be made for sector devices (MD1:, FD0: to FD3:).*

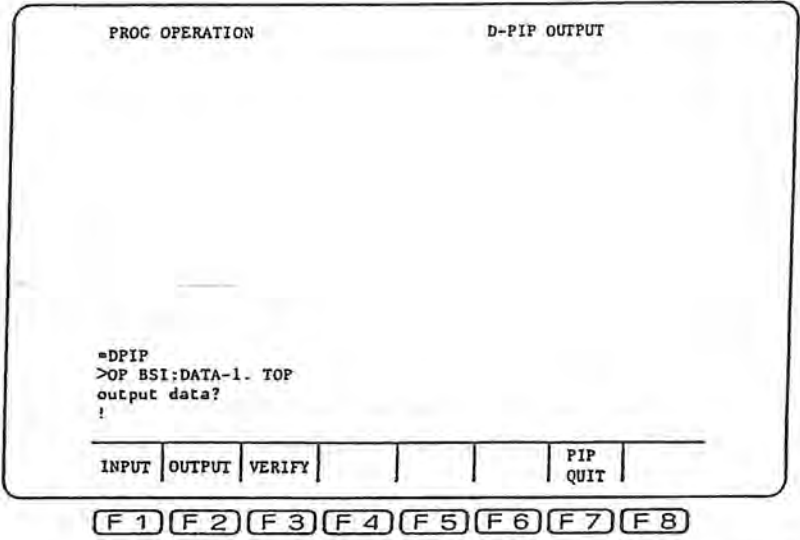
*When the ;V comparison is made, if the data matches, "all same data" will be displayed on the console line. If a data mismatch is found, "Tape read verify ERROR" will be displayed, and the VERIFY operation will end.*

- (8) If the data format is incorrect, or the tape contains illegal data, "5305 Tape file format ERROR" will be displayed on CRT console line and the data line which contains the error will be displayed as follows:



## 2. DATA OUTPUT (PUNCH)

- (1) Press the function key [F2] (PUNCH), and use the panel to designate the data output device, output file name, and option.



- (2) If the device name is omitted, the system will select the tape output device designated by parameter (word) No. 44.
- (3) The following device names can be designated:
- PP:, CN0:, (or TT:), CN1:, CN2:, CN3:, MD1:, FD0:, FD1:, FD2:, FD3:
- PP: ..... Parallel interface (optional)
  - CN0: ..... RS232C interface channel 0  
"TT:" can also be used.
  - CN1: ..... RS232C interface channel 1 (optional)
  - CN2:, CN3: ..... RS232C interface channel 2, 3 (optional)
  - MD1: ..... User memory  
Standard : 60 m (200 ft)  
Optional : 160 m, 320 m, 640 m, 1280 m, 2560 m, 3840 m, 5120 m  
(525 ft, 1050 ft, 2100 ft, 4200 ft, 8400 ft, 12600 ft, 16800 ft)
  - FD0: ..... Floppy disk drive unit channel 0
  - FD1: to FD3: ..... Floppy disk drive unit channel 1 to 3 (optional)
- (4) If the output file name is omitted, the system will select "A.TOP" as the file name.
- (5) When item (1) is executed, "Is punch data?" is displayed on the console line. When an exclamation mark "!" is displayed on the next line, the "waiting for input" mode is established.



(6) Designate output data by using keyboard.

a) ! [WRITE]

All data is output.  
(Output varies according to system specification.)

b) !T [WRITE]

Tool data is output.

c) !T, O [WRITE]

Tool data and zero point data are output.

d) !T1, T2, O1, P1 [WRITE]

Tool offset data, nose radius compensation data, zero point data, and user parameter data are output.

*Note 1: If an incorrect command, or a command containing illegal data is given, "5306 Data command ERROR" will be displayed on the console line, and data output will end.*

*Note 2: If no data settings are made after installing the NC software, OVERFLOW will be displayed on the CRT. If the data output command is given when in this condition, the "5312 Output data over flow" error will occur, and data output will be impossible. Therefore, be sure the data setting is made prior to data output.*

(7) Option Designations

;A . . . . . Output occurs for the A turret side of the designated data. (For 2-saddle, 2-turret specification)

;B . . . . . Output occurs for the B turret side of the designated data. (For 2-saddle, 2-turret specification)

;S . . . . . Output occurs with a space.

;E . . . . . Effective for tape, RS232C output  
Indicates that tape output uses EIA code.

;I . . . . . Effective for tape, RS232C output  
Indicates that tape output uses ISO code.

;R . . . . . Output occurs for the R-spindle side of the designated data.  
(For parallel 2-spindle specification)

;L . . . . . Output occurs for the L-spindle side of the designated data.  
(For parallel 2-spindle specification)

### 3. DATA VERIFY

Verification of the Data File Content and Data Stored in the NC

- (1) Press the function key [F3] (VERIFY), and use the panel to designate the data input device, input file name, and option.



PROG OPERATION				D-PIP VERIFY			
<pre> =DPIP &gt;V input file name=DATA-1. TOP (TI/R) N1x123. 456 Z=34. 567 verify continue (Y/N) !           </pre>							
INPUT	OUTPUT	VERIFY				PIP QUIT	
<span style="border: 1px solid black; padding: 1px 5px;">F 1</span>	<span style="border: 1px solid black; padding: 1px 5px;">F 2</span>	<span style="border: 1px solid black; padding: 1px 5px;">F 3</span>	<span style="border: 1px solid black; padding: 1px 5px;">F 4</span>	<span style="border: 1px solid black; padding: 1px 5px;">F 5</span>	<span style="border: 1px solid black; padding: 1px 5px;">F 6</span>	<span style="border: 1px solid black; padding: 1px 5px;">F 7</span>	<span style="border: 1px solid black; padding: 1px 5px;">F 8</span>

- (2) If the device name is omitted, the system will select the tape input device designated by parameter (word) No. 54.

- (3) The following device names can be designated:

TR:, CN0:, (or TT:), CN1:, CN2:, CN3:, MD1:, FD0:, FD1:, FD2:, FD3:

TR: ..... Tape reader (optional)

CN0: ..... RS232C interface channel 0  
 "TT:" can also be used.

CN1: ..... RS232C interface channel 1 (optional)

CN2:, CN3: ..... RS232C interface channel 2, 3 (optional)

MD1: ..... User memory

Standard : 60 m (200 ft)

Optional : 160 m, 320 m, 640 m, 1280 m, 2560 m, 3840 m, 5120 m  
 ( 525 ft, 1050 ft, 2100 ft, 4200 ft, 8400 ft, 12600 ft, 16800 ft)

FD0: ..... Floppy disk drive unit channel 0

FD1: to FD3: ..... Floppy disk drive unit channel 1 to 3 (optional)

- (4) If the file name is omitted when the device name is MD1:, FD0: to FD3:, the system searches for the file name "A.TOP", and the verify function occurs accordingly.

- (5) When tape input devices (TR:, CN0: to CN3:) are used, the file name on the tape will be displayed on the console line.
- (6) When tape input devices are used, if the designated file name does not match the file name on the tape, "5304 Tape file name not same ERROR" will be displayed on the console line, and the VERIFY function will end.
- (7) If a data mismatch is found during the VERIFY function, the data line which contains the error is displayed on the console line, with the message "verify continue? (Y/N)". Key in "Y" and press WRITE key to continue the VERIFY function with the next data. Key in "N" and press WRITE key to end the VERIFY function. If no data mismatch is found, "all same data" will be displayed on the console line.
- (8) Option Designations
  - ;E . . . . . Effective for tape, RS232C input  
Indicates that the tape is using EIA code.
  - ;I . . . . . Effective for tape, RS232C input  
Indicates that the tape is using ISO code.

*Note:    [;E] and [;I] designation cannot be made for sector devices (MD1:, FD0: to FD3:).*

## 4. PRECAUTIONS ON TAPE READ-IN, PUNCHOUT AND VERIFYING OPERATIONS

There are two coding systems: EIA and ISO; selection of the coding system can be made by

- Parameter setting, or
- Designating the desired coding system each time, read-in, punch out or verifying operation is made.

### (1) Parameter Setting

Two parameters (optional parameter (bit) No. 1, bit 0 and bit 1) are used to determine the coding system: "Tape Code Parity Discrimination" and "Tape Code ISO Code". The coding system in each program operation mode is determined by the combination of these two parameters.

	Tape Code Parity Recognition (bit 1)	Tape Code ISO Code (bit 0)	Operation Condition
(A)	1	1	In the READ and VERIFY modes, the coding system is automatically recognized - ISO or EIA. In the PUNCH mode, program data is punched in ISO coding system.
(B)	1	0	In the READ and VERIFY modes, the coding system is automatically recognized - ISO or EIA. In the PUNCH mode, the program data is punched in the EIA coding system.
(C)	0	1	In the READ and VERIFY modes, the control assumes the coding system is ISO. (If the actual coding system is not ISO, an error results.) In the PUNCH mode, the program data is punched in ISO coding system.
(D)	0	0	In the READ and VERIFY modes, the control assumes the coding system is EIA. (If the actual coding system is not EIA, an error results.) In the PUNCH mode, the program data is punched in EIA coding system.

The standard parameter setting is (A), in which the control can read the data coded according to EIA and ISO coding systems. Punch out data is coded in ISO.

This parameter setting is effective when neither option code "E;" (EIA) nor "I;" (ISO) is designated in READ, VERIFY and/or PUNCH operation.

### (2) ISO or EIA Designation for Respective Program Operation - READ, VERIFY and PUNCH

By designating "E;" (EIA) or "I;" (ISO) each time when executing the required tape operation, READ, VERIFY and/or PUNCH, the operator can directly select the coding system, ISO or EIA, disregarding the coding system selected by parameter setting.



## 5. ERROR MESSAGES

5304 Tape file name not same

In the data input/output function, the file name input or designated in the verify operation does not match the file name punched on tape.

Character-string : File name on tape

Code : None

5305 File format

In the data input/output function, the data format of the tape through the input or verify operation is incorrect.

Character-string : Data record (block) which caused an error

Code : 1 ..... File record (block) data does not end correctly.

2 ..... The first character of the file is not an alphabetic character, or the number of digits in the data is too large.

3 ..... The data does not have data ID (Tn, On, Pn) at the beginning.

4 ..... Data number Nn is not used at the beginning or the place following the data ID in the record data.

5 ..... Data which cannot be set is contained in the tape data.

6 ..... On the 2-saddle model, turret designation G code is wrong.

7 ..... Data ID Tn, On, or Pn is not correct.

8 ..... Data number Nn is not correct.

5306 Data command

In the data input/output function, data ID designation is wrong in the designation of the output data.

Character-string : Data ID which is designated

Code : 1 ..... Designation method is wrong.

2 ..... A character other than T, O or P is designated as data ID.

3 ..... Data ID number not contained in the data to be output is designated.

- 5307      Input data over flow  
In the data input/output function, setting is impossible as the data input is too small or too large.  
Character-string : Record in which error has occurred  
Code            : None
- 5308      Stroke end limit over  
In the data input/output function, variable limit data input is outside the travel end limit range.  
Character-string : Record in which error has occurred  
Code            : None
- 5309      Time data  
In the data input/output function, time data input is not correct.  
Character-string : None  
Code            : 1 ..... Hour:minute data is wrong.  
                  2 ..... Hour:minute:second data is wrong.
- 5310      Data not same  
In the data input/output function, verify error occurs during the input verify operation.  
Character-string : Record in which error has occurred  
Code            : None
- 5311      Tool entry  
In the data input/output function, S (selection tool number) of T5 (tool life management group information) has not been registered.  
Character-string : Record in which error has occurred  
Code            : None
- 5312      Output data over flow  
In the data input/output function, the data to be output is too large.  
Character-string : None  
Code            : Data to be output (hexadecimal)
- 5313      Output data under flow  
In the data input/output function, the data to be output is too small.  
Character-string : None  
Code            : None