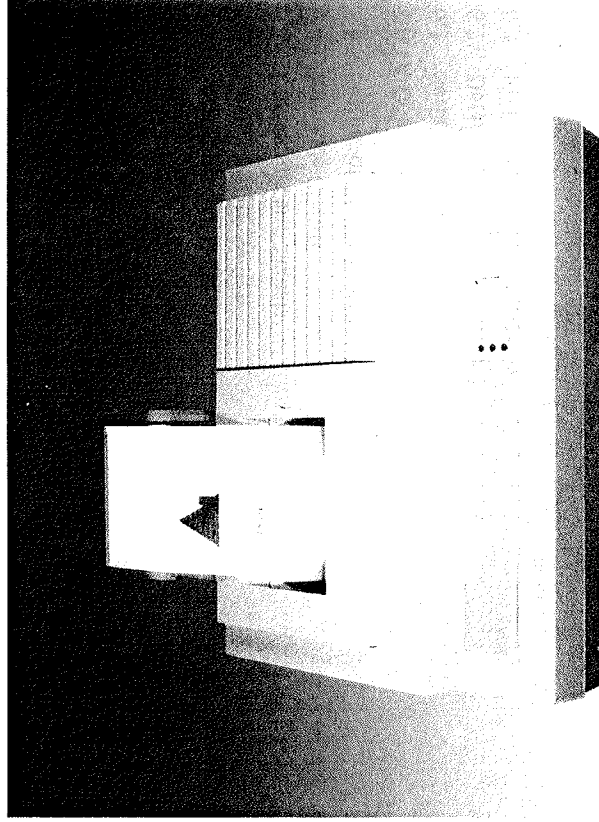


**Personal Printer
iDP-560RS**

Owner's Manual



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iDP-560RS is the impact dot printer with serial interface. The compact and light weight printer is sufficiently provided with various functions in order to suffice the requirements of personal computers.

This printer is useful especially for receipts and data recording on normal and carboned roll papers.

Use this printer properly after reading carefully the manuals of the printer and your computer.

1.1 Features

The printer features the following:

1. Compact dot matrix printer
2. Light weight
3. Low power consumption
4. Prints in two colors of red and black
5. Graphic function

1.2 Accessories

Check all your accessories with the following list. If anything is missing, contact your dealer.

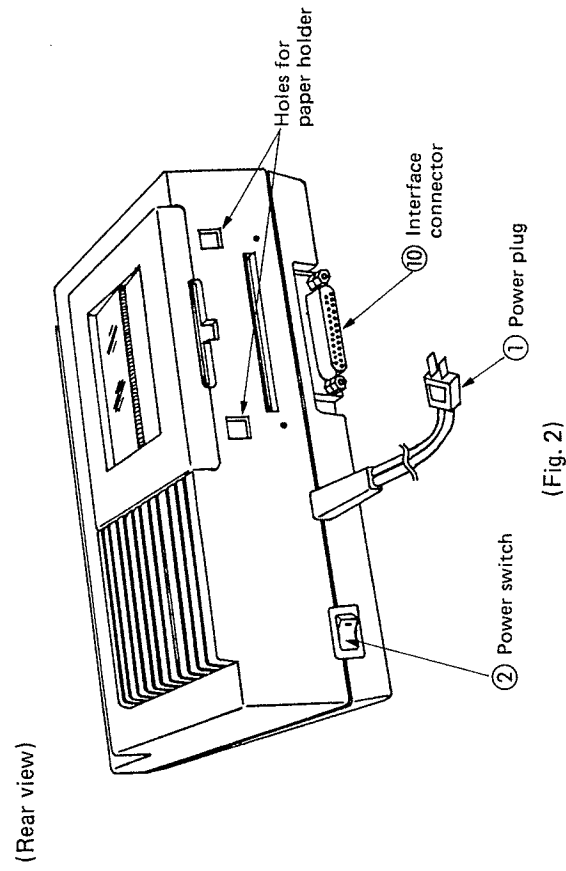
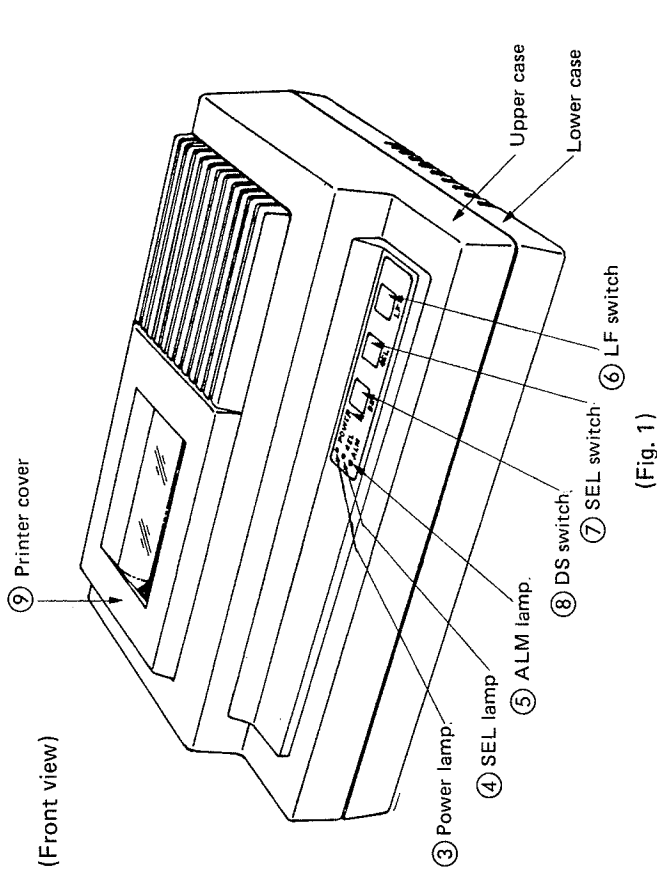
- Paper holder
 - Roll paper
 - Owner's manual
- One set each

2. Basic Specifications

- ① Printing Method: Serial Dot Matrix
- ② Printing Speed: 60 characters/second approx.
48 LPM with 40 column, 128 LPM with 5 column (approx.)
- ③ Character: 7 x 5 (Text Mode)
7 x 240 dot matrix (Graphic Mode)
- ④ Column Capacity: 40 column
- ⑤ Character Size: 2.75 mm (H) x 1.25 mm (W)
- ⑥ Line Spacing: 5.5 mm (Text Mode)
2.75 mm (Graphic Mode)
- ⑦ Line Feed Speed: 6.0 lines/second approx. (Text Mode)
6.2 lines/second approx. (Graphic Mode)
- ⑧ Character Code: Refer to character code table
- ⑨ Paper: Width 69±1 mm, External diameter 80 mm or less
In red and black; Width 13 mm
- ⑩ Ink Ribbon: Spool Diameter: 30 mm or 35 mm
- ⑪ Voltage: 115 V ± 10% 50/60 Hz
200 V ± 10% 60 Hz
230 V ± 10% 50/60 Hz
- ⑫ Power: 32 W max.
- ⑬ Weight: 2 Kg (4.4 Lbs) Approx.
- ⑭ Dimensions: 240 mm (W) x 176 mm (D) x 81.5 mm (H)
9.4" (W) x 6.9" (D) x 3.2" (H)
- ⑮ Interface: Serial Interface (RS-232C, TTL Level, Current Loop)
- ⑯ Operating Temperature: 5°C ~ 35°C
- ⑰ Storage Temperature: -25°C ~ 60°C

3. Appearance and Parts Name

3.1 Appearance and Parts Name



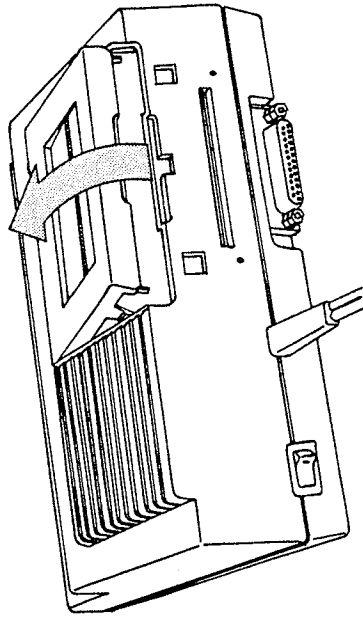
3.2 Description on Each Part

- ① Power Plug Insert this plug in the plug socket under the prescribed voltage.
- ② Power Switch As the power switch is turned on, initializing performance of the printer starts and the print head returns to the left end (home position).
- ③ Power lamp The lamp lights up as power switch is on and turns off when the switch is off.
- ④ SEL Lamp The lamp lights up when the printer is in a SELECT (ON-LINE) state and is extinguished by DESELECT (OFF LINE) state of the printer.
The printing operation is maintained while this lamp keeps on lighting.
- ⑤ ALM Lamp This lamp is turned on when the printer operation is out of normal condition. When this ALARM state happens, printing and Line Feed operation is suspended. For a release from an ALARM state, push DS switch or turn off the power switch once and turn on again.
- ⑥ LF Switch Use this switch for paper feeding and line spacing when the printer is in DESELECT state.
- ⑦ SEL Switch Printer is set in SELECT (ON LINE) state by a push of this switch.
- ⑧ DS Switch By depressing this switch, the printer is set in DESELECT (OFF LINE) state. If this switch is on during printing, the printer is Deselect state after completing the print of the line. The switch is used also for releasing the printer from ALARM state.
- ⑨ Printer Cover Set this cover correctly in place so that dusts and noise can be avoided.
- ⑩ Interface Connector This is for connection with various personal computers by connecting cable.
Make sure that both your computer and printer are powered off before connecting cable.

4. Operation

4.1 Preparing to use your Printer

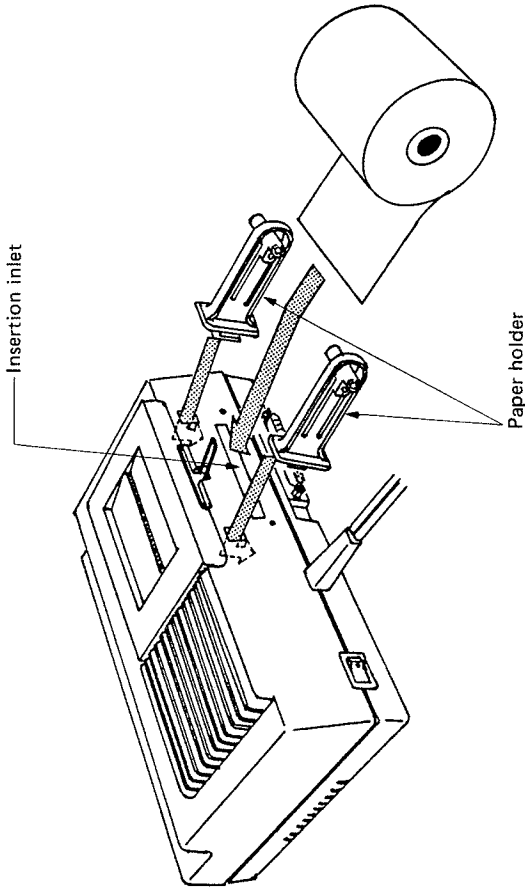
Upon unpacking your printer, remove the printer cover as shown in Fig. 3.



(Fig. 3)

Take out cushion sponge between printer cover and ink ribbon. Then remove the tape which fixes the ribbon spool. Check again, the ink ribbon is set properly.

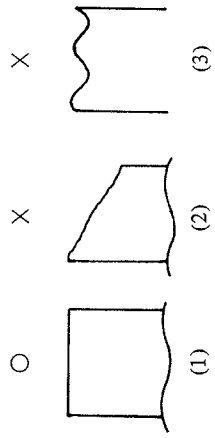
4.2 Loading the Paper



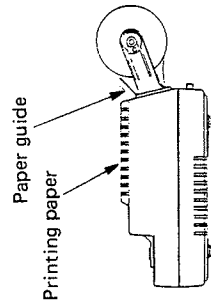
(Fig. 4)

Procedures Paper Insertion

1. Cut the paper in right angle to its longitudinal center line as shown in Fig. 5. (1)
2. Insert the paper into insertion inlet on the rear side of the printer.
3. Turn on the power switch and feed the paper by pushing the LF switch.
4. When the printing paper comes out of the clearance (Paper cutter part) on the printer cover, fix the paper by means of paper holder, then set it on the main unit.
5. Set paper guide properly as shown in Fig. 6
Caution; Do not pull paper to backward.



(Fig. 5)



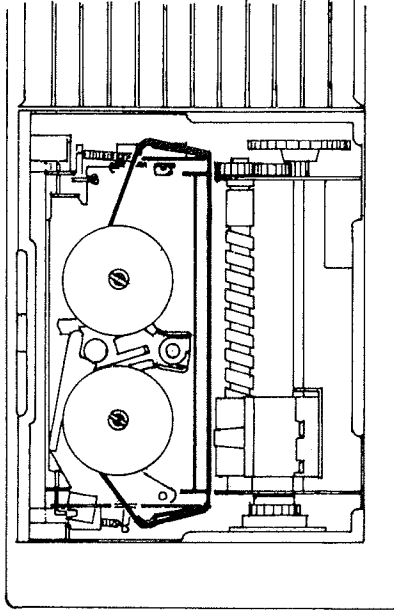
(Fig. 6)

4.3 Setting the Ink Ribbon

For setting the ribbon, disconnect the power source beforehand. When the printing has been continued for many hours, be careful not to touch printer head as it might be hot.

Setting Procedures

1. Remove the printer cover.
2. Set the ribbon as black part of the ribbon is on the upper side.
3. Check that the ink ribbon is not sagging or twisted.



(Fig. 7)

4.4 Testing Your Printer

iDP-560 Model has a self-printing pattern in order to check the printing function. Take the following procedures to test your printer.

1. Set the paper properly.
2. Turn off the power switch.
3. Turn on the power switch while keep pressing the LF switch pressed down, then release the LF switch.
4. To stop the printing, turn off the power switch. After 28 lines are printed, the printing is stopped automatically.

4.5 Cautions

1. Never operate your printer without loading paper and setting Ink Ribbon. Any printing without paper and Ink Ribbon may cause damage of printer head.
2. Replace ink ribbon before it is worn with rents.
3. Be careful not to drop any foreign matters, such as paper clips, pins and the like into your printer. Those can cause mechanical trouble.
4. Nothing shall be placed on the radiation vents of the Printer.
5. Place your printer always on a stable desk which is set horizontal.
6. No organic solvent (alcohol, thinner, benzine or the like) shall be used in sweeping clean the surface of the main body case.
7. Make sure that the power of the printer is turned off whenever you do the followings.
 - (1) Taking out any foreign matters which were dropped into the printer.
 - (2) Replacing the ink ribbon.

5. Interface

5.1 Serial Specifications

- (1) Synchronous Asynchronous
- (2) Baud rate
RS type: 110, 300, 600, 900, 1200, 2400, 4800, 9600, BPS
CL type: 110, 300, 600, 900, 1200 BPS
One of the above baud rates is selected by users.
- (3) Data Format
Start bit: 1 BIT
Data bit: 7 or 8 BIT
Parity bit: Odd number parity, even number parity or no parity check, one of which is selected by users
Stop bit: 1 or 2 BIT
- (4) Signal level
RS-232C
MARK = 1 (-3V ~ -12V)
SPACE = 0 (+3V ~ +12V)
CURRENT LOOP
MARK = 1 (Current)
SPACE = 0 (Non-current)
TTL
MARK = 1 (Open collector)
SPACE = 0 (Open collector)
- (5) DTR signal
RS232C and TTL
MARK: Not ready for DATA receipt
SPACE: Ready for DATA receipt
Current loop
When current between connector 17 pin and 24 pin is
MARK (Current): : Ready for DATA receipt
SPACE (Non-current) : Not ready for DATA receipt

5.2 Setting of DIP Switch

Following functions are available by setting DIP switch.

DIP switch No.	Function		Remarks
	ON	OFF	
SW11-1	Not-Effective	Effective	Detective function at the end of paper roll (Option)
SW11-2 SW11-3 SW11-4	Selection of Baud Rate Please refer to the table below		
SW11-5	7 bit DATA	8 bit DATA	Selection of DATA bit length
SW11-6			
SW11-7	No parity check	Parity check	
SW11-8	Even parity check	Odd parity check	

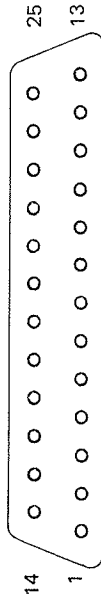
* This baud rate is tentative.

SW11-2	SW11-3	SW11-4	Baud Rate
OFF	OFF	OFF	9,600*
OFF	OFF	ON	4,800
OFF	ON	OFF	2,400
OFF	ON	ON	1,200
ON	OFF	OFF	900
ON	OFF	ON	600
ON	ON	OFF	300
ON	ON	ON	110

5.3 Connecters and Signals

Signal Pin	Return Line	Signal Name	Direction of Signal	Function	RS232C	CURRENT LOOP	TTL
1		FG		Frame GND			
7		SG		GND			
3		RD	A → B	Input DATA	○		○
20		DTR	←	BUSY signal	○		○
14		FAULT	←	ALARM signal	○		○
25	23	RD	→	Input DATA		○	
17	24	DTR	←	BUSY signal		○	

A : Computer
B : Printer

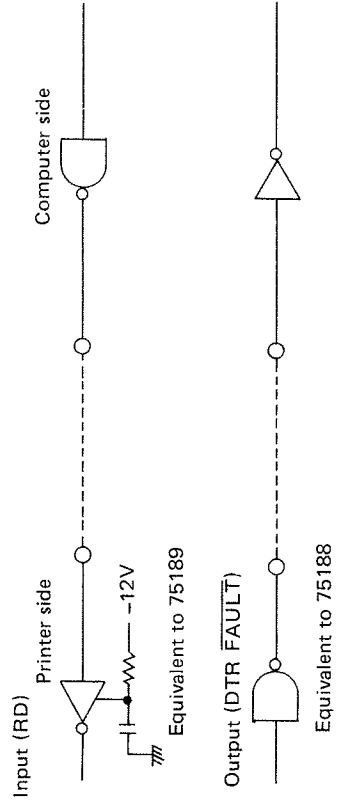


Notes:

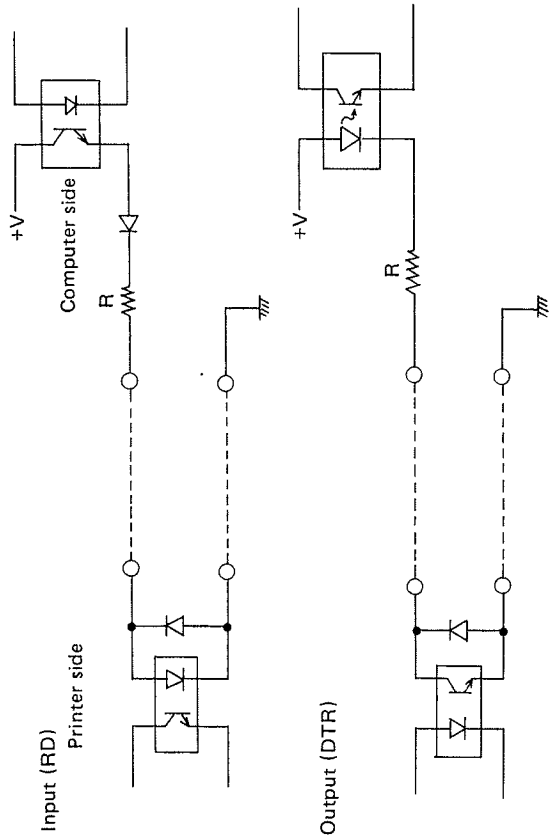
1. Signal of RS-232C conforms to EIA RS-232C level.
2. Signal of CURRENT LOOP should be restricted within 10 ~ 20 mA.
3. Keep signal pin No. 3 at MARK status when no transfer of DATA.
4. Selection of modes, those are RS-232C, CURRENT LOOP and TTL, can be made by the preset jumper (Please refer to 'Setting of Preset Jumper').

5.4 Interface Circuit

(a) RS-232C

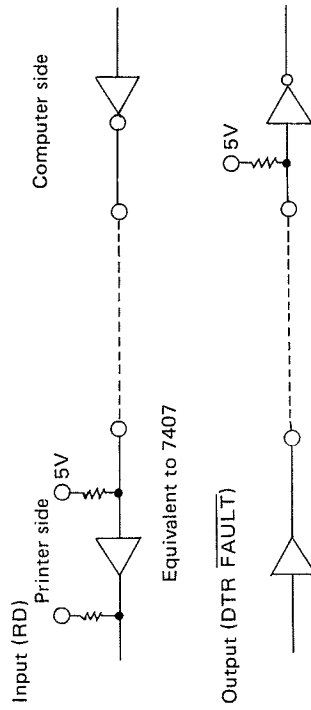


(b) Current Loop



Note: Resistance should be set so that Current Loop is restricted within 10 ~ 20 mA.

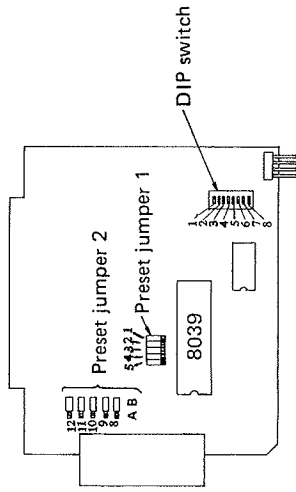
(c) TTL



Note: Output is open collector.

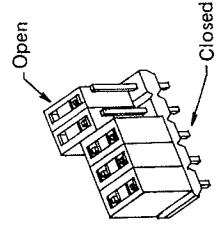
5.5 Setting of Preset jumper

Following function are available by setting preset jumper 1 and 2. Please turn off power and remove a bottom case before setting.



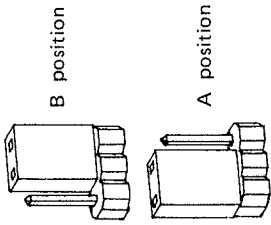
Preset jumper 1

Preset jumper	Setting	Set at shipping
1	Closed	Refer to Character code
	Open	Refer to Character code
2	Closed	Refer to Character code
	Open	Refer to Character code
3	Closed	CR code is void when the buffer is blank.
	Open	CR code is for line feed when the buffer is blank
4	Closed	CR code is for line feed when the code comes immediately after full buffer printing
	Open	CR code is void when it comes immediately after full buffer printing
5	Closed	CR code is void
	Open	CR code is for line feed



Preset jumper 2

Preset jumper	Mode		
	RS-232C	CURRENT LOOP	TTL
8	B	X	A
9	B	X	A
10	B	X	A
12	B	A	A



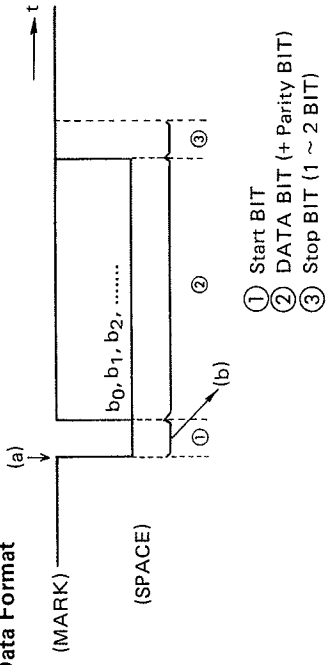
X: Both A and B can be set.

11	A	DATA can be transferred at DTR=MARK (RS-232C/TTL level)
		DATA can be transferred at DTR=SPACE (CURRENT LOOP)
11	B	DATA can be transferred at DTR=SPACE (RS-232C/TTL level)
		DATA can be transferred at DTR=MARK (CURRENT LOOP)

At shipping all of preset jumper 2 are set at B.

6. DATA Construction

6.1 Serial Data Format



(1) Start bit

At 1/2 BIT (0.8 sec.) after (a), signal level is checked out, (b). When signal level is SPACE, START BIT is recognized at this stage. When signal level is MARK, continuous search for START BIT is made for the next bit.

(2) DATA BIT + PARITY BIT

DATA BIT and PARITY BIT are checked out every 1/2 BIT (0.8 sec.) from the half point of START BIT, (b).

Signal level of these points (MARK=1, SPACE=0) are read as input DATA. The sequence of these BIT is BIT 0, BIT 1 ~ PARITY BIT from START BIT.

(3) STOP BIT

STOP BIT is 1 or 2 BIT and its signal level is MARK. If SPACE LEVEL is read at STOP BIT, FRAMING ERROR occurs.

6.2 Detection System for Errors

The printer detects PARITY and FRAMING ERROR. ALARM(ALM) LAMP informs the user error occurrence. When any error is detected, the printer deletes the wrong DATA and waits for new DATA, ALM LIGHT can be put out by depressing DS switch.

Framing Error

Framing error occurs when SPACE signal is checked out at STOP BIT. ALM LAMP informs the user this error and the wrong data is neglected by the printer.

Parity Error

Parity check function works only when the user designates it. ALM LIGHT informs you this error. The wrong data is neglected by the printer.

Other Errors

When any trouble is found out at the printer, ALM LAMP informs the user this error. In this case, $\overline{\text{FAULT}}$ signal is SPACE, DTR signal is BUSY and the machine becomes deselect condition.

ALRM condition will be released by depressing DS Switch after removing the trouble at the printer. The machine is now SELECT condition and starts to input DATA.

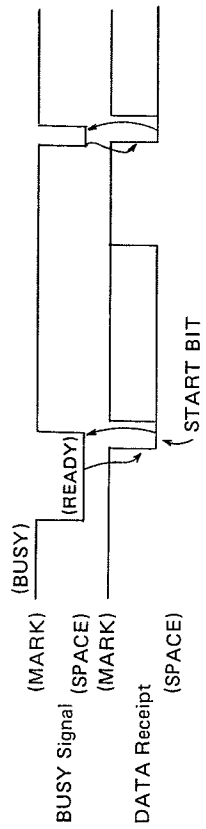
6.3 Input Control and Buffering

DATA receipt is controlled by each 1 word. In case the connected computer neglects this regulation and transfers DATA during BUSY, "OVER RUN ERROR" occurs. To avoid this error, DATA should be transferred after confirming the printer is at "READY". However, if the connected computer has double buffer system, the printer can accept up to 2 words.

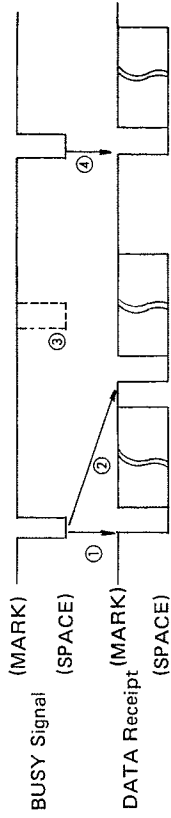
(1) Input Control to Single Buffer

BUSY signal is SPACE when the printer is ready to accept DATA (signal level of BUSY can be changed by H/W)

After receiving START BIT from the computer, (1/2 START BIT), BUSY signal becomes MARK level.



(2) Input Control for Double Buffer



Double buffer transfer is made as follows.

1. The computer transfers 1st BYTE of DATA after checking READY condition.
2. The computer transfers 2nd BYTE of DATA after checking READY condition.
3. The printer continues BUSY condition for receiving 2nd BYTE of DATA.
4. The computer transfers 3rd BYTE of DATA after checking READY condition.

The printer expects Double Buffer transfer at the first stage. Therefore, after completion of 1st BYTE of DATA reception, the printer waits for 2nd BYTE of DATA.

The printer recognizes Single Buffer transfer for the absence of START BIT after 1 - 2 STOP BIT.

7. Control Code

Control codes are the same for 7 BIT DATA and 8 BIT DATA except SI & SO code.

7.1 SI & SO Code

Symbol	8 BIT DATA	7 BIT DATA
SI	Standard character designation (Same as US)	Designation of SI side character
SO	Enlarged character designation (Same as RS)	Designation of SO side character

7.2 Function Code

Symbol	Code (Hexadecimal)	Function
LF	0A	Feeds a new line after printing.
CR	0D	Feeds a new line after printing. You can select CR function in accordance with your computer's output. For details, refer to 5.5 Setting the Preset Jumper.
RS	1E	Enhanced character designation. The designation is released with US code or line feed.
US	1F	Standard character designation.
FF	0C	Carries out form feed performance after printing.
DC1	11	Makes the printer SELECT (ON LINE) state. Only this code can be accepted irrespective of DESELECT (OFF LINE) state.
DC2	12	Red printing is specified/released. Designation/release (alternative) of red one line printing is possible with this code.
DC3	13	Makes the printer DESELECT (OFF LINE) state.

Symbol	Code (Hexadecimal)	Function
DC4	14	Designation/release of reverse printing. Designation/release (alternative) of reverse printing is possible with this code.
CAN	18	Clears the print data in the buffer. All the previous input data is cleared with this code. However, in case of graphic print mode, this code is treated as data.
ESC+"K"	1B, 4B	Graphic print (correspondence with bit) mode designation. It is not possible to print graphic mode and another character mode in one line.
ESC+"C"	1B, 4B	Page length designation and paging action. Refer to 7.3
ESC+"0"	1B, 4F	Paging is off.
ESC+"1"	1B, 31	2.75mm line spacing.
ESC+"2"	1B, 31	5.5mm line spacing.

7.3 Input Data Format

The input data to the printer is made by the codes listed in the Character Code Table.

1 Standard Character Print Mode Designation

US (1F)	DATA
---------	------

Designation of standard character print mode is made immediately after power-on and initialization or after print. Therefore US code can be omitted. In addition, when the data of 40/24 characters (standard character mode) is input in one line, an automatic line feed is carried out after printing (full buffer print). For 8 BIT DATA SI code is the same as US code.

2 Enhanced Character Print Mode Designation

RS (1E)	DATA	CR(OD)
---------	------	--------

All the print data which follow RS code are enhanced and are reversed to standard character by US code.

You can print the both standard and enhanced characters in one line. Automatic printing is carried out when full column data (40 columns in standard character) is input.

This RS code is released automatically after printing. For 8 BIT DATA SO code is the same as RS code.

3 Red Print Mode Designation

DC2 (12)	DATA	CR(OD)
----------	------	--------

Red Print Mode is designated by DC2 code and released after printing one line. It is not possible to print Red and Black printing in one line. If DC2 code is input again in the same line, Red Print Mode is released and the entire printing in the line is printed in Black.

4 Graphic Print (correspondence with bit) Mode Designation (only 40 columns)

ESC (1B)	K (4B)	n_1	n_2	DATA
----------	--------	-------	-------	------

Input ESC K (1B, 4B) at the top of the line and then input Graphic Print Data, which is converted to binary, into n_1 . After that, input dummy data in n_2 .

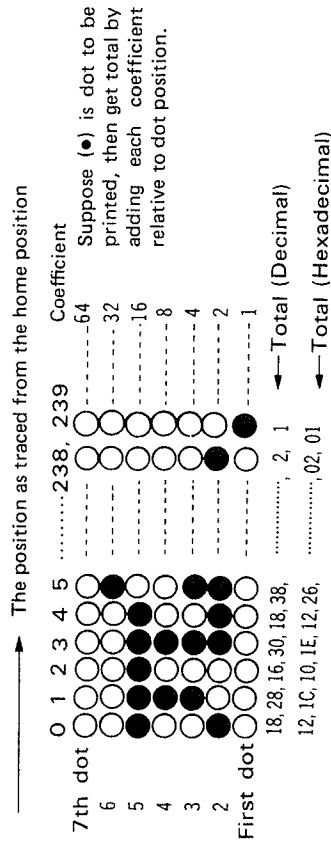
If it is also the Graphic Print in the next line, ESC K n_1 n_2 should be input once again before the data. The number for Graphic Print Data should be; $1 \leq n_1 \leq 240$

Any numbers other than the above comes to 240.

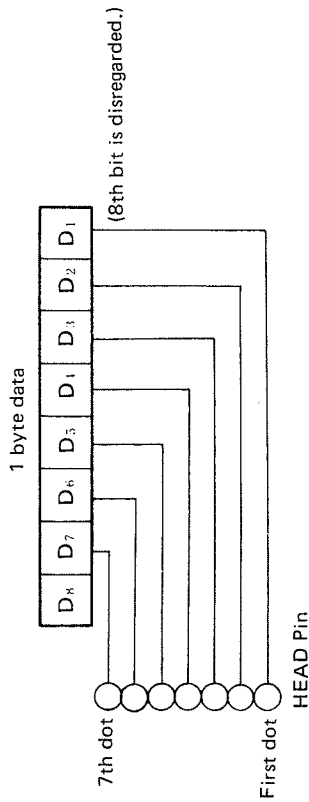
Graphic Print mode is released and standard character mode is set after printing.

5 Graphic Print Data (only 40 columns)

Printing in seven lengthwise dots by 240 rows can be made in one line. The 7 lengthwise dots are input as the graphic print data. The data are computed as follows:



Correspondence of headpin to graphic print data



As will be understood from the above, the data are used in which the first dot corresponds to the first bit and the 7th dot corresponds to the 7th bit. The 8th bit is disregarded. Try to select decimal data or hexadecimal data matching to the host computer.

6 Paging designation and page length designation

ESC (1B)	C (43)	n
----------	--------	---

Input ESC C (1B 43) at the top of the line and next input n, which are integers. With this code, the length (number of lines) per page can be set, and paging action is started, and the space of three lines are left at the both top and bottom of the page, n should be;

$$14 \leq n \leq 120$$

Otherwise, it comes to 66. The paging can be released by ESC O (1B 4F).

7 Form Feed

FF (0C)

With this code, paper feed goes on. If there is data in the buffer when this code is input, the printer does form feed after the printing. The top of form for the next page is made in accordance with the page length which was specified with ESC C n.

Top of position of the page is determined when power is turned on or when page length is specified with ESC C n.

8 Cancelling

CAN (18)

All the data input in one line prior to CAN are cleared entirely with this code. However, in case of graphic print mode, this code is treated as graphic data.

9 Line Spacing Designation (only 40 columns)

ESC (1B)	1 (31)
----------	--------

With this code, 2.75mm line spacing can be set for graphic print.

10 Standard Line Spacing Designation (only 40 columns)

ESC (1B)	2 (32)
----------	--------

With this code, 5.5mm line spacing can be set.

11 Reverse Characters command

DC4 (14)	DATA	CR (0D)
----------	------	---------

This code is used to input reverse characters command. If DC4 code is detected again on the same line, this command will be released.

It is possible to input DC4 code repeatedly on one line, completing one-line printing.

8. Initial Setting

Followings are automatically set after Power-on or depressing DEL switch (After ALRM condition).

1. A printer head returns to its home position.
2. Printer becomes DESELECT (OFF LINE) condition.
3. Print buffer function is cleared.
4. Standard character mode is set.
5. 66 per lines per page is set.
6. The first line is set at the present line.
7. Line pitch is set at 5.5mm.
8. Designation of reverse and red printing is cleared.
9. For 7 BIT DATA, character code of SI is applied.

9. Character Code Table

(1) Character Code Table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	
ONUL																
1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241	
DC1																
2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242	
DC2																
3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243	
DC3																
4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244	
DC4																
5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245	
6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246	
7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247	
8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248	
CAN																
9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249	
10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250	
ALF																
11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251	
B																
ESC																
12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252	
C																
FF																
13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253	
D																
CR																
14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254	
SO																
RS																
15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255	
SI																
US																

(2) Foreign Characters

	U.S.A	England	France	W.Germany
Preset jumper 1	Open	Closed	Closed	Open
Preset jumper 2	Open	Closed	Open	Closed
23H (35)				
40H (64)				
58H (91)				
5CH (92)				
50H (93)				
78H (123)				
7CH (124)				
7DH (125)				
7EH (126)				

Designation of characters can be made for four languages by setting 1 and 2 of preset jumper 1.

(3) Character Code Table for 7 BIT DATA

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	16	32	48	64	80	96	112									
1	17	33	49	65	81	97	113									
2	18	34	50	66	82	98	114									
3	19	35	51	67	83	99	115									
4	20	36	52	68	84	100	116									
5	21	37	53	69	85	101	117									
6	22	38	54	70	86	102	118									
7	23	39	55	71	87	103	119									
8	24	40	56	72	88	104	120									
9	25	41	57	73	89	105	121									
10	26	42	58	74	90	106	122									
11	27	43	59	75	91	107	123									
12	28	44	60	76	92	108	124									
13	29	45	61	77	93	109	125									
14	30	46	62	78	94	110	126									
15	31	47	63	79	95	111	127									

SI Side

SO Side

10. Maintenance

With respect to maintenance:

The mechanical part of the printer must be free from dirt and dust. Remove the printer cover periodically to clean printer mechanism with soft brush to eliminate any dirt and dust.