

Wm. Appenberger & Sons
1188 Rice St., St. Paul. 55420
487-2022

brother®

Daisy Wheel Printer

Model HR-25

Instruction Manual



$700 \times 1.62 = 1134$
 $700 \times 1.10 = 826$

1680
432

Thank you for purchasing a Brother daisy wheel printer.

To get optimum performance, be sure the instruction manual is read throughly to ensure proper usage.

Keep the instruction manual in a handy place for ready reference.

"This equipment generates and uses radio frequency energy and if not installed and used properly, that is in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- - reorient the receiving antenna
- - relocate the computer with respect to the receiver
- - move the computer away from the receiver
- - plug the computer into a different outlet so that computer and receiver are on different branch circuits.

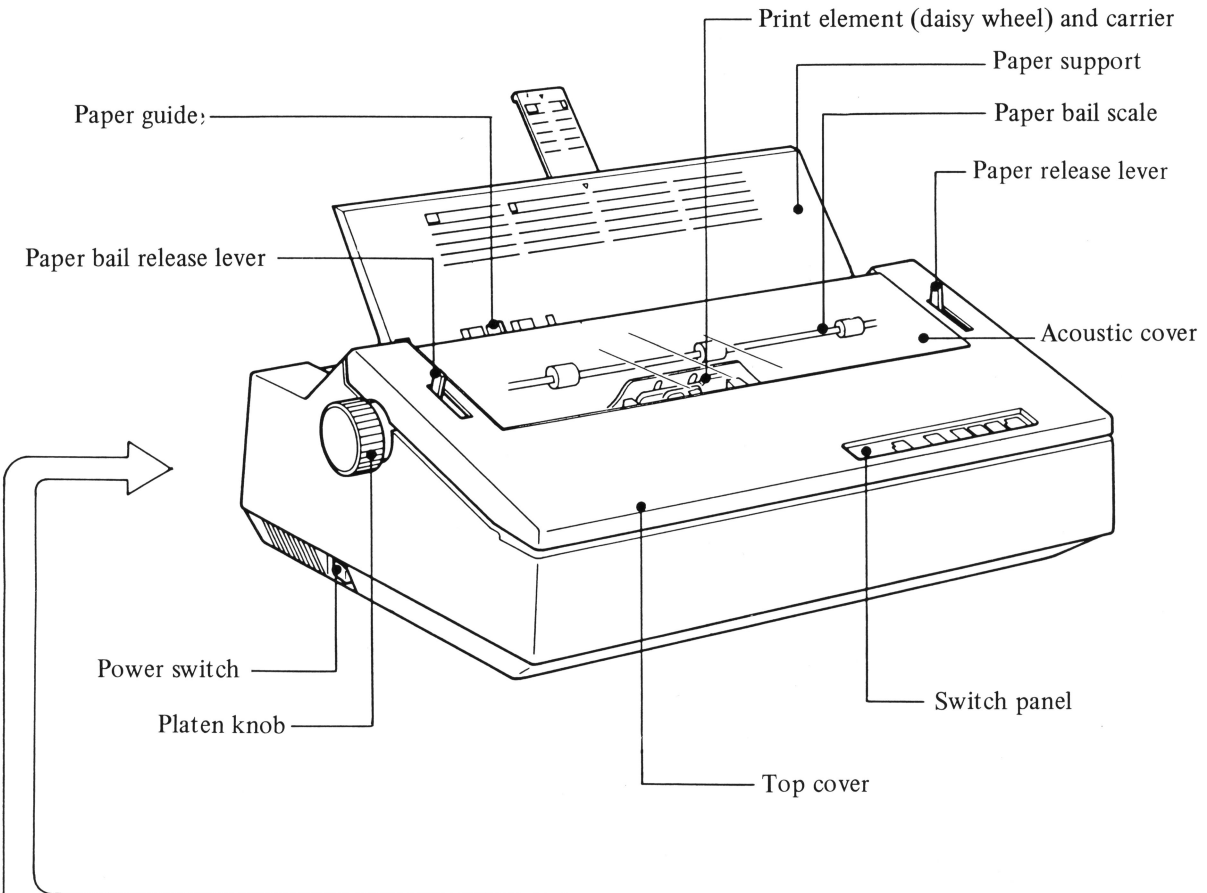
If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the US Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4."

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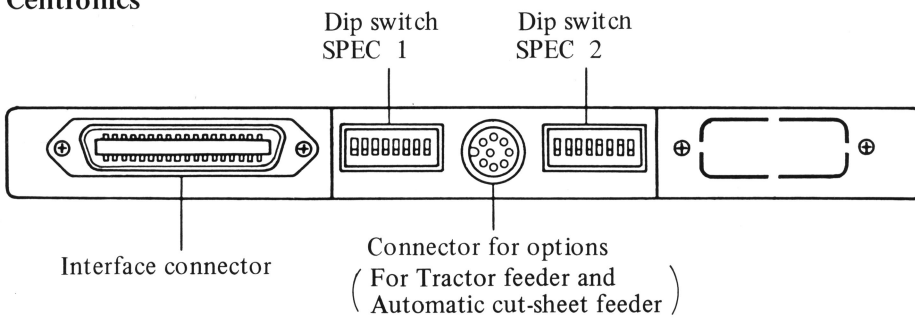
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Name of Each Part

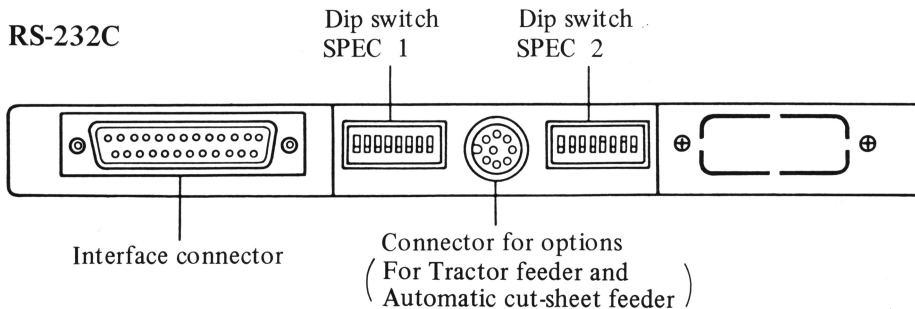


Interface layout (Located in rear of printer)

Centronics



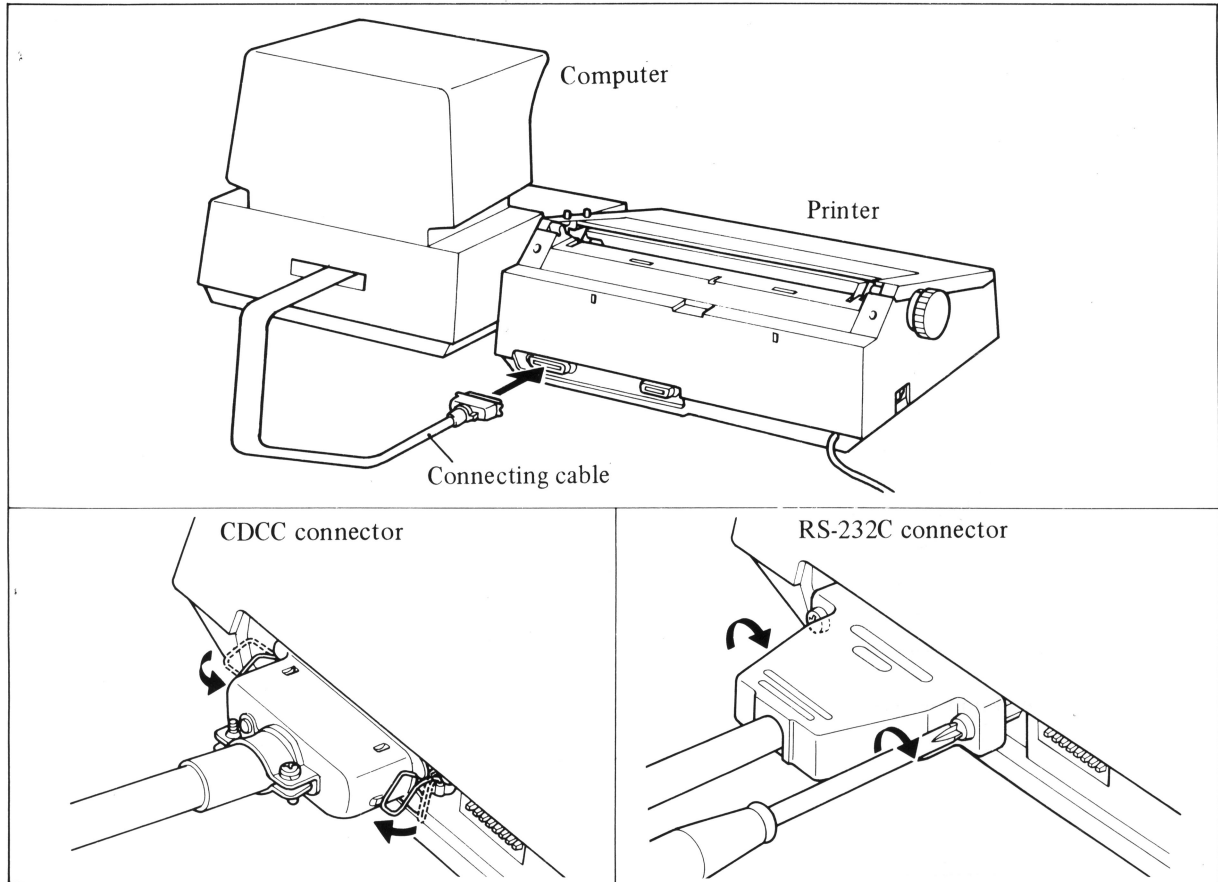
RS-232C



Preparation for Printing

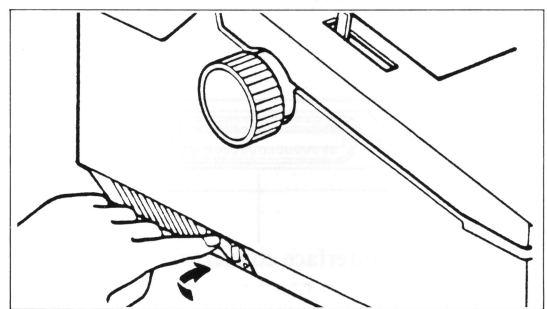
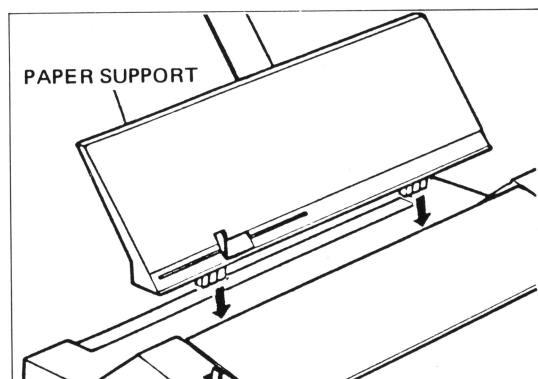
1. Set-up Procedure

1. Connect the printer to the computer.




* Be sure to place the ON/OFF switch in the OFF position before making the connection.

2. Insert the power plug into a power outlet.
3. Fit the paper support into the two holes on the top of the cover.



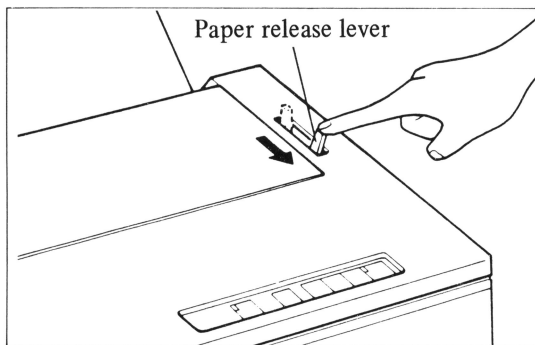
* Check to see that the POWER lamp and Select indication lamp on the switch panel are ON.

Notes:

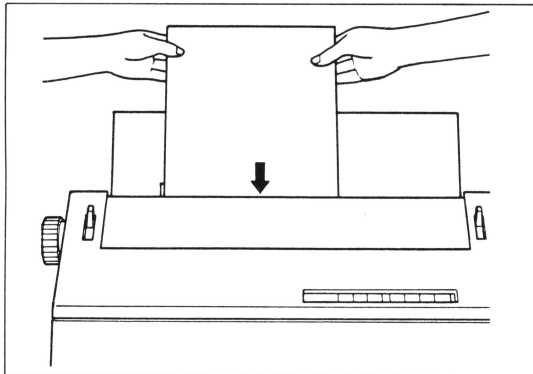
- (1) If the Select indication lamp is OFF, the top cover may be slightly open. Close the top cover and depress the Select switch () to see if the Select indication lamp lights.
- (2) Check to see that the ribbon and daisy wheel cassette have been correctly set in the printer. (Refer to pages 12 to 13.)

2. Automatic Paper Loading

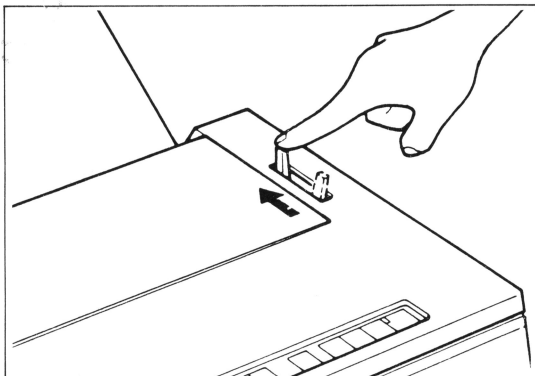
1. Pull the paper release lever inward.




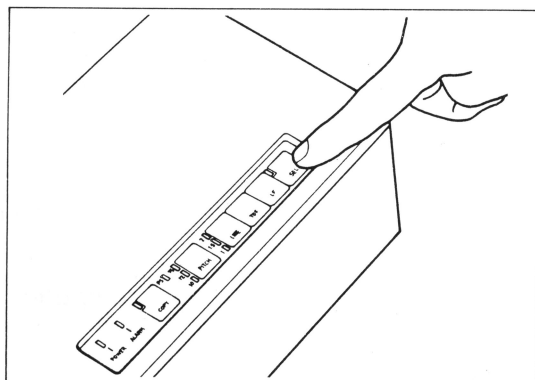
2. Set paper.
Insert paper until it is blocked.




3. Push the paper release lever rearward.



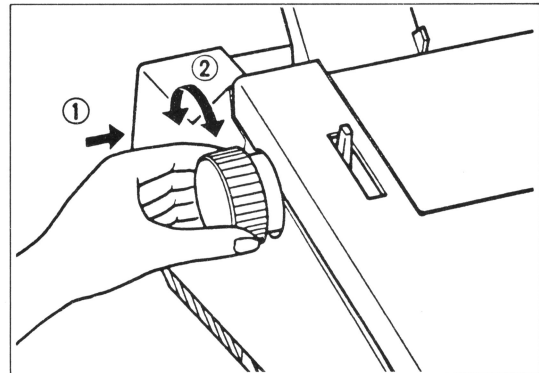
4. Push the Select switch () to put the printer in De-select (Off-line) state.



5. Press the top of form switch (). The paper will be fed automatically to its preset position. [approx. 30 mm (1.2 in.) from the top end of paper].

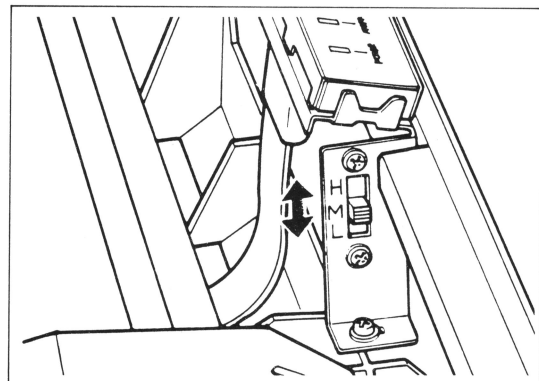
Use manual feeding of the paper with the platen knob when making fine adjustments to the position of the paper.

* Make sure that you depress the platen knob before turning it.



3. Impression Control

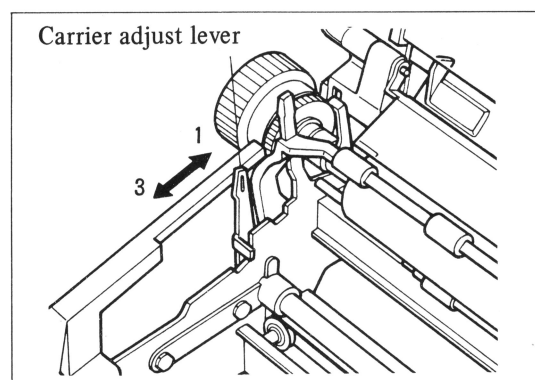
This switch is for adjusting the print impression according to the quality of paper, its thickness or the number of copies being made. H is the strongest setting, while L is the weakest.



4. Carrier position adjustment

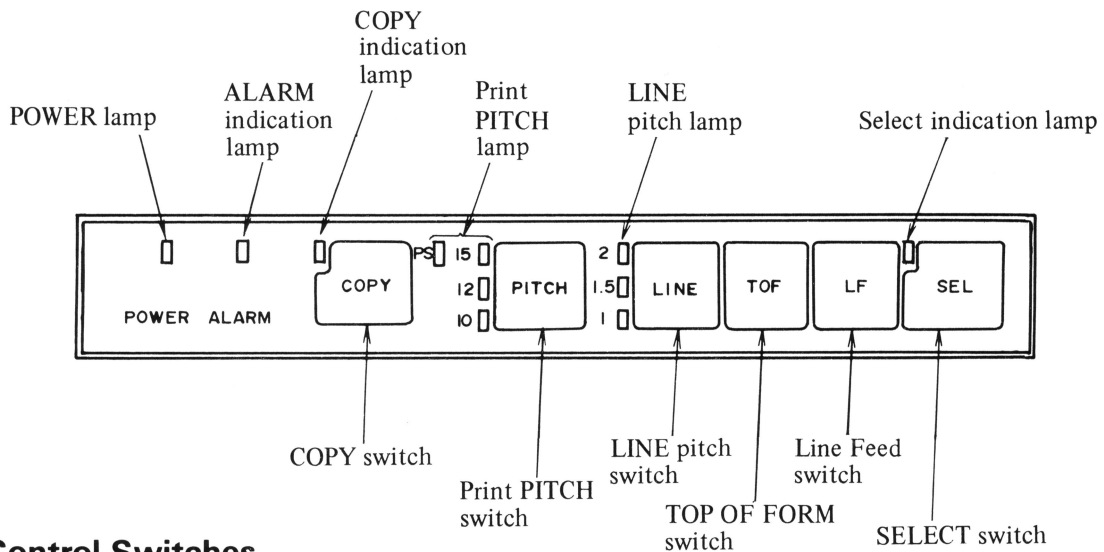
Set the carrier adjust lever according to the thickness and number of sheets of paper used.

The lever has three positions. Set to position "1" when a sheet of ordinary paper is used.




Operation

Switch Panel




1. Control Switches

1. SELECT switch ()

- Puts the printer in Select (On-line) or De-select (Off-line). Select and De-select alternate each time when this switch is depressed.
- When the ON/OFF switch is set to ON with Select switch () depressed, the printer enters test mode and performs test printing (prints of its own accord).

2. Line Feed switch ()




- Set the printer in De-select state.
- Depress this switch to feed paper a line at the pitch specified by the LINE pitch switch ().
- Continue to depress this switch for over 0.5 sec. to advance paper continuously.

3. TOP OF FORM switch ()

- Set the printer in De-select state.
 - 1) Cut sheet (Standard specification)
 - a. When this switch is pushed, the paper bail will automatically open, paper will go into the printer, and the paper bail will automatically close.
 - b. When this switch is pushed again after printing, paper will be discharged.
 - 2) Cut sheet (Cut sheet feeder unit specification)

When this switch is pushed, the existing sheet of paper will be discharged, the paper bail will automatically open, a new sheet of paper will be fed to the predetermined position, and the paper bail will automatically close.
 - 3) Continuous paper (Tractor unit specification)

When this switch is pushed, paper will be advanced to the top of form position of the next page.
- The page length is set by the DIP switch (refer to page 6) and by code from the computer.


4. LINE pitch switch ()
 - Specifies line spacing. Each time this switch is depressed, line spacing changes to 1 (1/6 in.), 1.5 (1/4 in.) and 2 (1/3 in.) in that order. (Indicated by LINE pitch indication lamp.)
 - When power is turned on, line spacing is set to 1 (1/6 in.).
 - Enabled only when the printer is in De-select state.
5. Print PITCH switch ()
 - Specifies character spacing. Each time this switch is depressed, character spacing switches to 10 (1/10 in.), 12 (1/12 in.), 15 (1/15 in.) and PS in that order. (Indicated by print PITCH indication lamp.)
 - When power is turned on, character spacing is set to 10 (1/10 in.).
 - Enabled only when the printer is in De-select state.
6. COPY switch ()

Reprints the data in the buffer or clears the data in the buffer.


2. Indication lamps

1. POWER lamp

Lights when power supply switch is set to ON.
2. ALARM indication lamp
 - Lights when printer is abnormal (character selection error, paper feed error, or carriage motion error).
 - Lights when ribbon is at its end.
 - Lights when the tractor unit is installed on the printer and no paper is set or paper is short.
 - Lights when there is no cut sheet during use of the cut sheet feeder unit.
3. Select indication lamp
 - Lights when printer is in selected condition.
4. LINE pitch lamp

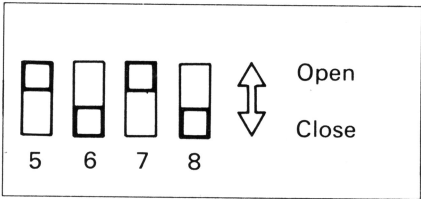
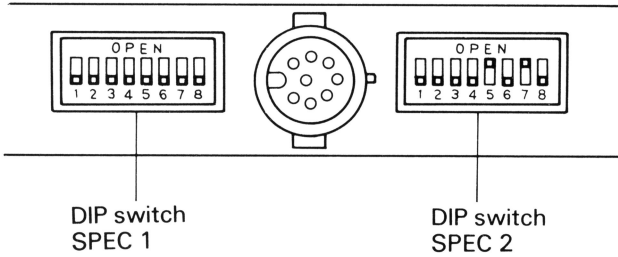
Displays line spacing. Green LED's 1, 1.5 and 2 light when the LINE pitch switch () is depressed.

 - * Green lamp 1 lights when power supply is turned on.
5. Print PITCH lamp

Displays character spacing. Green LED's 10, 12, 15 and PS light as the print PITCH switch () is depressed.

 - * Green lamp 10 lights when power supply is turned on.
6. COPY indication lamp
 - Lights when the data in the buffer is left or when the data left in the buffer is printed in the Deselect state.
 - Flashes when printing of data left in the buffer is temporarily suspended.

Setting of DIP Switch



DIP switch SPEC 1

* in the following tables indicates the DIP switch setting on standard printer when it is shipped.

1. Switches #1 through #4 (language group selection)

Set according to the printing wheel to be used.

For the printing code by country, see the code table at the end.

SPECIFICATIONS		#1	#2	#3	#4
Language group selection	US ASCII	CLOSE	CLOSE	CLOSE	CLOSE
	GERMAN	CLOSE	CLOSE	CLOSE	OPEN
	STERLING AREA	CLOSE	CLOSE	OPEN	CLOSE
	FRENCH	CLOSE	CLOSE	OPEN	OPEN
	DUTCH	CLOSE	OPEN	CLOSE	CLOSE
	ITALIAN	CLOSE	OPEN	CLOSE	OPEN
	S. SPANISH	CLOSE	OPEN	OPEN	CLOSE
	ENGLISH WP	CLOSE	OPEN	OPEN	OPEN
	SYMBOL	OPEN	CLOSE	CLOSE	CLOSE
	INTERNATIONAL	OPEN	CLOSE	CLOSE	OPEN
	STANDARD ENGLISH	OPEN	CLOSE	OPEN	CLOSE
	PORTUGUESE	OPEN	CLOSE	OPEN	OPEN
	LATIN-AMERICAN SPANISH	OPEN	OPEN	CLOSE	CLOSE
	CANADIAN ENGLISH & FRENCH	OPEN	OPEN	CLOSE	OPEN

Note: DIP switch must be selected when power is switched off. Namely, selection of DIP switch will be effective when power is turned on and cannot be rest unless power is turned off.

2. Switches #5 through #8 (page length setting)

Set the switches to match the page length of cut sheets, continuous paper, etc.

Specifications		#5	#6	#7	#8
Page length setting	11 inches	CLOSE	CLOSE	CLOSE	CLOSE
	3 inches	CLOSE	CLOSE	CLOSE	OPEN
	3.5 inches	CLOSE	CLOSE	OPEN	CLOSE
	4 inches	CLOSE	CLOSE	OPEN	OPEN
	5 inches	CLOSE	OPEN	CLOSE	CLOSE
	5.5 inches	CLOSE	OPEN	CLOSE	OPEN
	6 inches	CLOSE	OPEN	OPEN	CLOSE
	7 inches	CLOSE	OPEN	OPEN	OPEN
	8 inches	OPEN	CLOSE	CLOSE	CLOSE
	8.5 inches	OPEN	CLOSE	CLOSE	OPEN
	9 inches	OPEN	CLOSE	OPEN	CLOSE
	10 inches	OPEN	CLOSE	OPEN	OPEN
	11 2/3 inches	OPEN	OPEN	CLOSE	CLOSE
	12 inches	OPEN	OPEN	CLOSE	OPEN
	14 inches	OPEN	OPEN	OPEN	CLOSE
17 inches	OPEN	OPEN	OPEN	OPEN	

Note: The above settings are effective only when ON/OFF switch is set to ON.

DIP switch SPEC 2

1. Switch #1 (Auto Line Feed)

Selects carrier return operation plus line feed or carrier return operation only by receiving CR code.

Specifications		#1
AUTO LINE FEED	YES	OPEN
	NO	CLOSE

OPEN – Gives automatic line feed (single or double) on every carrier return.

CLOSE – No line feed on carrier return. Line feed occurs only on separate line feed common.

Note: The above settings are effective only when ON/OFF switch is set to ON.

2. Switch #2 (Auto Skip Perforation)

When paper is advanced to the bottom margin set by the code from external equipment, paper will be fed to the top margin of the next page. (When there is no setting code from an external equipment, the top margin will be set to 1" from the top end of page, whereas the bottom margin will be set to 1" from the bottom end of paper.)

Specifications		#2
Auto skip perforation	YES	OPEN
	NO	CLOSE *

To be loaded when ON/OFF switch is set to ON.

3. Switch #3 (Selection of data length) RS-232C serial type only

Specifications		#3
Selection of data length	7 bits	CLOSE *
	8 bits (NO PARITY)	OPEN

To be loaded when ON/OFF switch is set to ON.

4. Switch #4 (Selection of parity)RS-232C serial type only

Specifications		#4
Selection of parity	Odd	CLOSE *
	Even	OPEN

To be loaded when ON/OFF switch is set to ON.

5. Switches #5 through #7 (Selection of baud rate) RS-232C serial type only




















Specifications		SW#5	#6	#7
Selection of baud rate	9600 bauds	CLOSE	CLOSE	CLOSE
	4800 bauds	CLOSE	CLOSE	OPEN
	2400 bauds	CLOSE	OPEN	CLOSE
	1200 bauds	CLOSE	OPEN	OPEN
	600 bauds	OPEN	CLOSE	CLOSE
	300 bauds	OPEN	CLOSE	OPEN *
	150 bauds	OPEN	OPEN	CLOSE
	110 bauds	OPEN	OPEN	OPEN

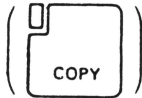


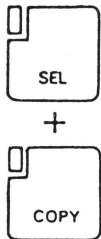


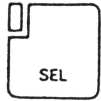


6. Switch #8 Not used

Copy Function

By storing the data from an external equipment in the buffer, the COPY function enables the printer to print by itself the same document in multiple copies.

: ON
 : Flashing
 : OFF

Operating procedures	Switch operation	Indication lamp	
		SEL	COPY
<p>(To store data from external equipment into memory)</p> <p>① Push the Select switch to put the printer in De-select state. (The Select indication lamp will go out.)</p>			
<p>② While pushing the COPY switch, push the Select switch. (The COPY indication lamp will light and the internal buffer will be cleared.)</p>	 + 		
<p>③ Set paper in the printer and push the Select switch to put the printer in Select state (On-line). (The COPY lamp will light.) In this state, send data from an external equipment, and the printer, while storing the data in the internal buffer, will print the data.</p>			
<p>④ After data input has been finished, push the Select switch to put the printer in De-select state. (To suspend printing temporarily during inputting as when RE is detected and then resume data inputting, make ribbon change, etc. and then go back to Step ③ and proceed.)</p>			
<p>(To print data from internal buffer)</p> <p>⑤ Set the printer to De-select condition. Push the COPY switch. (The COPY indication lamp will flash.) Set paper in the printer.</p>			
<p>⑥ When the COPY switch is pushed, the data in the buffer will be printed. (The COPY indication lamp will light.) To interrupt copy printing, press the COPY switch again. Then, the printer stops printing and returns to Step 7.</p>			

<p>⑦ After printing all data, the copy printing pauses (COPY lamp flashes). To make another copy, set the paper in the printer and return to Step 6.</p> <p>* In case the printing is to be resumed after interruption due to ribbon end, etc., return to Step 6 after replacing ribbon or correcting other causes for interruption.</p> <p>* In case the printer is equipped with optional Tractor Feeder or Auto Cut Sheet Feeder, following a pause of approximately 5 seconds the printer automatically returns to Step 6 and resumes printing.</p>			
<p>(The printer will return from the mode of printing data from the internal buffer to the mode of receiving data from an external equipment.)</p> <p>⑧ While pushing the Select switch, push the COPY switch. (The COPY indication lamp will go out.) The printer will enter a Deselect state.</p>			
<p>⑨ After paper has been set, push the Select switch to put the printer in Select state and let an external equipment send data. (The Select indication lamp will light.)</p>			
<p>(To clear internal buffer)</p> <p>⑩ To clear the buffer in the printer intermediately perform Steps ①, ②, ⑤, ⑧ and ⑨, and buffer will be cleared.</p>			

Direct Printing Function

The direct printing function enables you to use the printer just like a typewriter by keying in data from the keyboard of a personal computer.

If no data is transmitted in about 0.1 sec. from an external device, the data store in the buffer will be automatically printed.

An example of BASIC program (IBM personal computer) for direct printing:

```
10  A$ = INKEY$  
20  LPRINT A$;  
30  GO TO 10  
40  END
```

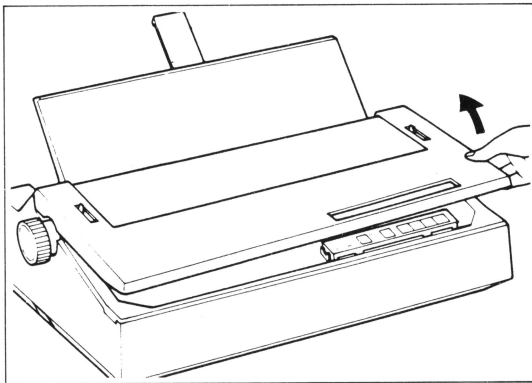
Daisy Wheel Change

The daisy wheel is an easily replaceable cassette type. Type styles can be easily switched to match your job simply by changing cassette type daisy wheels.

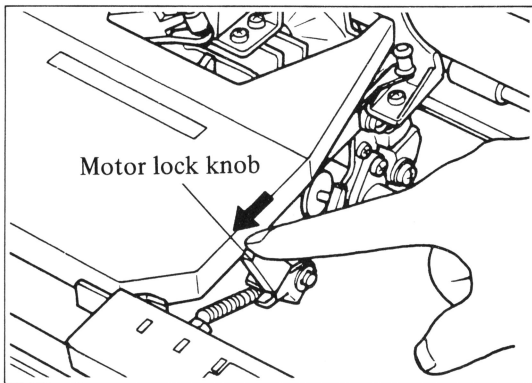
A daisy wheel cassette shows the following items.

- * Type pitch..... 10, 12, 15, PS
- * Type style PRESTIGE, BROUGHAM, etc.

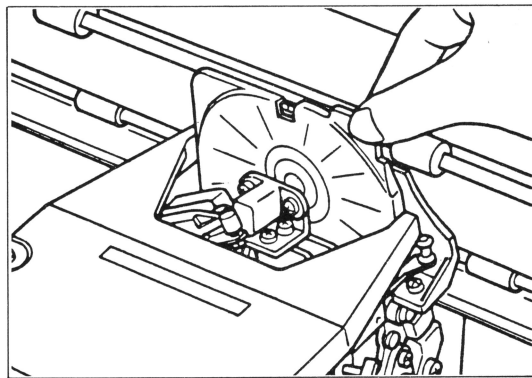
1. Open the top cover.



2. Pull the motor lock knob toward you.



3. Lift the daisy wheel cassette by holding the right corner.

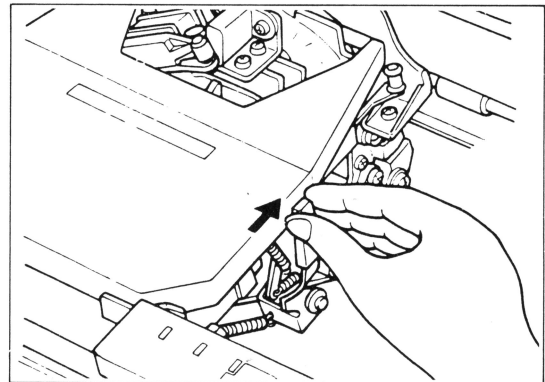


4. Push a new cassette all the way in the guide by reversing the procedure of Step 3. (The cassette will slip in smoothly if pressed slightly toward you while inserting.)

5. Push the sloping portion of the hammer cover toward the platen until it locks into place with a clicking sound.

* If the cassette does not lock into place, incorrect printing will result. Reinsert.

* Use care to make sure that the cassette is not inserted inside out.



6. Check to be sure that the ribbon has been set in position before closing the top cover.

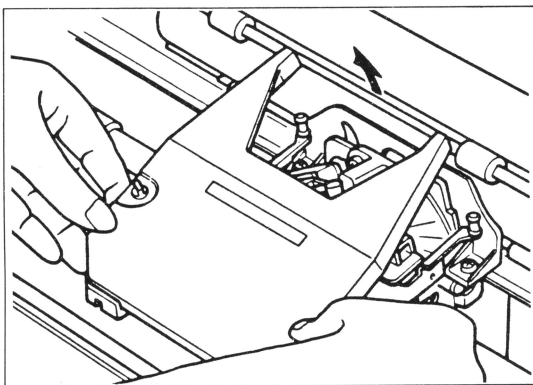
* The cassette ribbon need not be removed when changing daisy wheels.

Cassette Ribbon Change

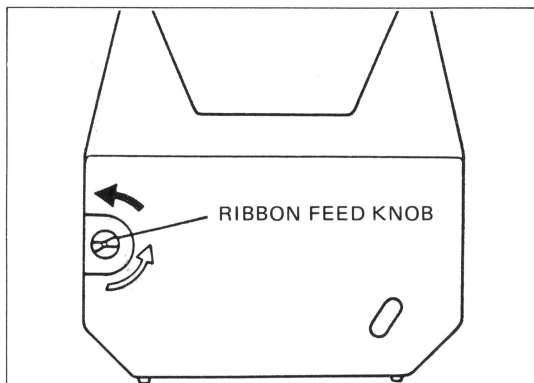
The following three kinds of cassette ribbons are available:

- * One-time carbon ribbon
- * Multi-use carbon ribbon
- * Fabric ribbon

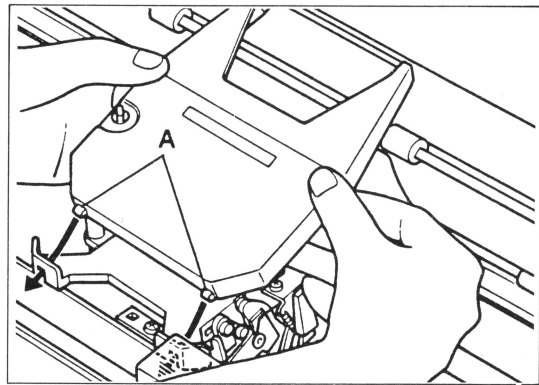
1. Open the top cover.
2. Hold the cassette ribbon with both hands, lift the ribbon side first, and remove.



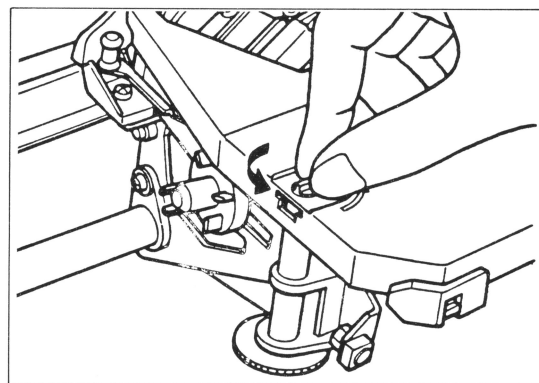
3. Turn the ribbon feed knob on a new cassette to make sure that there is no slack in the ribbon.



4. First fit the bars (A). Then set the ribbon to thread it between the ribbon guide and the paper meter.



5. Lightly press down from above until a click is heard.
6. Turn the ribbon feed knob to eliminate slackness of the ribbon.

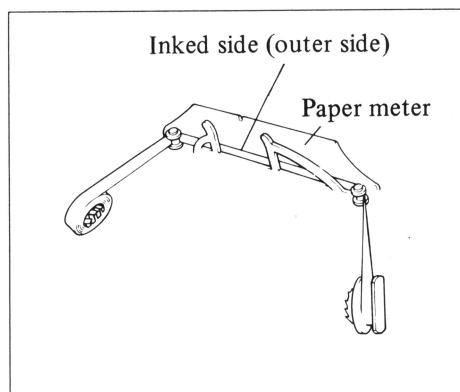
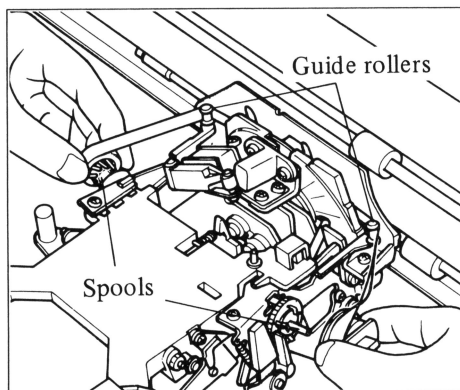
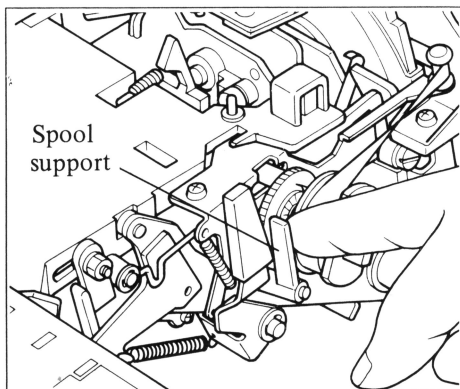


7. Close the top cover.
(The carrier will move to the left end and will return to its original position.)

Note:

The ribbon case has a slit which can be used to visually check the amount of ribbon remaining.

Color Ribbon Change




1. Open the top cover.
2. Move the carrier to the center.
3. Remove the cassette ribbon.
4. Release the spool support on the right-hand side of the tape by lifting it towards you.
5. The spools are easily removed by lifting them sideways as shown in the figure.
6. When inserting a new ribbon, insert the left-hand spool first. After threading the tape carefully through the guide rollers, set the right-hand spool in place.
7. After fitting both spools, take up any slack in the tape by winding on the right-hand spool.

Note:


Ensure that the inked side of the tape faces the platen.

Detections

- **COVER-OPEN detection function (See Fig. 1)**

The printer has a switch which senses whether the top cover is opened or closed. If the ON/OFF switch is set to ON and the top cover open, the printer will stop operation. Closing of the cover causes the carrier to return automatically to left and printing is restarted once. Select state is re-established by pushing the SELECT switch ().

- **Ribbon End (RE) detection function (See Fig. 2)**

1. If the ribbon end is detected, the printer will be put in Deselect state and the ALARM indication lamp light to sound buzzer.
2. When the ribbon cassette is unloaded, the ALARM indication lamp will go off and the buzzer cease to sound.
3. Set a new ribbon cassette. (Refer to page 13.)
4. Push the SELECT switch () to put the printer back into Select state, and the printer will resume printing.

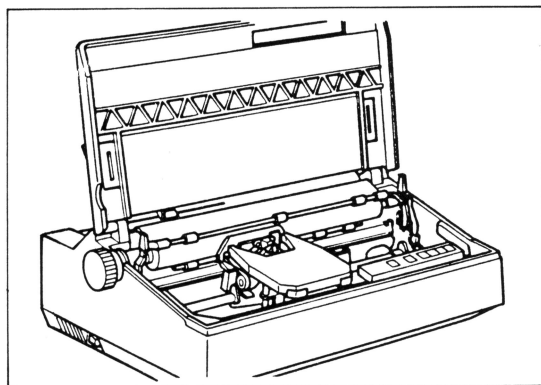


Fig. 1

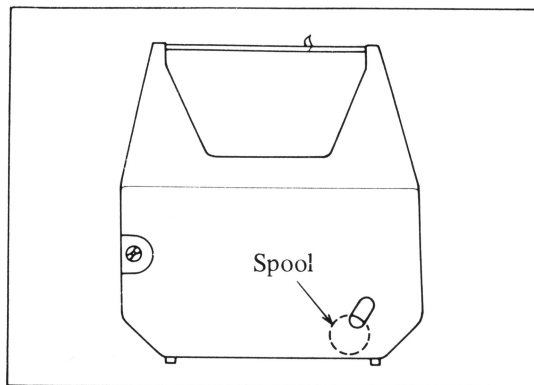



Fig. 2

- **Paper End (PE) detection function**

This function is enabled when an optional tractor unit or cut sheet feeder unit is used.

1. **Tractor Unit specification**

1. When PE is detected intermediately during printing of a line, the printer will enter a De-select state after printing the line and the ALARM indication lamp will light to sound the buzzer.
 - * This state will last until a new sheet of paper is set.
2. Set a new sheet of paper.
3. The ALARM indication lamp will go out when the new sheet of paper is set.
4. Push the SELECT switch () to put the printer back into a Select state, and the printer will resume printing.


2. Cut sheet feeder unit specification


1. If a sheet of paper is inserted without setting it correctly, the printer will become in De-select state and the ALARM indication lamp will light to sound the buzzer.

* This state will last until a new sheet of paper is set or the printer is put into an Interrupt state.


2. Set a new sheet of paper.

3. The ALARM indication lamp will go out when the new sheet of paper is set.

4. Push the TOP OF FORM switch () and insert the sheet of paper.

5. Push SELECT switch () to put the printer back into a Select state, then the printer will resume printing.

Note:

If the SELECT switch () is pushed while the ALARM indication lamp is ON, another line can be printed in the remaining portion of paper after detection of paper end (PE).

This makes it possible to use the available space of paper fully.

Function Codes

This section describes the various function codes which enable you to get the best service from the printer.

These codes are described on the basis of the ASCII code.

ASCII Code Table

b ₈ - - -	0	0	0	0	0	0	0
b ₇ - - -	0	0	0	0	1	1	1
b ₆ - - -	0	0	1	1	0	0	1
b ₅ - - -	0	1	0	1	0	1	1
b ₄ b ₃ b ₂ b ₁	0	1	2	3	4	5	6
0 0 0 0	0	NUL	SP	0	@	P	· p
0 0 0 1	1	DC1	!	1	A	Q	a q
0 0 1 0	2		"	2	B	R	b r
0 0 1 1	3	DC3	#	3	C	S	c s
0 1 0 0	4		\$	4	D	T	d t
0 1 0 1	5		%	5	E	U	e u
0 1 1 0	6		&	6	F	V	f v
0 1 1 1	7	BEL	'	7	G	W	g w
1 0 0 0	8	BS CAN	(	8	H	X	h x
1 0 0 1	9	H T	)	9	I	Y	i y
1 0 1 0	A	L F	*	:	J	Z	j z
1 0 1 1	B	V T ESC	+	;	K	[	k {
1 1 0 0	C	F F	,	<	L	\	l |
1 1 0 1	D	C R	-	=	M	]	m }
1 1 1 0	E	RS	.	>	N	^	n ~
1 1 1 1	F	US	/	?	O	_	o DEL

* Characters ϕ (20H) and ' (7FH) can be printed by commanding ESC + Y and ESC + Z, respectively.

* Underlined codes ignored

1. Control Codes (corresponding to ASCII codes) and Their Functions

Standard Control Codes

Symbol	Code	Function
BEL (Bell)	07 H	Acoustic alarm sounds for about 2 sec.
BS (Back Space)	08 H	Moves carrier back by one character.
LF (Line Feed)	0A H	Prints one line of data in data buffer and then feeds paper. The next print data is printed following the printing before line feed. (Does not return to left margin.)
FF (Form Feed)	0C H	Prints one line of data in data buffer and then feeds paper DIP switch specified lines less executed paper feed lines. (Does not return to left margin.)
CR (Carrier Return)	0D H	1) Prints one line of data in data buffer. 2) After printing, carrier returns and one line is fed by instruction of automatic carrier return switch (OPEN) or ESC +". 3) Printer operates even if there is no printing data prior to this code.
DC1 (Device Control 1)	11 H	Puts printer in Select state.
DC3 (Device Control 3)	13 H	Puts printer in Deselect state.
CAN (Cancel) DEL (Delete)	18 H 7F H	Clears print data in data buffer up to CR, or LF, or VT, or FF code prior to this code.
VT (Vertical Tabulation)	0B H	After printing data up to VT, this command feeds paper to the next VT position. Does not operate if the next VT position is not set. (Does not return to left margin)
HT (Horizontal Tabulation)	09 H	Carrier moves to the next HT position. Does not operate if the next HT position is not set.
ESC (Escape)	1B H	Extension code which, combined with the following code, makes control code.

ESC (escape) Codes

Symbol	Function
ESC+BS	1/120" BS
ESC+HT+n	Absolute HT movement
ESC+LF	Reverse paper feed
ESC+VT+n	Absolute VT movement
ESC+FF+n	Page length set: Reset to DIP switch by ESC+S
ESC+CR+P	Printer reset
ESC+RS+n	VMI set: Reset to switch panel by ESC+S
ESC+US+n	HMI set: Reset to switch panel by ESC+S

Symbol	Function
ESC+"	Auto LF "ON"
ESC+#	Auto LF "OFF"
ESC+&	Bold, shadow, double print clear
ESC+–	VT set at current position
ESC+/ ESC+0	Auto backward print set
ESC+0	Right margin set at current position
ESC+1	HT set at current position
ESC+2	All HT, VT clear
ESC+5	Forward print set
ESC+6	Backward print set
ESC+8	Current position HT clear
ESC+9	Left margin set at current position
ESC+A	Color print set
ESC+B	Black print set
ESC+C	Top margin, bottom margin clear
ESC+D	Paper fed backward 1/2 of VMI
ESC+E	Auto underline set
ESC+F	Double print set
ESC+H	Auto strike-out set
ESC+I	Auto strike-out clear
ESC+L	Bottom margin set at current position
ESC+O	Bold print set
ESC+P	PS mode set
ESC+Q	PS mode clear
ESC+R	Auto underline clear
ESC+S	Reset to switch panel, DIP switch
ESC+T	Top margin set at current position
ESC+U	Paper fed 1/2 of VMI
ESC+W	Shadow print set
ESC+X	WP clear
ESC+Y	Prints 20H of print code table
ESC+Z	Prints 7FH of print code table
ESC+\	Auto backward print clear

2. ESC Sequence Functions

Print Format

(1) Setting Character Pitch (HMI)

ESC + US + n sets character pitch.

ESC + S causes HMI to return to Panel SW.

$$\text{HMI} = (n - 1) \times 1/120$$

The n specifies 1–126 excepting NUL and DEL codes and HMI can be set in 1/120-inch increments.

After HMI is set, carrier moves in the amount of HMI in each print or space.

Under PS mode, the setting can not be made.

ESC + S causes HMI to return to Panel SW.

(2) Setting Line Pitch (VMI)

ESC + RS + n sets line pitch.

ESC + S causes VMI to return to Panel SW.

$$\text{VMI} = (n - 1) \times 1/48$$

The n specifies 1–126 excepting NUL and DEL codes and VMI can be set in 1/48-inch increments.

After VMI is set, paper is fed in the amount of VMI in LF and reverse LF or in the amount of VMI/2 in SUPER/SUB SCRIPT.

ESC + S causes VMI to return to Panel SW.

(3) Setting Page Length

ESC + FF + n sets page length.

ESC + S causes page length to return to DIP SW.

$$\text{Page length} = n \times \text{VMI}$$

The n specifies 1–126 excepting NUL and DEL codes and the printer interprets the existing VMI as one line. Since the absolute position from page top is stored as page length, if VMI is changed from the preset value, the number of lines in page length changes.

ESC + S causes page length to return to DIP SW.

(4) Setting Left Margin

ESC + 9 sets left margin.

The code sets left margin at present position.

Absolute HT movement or BS enable the carrier to move further to the left of the left margin position. (New left margin can be set)

In case the setting position is larger than right margin, the new margin can not be set.

(5) Setting Right Margin

ESC + 0 sets right margin.

The code sets right margin at present position.

Absolute HT movement enables the carrier to move further to the right of the right margin position. (New right margin can be set)

In case the setting position is smaller than left margin, the new margin can not be set.

(6) Setting HT

ESC + 1 sets HT position.

ESC + 8 clears present position.

ESC + 2 clears whole HT positions.

HT position is set at present position and can be set up to 20 places.

To clear present HT position only, input ESC + 8; to clear whole HT positions, input ESC + 2, which also clears whole VT positions.

(7) Setting VT

ESC + – sets VT position.

ESC + 2 clears whole VT positions.

VT position is set at present position and can be set in 10 places.

Present VT position alone cannot be cleared.

ESC + 2 clears not only whole VT positions but also all HT positions.

(8) Setting Top Margin

ESC + T sets top margin.

ESC + C, Page Length Setting, or Remote Resetting clears top margin.

Top margin is set at present position.

Paper is automatically fed in the amount of top margin, when it reaches page top by LF. VT, absolute VT movement, or reverse LF enables paper feed within top margin. (New top margin can be set)

Top margin can be cleared by changing page length, or by remote resetting or ESC + C; however, when skip perforation is set, top margin returns to 1-inch margin.

In case the position falls within bottom margin, the new margin can not be set.

(9) Setting Bottom Margin

ESC + L sets bottom margin.

ESC + C, Page Length Setting, or Remote Resetting clears bottom margin.

Bottom margin is set at present position.

Paper is automatically fed to the following page top, when it reaches the bottom margin by LF, Auto LF or Half LF.

VT or absolute VT movement enables paper feed within bottom margin.

Bottom margin can be cleared by changing page length, or by remote resetting or ESC + C; however, when skip perforation is set, bottom margin returns to 1-inch margin.

In case the setting position falls within top margin, the new margin can not be set.

(10) Absolute HT Movement

ESC + HT + n sets absolute HT movement.

Movement range = $(n - 1) \times \text{HMI}$

The n specifies 1–126 excepting NUL and DEL codes and the range can be set in present HMI/120-inch increments.

This function makes carrier move directly from left end of platen to set position, but is not stored as HT. (Margins are ignored.)

Does not operate when set position goes beyond right end of platen.

- (11) Absolute VT Movement
ESC + VT + n sets absolute VT movement.
Movement range = $(n - 1) \times \text{VMI}$
The n specifies 1–126 excepting NUL and DEL codes and the range can be set in present VMI/48-inch increments.
This function feeds paper directly from page top to set position, but is not stored as VT. This can move beyond page length (page length is ignored) and within top and bottom margins (margins are ignored).
- (12) Reverse LF
ESC + LF sets reverse LF.
Feeds paper in reverse direction in the amount of present VMI.
- (13) Half LF
ESC + U sets half LF.
Feeds paper in the amount of present VMI/2. When VMI is an aliquant part of 2, fractions are to be discarded.
- (14) Reverse Half LF
ESC + D sets reverse half LF.
The paper is fed reversely by VMI/2. When VMI is an aliquant part of 2, fractions are to be discarded.
- (15) Auto Backward Print
ESC + / sets auto backward print.
ESC + \ clears auto backward print.
When this mode is set, the printer executes logic seeking; however, if the following ESC sequences are input, carrier moves to left margin by CR code and the printer starts forward print.
When ON/OFF switch is set to ON, auto backward print is automatically in set position.
- (16) Forward Print
ESC + 5 sets forward print.
Specifies printing to right.
When reaching right margin, carrier automatically returns with one line fed, and printout starts from left margin.
- (17) Backward Print
ESC + 6 sets backward print.
Specifies printing to left.
- (18) Auto LF
ESC + " sets auto LF.
ESC + # clears auto LF.
When CR code is input with auto LF in set, the printer automatically engages LF.
- (19) 1/120-inch BS
ESC + BS sets 1/120-inch BS.
Moves the carrier back by 1/120 inch.

WP Functions

(1) Proportional Spacing

ESC + P sets proportional spacing.

ESC + Q clears proportional spacing.

ESC + S causes proportional spacing to return to Panel SW.

After PS is set, the printer prints at PS.

When ON/OFF switch is set to ON with Panel SW set at PS, the HMI value equals 10. When PS has been set, the HMI value at that particular point is stored, Accordingly, when PS is cleared by ESC + Q, character pitch is in the HMI value then effective.

During PS mode, HT, spacing and BS are only effective for HMI. (HMI cannot be set in PS mode.) PS can be set at any point of operation.

(2) Auto Underline

ESC + E sets auto underline.

ESC + R, ESC + X clear auto underline.

After ESC + E is set, the printer prints and underlines, but does not underline spaces.

(3) Auto Strike-out

ESC + H sets auto strike-out.

ESC + I, ESC + X clear auto strike-out.

After ESC + H is input, prints and hyphenates, but does not hyphenate spaces.

(4) Shadow Print

ESC + W sets shadow print.

ESC + &, ESC + X, CR, clear shadow print.

This code moves carrier in 1/120 inch and makes a second strike.

When either bold-face print or double print is set during this mode, the new setting takes effect.

When shadow print is set, the printer prints to right.

(5) Bold-face Print

ESC + O sets Bold-face print

ESC + &, ESC + X, CR clear bold-face print

This moves carrier 1/180 inch and makes a second strike.

When either shadow print or double-strike print is set during this mode, the new setting takes effect.

When bold-face print is set, the printer prints to right.

(6) Double Print

ESC + F sets double print.

ESC + &, ESC + X, CR, clear double print.

This code makes double strikes without moving carrier.

When either bold-face print or shadow print is set during this mode, the new setting takes effect.

When double print is set, the printer prints to right.

(7) Setting Color Print

ESC + A sets color print.

After this code, the printer selects color ribbon to print in color.

ESC + B clears this mode to select black ribbon.

(8) Setting Black Print

ESC + B sets black print.

After this code, the printer selects black ribbon to print in black.

ESC + A clears this mode to select color ribbon.

(9) Wheel 20H Print

ESC + Y sets wheel 20H print.

Prints wheel spoke No. 20H.

(10) Wheel 7FH Print

ESC + Z sets wheel 7FH print.

Prints wheel spoke No. 7FH.

Printer Reset

Printer Reset

ESC + CR + P sets printer reset.

Initializes printer (when ON/OFF switch is set to ON.)

Settings to Make When ON/OFF Switch is Set to ON

1. Print pitch 10 (1/10 inch)
2. Line pitch 1 (1/6 inch)
3. Red, black print Black
4. Print system Auto backward print
5. Page length by DIP switch
6. CR function by DIP switch
7. Skip perforation by DIP switch

{ Top margin: 1 inch from top end of paper
{ Bottom margin: 1 inch from bottom end of paper

ESC sequence function table

Classification	Code Sequence	HEX Code	Function
Print pitch	ESC+P	1B, 50	PS mode set
	ESC+Q	1B, 51	PS mode clear
	ESC+US+n	1B, 1F, n	HMI set $\{(n-1) \times 1/120\}$
	ESC+S	1B, 53	Reset to panel SW
LF pitch	ESC+RS+n	1B, 1E, n	VMI set $\{(n-1) \times 1/48\}$
	ESC+S	1B, 53	Reset to panel SW
LF direction	ESC+U	1B, 55	Paper advanced 1/2 of VMI
	ESC+D	1B, 44	Paper fed backward 1/2 of VMI
	ESC+LF	1B, 0A	Paper fed backward
Margin	ESC+0	1B, 30	Right margin set at current position
	ESC+9	1B, 39	Left margin set at current position
Horizontal tab	ESC+HT+n	1B, 09, n	Absolute HT movement { HMI x (n-1) }
	ESC+1	1B, 31	HT set at current position
	ESC+8	1B, 38	Current position HT clear
	ESC+2	1B, 32	All HT, VT clear
Vertical tab	ESC+VT + n	1B, 0B, n	Absolute VT movement { VMI x (n-1) }
	ESC+—	1B, 2D	VT set at current position
	ESC+2	1B, 32	All HT, VT clear
Page	ESC+FF+n	1B, 0C, n	Page length set (n x VMI)
	ESC+T	1B, 54	Top margin set at current position
	ESC+L	1B, 4C	Bottom margin set at current position
	ESC+C	1B, 43	Top margin, bottom margin clear
	ESC+S	1B, 53	Reset to panel SW
Print system	ESC+/ ESC+\	1B, 2F 1B, 5C	Auto backward print set Auto backward print clear
	ESC+5	1B, 35	Forward print set
	ESC+6	1B, 36	Backward print set
	ESC+BS	1B, 08	1/120" back space
CR function	ESC+''	1B, 22	Auto LF ON (CR+LF)
	ESC+#	1B, 23	Auto LF OFF (CR)
Color, black print	ESC+A	1B, 41	Color print set
	ESC+B	1B, 42	Black print set
Extra code table print	ESC+Y	1B, 59	Prints 20H of print code table
	ESC+Z	1B, 5A	Prints 7FH of print code table
Stress characters	ESC+F	1B, 46	Double print set
	ESC+O	1B, 4F	Bold-face print set
	ESC+W	1B, 57	Shadow print set
	ESC+&	1B, 26	Double, bold, shadow print clear
	ESC+E	1B, 45	Auto underline set
	ESC+R	1B, 52	Auto underline clear
	ESC+H	1B, 48	Auto strike-out set
	ESC+I	1B, 49	Auto strike-out clear
	ESC+X	1B, 58	WP clear
Printer reset	ESC+CR+P	1B, 0D, 50	Printer reset

Notes: (1) Switching of print pitch and line pitch by code does not change switch panel display.
(2) (n) is a value included between HEX (01) and HEX (7E).

ESC sequence operation example

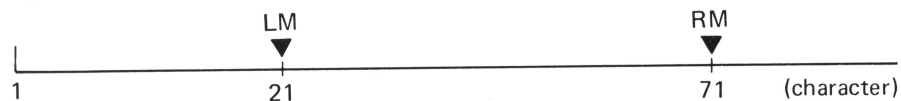
- Setting HMI and VMI

Example: To set HMI value to 12/120'' and VMI value to 8/48''

Symbol	ESC, US, (13D), ESC, RS, (09D)
Code	1B, 1F, 0D, 1B, 1E, 09
Explanation	HMI = 12/120'' VMI = 8/48''

- Left margin, right margin set method

Example: To set left margin at 21st character and right margin at 71st character



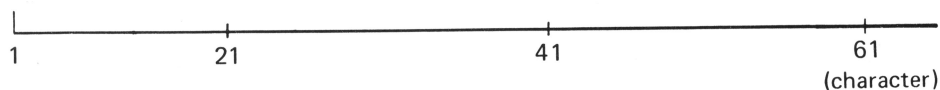
(1) Code sequence	SP,..... SP, ESC, 9, SP,.....SP, ESC, 0
HEX code	20,.....20, 1B, 39, 20,.....20, 1B, 30
Explanation	20 data Left margin set 50 data Right margin set

* (2) Code sequence	ESC, HT, (21D) ESC, 9, ESC, HT, (71D) ESC, 0
HEX code	1B, 09, 15, 1B, 39, 1B, 09, 47, 1B, 30
Explanation	Moves to 21st character Left margin set Moves to 71st character Right margin set

* This method (2) in the above will be convenient when setting new margins or when right and left margins to be set are outside current right and left margins.

- Horizontal tab set method

Example: To set horizontal tab at 21st, 41st and 61st characters

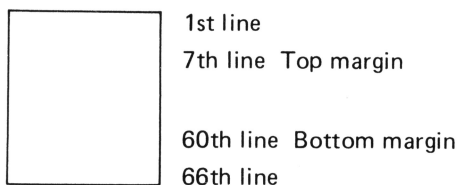


(1) Code sequence	SP,..... SP, ESC, 1, SP,..... SP, ESC, 1, SP,..... SP, ESC, 1
HEX code	20,.....20, 1B, 31, 20,.....20 1B, 31, 20,.....20, 1B, 31
Explanation	20 data HT set 20 data HT set 20 data HT set

(2) Code sequence	ESC, HT, (21D), ESC, 1, ESC, HT, (41D), ESC, 1, ESC, HT, (61D), ESC, 1
HEX code	1B, 09, 15, 1B, 31, 1B, 09, 29, 1B, 31, 1B, 09, 3D, 1B, 31
Explanation	Moves to 21st character HT set Moves to 41st character HT set Moves to 61st character HT set

- Page length, top margin and bottom margin set method

Example: To set page length to 66 lines, top margin at 7th line, and bottom margin at 60th line



(1) Code sequence	ESC, FF, (66D), LF,LF,	ESC, T,	LF,LF,	ESC, L
HEX code	1B, 0C, 42, 0A,0A,	1B, 54,	0A, 0A,	1B, 4C
Explanation	Page length set	6 data	Top margin set	53 data Bottom margin set

(2) Code sequence	ESC, FF, (66D), ESC, VT, (7D),	ESC, T,	ESC, VT,(60D),	ESC, L
HEX code	1B, 0C, 42, 1B, 0B, 07,	1B, 54,	1B, 0B, 3C,	1B, 4C
Explanation	Page length set	Moves to 7th line	Top margin set	Moves to 60th line Bottom margin set

- Vertical tab set method

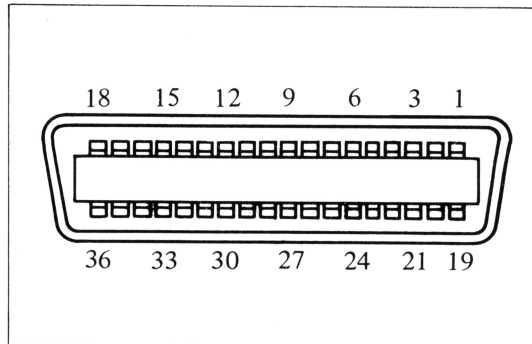
Example: To set vertical tab at 11th line, 21st line and 31st line

(1) Code sequence	LF, LF, ESC, -,	LF, LF, ESC, -,	LF, LF, ESC, -
HEX code	0A, 0A, 1B, 2D,	0A, 0A,	1B, 2D, 0A,0A, 1B, 2D
Explanation	10 data VT set	10 data	VT set 10 data VT set

(2) Code sequence	ESC, VT, (11D), ESC, -,	ESC, VT, (21D), ESC, -,	ESC, VT, (31D), ESC, -
HEX code	1B, 0B, 0B, 1B, 2D,	1B, 0B, 15,	1B, 2D 1B, 0B, 1F 1B, 2D
Explanation	Moves to 11th line VT set	Moves to 21st line	VT set Moves to 31st line VT set

Interface

1. Centronics Parallel Interface



(1) Connector Signal Code

Pin No.	Signal	Pin No.	Signal
1	DATA STROBE	19	TWISTED PAIR GND
2	DATA 1	20	TWISTED PAIR GND
3	DATA 2	21	TWISTED PAIR GND
4	DATA 3	22	TWISTED PAIR GND
5	DATA 4	23	TWISTED PAIR GND
6	DATA 5	24	TWISTED PAIR GND
7	DATA 6	25	TWISTED PAIR GND
8	DATA 7	26	TWISTED PAIR GND
9	DATA 8	27	TWISTED PAIR GND
10	ACKNLG	28	TWISTED PAIR GND
11	BUSY	29	TWISTED PAIR GND
12	PE	30	INPUT PRIME RET
13	SLCT	31	INPUT PRIME
14		32	FAULT
15		33	
16	0V	34	
17	0V	35	
18	5V	36	

Printer side: Amphenol (DDK) 57-40360-12

Cable side: Amphenol (DDK) 57-30360-12

(2) Name of Signals and Functions

1) DATA STROBE (input)

Indicates that DATA 1 to DATA 8 are effective.

Pulse width requires 1 μ sec. MIN.

HIGH normal condition

LOW readout of data

Option: Readout of data on return from LOW to HIGH

2) DATA 1 to DATA 8 (input)

Indicates information from 1 bit to 8 bits.

(8th bit is ignored.)

DATA 1HIGH

DATA 0LOW

3) $\overline{\text{ACKNLG}}$ (output)

Indicates acknowledgement of data input.

Pulse width is $5 \pm 1 \mu\text{sec}$.

HIGH normal condition

4) BUSY (output)

DC level signal, indicating whether printer is ready for operation.

Input can be made only when this signal is "LOW".

Only the DC1 code can be input even when the signal is "HIGH".

5) PE (output)

DC level signal which becomes "HIGH" when paper is short.

6) SLCT (output)

DC level signal which is "HIGH" when printer is selected.

7) $\overline{\text{INPUT PRIME}}$ (input)

Puts printer to initial condition when this signal is input.

8) $\overline{\text{FAULT}}$ (output)

DC level signal which becomes "LOW" when printer is in the following condition.

- ① at PE
- ② at RE
- ③ when top cover is opened.
- ④ character selection error, carrier error
- ⑤ at De-select state

9) 5V

Power supply line

10) 0V

Frame ground, signal ground

11) TWISTED PAIR GND

Return ground of signal line

12) $\overline{\text{INPUT PRIME RET}}$

Return ground

13) Set/reset conditions of SLCT, BUSY, FAULT, ALARM lamps.

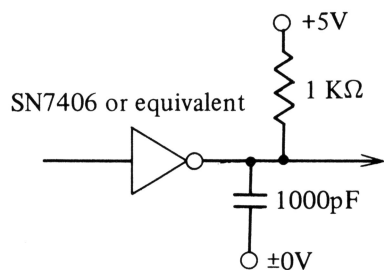
	Set Condition	Reset Condition
SLCT	<ol style="list-style-type: none"> 1. DC 1 code input 2. SELECT switch ON 	<ol style="list-style-type: none"> 1. Cover open 2. DC 3 code input 3. PE 4. RE 5. Character selection error 6. Carrier error 7. SELECT switch OFF
BUSY	<ol style="list-style-type: none"> 1. SLCT reset condition 2. 0 byte in buffer 	<ol style="list-style-type: none"> 1. SLCT ON 2. 1 byte in buffer
FAULT	<ol style="list-style-type: none"> 1. Character selection error 2. Carrier error 3. SLCT OFF 4. PE 5. RE 6. Cover open 7. DC 3 code input 	<ol style="list-style-type: none"> 1. SLCT ON
ALARM	<ol style="list-style-type: none"> 1. Character selection error 2. Carrier error 3. PE 4. RE 	<ol style="list-style-type: none"> 1. SLCT ON

(Note) No data accepted during BUSY.

(3) Interface Circuit

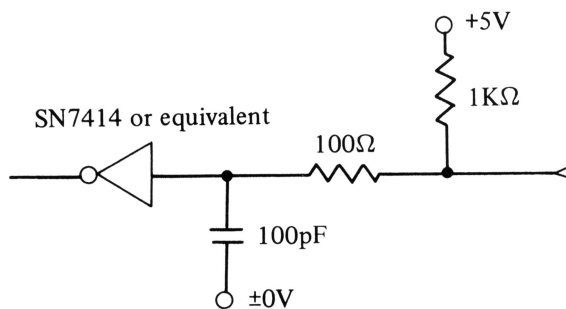
1) Driver circuit

$\overline{\text{ACKNLG}}$, BUSY , SLCT , $\overline{\text{FAULT}}$, PE

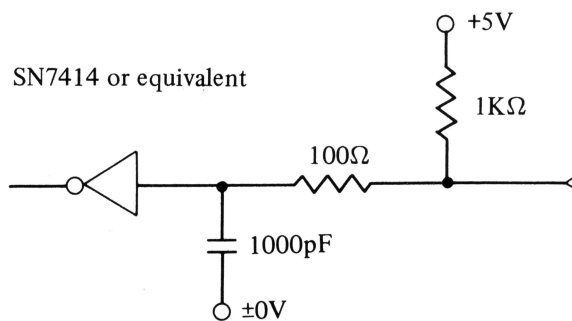


2) Receiver circuit

① D1 through D8



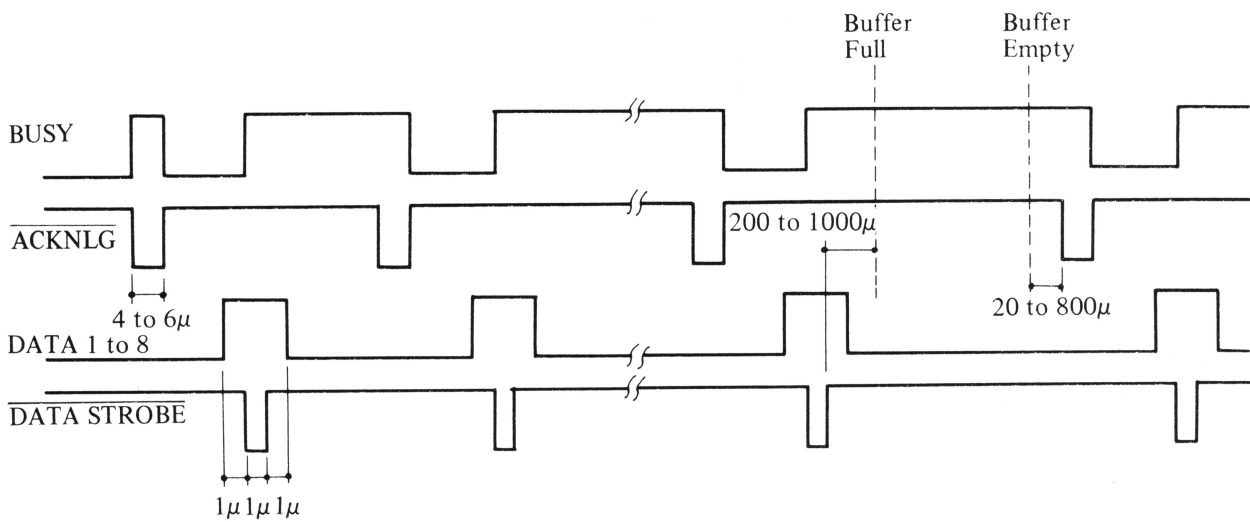
② $\overline{\text{DATA STROBE}}$, $\overline{\text{INPUT PRIME}}$



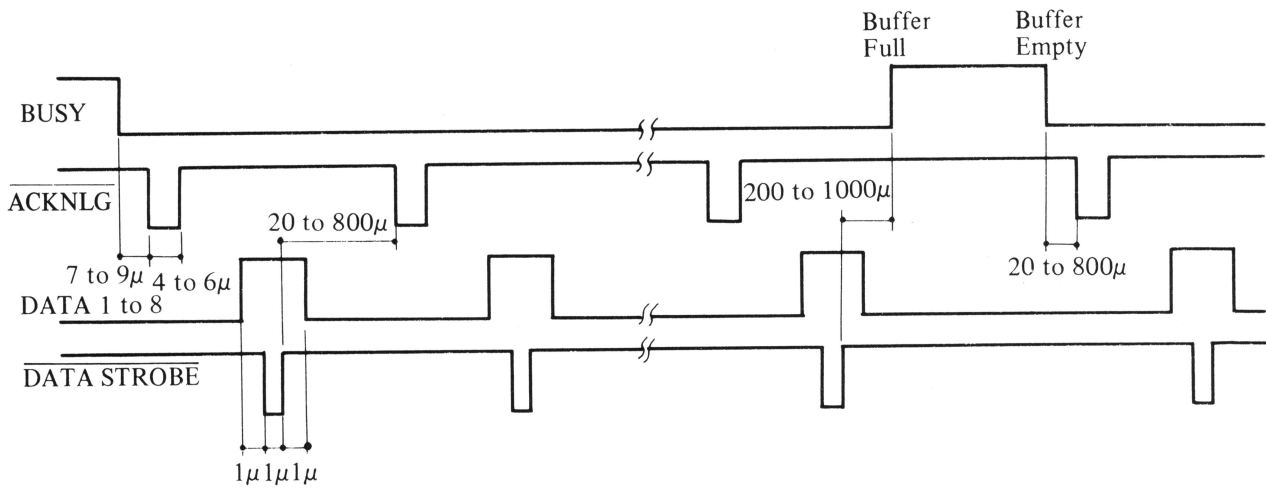
(4) Timing Chart

- * Standard specification (One Character Busy)
- * Option (One Line Busy)

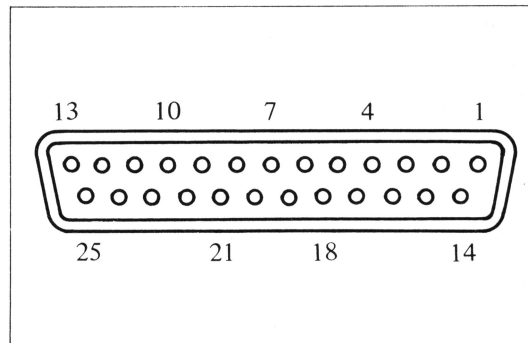
1) BUSY Signal (One character level)



2) BUSY Signal (One line level)



2. RS-232C Serial Interface



(1) Connector and Pin Configuration

Printer side: Amphenol (DDK) 17DB25S

Cable side: Amphenol (DDK) 17DB25P

Pin No.	Signal	Symbol	Controller, Printer	Remarks
1	Protective GND	FG	←→ (-)	
2	Transmitted Data	SD	← (output)	
3	Received Data	RD	→ (input)	
4	Request to Send	RS	← (output)	
5	Clear to Send	CS	→ (input)	
6	Data Set Ready	DR	→ (input)	
7	Signal GND	SG	←→ (-)	
8	Received Line Signal Detector	CD	→ (input)	
11	Secondary Request to Send	SCA	← (output)	
20	Data Terminal Ready	ER	← (output)	

Note: Protective GND is common to Signal GND.

(2) Explanation of Signals

1) Received Data (RD)

Data line transmitted from controller

2) Transmitted Data (SD)

Data line transmitted from printer to controller

3) Request to Send (RS)

Continuously "HIGH"

4) Clear to Send (CS)

When this line is "HIGH", DC1 and DC3 codes are output.

This line should always be kept "HIGH".

5) Data Set Ready (DR)

When this line is "HIGH", data are accepted.

6) Received Line Signal Detector (CD)

When this line is "HIGH", data are accepted.

7) Data Terminal Ready (ER)

Becomes "LOW" when printer is in busy condition.

8) Secondary Request to Send (SCA)

Becomes "HIGH" when printer is in busy condition.

(3) Standard Specification

1) Communication speed

110, 150, 300, 600, 1200, 2400, 4800, 9600 bauds

2) Synchronization

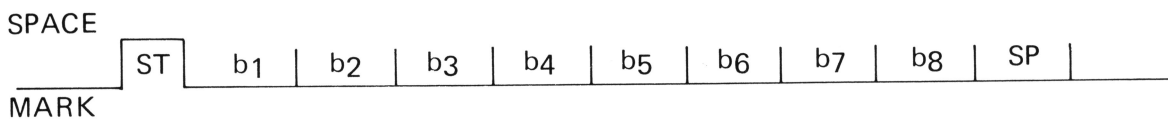
Start-stop

3) Communication control procedure

No procedure

4) Data format

10 bits/character



Beginning of character is the first movement (start bit) from MARK to SPACE. When there is no line data, MARK state is created.

ST : Start bit

b1 to b7 : Data bits (LSB=b1)

b8 : Parity bit (8 data bit is MSB data.)

SP : Stop bit

5) Error print

Prints ASCII code 40H symbol when vertical parity error, framing error or over-run error occurs.

(4) Signal Level

Logic	Normal voltage	Receiving-end voltage
MARK (OFF)	-12V	Less than -3V
SPACE (ON)	+12V	More than +3V

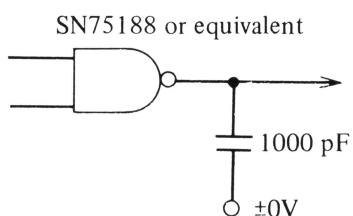
(5) Set/reset Conditions of SLCT, BUSY, and ALARM Status

Status	Set Condition	Reset Condition
SLCT	<ol style="list-style-type: none"> 1. DC 1 code input 2. SELECT switch ON 	<ol style="list-style-type: none"> 1. Cover open 2. DC 3 code input 3. PE, RE 4. Character selection error 5. Carrier error 6. SELECT switch OFF
BUSY	<ol style="list-style-type: none"> 1. SLCT OFF 2. PE, RE 3. 128 bytes in buffer 	<ol style="list-style-type: none"> 1. SLCT ON 2. Remainder of buffer becomes 256 bytes 3. Cancellation of PE, RE
ALARM	<ol style="list-style-type: none"> 1. Character selection error 2. Carrier error 3. PE, RE 	<ol style="list-style-type: none"> 1. SLCT ON 2. Cancellation of PE, RE

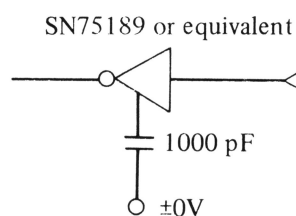
Note: Data is accepted even during BUSY. But after buffer is full, acceptance of data is not guaranteed.

(6) Driver/receiver Circuit

1) Driver circuit

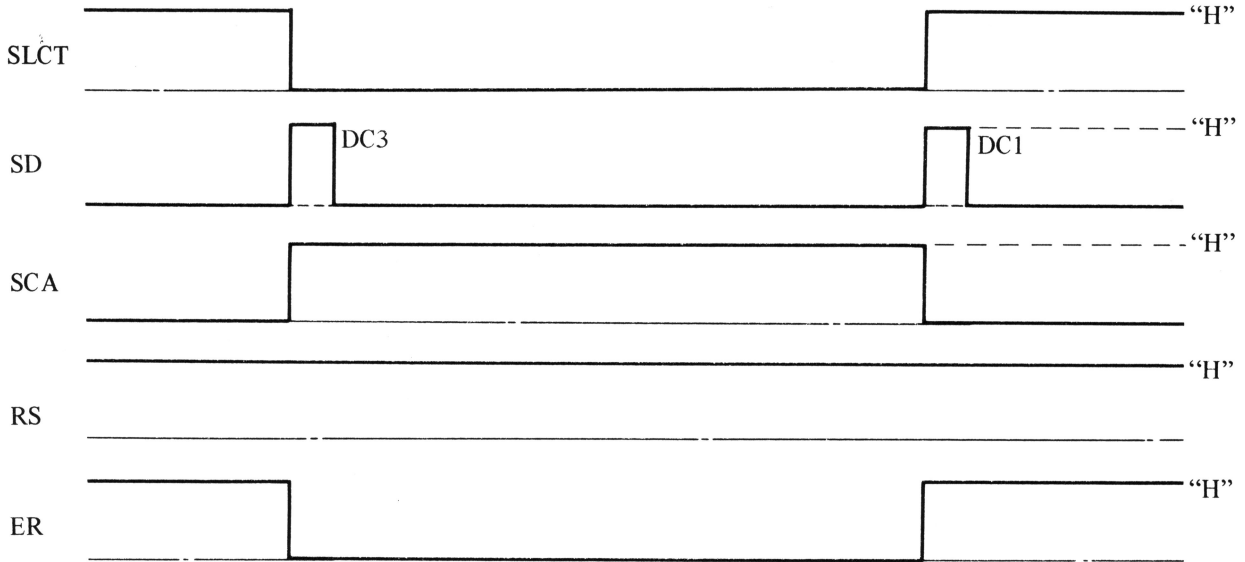


2) Receiver circuit



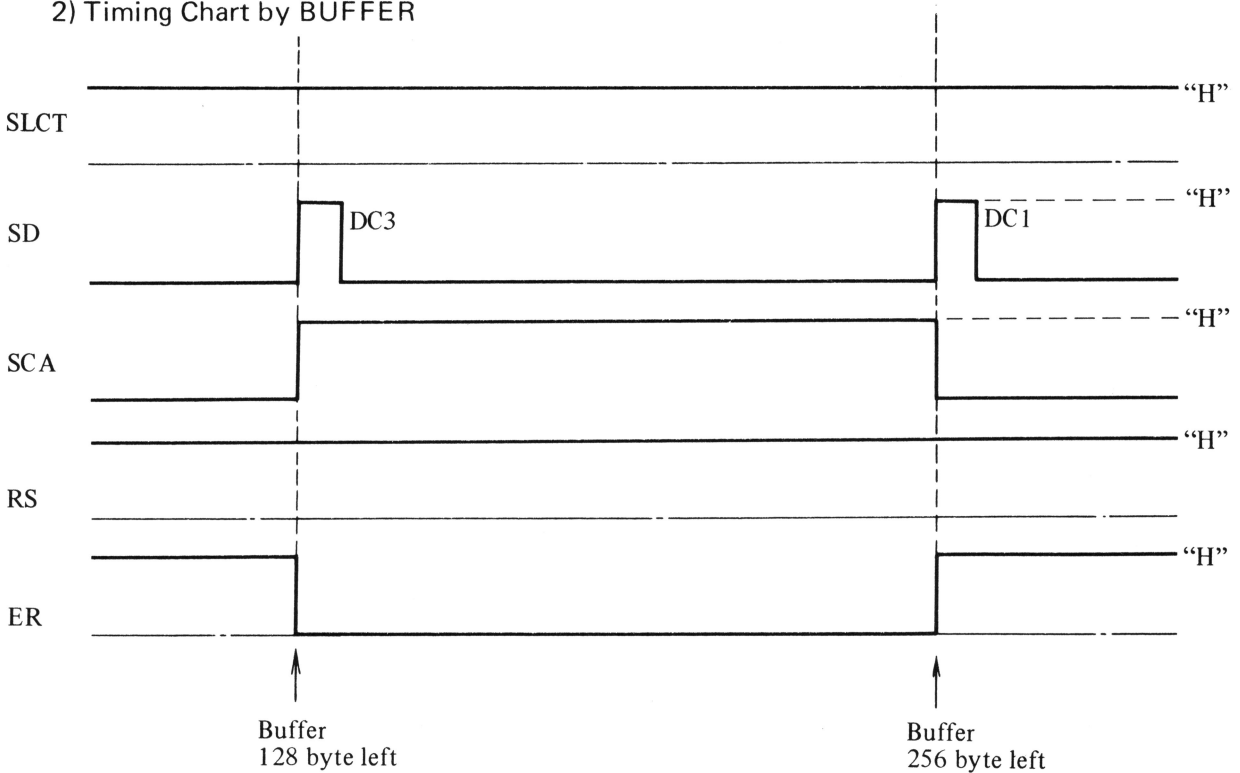
(7) Timing Chart

1) Timing Chart by SLCT



- ① SLCT → "L" In case of: PRINTER ERROR
COVER OPEN
SELECT SW. "OFF"
DC3 code input
- ② SLCT → "H" When above conditions are cancelled.

2) Timing Chart by BUFFER



Troubleshooting


If the printer is malfunctioning, check the following points.

Trouble	Probable Cause	Corrective Step
Ribbon does not move smoothly.	<ul style="list-style-type: none"> • Ribbon twisted or not set correctly. 	<ul style="list-style-type: none"> • Set ribbon correctly. (Refer to page 13.)
Printer does not operate at all.	<ul style="list-style-type: none"> • Power cord not connected. • Paper caught. • Fuse blown. 	<ul style="list-style-type: none"> • Connect power cord to power outlet. • Set ON/OFF switch to OFF and carefully remove caught paper. Before ON/OFF switch is set to ON, check condition of ribbon. • Check to see that when ON/OFF switch is at ON, display lamp is ON. If lamp is OFF, replace fuse.
Power is ON and data are transmitted, but printer does not print.	<ul style="list-style-type: none"> • Cable between input device and printer not connected. • Printer in Deselect state. • Daisy wheel not in position. 	<ul style="list-style-type: none"> • Check to see that connectors at both ends of data input cable have been properly connected. • Push SELECT switch. • Set daisy wheel.







If, after the above checks, the printer is still malfunctioning, call your dealer.

Test Printing (self printing)

The self test enables you to test the printing function of the printer without connecting with the CPU.

- 1) Set the ON/OFF switch to ON.
- 2) Set paper.
- 3) Set the ON/OFF switch to OFF.
- 4) While pushing the SELECT switch (), set the ON/OFF switch to ON. The printer will start test printing.
- 5) Set the ON/OFF switch to OFF to stop test printing.

Notes:

- (1) The  ,  ,  ,  ,  and  switches are disabled during test printing.
- (2) If ribbon end (RE) or paper end (PE) is detected during test printing, the printing will stop. In this case, set the ON/OFF switch to OFF and replace the ribbon cassette with a new one or set a new sheet of paper. (Refer to page 13.)

Daisy Printer Supplies

Daisy Wheel

Daisy wheels currently available are defined in Daisy Wheel List by Reorder No.

Daisy Wheel List

Type Destination	PICA 10	PRESTIGE 1012	ELITE 12	SCRIPT 1012	GRANDE 10	QUADRO 1012
American English	401 - 02	402 - 02	403 - 02	405 - 02	408 - 02	409 - 02
German	401 - 08	402 - 08	403 - 08	405 - 08	408 - 08	409 - 08
U. K. English	409 - 14	402 - 14	403 - 14	405 - 14	408 - 14	409 - 14
French	401 - 20	402 - 20	403 - 20	405 - 20	408 - 20	409 - 20
American Spanish	401 - 27	402 - 27	403 - 27	405 - 27	408 - 27	409 - 27
Swiss German	401 - 36	402 - 36	403 - 36	405 - 36	408 - 36	409 - 36
Dutch	401 - 32	402 - 32	403 - 32	405 - 32		409 - 32
English(WP)						
Norwegian, Danish	401 - 70	402 - 70	403 - 70	405 - 70	408 - 70	409 - 70
Canadian (Bilingual)	401 - 16	402 - 16	403 - 16	405 - 16	408 - 16	409 - 16
Italian	401 - 52	402 - 52	403 - 52	405 - 52	408 - 52	409 - 52
Spanish		402 - 75		405 - 75	408 - 75	409 - 75
Swedish, Finnish	401 - 60	402 - 60	403 - 60	405 - 60	408 - 60	409 - 60
Portuguese		402 - 64		405 - 64		409 - 64
ASCII	401 - 97	402 - 97	403 - 97			
International		452 - 95				

QUADRO 15	BROUGHAM 10	BROUGHAM 12	PRESTIGE ITALIC 1012	OCR-B 10	SYMBOL 10	ANELIA PS	LORI PS
410 - 02	411 - 02	412 - 02	414 - 02	415 - 02		418 - 02	420 - 02
410 - 08	411 - 08	412 - 08	414 - 08	415 - 08		418 - 08	420 - 08
410 - 14	411 - 14	412 - 14	414 - 14	415 - 14		418 - 14	420 - 14
410 - 20	411 - 20	412 - 20	414 - 20	415 - 20		418 - 20	420 - 20
410 - 27	411 - 27	412 - 27	414 - 27	415 - 27		418 - 27	420 - 27
410 - 36	411 - 36	412 - 36	414 - 36	415 - 36		418 - 36	420 - 36
410 - 32	411 - 32	412 - 32	414 - 32	415 - 32		418 - 32	420 - 32
	411 - 99	412 - 99					
410 - 70	411 - 70	412 - 70	414 - 70	415 - 70		418 - 70	420 - 70
410 - 16	411 - 16	412 - 16	414 - 16	415 - 16		418 - 16	420 - 16
410 - 52	411 - 52	412 - 52	414 - 52	414 - 52		418 - 52	420 - 52
410 - 75	411 - 75		414 - 75			418 - 75	420 - 75
410 - 60	411 - 60	412 - 60	414 - 60	415 - 60		418 - 60	420 - 60
410 - 64			414 - 64	415 - 64		418 - 64	420 - 64
410 - 97	411 - 97	412 - 97				418 - 97	420 - 97
460 - 95	461 - 95				492 - 95	468 - 95	470 - 95

Printer Maintenance and Precautions

To assure trouble-free operation for an extended period, please observe the following precautions.

- Cleaning operations should be limited to brushing away dust from externally visible areas.
Avoid using water, alcohol, thinner and other organic solvents.
- Do not place anything on the printer.
- Do not allow anything to fall in the machine.
Metallic objects such as pins and clips, if allowed to fall in the machine, could cause trouble.
- Do not install the printer in a place exposed to the direct sun, or near an object generating high temperatures, or in a place subject to vibration.
- Place the printer in a level position.
- Do not touch the surface of the printing portion by hand.
- A blown fuse should be replaced with a fuse of the same rating.

Specifications

Print speed	24 cps. max.	20 cps. (Shannon text, pica pitch)
Daisy wheel characters	96 Cassette type easy to change	
Daisy wheel life	10 million characters	
Characters/line	132 characters (1/10") 158 characters (1/12") 198 characters (1/15")	
Forms width	16.5" max. (Cut sheets)	
Copy función	1 original (45 kg) + 4 copies (15 kg)	
Carrier movement	Bidirectional shortest printing logic seeking	
Carrier return speed	1000 ms max. (13.2" return)	
Paper feed speed	3 ips	
Line spacing	6, 4, 3 lines/inch	
Ribbon	Cassette type	
Interface	Centronics parallel, RS-232C serial	
Switch panel	Lamps: POWER, SELECT, ALARM, LINE SELECT, PITCH SELECT, COPY Switches: SEL, LF, TOF, LINE, PITCH, COPY	
Noise	65 dB (A-scale 1m) or less	
Temperature	10° to 40°C (during operation)	
Humidity	20 to 80% (during operation) No dew condensation to be tolerated	
Buffer memory	3K OPTION 5K	
Overall dimensions	538 mm wide, 385 mm deep, 194.5 mm high	
Weight	13.7 kg	

The styling and specifications are subject to change without notice, as changes may be made to improve performance.

Options

The following options are available.

1. Tractor unit
2. Cut sheet feeder unit

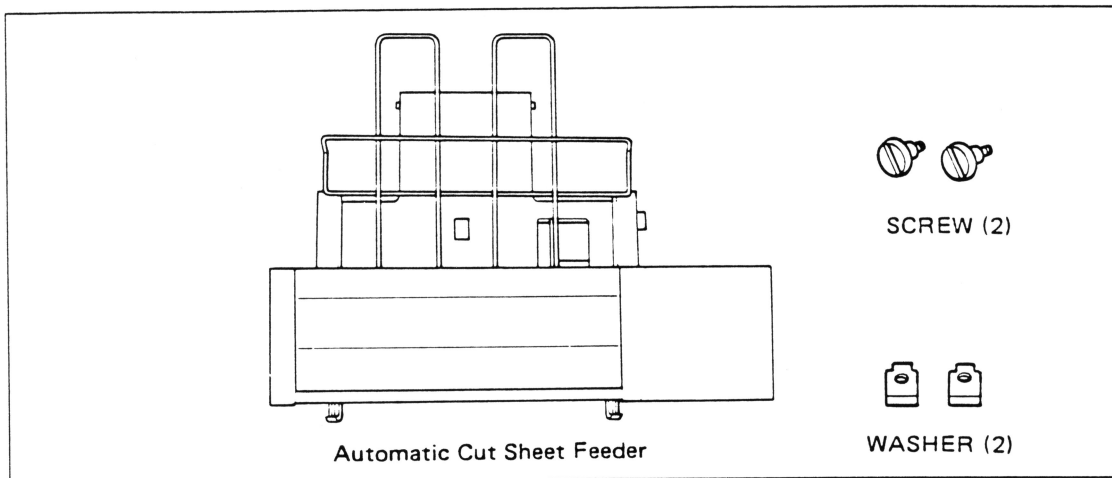
Optional items

1. Color ribbon
2. Daisy wheel

- Functional Comparison between Standard Specification and Tractor Unit and Cut Sheet Feeder Unit Specifications

	Standard Specification	Cut Sheet Feeder Unit Specification	Tractor Unit Specification
Function of TOP OF FORM switch	<ol style="list-style-type: none"> 1. When this switch is pushed, the paper bail will automatically open, paper will be fed to the predetermined position [about 30 mm (1.2 in.) from the top end of paper], and the paper bail will automatically close. 2. When this switch is pushed again after the end of printing, paper will be discharged. 	When this switch is pushed, the existing sheet of paper will be discharged, the paper bail will automatically open, a new sheet of paper will be fed to the predetermined position, and the paper bail will automatically close.	When this switch is pushed, paper will be fed to the TOP OF FORM position of the next page.
FF (OC) code	<ol style="list-style-type: none"> 1. When this code is received, the paper bail will automatically open, paper will be fed to the predetermined position [about 30 mm (1.2 in.) from the top end of paper], and the paper bail will automatically close. 2. When this code is received again after the end of printing, paper will be discharged. 	On reception of this code, the existing sheet of paper will be discharged, the paper bail will automatically open, a new sheet of paper will be fed to the predetermined position, and the paper bail will automatically close.	When this code is received, paper will be advanced to the TOP OF FORM position of the next page.
Paper end (PE) detection	/	The paper end detection takes place if there is no sheet left in cut sheet feeder when a sheet of paper is inserted in printer.	Detected when there is only small amount of paper left.

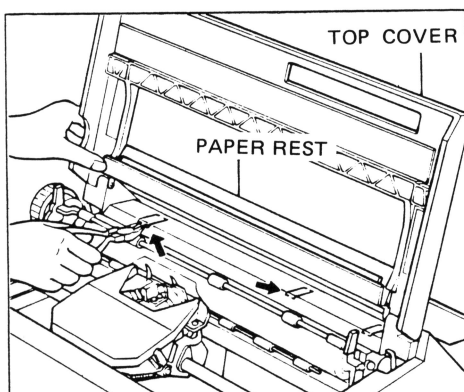
Automatic Cut Sheet Feeder



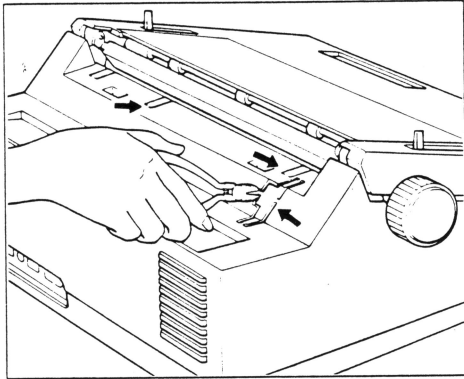
Specification

Applicable paper-width	A 4 (JIS) 210mm × 297mm	B 5 182 × 257mm
Capacity of paper	max. 150 sheets (within the scale of paper-guide)	
Weight of Paper	60 – 90g/ m ²	
Body dimension (after installed)	(W) 429mm (H) 298mm (D) 232mm	
Body weight	3.2kg	

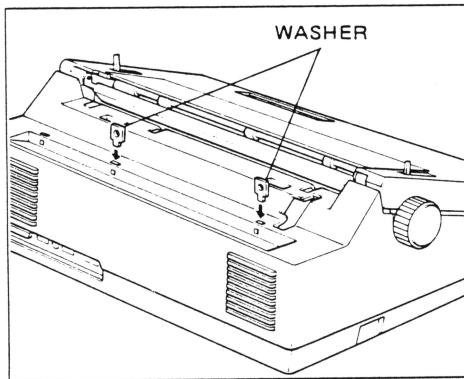
Installation



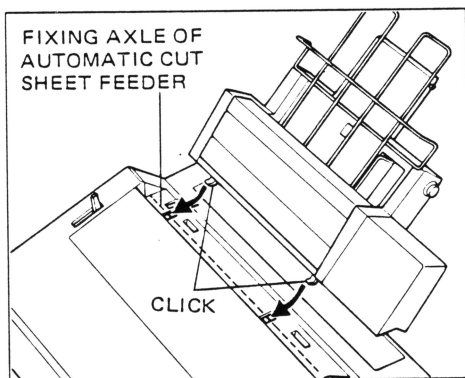
- 1) Turn the printer power supply OFF, and disconnect the plug.
- 2) Take the paper-support off and open the top-cover. Stand the paper-rest and cut off the 2 places of cover shown in Fig., with a nipper or such like.



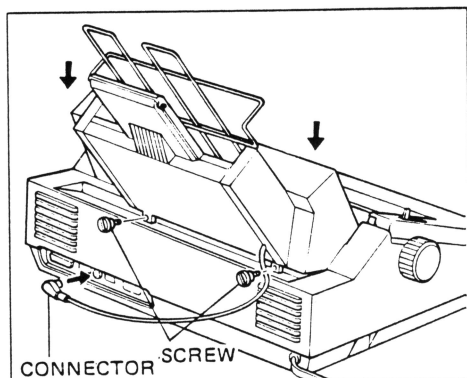
- 3) Put the paper-rest back and close the top-cover.
Cut off a portion of the cover as shown in Fig.
* When cutting off, use with something like cellophane tape not to drop these cut pieces into the inside cover.



- 4) Insert washers for fixing into 2 places.
* Make the convex part of washer downward.

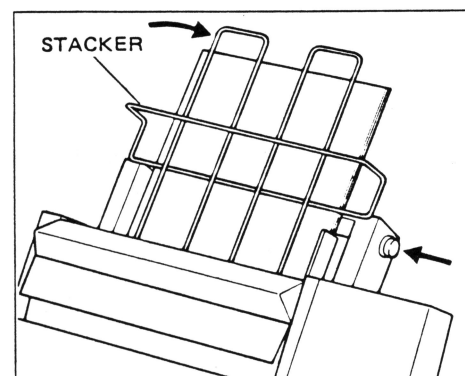
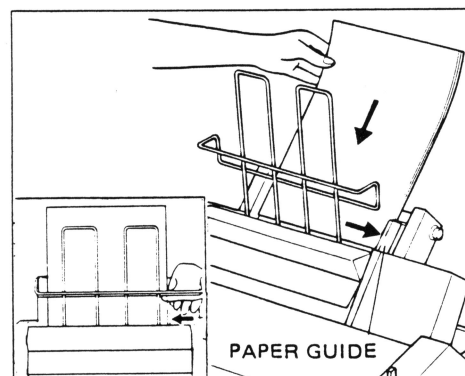
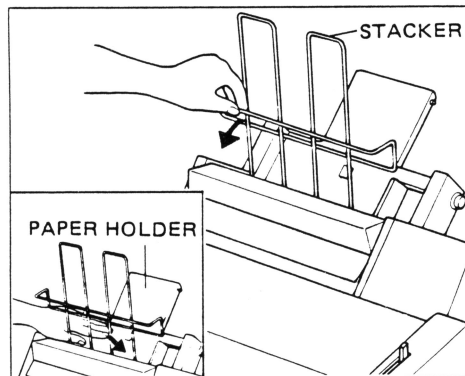
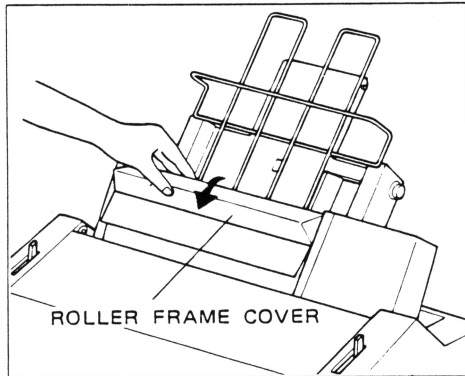


- 5) Secure with clicks (2 places) at the fixing axle of Automatic Cut Sheet Feeder.



- 6) Hold down lightly toward the arrow direction, and secure with 2 pcs of screw.
On doing this, check if Automatic Cut Sheet Feeder gears with the machine's firmly, by turning the platen round.
After then, insert the Connector.

Setting of paper






- 1) Turn the power supply switch ON.
- 2) Open the roller frame cover until it reaches the stopper toward your body side.
- 3) Give a pull at the stacker inward.
Check the status if locked, by pushing the center of paper-holder.
- 4) Move the paper-guide rightward and set paper.
* On setting of paper, unfasten it enough.
* Be carefull not to set too much of paper over the scale line of paper-guide.
- 5) As shown in Fig., put paper slightly at the left edge of the cover body and set the paper-guide to meet its right edge.
* Make sure that paper is touching at the left edge.
- 6) Set the stacker back to the first position, and push the button at right side of the side-cover.
Paper-holder is unlocked, and setting of paper is finished.

Operation

● Procedure of Automatic Paper Supply

On operation with Switch Panel:

- 1) Turn the printer power supply switch ON.
- 2) Set paper in Automatic Cut Sheet Feeder.
- 3) Depress SELECT switch () to make the mode in DESELECT.
- 4) By depressing TOP-OF-FORM switch (), paper is supplied automatically to the printer side from Automatic Cut Sheet Feeder.
- 5) After finish of printing, by depressing TOP-OF-FORM switch () again under DESELECT mode, paper is ejected and new paper is supplied automatically.



On operation with Computer:

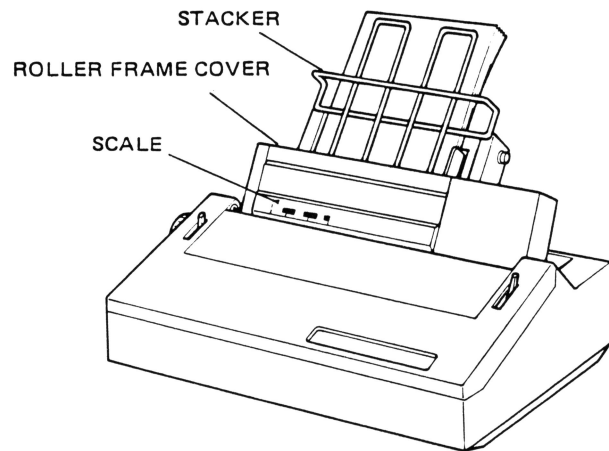
- 1) Turn the printer switch ON.
- 2) Set paper in Automatic Cut Sheet Feeder.
- 3) Make the mode of printer in SELECT.
- 4) Send FF of the control code to the printer.
After ejection of paper, paper is supplied automatically to the printer side from Automatic Cut Sheet Feeder.
- 5) After finish of printing, by sending FF of the control code to the printer, paper is ejected and new paper is supplied automatically.

● Cut-in operation

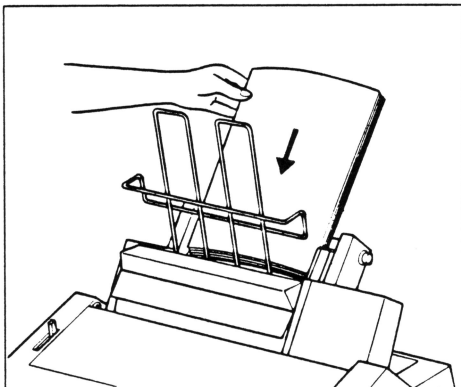
Cut-in operation is very easy.

If in need of using any different size of paper instead the present running paper in the machine, it is not necessary to remove Automatic Cut Sheet Feeder at all.

- 1) Make the mode in DESELECT.
- 2) Lay down the roller frame cover backward.
- 3) By depressing TOP-OF-FORM switch (), eject paper from the platen.
- 4) Take out printed paper from the stacker.
- 5) Set paper in the printer.
- 6) In need of using the same Line-Form as Automatic Cut Sheet Feeder's, set paper to meet at the scale below the roller frame cover.
- 7) Depress TOP-OF-FORM switch (), and set paper.

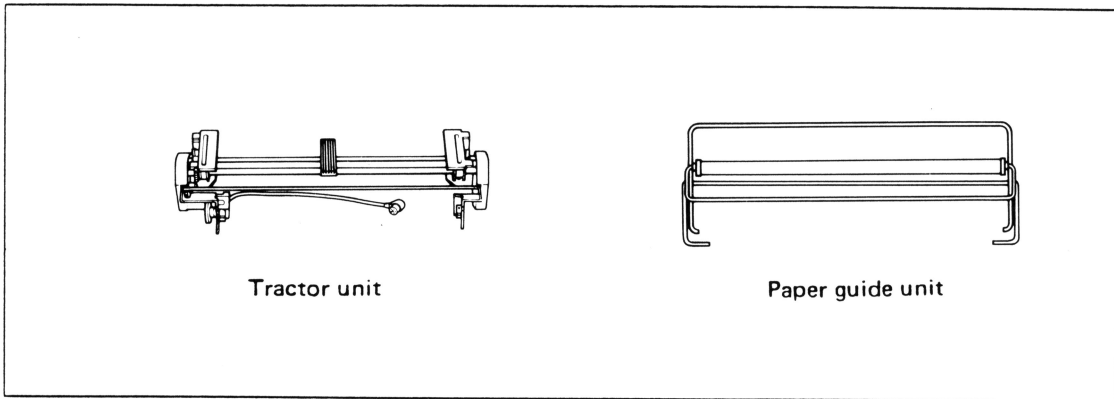


Caution on use



- 1) On use of this model, be sure to use the Acoustic cover.
- 2) Do not leave paper in paperholder for an extended period of time.
- 3) On paper warping
If paper for use is warped, correct the warping or insert paper in the direction as shown in Fig.

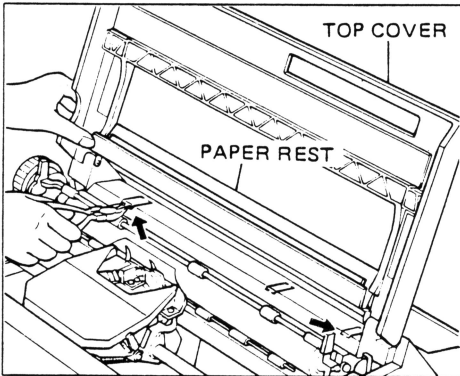
Tractor Feeder



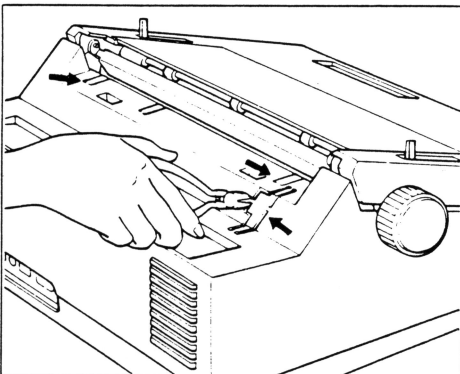
Specifications

Papers Applicable	Width	Max. 15"
	Thickness	0.35mm or less
Paper Feed		Pull-up System Reverse Direction of Paper Feed: Applicable
Paper Empty (PE) Switch		Equipped

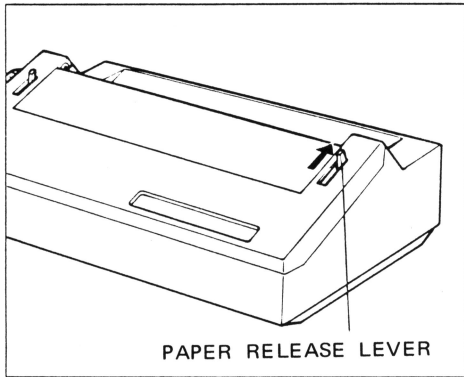
Installation



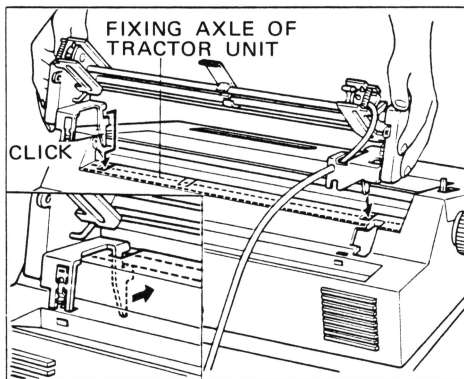
- 1) Turn the power supply switch of the machine OFF, and disconnect the electric plug. Take the paper support off and open the top-cover. Stand the paper-rest and cut off the 2 places of the cover shown in Fig., with a nipper or such like.



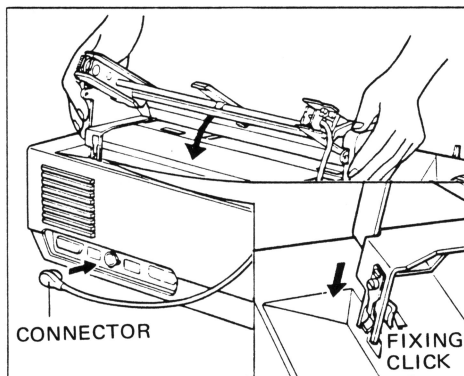
- 2) Put the paper-rest back and close the top-cover. Cut off a portion of the cover as shown in Fig.
* When cutting off use with something like cellophane-tape not to drop these cut pieces into the inside cover.



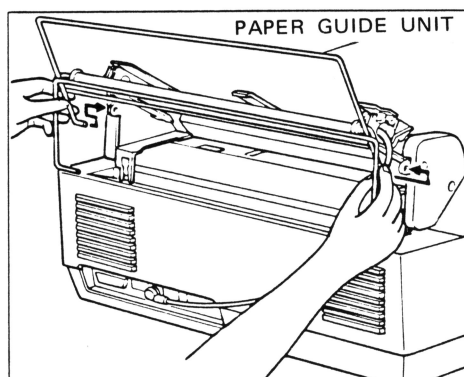
3) Push the paper release lever backward.



4) Secure with clicks (2 places) at the fixing axle of the tractor unit.

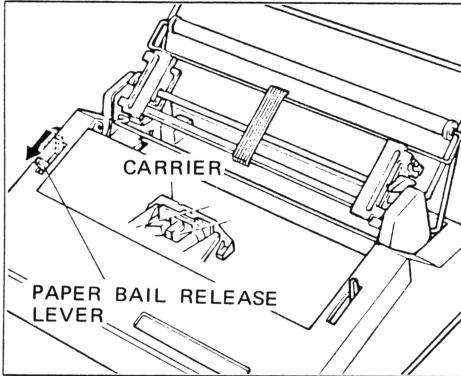


5) Set the fixing clicks of tractor unit into holes of the printer. (2 places)
Then, insert the connector.

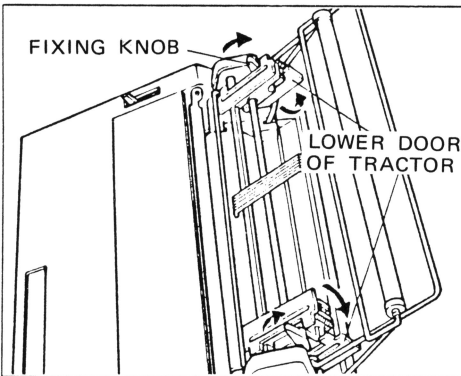


6) Set the paper guide unit to the mounting holes of tractor unit, spreading the both ends a bit.

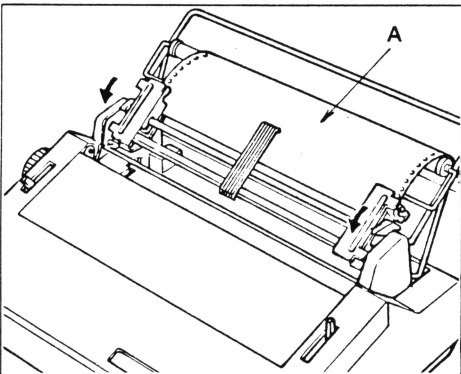
Setting of paper



- 1) Let the carrier travel to the center, and pull the paper bail release lever inward.
 - * On carrier's traveling, be sure to turn the power OFF.



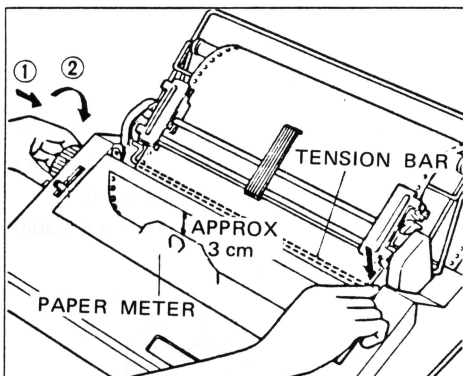
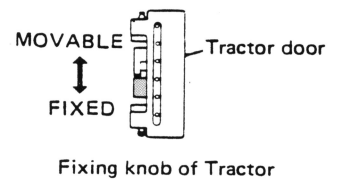
- 2) Open the lower door of tractor, and lift the fixing knob up.



- 3) Set the paper to the lower door of tractor from the back side of printer, through part-A of paper guide unit (in the Fig.). Then, put the fixing knob down.

* Set the paper in parallel so that the feed holes can fit in order.

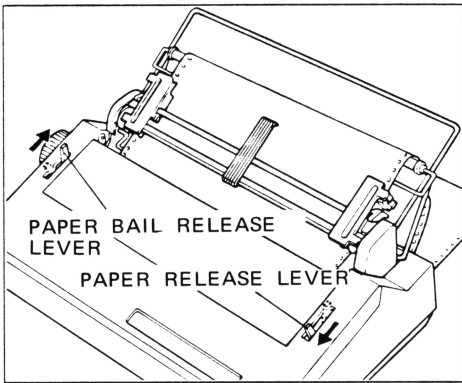
* Adjust the position of tractor not to become too loose and tight for paper.



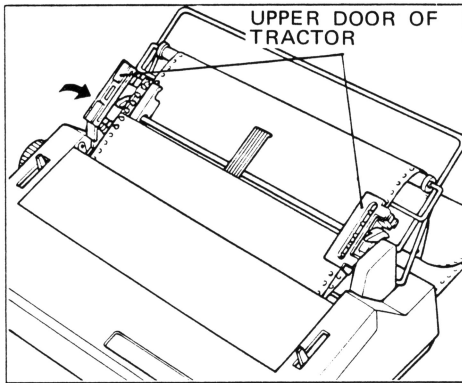
- 4) Press the tension bar down with fingers, and turn the platen knob, while pressing.

Pull the top of the paper out approximately 3 cm from the paper meter.

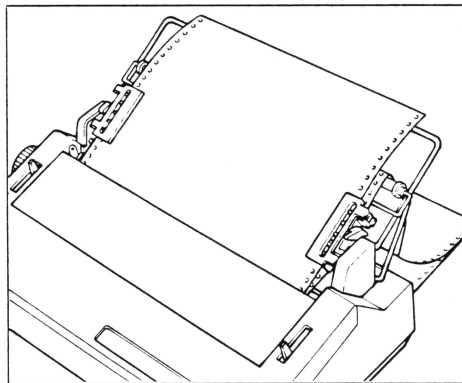
* Paper should be set over the tension bar.



- 5) Pull the paper release lever inward, and push the paper bail release lever backward.



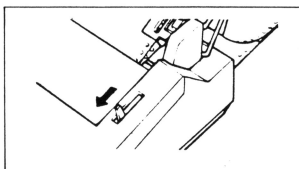
- 6) Feed and set the paper to the upper-door of tractor.



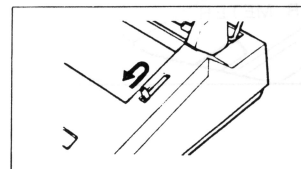
- 7) Also, feed the paper up to the appointed printing position.

Caution on use

When using the tractor, be sure to pull the paper release lever inward.
(Otherwise, it can cause abnormal paper feeding trouble.)



When the tractor is reset, be sure to use the tractor, after switching the paper release lever forward and backward.
(Otherwise, it can cause abnormal paper feeding trouble.)



Code Table by Language Group

b ₈ ---	0 0	0 0 0 0 0 0
b ₇ ---	0 0	0 0 1 1 1 1
b ₆ ---	0 0	1 1 0 0 1 1
b ₅ ---	0 1	0 1 0 1 0 1
b ₄ b ₃ b ₂ b ₁	0 1	2 3 4 5 6 7
0 0 0 0	0	€ 0 @ P ` p
0 0 0 1	1 DC1	! 1 A Q a q
0 0 1 0	2	" 2 B R b r
0 0 1 1	3 DC3	# 3 C S c s
0 1 0 0	4	\$ 4 D T d t
0 1 0 1	5	% 5 E U e u
0 1 1 0	6	& 6 F V f v
0 1 1 1	7 BEL	' 7 G W g w
1 0 0 0	8 BS CAN	(8 H X h x
1 0 0 1	9 H T	) 9 I Y i y
1 0 1 0	A L F	* : J Z j z
1 0 1 1	B V T ESC	+ ; K [k {
1 1 0 0	C F F	, < L \ l |
1 1 0 1	D C R	- = M] m }
1 1 1 0	E RS	. > N ^ n ~
1 1 1 1	F US	/ ? O _ o `

b ₈ ---	0 0	0 0 0 0 0 0
b ₇ ---	0 0	0 0 1 1 1 1
b ₆ ---	0 0	1 1 0 0 1 1
b ₅ ---	0 1	0 1 0 1 0 1
b ₄ b ₃ b ₂ b ₁	0 1	2 3 4 5 6 7
0 0 0 0	0	€ 0 @ P ° p
0 0 0 1	1 DC1	! 1 A Q a q
0 0 1 0	2	" 2 B R b r
0 0 1 1	3 DC3	# 3 C S c s
0 1 0 0	4	\$ 4 D T d t
0 1 0 1	5	% 5 E U e u
0 1 1 0	6	& 6 F V f v
0 1 1 1	7 BEL	' 7 G W g w
1 0 0 0	8 BS CAN	(8 H X h x
1 0 0 1	9 H T	) 9 I Y i y
1 0 1 0	A L F	* : J Z j z
1 0 1 1	B V T ESC	+ ; K [k ¼
1 1 0 0	C F F	, < L ± l ½
1 1 0 1	D C R	- = M] m ¶
1 1 1 0	E RS	. > N ' n §
1 1 1 1	F US	/ ? O _ o `

ASCII

AMERICAN ENGLISH

b ₈ ---	0 0	0 0 0 0 0 0
b ₇ ---	0 0	0 0 1 1 1 1
b ₆ ---	0 0	1 1 0 0 1 1
b ₅ ---	0 1	0 1 0 1 0 1
b ₄ b ₃ b ₂ b ₁	0 1	2 3 4 5 6 7
0 0 0 0	0	μ 0 § P ` p
0 0 0 1	1 DC1	! 1 A Q a q
0 0 1 0	2	" 2 B R b r
0 0 1 1	3 DC3	# 3 C S c s
0 1 0 0	4	\$ 4 D T d t
0 1 0 1	5	% 5 E U e u
0 1 1 0	6	& 6 F V f v
0 1 1 1	7 BEL	' 7 G W g w
1 0 0 0	8 BS CAN	(8 H X h x
1 0 0 1	9 H T	) 9 I Y i y
1 0 1 0	A L F	* : J Z j z
1 0 1 1	B V T ESC	+ ; K Ä k ä
1 1 0 0	C F F	, ' L Ö l ö
1 1 0 1	D C R	- = M Ü m ü
1 1 1 0	E RS	. ' N ° n ß
1 1 1 1	F US	/ ? O _ o `

b ₈ ---	0 0	0 0 0 0 0 0
b ₇ ---	0 0	0 0 1 1 1 1
b ₆ ---	0 0	1 1 0 0 1 1
b ₅ ---	0 1	0 1 0 1 0 1
b ₄ b ₃ b ₂ b ₁	0 1	2 3 4 5 6 7
0 0 0 0	0	€ 0 @ P ½ p
0 0 0 1	1 DC1	° 1 A Q a q
0 0 1 0	2	" 2 B R b r
0 0 1 1	3 DC3	£ 3 C S c s
0 1 0 0	4	\$ 4 D T d t
0 1 0 1	5	% 5 E U e u
0 1 1 0	6	& 6 F V f v
0 1 1 1	7 BEL	' 7 G W 8 w
1 0 0 0	8 BS CAN	(8 H X h x
1 0 0 1	9 H T	) 9 I Y i y
1 0 1 0	A L F	* : J Z j z
1 0 1 1	B V T ESC	+ ; K [k ¼
1 1 0 0	C F F	, ¾ L ± l ½
1 1 0 1	D C R	- = M] m °
1 1 1 0	E RS	. ÷ N ⅔ n '
1 1 1 1	F US	/ ? O _ o `

GERMAN

ENGLISH (U.K.)

Table 1

b ₈ ---	0 0	0 0 0 0 0 0
b ₇ ---	0 0	0 0 1 1 1 1
b ₆ ---	0 0	1 1 0 0 1 1
b ₅ ---	0 1	0 1 0 1 0 1
b ₄ b ₃ b ₂ b ₁	0 1	2 3 4 5 6 7
0 0 0 0	0	¼ 0 à P ± P
0 0 0 1	1	! 1 A Q a q
0 0 1 0	2	" 2 B R b r
0 0 1 1	3	Fr 3 C S c s
0 1 0 0	4	\$ 4 D T d t
0 1 0 1	5	% 5 E U e u
0 1 1 0	6	& 6 F V f v
0 1 1 1	7	' 7 G W g w
1 0 0 0	8	(8 H X h x
1 0 0 1	9	) 9 I Y i y
1 0 1 0	A	* : J Z j z
1 0 1 1	B	+ ; K ° k é
1 1 0 0	C	, ' L ç l ù
1 1 0 1	D	- = M § m è
1 1 1 0	E	. ' N ^ n ..
1 1 1 1	F	/ ? O _ ½

b ₈ ---	0 0	0 0 0 0 0 0
b ₇ ---	0 0	0 0 1 1 1 1
b ₆ ---	0 0	1 1 0 0 1 1
b ₅ ---	0 1	0 1 0 1 0 1
b ₄ b ₃ b ₂ b ₁	0 1	2 3 4 5 6 7
0 0 0 0	0	[0 ± P ' p
0 0 0 1	1	! 1 A Q a q
0 0 1 0	2	" 2 B R b r
0 0 1 1	3	# 3 C S c s
0 1 0 0	4	\$ 4 D T d t
0 1 0 1	5	% 5 E U e u
0 1 1 0	6	& 6 F V f v
0 1 1 1	7	' 7 G W g w
1 0 0 0	8	(8 H X h x
1 0 0 1	9	) 9 I Y i y
1 0 1 0	A	* : J Z j z
1 0 1 1	B	+ ; K i k °
1 1 0 0	C	, ' L Ñ l ñ
1 1 0 1	D	- = M ÿ m '
1 1 1 0	E	. ' N ^ n ..
1 1 1 1	F	/ ? O _ o]

FRENCH

AMERICAN SPANISH

b ₈ ---	0 0	0 0 0 0 0 0
b ₇ ---	0 0	0 0 1 1 1 1
b ₆ ---	0 0	1 1 0 0 1 1
b ₅ ---	0 1	0 1 0 1 0 1
b ₄ b ₃ b ₂ b ₁	0 1	2 3 4 5 6 7
0 0 0 0	0	| 0 @ P ° P
0 0 0 1	1	! 1 A Q a q
0 0 1 0	2	" 2 B R b r
0 0 1 1	3	# 3 C S c s
0 1 0 0	4	\$ 4 D T d t
0 1 0 1	5	% 5 E U e u
0 1 1 0	6	& 6 F V f v
0 1 1 1	7	' 7 G W g w
1 0 0 0	8	(8 H X h x
1 0 0 1	9	) 9 I Y i y
1 0 1 0	A	* : J Z j z
1 0 1 1	B	+ ; K [k §
1 1 0 0	C	, < L © l ¶
1 1 0 1	D	- = M] m †
1 1 1 0	E	. > N © n ¶
1 1 1 1	F	/ ? O _ =

b ₈ ---	0 0	0 0 0 0 0 0
b ₇ ---	0 0	0 0 1 1 1 1
b ₆ ---	0 0	1 1 0 0 1 1
b ₅ ---	0 1	0 1 0 1 0 1
b ₄ b ₃ b ₂ b ₁	0 1	2 3 4 5 6 7
0 0 0 0	0	¾ 0 ñ P ' p
0 0 0 1	1	! 1 A Q a q
0 0 1 0	2	" 2 B R b r
0 0 1 1	3	£ 3 C S c s
0 1 0 0	4	\$ 4 D T d t
0 1 0 1	5	% 5 E U e u
0 1 1 0	6	& 6 F V f v
0 1 1 1	7	' 7 G W g w
1 0 0 0	8	(8 H X h x
1 0 0 1	9	) 9 I Y i y
1 0 1 0	A	* : J Z j z
1 0 1 1	B	+ ; K ° k ¼
1 1 0 0	C	, ' L ± l ij
1 1 0 1	D	- = M f m ½
1 1 1 0	E	. ' N ^ n ..
1 1 1 1	F	/ ? O _ o '

AMERICAN ENGLISH W.P.

DUTCH

Table 2

b ₈ ---	0	0	0	0	0	0	0	
b ₇ ---	0	0	0	0	1	1	1	
b ₆ ---	0	0	1	1	0	0	1	
b ₅ ---	0	1	0	1	0	1	0	
b ₄ b ₃ b ₂ b ₁	0	1	2	3	4	5	6	7
0 0 0 0	0		0	0	P	·	P	
0 0 0 1	1	DC1	!	1	A	Q	a	q
0 0 1 0	2		"	2	B	R	b	r
0 0 1 1	3	DC3	#	3	C	S	c	s
0 1 0 0	4		\$	4	D	T	d	t
0 1 0 1	5		%	5	E	U	e	u
0 1 1 0	6		&	6	F	V	f	v
0 1 1 1	7	BEL	'	7	G	W	g	w
1 0 0 0	8	BS CAN	(	8	H	X	h	x
1 0 0 1	9	H T	)	9	I	Y	i	y
1 0 1 0	A	L F	x	:	J	Z	j	z
1 0 1 1	B	V T ESC	+	;	K	½	k	°
1 1 0 0	C	F F	,	°	L	Ñ	l	ñ
1 1 0 1	D	C R	-	=	M	¿	m	ç
1 1 1 0	E	RS	.	a	N	^	n	ˆ
1 1 1 1	F	US	/	?	O	_	o	ˆ

S. SPANISH

b ₈ ---	0	0	0	0	0	0	0	
b ₇ ---	0	0	0	0	1	1	1	
b ₆ ---	0	0	1	1	0	0	1	
b ₅ ---	0	1	0	1	0	1	0	
b ₄ b ₃ b ₂ b ₁	0	1	2	3	4	5	6	7
0 0 0 0	0		0	0	Š	P	·	P
0 0 0 1	1	DC1	!	1	A	Q	a	q
0 0 1 0	2		"	2	B	R	b	r
0 0 1 1	3	DC3	£	3	C	S	c	s
0 1 0 0	4		\$	4	D	T	d	t
0 1 0 1	5		%	5	E	U	e	u
0 1 1 0	6		&	6	F	V	f	v
0 1 1 1	7	BEL	'	7	G	W	g	w
1 0 0 0	8	BS CAN	(	8	H	X	h	x
1 0 0 1	9	H T	)	9	I	Y	i	y
1 0 1 0	A	L F	*	:	J	Z	j	z
1 0 1 1	B	V T ESC	+	;	K	°	k	à
1 1 0 0	C	F F	,	[	L	ç	l	ò
1 1 0 1	D	C R	-	=	M	é	m	è
1 1 1 0	E	RS	.	]	N	^	n	ì
1 1 1 1	F	US	/	?	O	_	o	ˆ

ITALIAN

b ₈ ---	0	0	0	0	0	0	0	
b ₇ ---	0	0	0	0	1	1	1	
b ₆ ---	0	0	1	1	0	0	1	
b ₅ ---	0	1	0	1	0	1	0	
b ₄ b ₃ b ₂ b ₁	0	1	2	3	4	5	6	7
0 0 0 0	0		0	0	Š	P	·	P
0 0 0 1	1	DC1	é	1	A	Q	a	q
0 0 1 0	2		"	2	B	R	b	r
0 0 1 1	3	DC3	#	3	C	S	c	s
0 1 0 0	4		\$	4	D	T	d	t
0 1 0 1	5		%	5	E	U	e	u
0 1 1 0	6		&	6	F	V	f	v
0 1 1 1	7	BEL	'	7	G	W	g	w
1 0 0 0	8	BS CAN	(	8	H	X	h	x
1 0 0 1	9	H T	)	9	I	Y	i	y
1 0 1 0	A	L F	*	:	J	Z	j	z
1 0 1 1	B	V T ESC	+	;	K	[	k	¼
1 1 0 0	C	F F	,	<	L	±	l	½
1 1 0 1	D	C R	-	=	M	]	m	°
1 1 1 0	E	RS	.	>	N	^	n	ç
1 1 1 1	F	US	/	?	O	_	o	ˆ

CANADIAN

b ₈ ---	0	0	0	0	0	0	0			
b ₇ ---	0	0	0	0	1	1	1			
b ₆ ---	0	0	1	1	0	0	1			
b ₅ ---	0	1	0	1	0	1	0			
b ₄ b ₃ b ₂ b ₁	0	1	2	3	4	5	6	7		
0 0 0 0	0		0	0	Ÿ	0	Š	P	·	p
0 0 0 1	1	DC1	!	1	A	Q	a	q		
0 0 1 0	2		"	2	B	R	b	r		
0 0 1 1	3	DC3	£	3	C	S	c	s		
0 1 0 0	4		\$	4	D	T	d	t		
0 1 0 1	5		%	5	E	U	e	u		
0 1 1 0	6		&	6	F	V	f	v		
0 1 1 1	7	BEL	'	7	G	W	g	w		
1 0 0 0	8	BS CAN	(	8	H	X	h	x	
1 0 0 1	9	H T	)	9	I	Y	i	y	
1 0 1 0	A	L F	*	:	J	Z	j	z		
1 0 1 1	B	V T ESC	+	;	K	ˆ	k	'		
1 1 0 0	C	F F	,	°	L	¿	l	ç		
1 1 0 1	D	C R	-	=	M	Ç	m	ç		
1 1 1 0	E	RS	.	a	N	^	n	ˆ		
1 1 1 1	F	US	/	?	O	_	o	ˆ		

PORTUGUESE

Table 3

b ₈ →	b ₇ →	b ₆ →	b ₅ →	0	0	0	0	0	0	0	0	
b ₄ b ₃ b ₂ b ₁	0	1	2	3	4	5	6	7				
0 0 0 0	0		“	0	β	P	`	p				
0 0 0 1	1	DC1	!	1	A	Q	a	q				
0 0 1 0	2		"	2	B	R	b	r				
0 0 1 1	3	DC3	£	3	C	S	c	s				
0 1 0 0	4		\$	4	D	T	d	t				
0 1 0 1	5		§	5	E	U	e	u				
0 1 1 0	6		&	6	F	V	f	v				
0 1 1 1	7	BEL	'	7	G	W	g	w				
1 0 0 0	8	BS CAN	(	8	H	X	h	x				
1 0 0 1	9	H T	)	9	I	Y	i	y				
1 0 1 0	A	L F	*	:	J	Z	j	z				
1 0 1 1	B	V T ESC	+	;	K	≡	k	#				
1 1 0 0	C	F F	,	|	L	Ñ	l	ñ				
1 1 0 1	D	C R	-	=	M	¿	m	ç				
1 1 1 0	E	RS	.	i	N	>	n	o				
1 1 1 1	F	US	/	?	O	-	o	ÿ				

INTERNATIONAL

b ₈ →	b ₇ →	b ₆ →	b ₅ →	0	0	0	0	0	0	0	0	
b ₄ b ₃ b ₂ b ₁	0	1	2	3	4	5	6	7				
0 0 0 0	0		×	0	^	ℓ	∫	ρ				
0 0 0 1	1	DC1	⊗	1	∇	Γ	α	γ				
0 0 1 0	2		∩	2	∞	Θ	β	θ				
0 0 1 1	3	DC3	∴	3	Ψ	Σ	ψ	σ				
0 1 0 0	4		±	4	Φ	→	φ	τ				
0 1 0 1	5		∫	5	←	≡	ε	ξ				
0 1 1 0	6		÷	6	<	α	>	x				
0 1 1 1	7	BEL	∩	7	Λ	Δ	λ	δ				
1 0 0 0	8	BS CAN	√	8	Π	≡	η	χ				
1 0 0 1	9	H T	|	9	↑	T	ι	υ				
1 0 1 0	A	L F	•	∩	∏	≈	π	ζ				
1 0 1 1	B	V T ESC	,	∩	§	†	κ	{				
1 1 0 0	C	F F	'	∩	Ω	∩	ω	}				
1 1 0 1	D	C R	=	∩	∂	∩	μ	≅				
1 1 1 0	E	RS	'	∩	∂	∩	ν	≥				
1 1 1 1	F	US	∩	∩	∩	∩	ο	©				

SYMBOL

Table 4

9705

292-0276

brother

Sep. 1983

Printed in Japan 59450001 (E)