Canon

PARALLEL INTERFACE-30

English Edition

Introduction

This booklet provides instructions on the installation and operating conditions of the Canon Serial I/F-30.

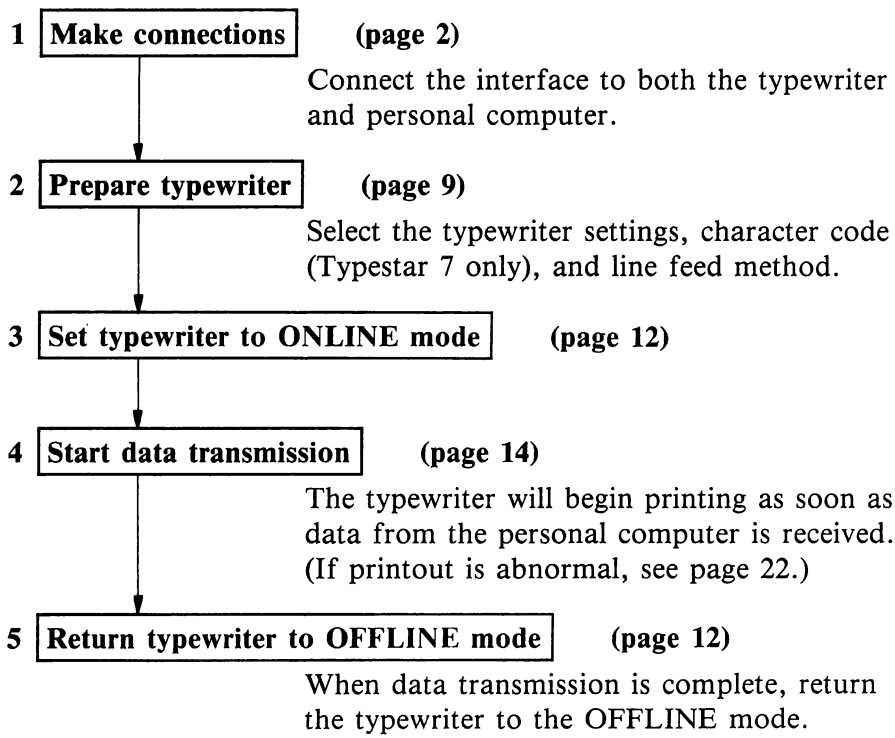
This interface can be used to connect Canon's S-15, S-16 and Typestar 7 electronic typewriters to a personal computer to enable them to be used as a line printer for high-quality printouts.

- *This interface is to be used under the same operating conditions as Canon's electronic typewriters.*
- *See the operation manual provided with the typewriter for instructions on its use.*
- *The typewriter character set determines what characters can be printed out, and it may not necessarily match the character set of the personal computer. If printout is not normal, the cause may be differences in the respective character sets.*
- *The cable and connectors needed to connect this interface with a personal computer is not provided. The necessary cable with connectors can be purchased commercially, or the cable and connectors purchased separately, and the cable wired according to the wiring diagrams in this manual.*

Contents

Data Transfer Procedure

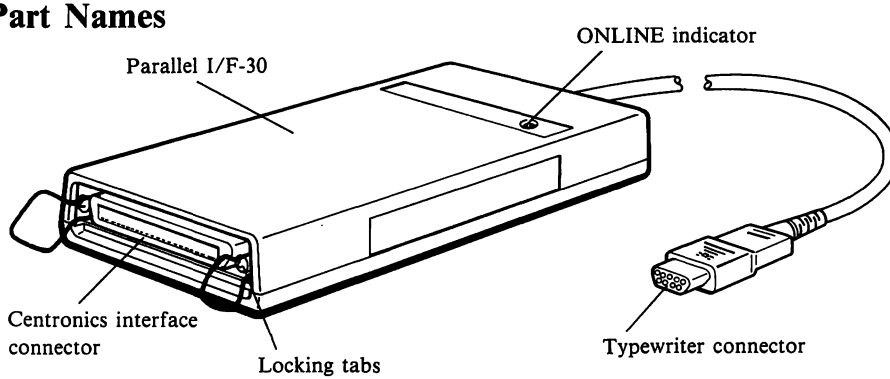
The procedure for data transfer, from connections to actual data transmission, is summarized below. For details, refer to the page noted in parentheses at the end of each step.



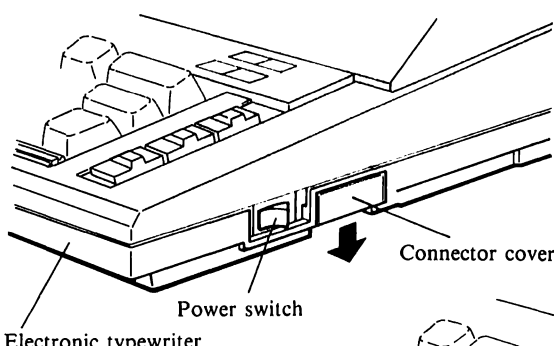
Connections

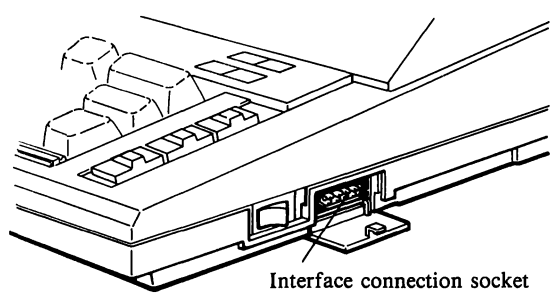
Connectors and Indicators

Part Names



- The socket for the typewriter connector is located on the right side of the typewriter and is protected by a cover. To open, press on the cover and then push down gently.





Controls and Connections

- **ONLINE Indicator**
  The ONLINE indicator lights when the typewriter is in the online mode.

- **Centronics Interface Connector**
  Connect the interface to the parallel interface connector on the personal computer with a cable for use with 36-pin parallel interface connectors. After attaching the connectors, secure them with the locking tabs.
  - *See pages 4 to 5 for an explanation of the pin functions.*

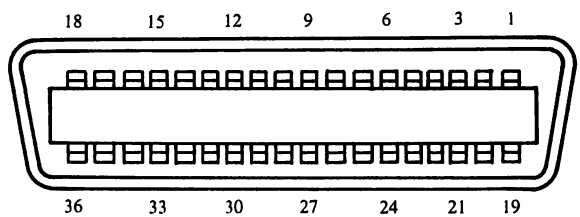
- **Typewriter Connector**
  Plug the typewriter connector into the interface connection socket on the typewriter (see page 2).
  - *Make sure the power switch of the typewriter is turned off before connecting it to the interface.*

Centronics Interface Connector

The Parallel I/F-30 is provided with a Centronics-type connector that permits it to be connected to a personal computer with the same type of cable used to connect a printer. The signal assignments for the terminals of Centronics-type interface connectors are usually the same from one computer to another, but there are some exceptions. Check the signal assignments below to be sure that connections will be made correctly.

- *See the operation manual of the personal computer for a diagram of the signal assignments of the parallel interface connector on the computer.*

Connector Signal Assignments

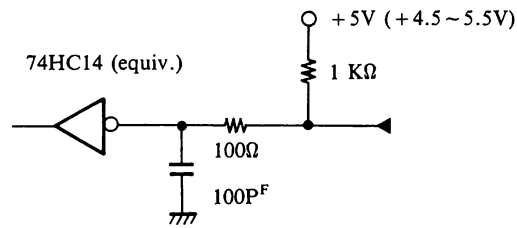


Pin No.	Signal	Direction	Function
1	$\overline{\text{DATA STROBE}}$	←	Input synchronization signal for data read (DATA 1 - 8). Normally HIGH, becomes LOW to read data.
2 3 4 5 6 7 8 9	DATA 1 DATA 2 DATA 3 DATA 4 DATA 5 DATA 6 DATA 7 DATA 8	←	Input for data bits 1 through 8. HIGH when bit is 1, LOW when bit is 0.

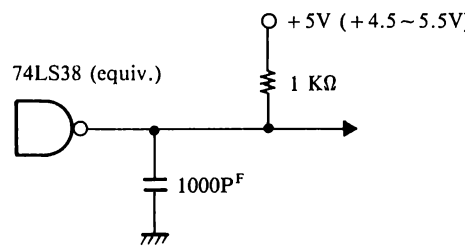
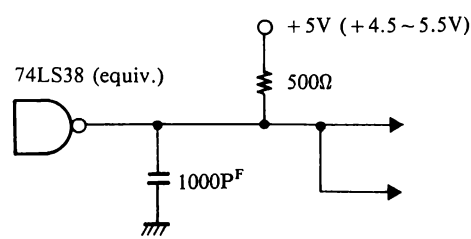
Pin No.	Signal	Direction	Function
10	$\overline{\text{ACKNOWLEDGE}}$	→	Signal to computer to verify reception of data and indicate that interface is ready to receive more data. Normally HIGH.
11	BUSY	→	When HIGH, indicates that reception is not possible. When LOW, indicates that reception is possible.
12	0 V (PE)	→	PAPER END signal. Always 0 V; not used for paper end detection.
13	SELECT	→	When HIGH, indicates that interface is online (selected) and ready to receive.
14	0 V	→	Ground terminal
15	N.C.	—	Not used
16 17	0 V	→	Ground terminal
18	N.C.	–	Not used
19 〜 30	TWISTED PAIR GND (0 V)	—	Twisted pair return signal. Pin nos. 19 - 30 are paired with Pin nos. 1 - 12.
31	N.C.	—	Not used
32	$\overline{\text{FAULT}}$	→	Becomes LOW and stops reception if interface malfunctions.
33	0 V	—	Ground terminal
34 ~ 36	N.C.	—	Not used

Interface Configuration

- **Input Circuit**

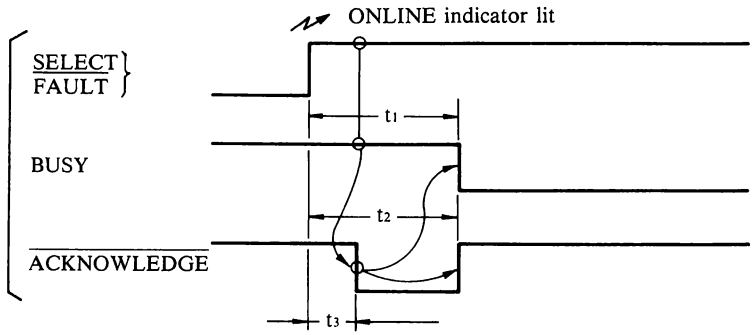
Signal	Circuit
DATA 1 DATA 2 DATA 3 DATA 4 DATA 5 DATA 6 DATA 7 DATA 8 $\overline{\text{DATA STROBE}}$	

- **Output Circuit**

Signal	Circuit
BUSY $\overline{\text{ACKNOWLEDGE}}$	
SELECT $\overline{\text{FAULT}}$	

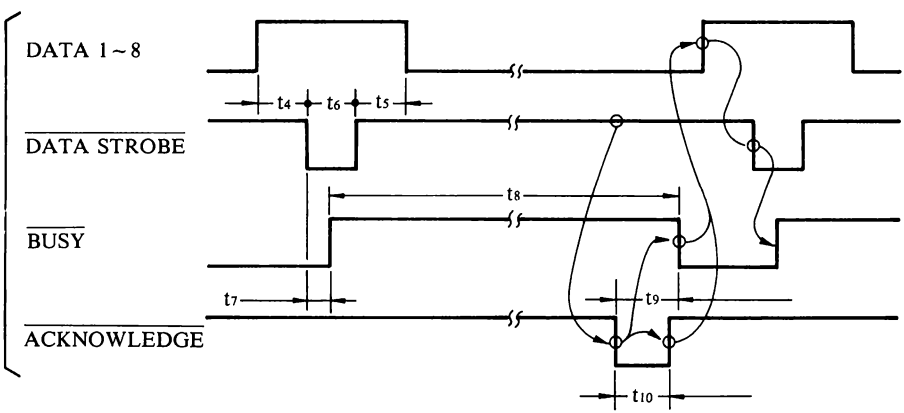
Timing Chart

- **Switch to online mode**



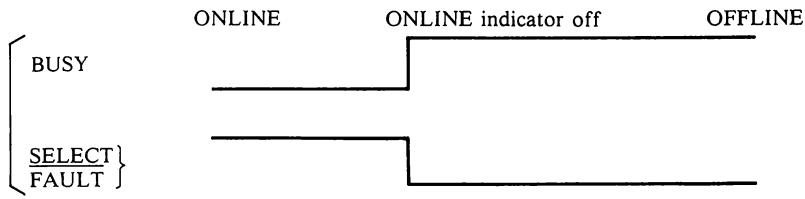
$t_1, t_2 = 15 \sim 30\mu s$
$t_3 = 5 \sim 15\mu s$

- **Data reception**

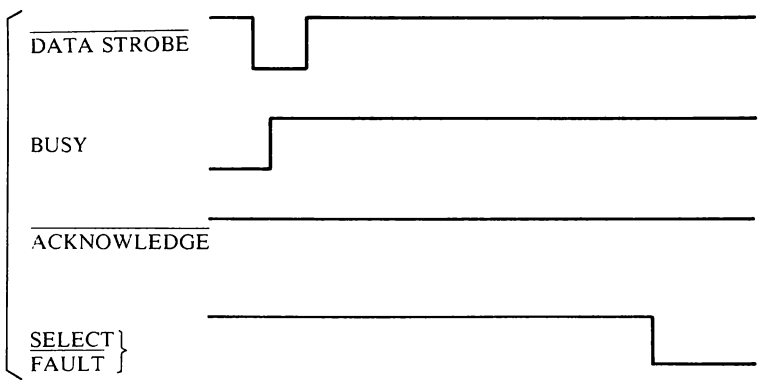


t_4, t_5 = Min. 500*ns*
$t_6 = 500ns \sim 500\mu s$
$t_7 = 200ns \sim 1\mu s$
t_8 = Min. 8.3*ms*
$t_9, t_{10} = 5 \sim 15\mu s$

- **Switch to offline mode while waiting for signal**



- **Switch to offline mode during data reception**



Preparing the Typewriter

Typewriter Settings

The characteristics of the printout produced by the typewriter depend on the typewriter settings. Select the desired settings on the typewriter before switching the typewriter to the online mode. See your typewriter instruction manual for instructions on how to make the various settings shown below.

- **Left margin, Right margin**
- **Tab**
- **Line pitch**
- **Typestyle**
- **Character pitch**
  On the Typestar 7, the character pitch is automatically set for the typestyle chosen. On the S-15 and S-16, the character pitch should be set appropriately for the daisy wheel used.
- **Print mode**
  The print mode on the Typestar 7 is automatically set to normal print. For the S-15 and S-16, the setting must be made manually.

  - ***Settings for items other than the above will be ignored.***

Character Codes/Line Feed Method

- When this interface is used with the Typestar 7, you can choose between the ASCII and LOCAL character code settings. (The initial setting is for the ASCII character code.) The setting for the S-15 and S-16 is factory preset and cannot be changed. Note also that the character codes for the S-15 and S-16 are different from those for the Typestar 7. (See pages 15-18 for character code tables.)

- When the CR code ($0D_H$) is received, you can choose between two types of line feed: a carrier return only (CR), or a carrier return plus line feed (CR/LF). (The initial setting is CR/LF.)

These settings will remain effective until changed. (The settings are retained in the memory when the power is turned off if dry batteries or the NiCd battery pack is installed, or the AC adapter is connected.

When using the S-15 or S-16

On the S-15, current settings are printed out, and on the S-16 they are shown on the display. When using the S-15, be sure to insert a sheet of paper before making settings.

1. Press the [CODE] key and then the [M] key.
   The message "BAUD RATE : 1200" will be printed out by the S-15 and shown on the S-16 display.

2. Press the [RETURN] key four times.
   The following will be printed out or displayed in order: BIT LENGTH : 7, PARITY BIT : EVEN, STOP BIT : 1. Then, CR CR/LF : CR/LF will be printed out or shown on the display. (It is not necessary to set BAUD RATE, BIT LENGTH, PARITY BIT, or STOP BIT.)

3. Each time the [BACKSPACE] key (or [←] and [→] keys on the S-16) is pressed, the line feed method setting will alternate between CR and CR/LF in the printout or on the display.

4. When the desired setting is printed out or shown on the display, press the [CODE] key to enter the setting.

When using the Typestar 7

1. Press the [CODE] key and then the [MODE] key.
   CODE : ASCII will appear on the display.

2. The character code setting shown on the display will alternate between LOCAL and ASCII each time the [←] or [→] key is pressed.

3. When the desired character code appears on the display, press the [RETURN] key five times.
   BAUD RATE : 1200, BIT LENGTH : 7, PARITY BIT : EVEN, and STOP BIT : 1 will be displayed in order, followed by CR CR/LF : CR/LF. (It is not necessary to set BAUD RATE, BIT LENGTH, PARITY BIT, or STOP BIT.)

4. The line feed method setting shown on the display will alternate between CR and CR/LF each time the [←] or [→] key is pressed.

5. When the desired setting appears on the display, press the [CODE] key.

ONLINE Mode and OFFLINE Mode

ONLINE Mode

- When the typewriter is in the online mode, the Parallel I/F-30 can receive data from the computer and print it out on the typewriter. Set the typewriter to the online mode for data transmission.

- The ONLINE indicator on the Parallel I/F-30 will light when it is ready to receive data when the typewriter is in the online mode. In addition, the message "ON LINE" will appear on the display of the S-16 and the Typestar 7.

OFFLINE Mode

- The typewriter can be used normally when it is in the offline mode.

- Communication parameters and typewriter settings must be made with the typewriter in the offline mode.

Switching Between ONLINE and OFFLINE Modes

Press the [CODE] key and then the [O] key.

- When the typewriter is in the online mode, the ONLINE indicator on the interface will light. On the S-16 and Typestar 7, the message "ON LINE" will appear on the display.

- When the typewriter is in the offline mode, the ONLINE indicator on the interface will be out, and the message "ON LINE" will be cleared from the display of the S-16 and Typestar 7.

- The typewriter can be switched between the online and offline modes by pressing [CODE] and then [O].

- *If you press* CODE *and* O *when the typewriter is not connected to the interface, an alarm will sound.*
- *You cannot switch between the online mode and offline mode during printing. Wait until printing has been completed, or interrupt printing, to switch to the offline mode.*
- *When the typewriter is switched from the offline to the online mode, the contents of the typewriter buffer are automatically cleared.*
- *The typewriter is in the offline mode when it is first turned on.*

Data Transfer

After connecting the interface, switch the typewriter to the online mode to start printing. Printing will be performed according to the character and control codes sent from the computer.

If the character codes you wish to send to the typewriter for printout are different from the codes listed in the character code tables, or if you wish to send control codes, a command to convert character codes to the actual characters for printout should be included in the program to be run on the computer.

- *For details on how to use a command to convert character codes into characters, see the operating instructions for the computer used.*

Character codes are expressed in hexadecimal notation. The two-digit representations for the characters in the character code tables are formed by placing the values (0 - 7) along the top of the table to the left of the values (0 - F) down the side of the table.

Example: In the ASCII character code table,
A is 41_H and k is $6B_H$

The letter H following the codes means they represent hexadecimal values.
In the hexadecimal number system, the letters A through F are used to represent the numbers 10 through 15.

Character Code Tables

Character Code Table for S-15 and S-16

	0	1	2	3	4	5	6	7
0			SP	0	´	P	`	p
1			!	1	A	Q	a	q
2			"	2	B	R	b	r
3			#	3	C	S	c	s
4			$	4	D	T	d	t
5			%	5	E	U	e	u
6			&	6	F	V	f	v
7	BEL		'	7	G	W	g	w
8	BS		(	8	H	X	h	x
9	HT		)	9	I	Y	i	y
A	LF		*	:	J	Z	j	z
B		ESC	+	;	K	¨	k	¢
C			,	SP	L	ç	l	¡
D	CR		-	=	M	¿	m	£
E			.	SP	N	ˆ	n	~
F			/	?	O	—	o	

Character Code Table for Typestar 7

- **ASCII Character Code Table**

If your personal computer uses the ASCII character codes, selecting the ASCII character code setting on the Typestar 7 will allow you to print out program listings and other data without having to make any character conversions.

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

- **LOCAL Character Code Table**
  The LOCAL character codes are used to print the characters shown on the Typestar 7 keyboard. When the LOCAL character codes are selected, the characters in the table below can be printed out.
  - *See page 19 for an explanation of the SO and SI codes.*

SO with 7-bit data bit length →											2	3	4	5	6	7
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	`	p			SP	°				
1			!	1	A	Q	a	q			¡	±	`	à		
2			"	2	B	R	b	r			¢	²	´	Ç		
3			#	3	C	S	c	s			£	³	^	è	a	
4			$	4	D	T	d	t			$		~	é		
5			%	5	E	U	e	u			¥			ì		
6			&	6	F	V	f	v			#	¶		ò		
7	BEL		'	7	G	W	g	w			§			ù		
8	BS		(	8	H	X	h	x					¨			
9	HT		)	9	I	Y	i	y			_					
A	LF		*	:	J	Z	j	z			|					
B		ESC	+	;	K	[	k	§							o	ß
C			,	<	L	¥	l	|				1/4				
D	CR		–	=	M	]	m	¶				1/2				
E	SO		.	>	N		n	~			ñ					
F	SI		/	?	O	_	o				Ñ	¿				

U.S.A. only

SO with 7-bit data bit length →											2	3	4	5	6	7
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	`	p			SP	°				
1			!	1	A	Q	a	q			¡		`	à		
2			"	2	B	R	b	r				2	´	Ç		
3			£	3	C	S	c	s			£	3	^	è	a	
4			$	4	D	T	d	t			$		~	é		
5			%	5	E	U	e	u						í		
6			&	6	F	V	f	v			#			ó		
7	BEL		'	7	G	W	g	w			§			ù		
8	BS		(	8	H	X	h	x					¨			
9	HT		)	9	I	Y	i	y			_			ℓ		
A	LF		*	:	J	Z	j	z			|					
B		ESC	+	;	K	[	k	{							o	ß
C			,	<	L	\	l	|				1/4		1/8		
D	CR		–	=	M	]	m	}				1/2				
E	SO		.	>	N	^	n	~			ñ					
F	SI		/	?	O	_	o				Ñ	¿			'n	

U.K. only

Control Codes

In addition to the character codes listed in the previous tables, the following control codes can also be used.
Upon receiving a control code, the typewriter will execute the corresponding function.

Control Code		Function
Code Name	Hex Code	
BEL	07_H	Bell tone (alarm)
BS	08_H	Backspace
HT	09_H	Horizontal tab
LF	$0A_H$	Line feed
CR	$0D_H$	Carrier return
SO	$0E_H$	Shift out
SI	$0F_H$	Shift in
ESC!	$1B_H 21_H$	Printing stop

- *Either CR or CR/LF can be chosen as the function corresponding to the CR code.*
- *The SO and SI control codes are effective only with the Typestar 7 in the LOCAL Character Code setting, and then only when the data bit length is 7 bits. The SO code works to shift the characters of the LOCAL character code table from columns A to F into columns 2 to 7 to create an expanded character set (see pages 16 and 17).*
  The SI code cancels the SO code.

Example: *Under the SO code:*
£ is 23_H and ¿ is $3F_H$

Printing Interrupt and Restart

Printing Interrupt

Printing is interrupted when:
1) the ESC! code is received.
2) the [⌫] key is pressed.

Printing Restart

- Printing restarts when the [RETURN] key is pressed.

Special Considerations

- Accents are printed out properly only when the Typestar 7 is set for LOCAL characters. In all other cases, accents will be printed out like any other character; it is not possible to overprint with an accent.

- If a meaningless code is received, it will be ignored and printing will continue unaffected. In addition, when the data bit length for the S-15 or S-16 is set for 8 bits, the high order bit will be ignored and the data will be treated as 7-bit data.

Typewriter Power Supply

If Batteries or NiCd Battery Pack Becomes Weak During Data Reception

If the typewriter batteries become weak during reception of data from the personal computer, the alarm will sound on the S-15 and S-16, and the display on the Typestar 7 or the S-16 will change to let you know that the batteries need replacing.

- When the batteries of the S-15 or S-16 become weak, an alarm will sound the same as when you use the machine as an ordinary typewriter. For an explanation of the alarm signals, see the operating instructions for the S-15 or S-16.
- When the batteries of the Typestar 7 become weak, the display will alternately show the message "ON LINE" and the battery change indicator symbols "□□□□."
- On the S-16, the display will alternate between the messages "ON LINE" and "LITHIUM □" to indicate that the lithium battery should be replaced.

When the batteries become weak, either replace the set of dry batteries, or recharge the NiCd battery pack. See the operating instructions for the typewriter for directions on how to change the batteries.

Changing the Batteries During Data Transfer

The contents of the buffer will be lost if the typewriter is stopped and the batteries replaced during data transfer. It is recommeded that the AC adapter be used to power the typewriter when it is used as a printer.

Abnormal Printout

- When the typewriter alarm sounds at the start of data transfer and printing cannot be executed, it is possible that the signal assignments of the connectors on the interface and personal computer do not match. Check to see that they are correctly matched.

- If characters differing from the transferred data are printed, check to see that the character codes for the computer and the typewriter are the same.

Specifications

Operating temperature :	10 - 35°C (50°F - 95°F)
Operating humidity :	20 - 85%
Power supply voltage :	3 - 12 V (D-sub 9-pin)
Power consumption :	480 mW max.

Specifications subject to change without notice.

FCC regulations

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 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 Commision helpful:
"How To Identify and Resolve Radio-TV Interference Problems".
This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock No. 004-000-00345-4.

* Use of shielded cable is required to comply with Class B limits of FCC rules.

NOTE

NOTE

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