CASIO FP-40

OWNER'S MANUAL

㊊ FC
FTZ

FOREWORD

Thank you for purchasing the CASIO FP-40 printer. This device is a compact printer designed for use with CASIO pocket computers, and features a built-in cassette interface. Be sure to read this manual carefully to fully enjoy all of the features and functions provided by this device. Also refer to the owner's manual of the computer for details on operation and programming.

IMPORTANT

The computer models that can be used with this device are listed below. Consult the owner's manual of your computer if its model name is not listed here.
PB-100, PB-100F, PB-110, PB-220, PB-410, PB-700, PB-770, FX-700P, FX-710P, FX-720P, FX-770P, FX-785P, FX-790P

* This device CANNOT be used with computer models PB-300, FX-750P, FX-802P, and FX-820P.
  This printer can also be used with computers equipped with Centronics standard interfaces by connecting the SB-43 interface pack.

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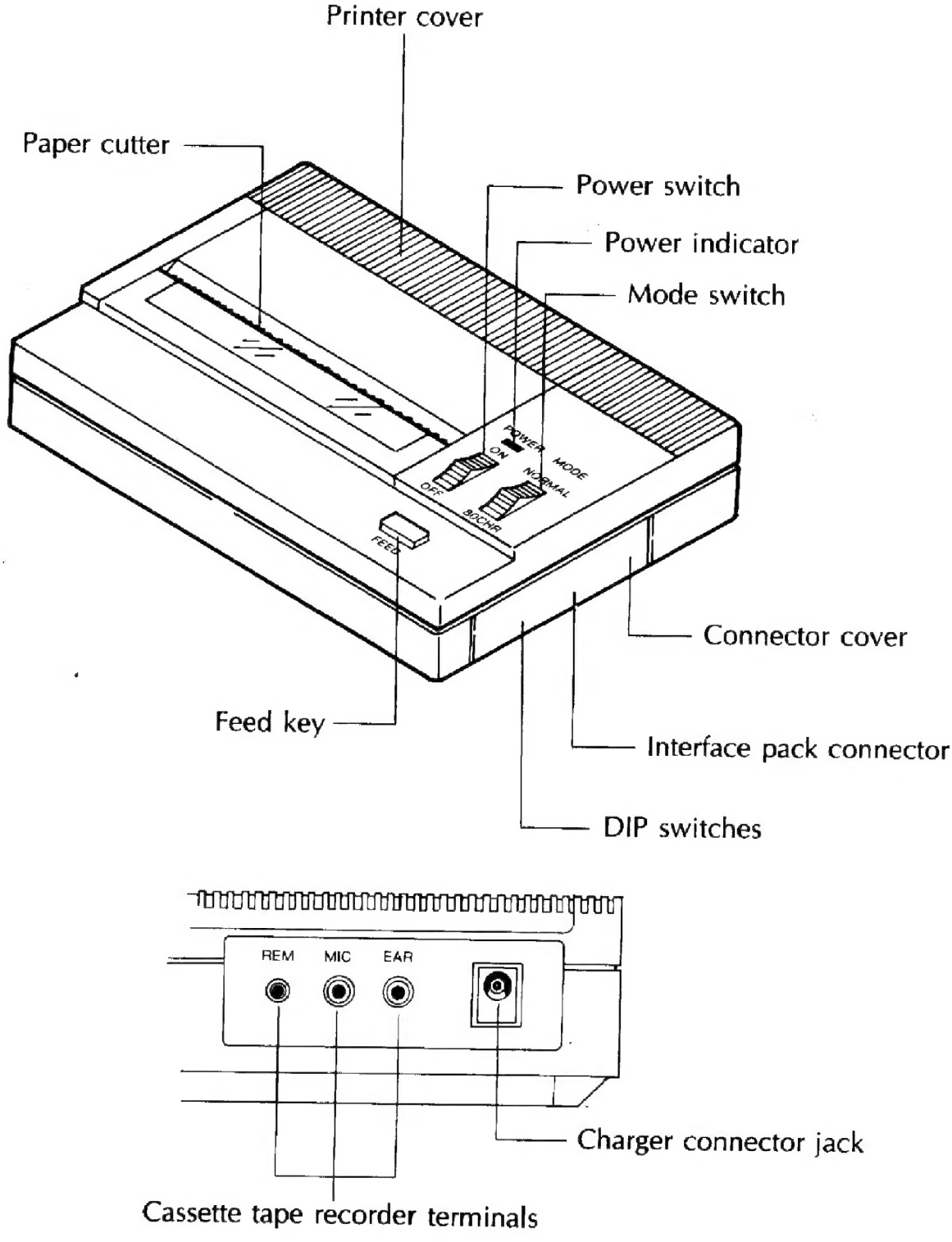
PRECAUTIONS

1. This device is constructed of precision electronic components and should never be disassembled.
2. Do not store or use this device in any area subject to sudden temperature extremes.
3. Do not store or use this device near heaters or in any area subject to excessive humidity or dust.
4. Never allow water, condensation or metal objects to enter inside of this device. Should anything ever enter inside, immediately switch power OFF, and contact your retailer or a nearby dealer.
5. Use only the CHA-2 battery charger to charge the power supply.
6. Avoid overloading outlets. This is not only dangerous, it may also effect the operation of this device.
7. Always switch power OFF when not in use. Unplug the charger for extended periods of non-use.
8. Using in the vicinity of radio or TV receivers may interfere with the receiver's signal.
9. Never use thinner, benzine or other volatile agents for cleaning. Use only a soft cloth dampened with a mild neutral detergent solution. Dip the cloth in the solution and wring out until almost dry.
10. Connect only equipment specified by the manufacturer (except for tape recorder and computer with Centronics standard interface). The manufacturer assumes no responsibility for any damage or abnormal operation caused by use of non-specified equipment.
11. Touching the connector may damage internal circuitry or result in poor connection.
12. The internal mechanism of the printer is precisely adjusted. Never touch the moving element.
13. Never interfere with the roll paper during printer operation. Doing so may result in irregular printout.
14. Use only the roll paper specified by the manufacturer. The manufacturer assumes no responsibility for any damage or abnormal operation caused by use of other types of paper.
15. Frequent errors during data read and write operations may indicate a dirty tape recorder head. Clean the tape head following the procedures specified by the recorder manufacturer.
16. Data read and write operations cannot be performed during printer operation. Confirm that printing is complete before data read or write.
17. The printer will automatically cease operation when the head is stopped by paper jams, etc. In this case, correct the problem and then switch power back ON to resume normal operation.
18. Always check the manual carefully to ensure proper operational procedures before assuming malfunction.

1. SYSTEM OVERVIEW

1-1 GENERAL GUIDE



Power switch

Turns the power of the device ON and OFF. The printer and cassette interface can be used when power is ON.

Mode switch

- NORMAL
  40 column/line printing
- 80 CHR
  80 column/line printing

* Commands to set NORMAL or 80 CHR printing take priority over manual settings (see page 16).

Feed key

Feeds roll paper. Each press advances paper one line, while holding down this key advances paper until the key is released. This key is not operative during printing operation and data read/write operation via the cassette interface.

Cassette tape recorder terminals

For connection of mini plugs when using a tape recorder. Each terminal should be connected as follows:

EAR: To tape recorder EAR or MONITOR terminal.
MIC: To tape recorder MIC or LINE IN terminal.
REM: To tape recorder REMOTE terminal.

* See page 49 for details on connections.

Interface pack connector

For connection of interface pack (SB-41, SB-42, SB-43) that corresponds to the type of computer being used (see page 6).

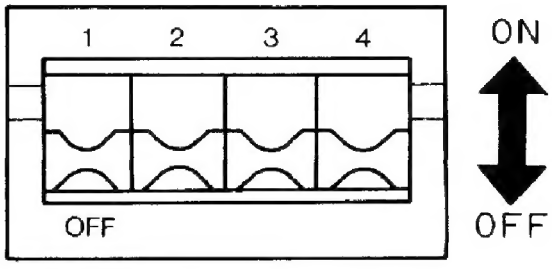
DIP switches

Located under the connector cover and set according to the type of computer being used. Also used to specify the character set for each country (see page 4).

1-2 DIP SWITCHES

Remove the connector cover to allow access to the DIP switches. The DIP switches are set according to the type of computer being used and also specify the character set for each country.
Always switch the power of the device OFF before setting DIP switches. Also remove the interface pack (when connected) before setting DIP switches.

<DIP switches>



DIP switches are numbered from 1 through 4 from the left. For all switches, the raised position is ON and the lower position is OFF. DIP switches can be set using a thin, pointed object.

DIP switch settings

- **Switch 1 Computer type**
  ON: Performs carrier return/line feed when the CR code ($0D_H$) is input (same operation when LF code is input). Set to this position when computers PB-700 or PB-770 are used with the SB-41 interface pack.
  OFF: Performs carrier return only when the CR code ($0D_H$) is input. Set to this position when computers PB-100, PB-100F, PB-110, PB-220, PB-410, FX-700P, FX-710P, FX-720P, FX-770P, FX-785P, or FX-790P are used with the SB-42 interface pack.
  When connecting to a computer other than those noted above via the SB-43 interface pack, first set to this position and execute LIST print. If line feed is not performed at the end of each line, change the setting to ON.

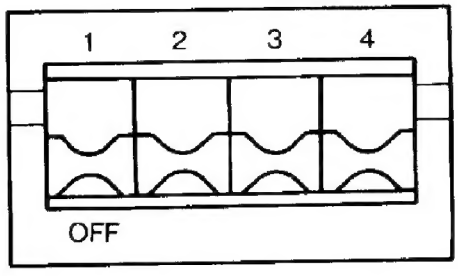
- **Switches 2 ~ 4 Character set**
  Used with PB-700 series or computers with Centronics standard interfaces to specify the character set for each country.

2	3	4	Character set
OFF	OFF	OFF	Japanese
ON	OFF	OFF	Italian
OFF	ON	OFF	Swedish
ON	ON	OFF	Danish
OFF	OFF	ON	English
ON	OFF	ON	German
OFF	OFF	ON	French
ON	ON	ON	American

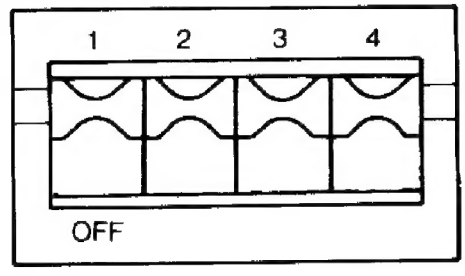
* See page 54 for actual character tables.

Example

PB-100 series



PB-700 series (American)



1-3 CONNECTION WITH A COMPUTER

Computers are connected using the appropriate interface pack as follows:

SB-41: PB-700 series (PB-700/770)

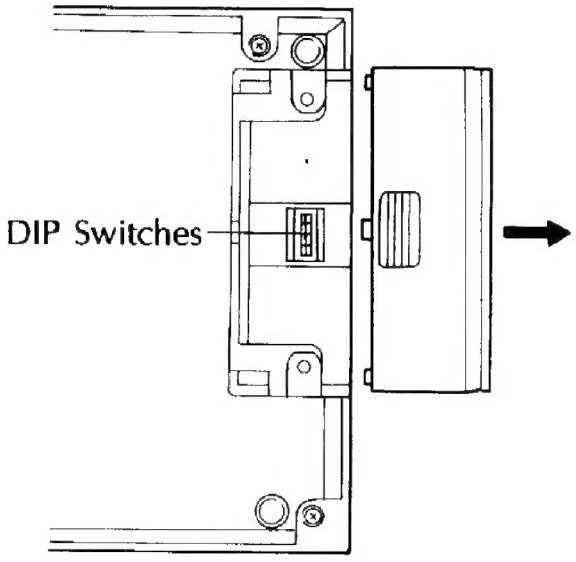
SB-42: PB-100 series (PB-100/100F/110/220/410, FX-700P/710P/720P/770P/785P/790P)

SB-43: Any computer equipped with a Centronics standard parallel interface (see SECTION 4).

Connections

① Switch the power of the FP-40 OFF.

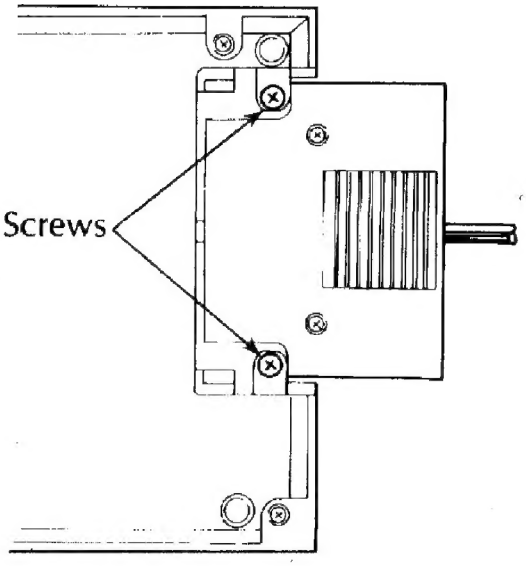
② Remove the connector cover and set DIP switches (see page 4).



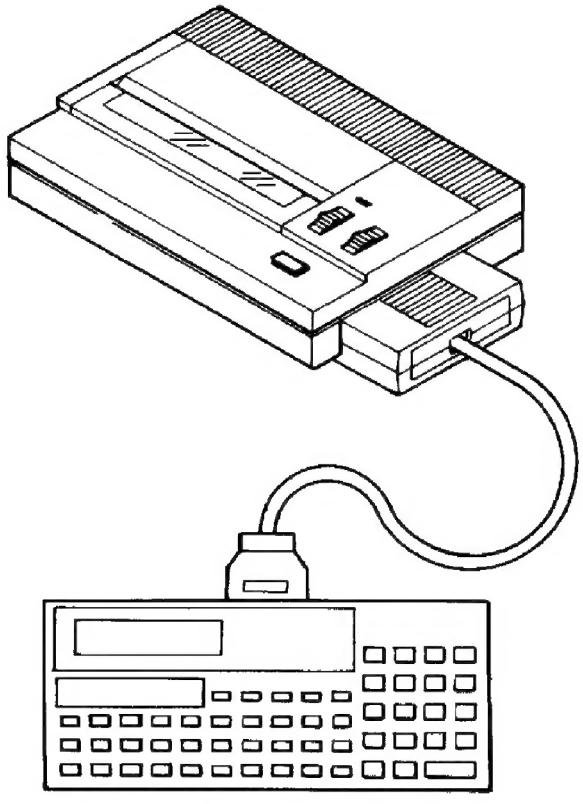
③ Insert the appropriate interface pack and fasten in place using two screws.

④ Switch the power of the computer OFF, and connect the cable leading from the interface pack to the computer.

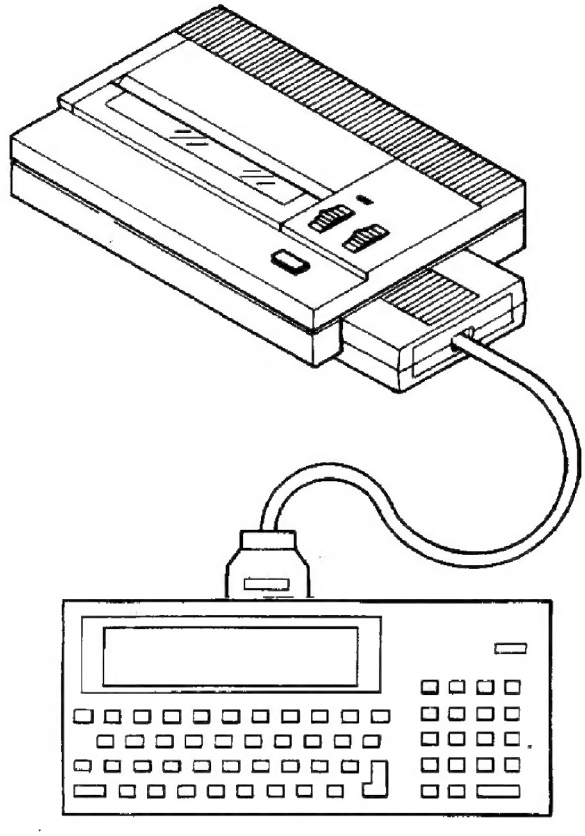
⑤ When connecting to a computer equipped with a Centronics standard interface, first switch the power of the computer OFF, and then attach the printer cable of the computer to the SB-43 interface pack.



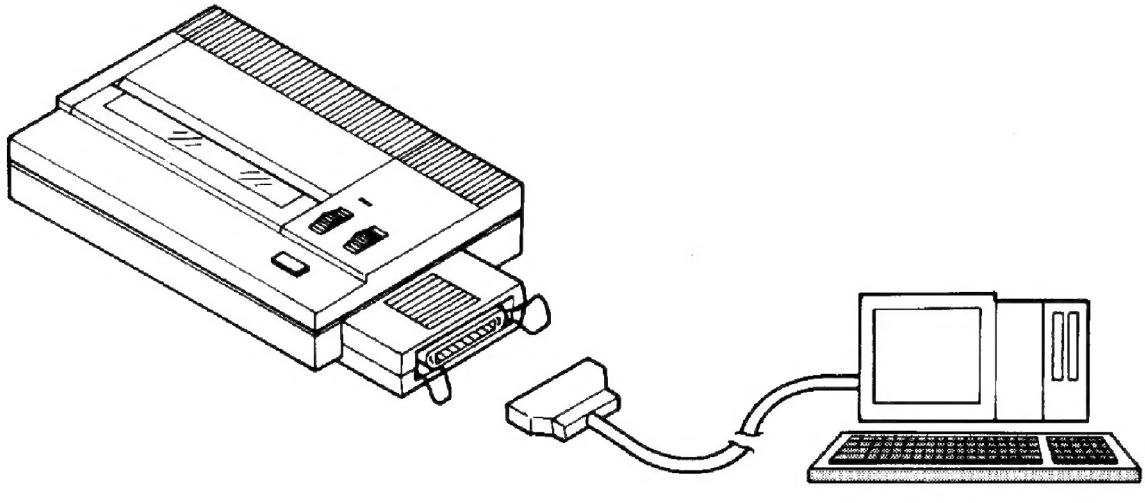
<PB-100 series>



<PB-700 series>



<Computers with Centronics standard interface>

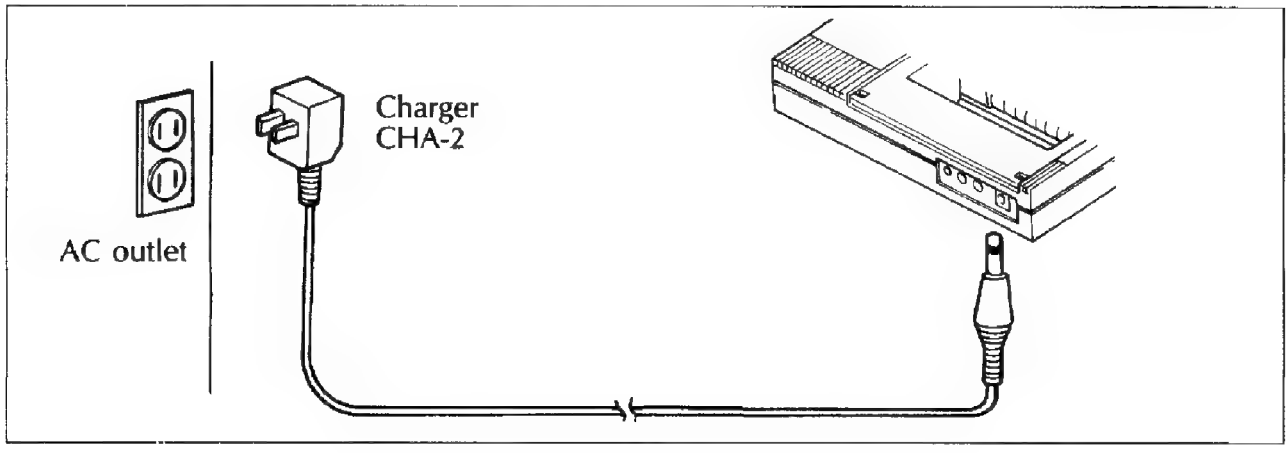


1-4 POWER SUPPLY

Rechargeable batteries are used as the power supply of this device. Slow print speed, slow paper feed, or total printer failure may indicate weak batteries. Recharge batteries as soon as possible after such symptoms occur. A full charge is attained in 15 hours. Operation is also possible after a partial charge of 1 ~ 2 hours, but subsequent operating time will be relative to the amount of the charge. A full charge allows 2500 lines of printing.

Procedure

Plug the CHA-2 charger into a standard household outlet and insert the connector into the connector jack on the back of the FP-40.



PRECAUTIONS

- Use only a CASIO CHA-2 charger to charge the batteries of this device. Other chargers may cause serious damage.
- The battery charger may become warm to the touch during recharging. This is normal and is no need for alarm. However, remove the charger from the AC outlet as soon as charging is complete.
- Batteries may not be at full charge because of the time which passes between shipment and purchase. Recharge batteries before first use of this device.
- Decreased operating time after a full charge may indicate that the batteries are reaching the end of their service lives. Take the device to the original retailer or nearby dealer for battery replacement when such symptoms occur.

1-5 ROLL PAPER LOADING

① Switch power ON after connecting to a computer.
② Open the printer cover as illustrated in Fig. 1.
③ Cut the leading end of the roll paper squarely across. Insert the leading end of the paper into the paper inlet and press the feed key until approximately 2 ~ 3 centimeters come out. Do not force the paper out by pulling on it.
④ Load the roll into the paper roll housing and close the printer cover.

Fig. 1

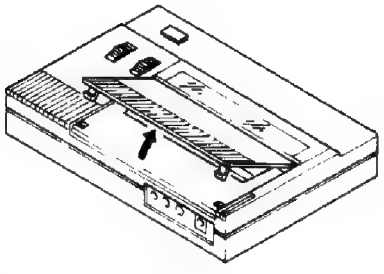


Fig. 2

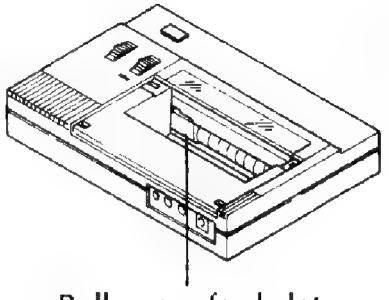
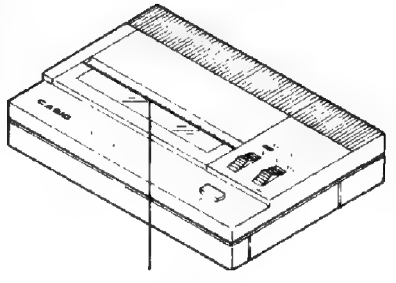


Fig. 3



CAUTION

Be sure to use the specified thermal recording paper (TRP-112) (size: 112mm(W) × 30mm (ϕ)). Also note the color of the paper may be affected by light, heat, paste, and adhesive tapes. Use starch based adhesives only.

1-6 SELF CHECK PROCEDURE

This device is equipped with a built-in self-check function that provides a print test before connection to a computer or before printing.

<OPERATION>

① Switch the power of the device OFF and set the DIP switches for the type of computer being used (see page 4).
② Insert the interface pack for the type of computer being used (see page 6).
③ Switch power ON while holding down the [FEED] key. Release the [FEED] key when the printer begins self-check operation.
④ Test printing continues even if the power of the device is switched OFF.

<PRINT SAMPLE>

```
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFG
HIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno
pqrstuvwxyz{¦}~ ▁▂▃▄▅▆▇█▏▎▍▌▋▊▉┼┴┬┤├▔─▕▏
⊓ ⊔ ∩ ∪  !"#$%&'()*+,-./0123456789:;<=>?
@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefg
hijklmnopqrstuvwxyz{¦}~
```

CAUTION

The sample print shown here is for the American language character set. Changing the settings of DIP switches 2 ~ 4 allows self-check printout for the selected language.

2. PRINTER OPERATION

2-1 PB-100 SERIES COMPUTERS

The following procedures outline the operation of this device when connected with a PB-100 series computer (PB-100/100F/110/220/410, FX-700P/710P/720P/770P/785P/790P through the SB-42 interface pack).
Setting the computer to the print mode allows printout of program lists and calculation results.

<OPERATION>

MODE 7
LIST EXE
MODE 8

<PROGRAM LIST>

```
10 INPUT A,B
20 C=A+B
30 D=A-B
40 E=A*B
50 F=A/B
60 PRINT C,D,E,F
```

(40 columns/line)

```
10 INPUT A,B
20 C=A+B
30 D=A-B
40 E=A*B
50 F=A/B
60 PRINT C,D,E,F
```

(80 columns/line)

<CALCULATION RESULT>

```
? 
17
? 
8
 25
 9
 136
 2.125
```

* Program executed in print mode.

CAUTION

- The number of columns per line (40 columns/80 columns) is set using the mode switch.
- Printable characters are limited to the characters available with the PB-100 series computer. Other characters available on the PB-700 series computers or on computers with Centronics standard interface cannot be printed.
- The PB-100 series computers cannot execute the control codes beginning on page 16 of this manual.

2-2 PB-700 SERIES/COMPUTER WITH CENTRONICS STANDARD INTERFACE

The following procedures outline the operation of this device when connected with a PB-700 series computer (PB-700/770) through the SB-41 interface pack. The same procedures used for the PB-700 series can be used for other computers with a Centronics standard interface through the SB-43 interface pack. With the PB-700 series, control codes can be used by employing the CHR$ function.

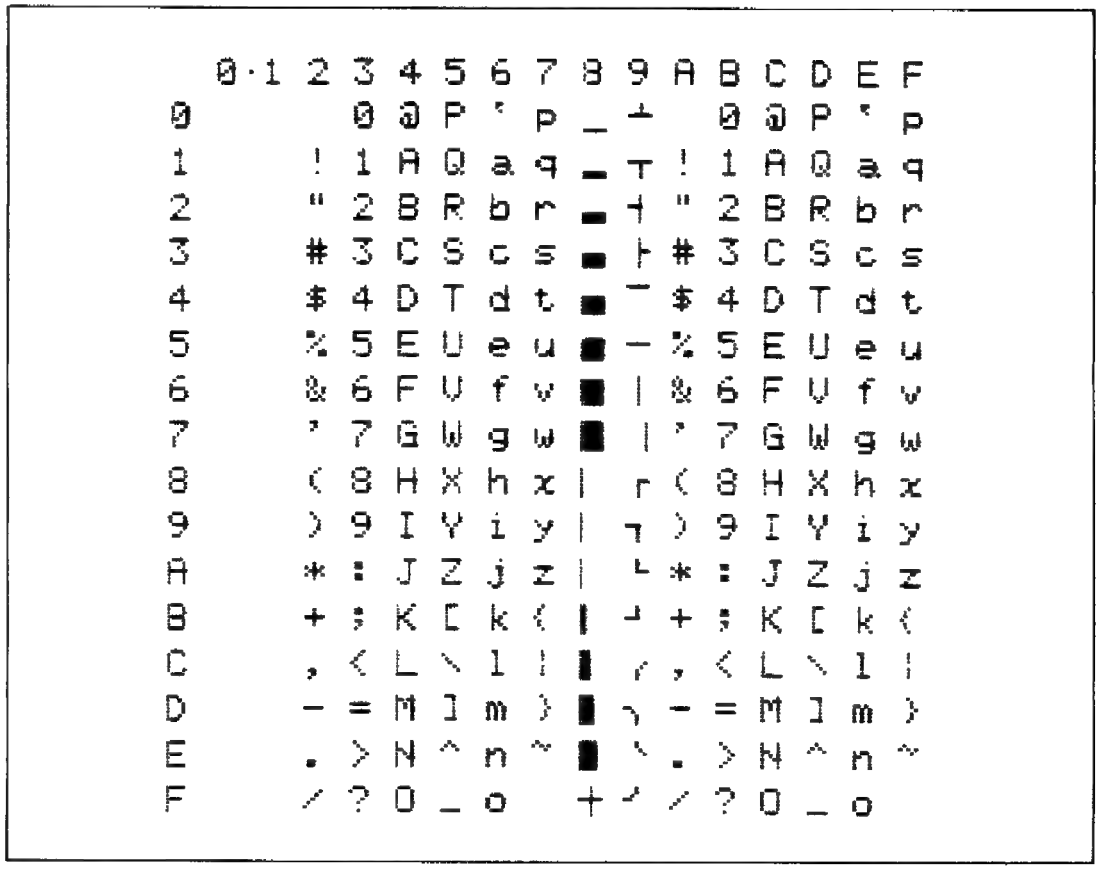
<PROGRAM LIST>

```
 10 LPRINT "  ";
 20 FOR I=0 TO 15
 30 LPRINT " ";RIGHT$(HEX$(I),1);
 40 NEXT I:LPRINT
 50 FOR I=0 TO 15
 60 LPRINT RIGHT$(HEX$(I),1);"    ";
 70 FOR J=2 TO 15
 80 LPRINT " ";CHR$(16*J+I);
 90 NEXT J
100 LPRINT
110 NEXT I
```

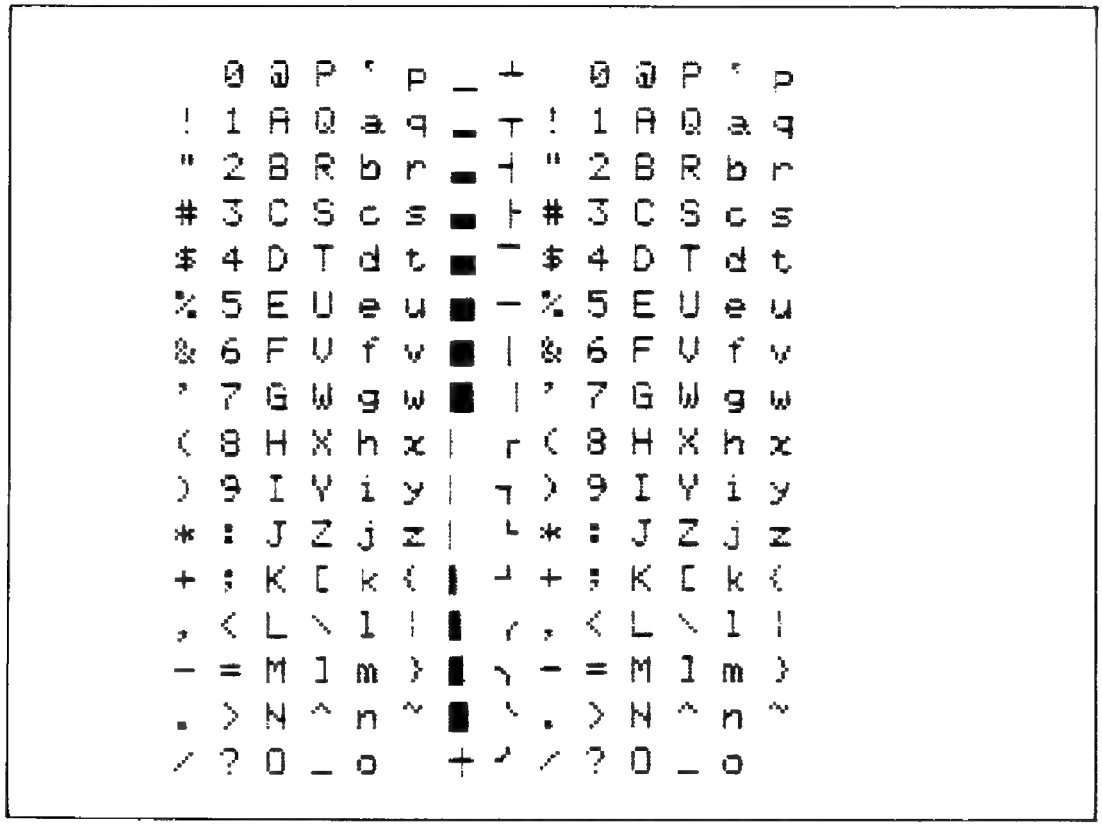
* 40 columns/line

* The PB-700 cannot perform the HEX$ function included in lines 30 and 60. Delete these two lines when executing this program on the PB-700.

The following printout is produced when this program is executed.



(PB-770)



(PB-700)

The sample printouts shown here include all of the characters available in the American language character set. The character sets for other languages can be produced by changing the setting FP-40 DIP switches (see page 5). Note that this program produces the characters assigned to codes $20_H \sim FF_H$ ($32_{10} \sim 255_{10}$). Codes $00_H \sim 1F_H$ are control codes and produce no printer output. Control codes are used to transmit certain control codes to the printer.

3. CONTROL CODES

3-1 CONTROL CODE SPECIFICATIONS

Besides printout of program lists and calculation results, various other functions of this device can be activated using the appropriate control codes. Control codes are made up of function codes in the range of 0_{10} ~ 31_{10} and escape sequences. In this manual, hexadecimal numbers are indicated as AB_H, while decimal numbers are indicated as 31_{10}. A escape sequence is indicated by the ESC code 27_{10} followed by a series of code.
Example: ESC "W" + n

All undefined function codes and escape sequences are disregarded, as are errors in the argument.

* Control codes cannot be used with PB-100 series computers and are only available with PB-700/770 and computers equipped with Centronics standard interface.

The following table shows the 13 types of available control codes.

CODE	FORMAT	FUNCTION
ESC 2	CHR$(27);"2";	1/6" paper feed
ESC A	CHR$(27);"A";CHR$(n);	n=8 1/9" paper feed n=12 1/6" paper feed
CR	CHR$(13);	Print/carrier return (DIP #1 OFF) Print/carrier return/line feed (DIP #1 ON)
LF *	CHR$(10);	Print and line feed
ESC R	CHR$(27);"R";CHR$(n);	n=0 ~ 10 Character set
SI	CHR$(15);	Condensed print set
DC 2	CHR$(18);	Condensed print reset
ESC W	CHR$(27);"W";CHR$(n);	n=1 Double width print set n=0 Double width print reset
ESC E	CHR$(27);"E";	Emphasized print set
ESC F	CHR$(27);"F";	Emphasized print reset
ESC SPACE**	CHR$(27);"␣";CHR$(n);	n=1 2-dot character spacing n=0 1-dot character spacing
ESC K	CHR$(27);"K";CHR$(n_1);CHR$($n_2$);	$n_1 + n_2 \times 256$ data single density bit image
ESC L	CHR$(27);"L";CHR$(n_1);CHR$($n_2$);	$n_1 + n_2 \times 256$ data double density bit image

* The LF code is not used with the PB-700 series (print/line feed is performed by CR code or LPRINT statement).
** ESC SPACE can only be used when condensed print is set. Spacing between characters is 1 dot in other print modes.
All numeric values in the table above are represented in decimal base.
Example: CHR$(27) → CHR$(&H1B)

3-2 CONTROL CODE COMBINATIONS

Control code print modes can be used in combination. The priority for condensed print (mode switch or SI code), double width print and emphasized print modes is indicated in the table below.

CONDENSED	DOUBLE WIDTH	EMPHASIZED	ACTUAL
X	X	X	Normal
O	X	X	Condensed
X	O	X	Double width
O	O	X	Double width
X	X	O	Emphasized
O	X	O	Emphasized
X	O	O	Emphasized
O	O	O	Emphasized

O Set
× Not set

* The actual priority is condensed < double width < emphasized.

3-3 CONTROL CODE/MODE SWITCH OPERATION IN EACH PRINT MODE

Code or operation / Mode	Control code (print command)												Bit image code		Mode switch	
	ESC 2	ESC A	CR	LF	ESC R	SI	DC2	ESC w+1	ESC w+0	ESC E	ESC F	ESC SPACE	ESC K	ESC L	N→80	80→N
NORMAL	○	○	○	○	○	○	○	○	○	○	○	●*1	○	○	○	
80 CHR (switch)	○	○	○	○	○	○	×	○	○	○	○	○	○	○		○*2
Condensed	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
Double width	○	○	○	○	○	●*3	○	○	○	○	○	●*1	○	○	●*3	
Emphasized	○	○	○	○	○	●*4	○	●*4	○	○	○	●*1	○	○	●*4	
Bit image	△	△	△	△	△	△	△	△	△	△	△	△	△	△	●*5	

○ : Valid. However, no operation is performed when certain print mode combinations are specified (i.e. SI code in the condensed print mode).
● : Invalid in specified print mode, but becomes operational when switched to the valid print mode.
× : Invalid. (Code disregarded.)
△ : Regarded as data in bit image mode.

*1 Valid after switching in condensed mode.
*2 Normal mode is specified even when SI code is specified.
*3 In effect after double width print canceled.
*4 In effect after emphasized print canceled.
*5 In effect after bit image canceled.

3-4 CONTROL CODES

1/6" paper feed

ESC 2

Function: Sets paper feed to 1/6".

Format: `LPRINT CHR$(27);"2";`
or `LPRINT CHR$(&H1B);"2";`

Details:

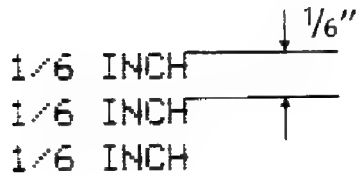
- Causes all subsequent paper feeds to be performed at 1/6" pitch.

* This setting is specified when the power of the device is switched ON.

Example:

```
10 LPRINT CHR$(27);"2";
20 FOR I=1 TO 3
30 LPRINT "1/6 INCH"
40 NEXT I
```

1/6" set



Paper feed

ESC A

Function: Sets paper feed to 1/9" or 1/6".

Format

```
LPRINT CHR$(27);"A";CHR$(n)
    or   LPRINT CHR$(&H1B);"A";CHR$(n)
* n = 8  or  n = 12
```

Details

- Causes all subsequent paper feeds to be performed at 1/9" or 1/6" pitch.
- n is an integer with the value of 8 or 12. Any value besides 8 or 12 does not execute the ESC A code.
- n is computed according to the value n/72. Therefore, $^{8}/_{72} = {}^{1}/_{9}$ and $^{12}/_{72} = {}^{1}/_{6}$.
- Line feed is set at 1/6" when the power of the device is switched ON. This indicates a 12-dot line feed and is used for normal printing.
- 1/9" indicates 8-dot line feed and is used for bit image graph printing (see page 35), and when using graphic characters ($80_H \sim 9F_H$).
- Program list printouts (LLIST) are also produced with 1/9" line feed when set.
- Switching from 1/9" back to 1/6" is performed using either ESC 2 or ESC A + 12.

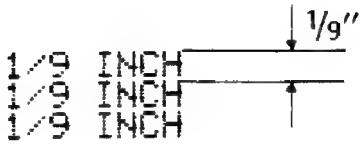
Example

```
10 LPRINT CHR$(27);"A";CHR$(8);
20 FOR I=1 TO 3
30 LPRINT "1/9 INCH"
40 NEXT I
50 LPRINT CHR$(27);"A";CHR$(12);
```

(1/6")

```
10 LPRINT CHR$(27);"A";CHR$(8); ———→ 1/9" set
20 FOR I=1 TO 3
30 LPRINT "1/9 INCH"
40 NEXT I
50 LPRINT CHR$(27);"A";CHR$(12); ———→ 1/6" set
```

(1/9")



Print/carrier return

CR

Function: Prints and returns carrier to the beginning of a line.

Format:
```
LPRINT CHR$(13);
    or  LPRINT CHR$(&H0D);
```

Details:

- When DIP switch #1 is OFF, prints the data in the print buffer and then returns the printhead to the extreme left.
  * The print buffer stores print data until enough is present to fill an entire line or until CR and LF codes are received.
- The printhead does not move if no print data is present in the print buffer before the CR code is input.
- When DIP switch #1 is ON, prints the print buffer contents followed by carrier return and line feed. Only line feed is performed when the printer buffer is empty.
  * Carrier return and line feed with the PB-700 series.

Example:

```
10 LPRINT "CASIO FP-40";
20 LPRINT CHR$(13);  ——————→ Carrier return
30 FOR I=1 TO 5
40 LPRINT CHR$(128); ——————→ Underline
50 NEXT I
60 LPRINT CHR$(10)   ——————→ Line feed
```

CASIO FP-40

* When DIP switch #1 is OFF
* See page 23 for details on CHR$(10)

Print/line feed

LF

Function: Prints and feeds to the next line.

Format:
```
LPRINT CHR$(10);
   or  LPRINT CHR$(&H0A);
```

Details:
- Prints the data in the print buffer feeds to the next line, and then returns the printhead to the extreme left.
  * The print buffer stores print data until enough is present to fill an entire line or until CR and LF codes are received.
- Line feed only is performed if no print data is present in the print buffer before the LF code is input.
  * The LF code is not used with PB-700 series. Print/line feed is performed by the CR code (LPRINT CHR$(13);) or LPRINT statement.

Example:

```
10 FOR I=1 TO 5
20 LPRINT I^2;
30 NEXT I
40 LPRINT CHR$(10); ————————→ Line feed
```

```
 1  4  9  16  25
```

Character sets

ESC R

Function: Specifies the character set to use for printing.

Format:
```
LPRINT CHR$(27);"R";CHR$(n);
    or  LPRINT CHR$(&H1B);"R";CHR$(n);
```
* n: integer in the range of $0 \leqq n \leqq 10$.

Details:
- Specifies a character set for a specific language.
- The value of n specifies the character set as follows:

n	SET	n	SET
0	USA	6	Italy
1	France	7	Japan
2	Germany	8	Spain
3	England	9	Norway
4	Denmark	10	Denmark II
5	Sweden		

- ESC R is invalid outside the range of $0 \leqq n \leqq 10$.
- Character set specification is performed according to the DIP switch settings before ESC R is input.
- See page 4 for details on each character set. The following program prints characters sets for each country.

Example:

```
   10 FOR K=0 TO 10
   20 READ AA$:LPRINT AA$,CHR$(27);"R";C ──────► Character set
HR$(K);
   30 LPRINT " ";
   40 FOR I=0 TO 15
   50 LPRINT " ";RIGHT$(HEX$(I),1);
   60 NEXT I:LPRINT
   70 FOR I=0 TO 15
   80 LPRINT RIGHT$(HEX$(I),1);"     ";
   90 FOR J=2 TO 15
  100 LPRINT " ";CHR$(16*J+I);
  110 NEXT J
  120 LPRINT
  130 NEXT I
  140 LPRINT :LPRINT :LPRINT
  150 NEXT K
  160 DATA U.S.A.,FRANCE,GERMANY,U.K.,DE
NMARK
  170 DATA SWEDEN,ITALY,JAPAN,SPAIN,NORW
AY,DENMARK 2
```

* See page 55 for sample printout.
* Delete lines 50 and 80 when using PB-700.

Condensed print set

SI

Function: Sets the condensed print mode.

Format:
```
LPRINT CHR$(15);
    or LPRINT CHR$(&H0F);
```

Details:
- Sets the condensed print mode to print all subsequent characters in condensed style.
  * See page 17 for the relationship among the condensed, double width and emphasized print modes.
- 80 columns/line and 73 columns/line are available in the condensed print mode using ESC SPACE (see page 33).
- The condensed print mode can be reset by switching power OFF, setting the mode switch to NORMAL, or by inputting the DC 2 code (see page 28).
- Program list printouts (LLIST) are also produced in condensed print when set.

Example:

```
10 FOR I=1 TO 3
20 LPRINT "40CHR/LINE ";
30 NEXT I
40 LPRINT
50 LPRINT CHR$(15); ----------> Condensed print mode set
60 FOR I=1 TO 3
70 LPRINT "80CHR/LINE ";
80 NEXT I
90 LPRINT
100 LPRINT CHR$(27);" ";CHR$(1); ----------> 73 columns/line set
110 FOR I=1 TO 3
120 LPRINT "73CHR/LINE ";
130 NEXT I
140 LPRINT
150 LPRINT CHR$(18);CHR$(27);" ";CHR$( ----> Condensed print mode reset
                                             80 columns/line
0)
```

```
40CHR/LINE 40CHR/LINE 40CHR/LINE
80CHR/LINE 80CHR/LINE 80CHR/LINE
73CHR/LINE 73CHR/LINE 73CHR/LINE
```

Condensed print reset

DC 2

Function: Resets the condensed print mode.

Format:
```
LPRINT CHR$(18);
    or LPRINT CHR$(&H12);
```

Details:
- Resets the condensed print mode specified by the SI code.
- The DC 2 code is disregarded when the mode switch is set to 80 CHR.

Example:

```
10 LPRINT "40CHR/LINE ";
20 LPRINT CHR$(15);"80CHR/LINE ";
30 LPRINT CHR$(18);"40CHR/LINE"
```

Condensed print mode set

Condensed print mode reset

```
40CHR/LINE 80CHR/LINE 40CHR/LINE
```

Double width print set/reset

ESC W

Function: Sets or resets the double width print mode.

Format:
```
LPRINT CHR$(27);"W";CHR$(n);
    or LPRINT CHR$(&H1B);"W";CHR$(n);
[LPRINT CHR$(27);"W";"n";
  or LPRINT CHR$(&H1B);"W";"n";]
```
* n = 0 or 1

Details:
- The double width print mode is set to print all subsequent characters in double width style when n = 1 following ESC W.
- The double width print mode is reset when n = 0.
- The ESC W code is valid even when the mode switch is set to 80 CHR.
- See page 17 for the relationship among the double width, emphasized, and condensed print modes.
- Program list printouts (LLIST) are also produced in double width print when set.
- The ESC W code is ignored when any other value besides 0 or 1 is assigned to n. Executing the following causes the segment beginning with CHR$(27) through the value "1" to be treated as the escape sequence, while the final 0 is treated as print data:
  LPRINT CHR$(27); "W"; "10"

Example:

```
10 FOR I=1 TO 3
20 LPRINT CHR$(15);"80CHR/LINE ";
30 LPRINT CHR$(18);"40CHR/LINE ";
40 LPRINT CHR$(27);"W";CHR$(1);"20CHR
/LINE";
50 LPRINT CHR$(27);"W";CHR$(0)
60 NEXT I
```

Condensed print mode set

Condensed print mode reset

Double width print mode set

Double width print mode reset

```
80CHR/LINE 40CHR/LINE 20CHR/LINE
80CHR/LINE 40CHR/LINE 20CHR/LINE
80CHR/LINE 40CHR/LINE 20CHR/LINE
```

Emphasized print set

ESC E

Function: Sets the emphasized print mode.

Format: `LPRINT CHR$(27);"E";`
or `LPRINT CHR$(&H1B);"E";`

Details:
- Sets the emphasized print mode to print all subsequent characters in emphasized style.
- Emphasized print is produced by doubling the horizontal dot density of the print.
- See page 17 for the relationship among the emphasized, condensed and double width print modes.
- Emphasized print is reset using the ESC F code (see page 32).
- Program list printouts (LLIST) are also produced in emphasized print when set.

Example:

```
10 FOR I=1 TO 3
20 LPRINT "Normal printing"
30 LPRINT CHR$(27);"E";
40 LPRINT "Emphasized printing"
50 LPRINT CHR$(27);"F";
60 NEXT I
```

Emphasized print mode set

Emphasized print mode reset

```
Normal printing
Emphasized printing
Normal printing
Emphasized printing
Normal printing
Emphasized printing
```

Emphasized print reset

ESC F

Function: Resets the emphasized print mode.

Format: `LPRINT CHR$(27);"F";`
or `LPRINT CHR$(&H1B);"F";`

Example:

```
10 LPRINT CHR$(27);"F";          ← Emphasized print mode reset
20 LPRINT "CASIO ";
30 LPRINT CHR$(27);"E";          ← Emphasized print mode set
40 LPRINT "POCKET COMPUTER"
50 LPRINT CHR$(27);"F";          ← Emphasized print mode reset
```

```
CASIO POCKET COMPUTER
```

Character spacing set

ESC SPACE

Function: Sets the spacing between characters for printout.

Format: `LPRINT CHR$(27);"␣";CHR$(n);`

or `LPRINT CHR$(&H1B);"␣";CHR$(n);`

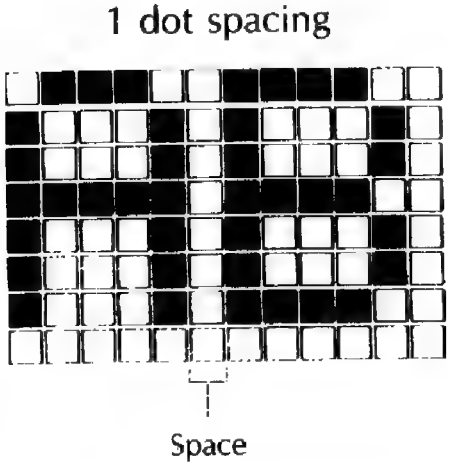
* n = 0 or 1
* ␣ indicates a space

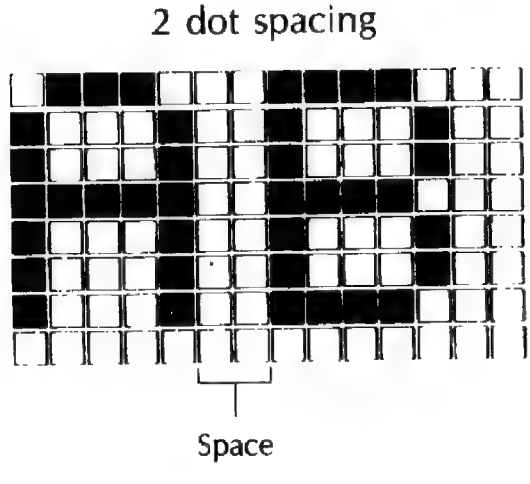
Details:

- In the condensed print mode, either 1 dot or 2 dots can be set as the spacing to the right of each character.
  * The ESC SPACE code is valid in the condensed mode whether specified by the SI code or mode switch (80 CHR).
- The following settings are performed for each value of n:

n	SPACING	COLUMNS/LINE
0	1 dot	80
1	2 dots	73

- The ESC SPACE code is ignored when any other value besides 0 or 1 is assigned to n.
- The following illustrates the available character spacing:





Though each character is formed within a 6(W) × 8(H) dot matrix, the bottom row and the extreme right column of the matrix are not used to form alphabetic characters. One more dot space is added to the right of the matrix when n = 1 (i.e. two dot space between matrices).

- 1-dot character spacing is set when power is switched ON and when any mode besides the condensed print mode is set.
- 2-dot spacing is used for graphic characters (80_H ~ $9F_H$, $E0_H$ ~ FE_H) and when other high density dot printing is performed.

Example:

```
10 LPRINT CHR$(15);
20 LPRINT "CASIO FP-40"
30 LPRINT CHR$(27);" ";CHR$(1);
40 LPRINT "CASIO FP-40"
50 LPRINT CHR$(27);" ";CHR$(0);CHR$(1
8);
```

Condensed print mode set

2-dot spacing set

1-dot spacing set
Condensed print mode reset

```
CASIO FP-40
CASIO FP-40
```

Single density bit image

ESC K+n_1+n_2

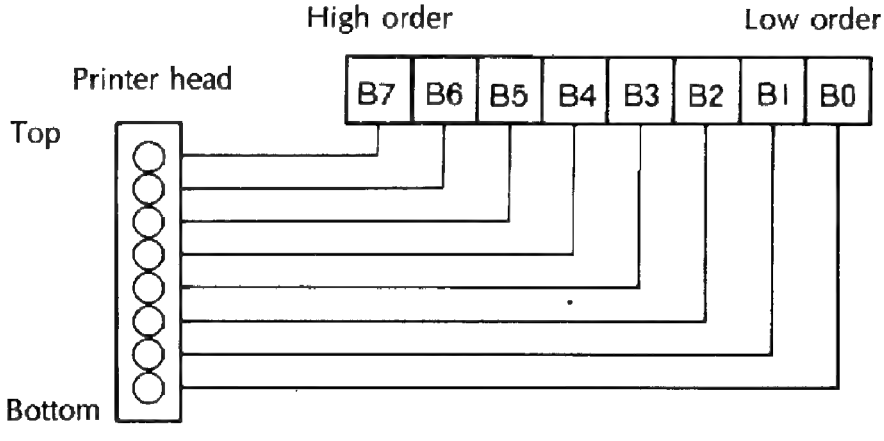
Function: Specifies single density bit image.

Format:
```
LPRINT CHR$(27);"K";CHR$(n1);CHR$(n2);
                                    [CHR$(d);]*
   or LPRINT CHR$(&H1B);"K";CHR$(n1);
                          CHR$(n2);[CHR$(d);]*
```

* n_1: integer in the range of $0 \leqq n_1 \leqq 255$
* n_2: 0 or 1
  $n_2 \times 256 + n_1 \leqq 256$
* d: integer in the range of $0 \leqq d \leqq 255$
* Followed by $n_2 \times 256 + n_1$ data items

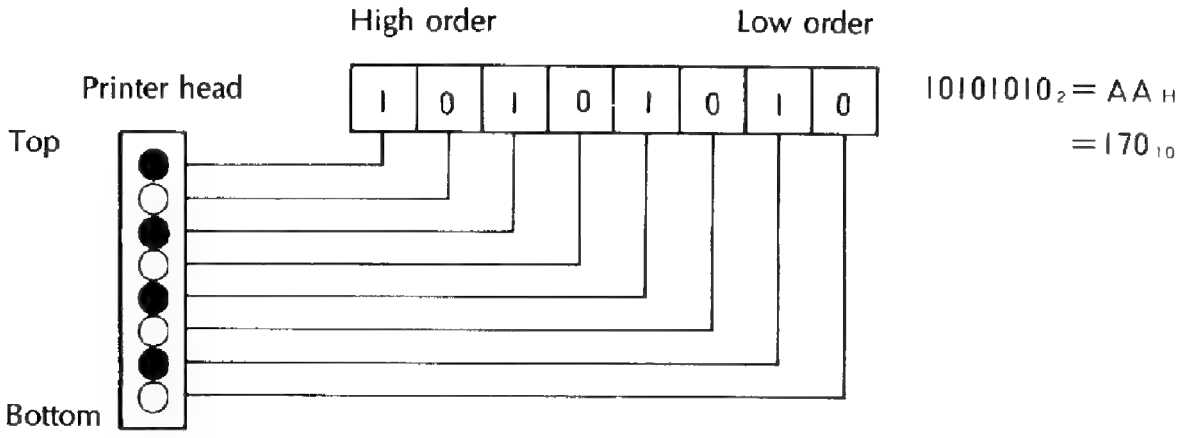
Details:

- Prints out single density bit image data which corresponds to the printer head dot configuration.
- Bit image is controlled according to whether or not printing is performed with 8-bit data dot units.
- Single density bit image is set by the n_1 and n_2 values following ESC K, and $n_2 \times 256 + n_1$ data items are read as bit image data. The device automatically returns to the normal character print mode after $n_2 \times 256 + n_1$ data items are printed.
- The bit image mode is maintained until $n_2 \times 256 + n_1$ data items are read and normal printing is impossible during this time.
- The following illustrates the relationship between the printer head and bit image data.



Viewing the printer head as an 8-bit binary number, it can be seen that "1" causes a dot to appear while "0" does not produce a dot.

Example:

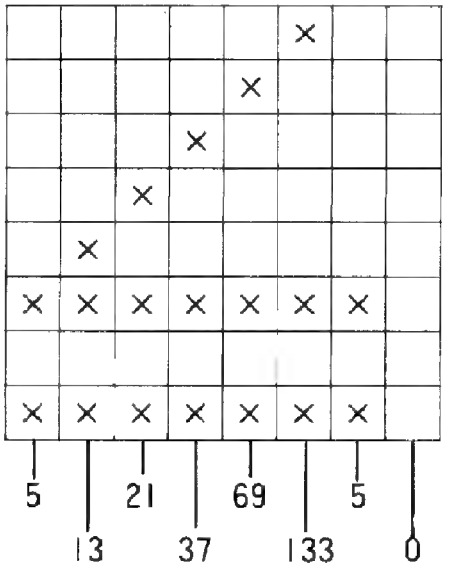


- A series of 8-bit data items along a line of print is used to draw lines, form characters, etc.
- The number of data items is calculated as "data items ÷ 256" where the quotient = n_2 and the remainder = n_1.
  Example
  128 ÷ 256 = 0 remainder 128, so n_1 = 128; n_2 = 0
  256 ÷ 256 = 1 remainder 0, so n_1 = 0; n_2 = 1
- Up to 512 bit image data items can be printed on a single line. Should $n_2 \times 256 + n_1$ exceed a value of 256, the line is printed to the end and all subsequent input data is disregarded. Mixing with character print has the same result as when the specified range exceeds the end of the line.

CAUTION

With a PB-700 series computer, if the bit image data include "13 ($0D_H$/CR code)", the data up to 13 only are printed. The remainder requires respecification of bit image printing.

Example 1: Print the following graphic pattern.




```
10 DD$=CHR$(27)+"K"+CHR$(2)+CHR$(0)
20 DD$=DD$+CHR$(5)+CHR$(13)
30 DD$=DD$+CHR$(27)+"K"+CHR$(6)+CHR$(
0)
40 DD$=DD$+CHR$(21)+CHR$(37)+CHR$(69)
+CHR$(133)+CHR$(5)+CHR$(0)
50 LPRINT DD$
```

Specifies single density bit image, and 2 data items.

Data up to 13

Specifies single density bit image, and 6 data items.

Data following 13

* With the PB-700 series computers, bit image data are specified by dividing it into 5 and 13, and 21, 37, 69, 133, 5, and 0.
* With computers equipped with Centronics standard interfaces, delete line 30, and change line 10 to read:
  10 DD$ = CHR$(27) + "K" + CHR$(8) + CHR$(0)

Example 2: Print Ω, Σ, μ, and ≙

```
   10 REM BIT IMAGE
   20 FOR K=1 TO 4
   30 DD$=""
   40 FOR I=1 TO 8
   50 READ A
   60 DD$=DD$+CHR$(A)
   70 GOSUB 1000
   80 NEXT I
   90 LPRINT CHR$(27);"K";CHR$(LEN(DD$))
;CHR$(0);
  100 LPRINT DD$;
  110 NEXT K
  120 LPRINT
  130 END
  200 REM
  210 DATA 57,69,131,128,131,69,57,0
  220 DATA 129,195,165,153,129,129,195,0
  230 DATA 1,254,8,8,8,240,8,0
  240 DATA 5,13,21,101,21,13,5,0
 1000 REM
 1010 IF A=13 THEN GOSUB 1100
 1020 RETURN
 1100 REM
 1110 LPRINT CHR$(27);"K";CHR$(LEN(DD$))
;CHR$(0);
 1120 LPRINT DD$;
 1130 DD$=""
 1140 RETURN
```

Print bit image

Ω data

Σ data

μ data

≙ data

Subroutine to check for data 13

Subroutine to print bit image data up to 13

ΩΣμ≙

* The example noted above is for PB-700 series computers. With computers equipped with Centronics standard interfaces, the subroutines included in lines 1000 ~ 1020, and 1100 ~ 1140, as well as the GOSUB 1000 in line 70 are not required.

Double density bit image

ESC L $+n_1+n_2$

Function: Specifies double density bit image.

Format:
```
LPRINT CHR$(27);"K";CHR$(n1);CHR$(n2)
                                    ;[CHR$(d);]*
   or  LPRINT CHR$(&H1B);"K";CHR$(n1);
                          CHR$(n2);[CHR$(d);]*
```

* n_1: integer in the range of $0 \leqq n_1 \leqq 255$
* n_2: integer in the range of $0 \leqq n_2 \leqq 2$
  $n_2 \times 256 + n_1 \leqq 512$
* d: integer in the range of $0 \leqq d \leqq 255$
* Followed by $n_2 \times 256 + n_1$ data items

Details:

- Prints out double density bit image data which correspond to the printer head dot configuration.
- Data are read and printed the same as with single density bit image, but horizontal density is doubled so images can be printed in half the space required in single density.
- See the explanation of single density bit image (page 35) for details on the relationship between bit image data and the printer head.
- The device automatically returns to the normal character print mode after bit image printing is complete.
- Up to 512 bit image data items can be printed on a single line. Should $n_2 \times 256 + n_1$ exceed a value of 512, the line is printed to the end and all subsequent input data is disregarded. Mixing with character print has the same result as when the specified range exceeds the end of the line.

CAUTION

With a PB-700 series computer, if the bit image data include "13 ($0D_H$/CR code)", the data up to 13 only are printed. The remainder requires respecification of bit image printing.

Example:

```
    10 LPRINT CHR$(27);"L";CHR$(0);CHR$(2
);
    20 FOR I=1 TO 64
    30 RESTORE 100
    40 FOR J=1 TO 8
    50 READ A$:A=VAL("&H"+A$)
    60 LPRINT CHR$(A);
    70 NEXT J
    80 NEXT I
    90 LPRINT
   100 DATA 18,0C,06,03,03,06,0C,18
```

→ Specifies double density bit image, and 512 data items.

→ Bit image data

REFERENCE

Bit image utility

Manually calculating the position of the printer head for printing of a line or symbol is quite complicated and requires considerable experience to perform properly. This utility program makes it possible to easily create symbols using an 8 × 8-dot matrix. Also, bit image data for the symbol can be obtained. This program was originally written for the PB-770, but can easily be adapted to the PB-700 by making the noted modifications.

Program

```
 10  CLS
 20 X=2:Y=2:F=0
 30 FOR I=0 TO 32 STEP 4
 40 DRAW(I,0)-(I,31)
 50 IF I=0 THEN 70
 60 DRAW(0,I)-(31,I)
 70 NEXT I
 80 LOCATE 11,3:PRINT "OFF";
 90 BEEP
100 K$=INKEY$:L=ASC(K$)
110 IF L=13 THEN 210
115 IF L=12 THEN BEEP :GOSUB PROG 0:GO
TO 100
120 DRAW(X,Y)
130 DRAWC(X,Y)
140 IF F=1 THEN DRAW(X,Y):DRAW((X-2)/4
+40,(Y-2)/4):GOTO 160
150 DRAWC((X-2)/4+40,(Y-2)/4)
160 IF K$="" THEN 100 ELSE BEEP
170 LOCATE 11,3
180 IF L=46 THEN IF F=0 THEN F=1:PRINT
 "ON "; ELSE F=0:PRINT "OFF";
190 IF K$>"0" THEN IF K$<="9" THEN IF
K$<>"5" THEN GOSUB (VAL(K$)+4)*100
200 GOTO 100
```

```
  210 DIM A$(7):BEEP 1
  220 FOR K=0 TO 7
  230 Z=0
  240 FOR I=0 TO 7
  250 IF POINT(K*4+2,(7-I)*4+2)<>0 THEN
Z=Z+2^I
  260 NEXT I
  270 A$(K)=RIGHT$(HEX$(Z),2)
  280 NEXT K
  290 BEEP
  300 LOCATE 7,0:FOR I=0 TO 3:PRINT A$(I
);" ";:NEXT I
  310 LOCATE 8,1:FOR I=4 TO 7:PRINT A$(I
);" ";:NEXT I
  320 LOCATE 5,2:PRINT "Print => Y key";
  330 LOCATE 5,3:PRINT "NO    => N key";
  340 K$=INKEY$:IF K$="N" THEN 10
  350 IF K$<>"Y" THEN 340
  360 PP$=""
  370 FOR I=0 TO 7
  380 PP$=PP$+CHR$(VAL("&H"+A$(I)))
  390 GOSUB 2000
  400 NEXT I
  410 LPRINT CHR$(27);"K";CHR$(LEN(PP$))
;CHR$(0);
  420 LPRINT PP$;
  430 FOR I=0 TO 7
  440 LPRINT " ";A$(I);
  450 NEXT I
  460 LPRINT
  470 GOTO 10
  500 X=X-4:Y=Y+4:IF X<0 THEN X=30
  510 IF Y>30 THEN Y=2
  520 RETURN
  600 Y=Y+4:IF Y>30 THEN Y=2
  610 RETURN
  700 X=X+4:Y=Y+4:IF X>30 THEN X=2
  710 IF Y>30 THEN Y=2
  720 RETURN
  800 X=X-4:IF X<0 THEN X=30
  810 RETURN
```

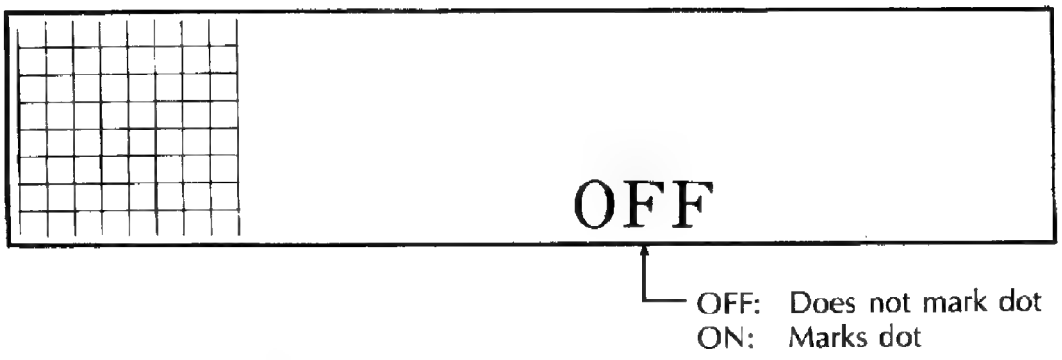
```
 1000 X=X+4:IF X>30 THEN X=2
 1010 RETURN
 1100 X=X-4:Y=Y-4:IF X<0 THEN X=30
 1110 IF Y<0 THEN Y=30
 1120 RETURN
 1200 Y=Y-4:IF Y<0 THEN Y=30
 1210 RETURN
 1300 X=X+4:Y=Y-4:IF X>30 THEN X=2
 1310 IF Y<0 THEN Y=30
 1320 RETURN
 2000 REM
 2010 IF RIGHT$(PP$,1)=CHR$(13) THEN GOS
UB 2100
 2020 RETURN
 2100 REM
 2110 LPRINT CHR$(27);"K";CHR$(LEN(PP$))
;CHR$(0);
 2120 LPRINT PP$;
 2130 PP$=""
 2140 RETURN
```

```
. 210 DIM A(7):BEEP 1
  270 A(K)=Z
  290 BEEP : CLS
  300 LOCATE 0,0:FOR I=0 TO 3:PRINT A(I)
;:NEXT I
  310 LOCATE 2,1:FOR I=4 TO 7:PRINT A(I)
;:NEXT I
  380 PP$=PP$+CHR$(A$(I))
  440 LPRINT A(I);
```

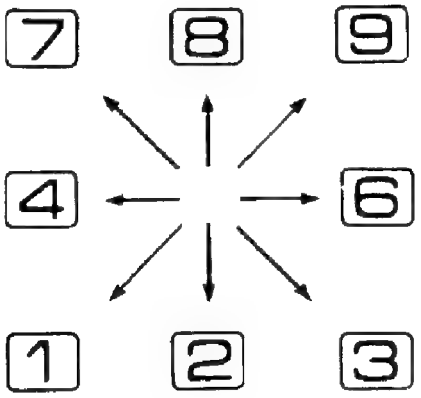
* In this case, data are expressed as decimal base.

Application

Executing this program displays an 8 × 8-dot matrix with a pointer flashing at the upper left dot.



The flashing pointer acts like a cursor as long as OFF is shown on the display. If ON is displayed, the dot at which the pointer is located is marked for printing. The ON/OFF setting is controlled by the ⊡ key. The following keys are used as indicated to move the pointer around the matrix.



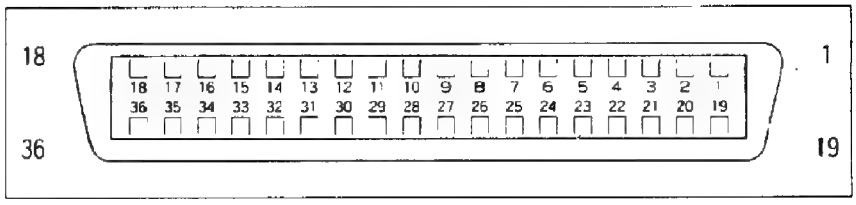
The [↵] is pressed after all the desired dots on the matrix are marked. At this time the computer calculates and displays the bit image data (PB-770: hexadecimal; PB-700: decimal) for the symbol created. The next display appears as:

Print = > Y key
NO = > N key

Pressing [Y] prints the symbol created and its bit image data. Execution then returns to the beginning of the program. The [BRK] key is used to terminate execution of this program.

4. PRINTER INTERFACE—CENTRONICS STANDARD 8-BIT PARALLEL

4-1 INTERFACE SIGNALS

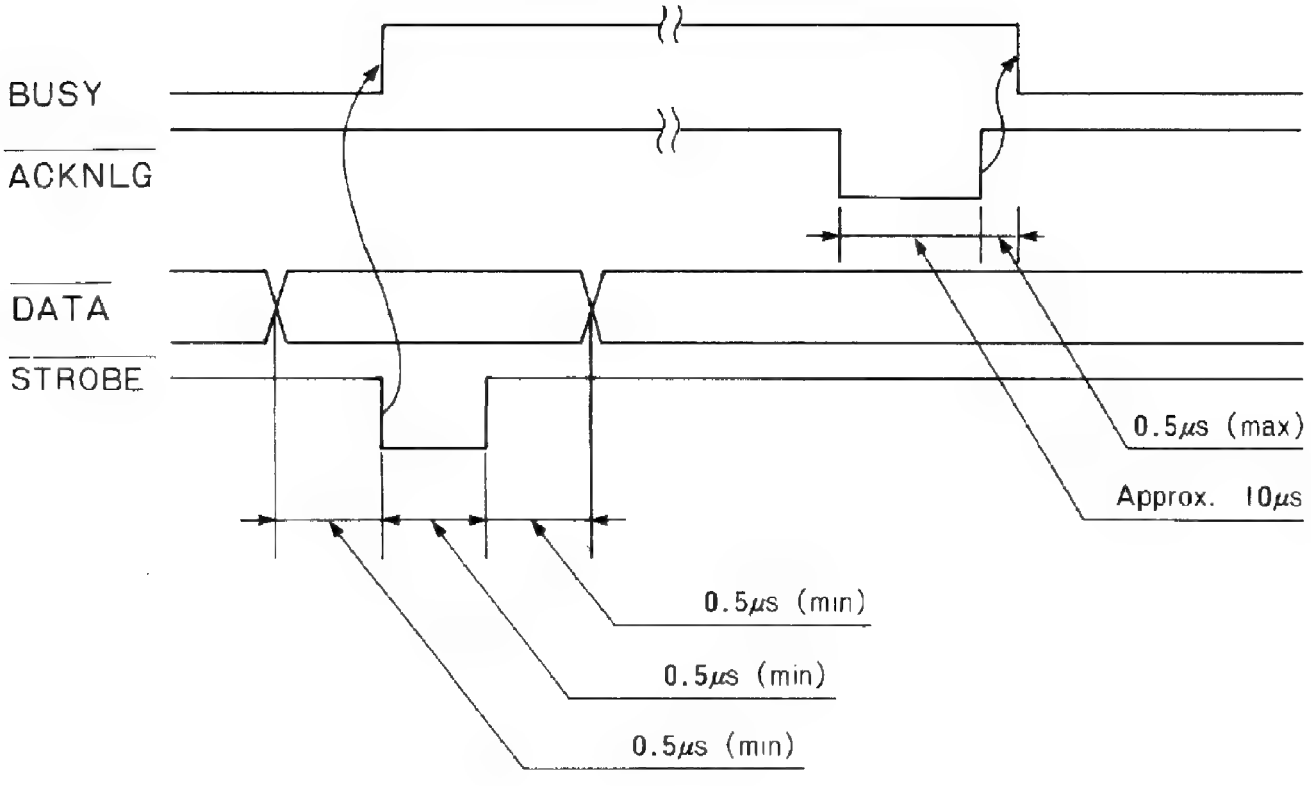


SIGNAL	PIN No.	RETURN	* INPUT/ OUTPUT	COMMENTS
DATA 1	2	20	INPUT	Each signal is expressed as parallel data from bit 1 through bit 8. HIGH makes data 1 while LOW makes data 0.
2	3	21		
3	4	22		
4	5	23		
5	6	24		
6	7	25		
7	8	26		
8	9	27		
$\overline{\text{STROBE}}$	1	19	INPUT	Data read strobe pulse. Usually HIGH. Data read when switched to LOW.
BUSY	11	29	OUTPUT	LOW indicates data can be accepted by printer. Switches to HIGH under following conditions to indicate data cannot be accepted by printer: 1 During data entry 2 During print operation
$\overline{\text{ACKNLG}}$	10	28	OUTPUT	Data transmission enabled at switch from LOW to HIGH.
$\overline{\text{ERROR}}$	32		OUTPUT	LOW indicates printer error condition; printer operation interrupted by paper jam, etc.
$\overline{\text{INIT}}$	31	30	INPUT	Switching to LOW initializes printer controller and clears printer buffer memory. Minimum pulse width of 50μs required.
GND	20) 30			Twisted pair return signal GND level

SIGNAL	PIN No.	RETURN	* INPUT/ OUTPUT	COMMENTS
GND	16			Connected to IC Vss in printer. Logic OV.
** CHASSIS GND	17			Printer chassis GND level.

* INPUT/OUTPUT expressed from printer side.
**CHASSIS GND connected internally to GND.

4-2 PARALLEL INTERFACE TIMING



5. CASSETTE INTERFACE

5-1 TAPE RECORDER CONNECTIONS

Applicable recorders

- This device can be used with commercially available cassette tape or microcassette tape recorders meeting the following conditions.
  1. Recorder MIC (microphone) terminal (or its equivalent) must have input impedance of at least 10KΩ and minimum input level of at least 3mV.
  2. Recorder EAR (earphone), MONITOR terminals (or their equivalents) must have output impedance of 10Ω or less and minimum output level of at least 2.5V.
  3. Recorder REMOTE terminal (or its equivalent) must be rated only to a maximum of 24V DC, 1A.
  4. Overall distortion factor must be less than 15%.

  It should also be noted that recorders whose performance is slightly outside of the values given above is sometimes adequate. Using such a recorder which does not meet the standards above will cause no damage to the recorder or computer.

  NOTE

  Use commercially available adaptors if plugs do not match sockets. Be sure to stay within the standards for the REMOTE terminal to avoid damage to the remote function of this device.

Precautions

The following points should be noted to allow optimum operation when this device is connected to a tape recorder.

- Ensure that this cassette interface is used with a PB-100 series and PB-700 series computers. Computers equipped with Centronics standard interfaces cannot be used.
- Ensure that the recorder jacks are not rusted or damaged.
- Clean and demagnetize the head of the recorder if necessary.
- Ensure that the tape has standard frequency characteristics.
- Ensure that the tape is not damaged or bent, and avoid recording on the first 30 seconds and the last 30 seconds of the cassette tape.
- Use battery power if proper recorder operations cannot be attained using an AC power supply or adaptor.
- Ensure that all connections are correct and secure. Never disconnect lines during operation. Always switch the power of the computer OFF before disconnecting lines.

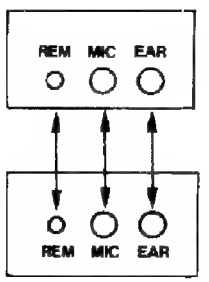
- Use the same recorder for recording and playback. Sometimes playback is impossible when the recorder being used is different from that used for recording.
- Store recorded tapes carefully to avoid stretching which may make playback impossible.
- Connect the computer to this device after switching the power of the computer OFF.

Recording and playback preparation

Connections

- Make connections using the accessory connecting cable.
- Use the white plug to connect the MIC terminal of this device with the recorder MIC terminal. (Connect to the RIGHT terminal when a stereo recorder is used.)
- Use the black plug to connect the EAR(IN) terminal of this device with the recorder EAR, MONITOR or EX SP terminal. (Connect to the terminal corresponding to the recorded side when a stereo recorder is used.)
- Use the gray plug to connect the REM terminal of this device with the recorder REMOTE terminal (when one is equipped).
- The three lines of the cable can all be connected at the same time. Some recorders, however, may generate noise which interferes with normal operations when the MIC and EAR terminals are connected at the same time. In this case, only connect to the MIC terminal when recording (computer → tape) and the EAR terminal when playing back (tape → computer).

INPUT TERMINALS



External tape recorder

Record level adjustment

- When a recorder with auto level control is used, set to AUTO.
- For manual adjustment, adjust the record level to 0vu while performing a test recording. Actually record the data once the optimum adjustment is attained.

NOTE

Do not attempt recording if extreme readings are being shown on the level meter. Instead, try using another recorder.

Output level adjustment

- Set the volume somewhere between its mid point and maximum, at a point higher than that normally used for listening to music (usually, the MAX setting is best).
- For stereo recorders, set the EAR terminal channel to MAX.
- If the recorder has a mixing feature, set the SOURCE to MAX and the MIC to MIN.

Other adjustments

- Set TONE, BASS, and TREBLE to a medium level.
- Determine the TAPE SELECTOR according to the type of tape used.

5-2 PB-100 SERIES OPERATIONS

Applicable units

PB-100, PB-100F, PB-110, PB-220, PB-410, FX-700P, FX-710P, FX-720P, FX-770P, FX-785P, FX-790P
* Consult the owner's manual for your computer if it is not specifically noted here.

Using this device in combination with a PB-100 series computer allows storage and retrieval of BASIC programs, variable data, data bank data, and assembly language programs. The actual functions and commands used differ according to the computer used. Consult the computer owner's manual for details.

Notes

- Tape recorder commands (SAVE, LOAD, PUT, GET, etc.) are not executed while in the PRINT ON mode (by pressing MODE 7 or executing MODE 7 in a program).
- Tape recorder commands cannot be executed during printing operations whether in the PRINT ON or PRINT OFF mode.

5-3 PB-700 SERIES OPERATIONS

Applicable units

PB-700, PB-770
* Consult the owner's manual for your computer if it is not specifically noted here.

Using this device in combination with a PB-700 series computer allows storage and retrieval of programs and data. The actual functions and commands used differ according to the computer used. Consult the computer owner's manual for details.

Notes

- Tape recorder commands (SAVE, LOAD, PUT, GET, etc.) are not executed during printer operations (NR error generated).

APPENDICES

CHARACTER TABLE

■ PB-100 SERIES

	Space	+	−	*	/	↑	!	"	#	$	>	≥	=	≤	<	≠
NUMBER	0	1	2	3	4	5	6	7	8	9	.	π	)	(	$\overline{E}$	E
UPPER CASE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
	Q	R	S	T	U	V	W	X	Y	Z	γ	σ				
LOWER CASE	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
	q	r	s	t	u	v	w	x	y	z						
SYMBOLS	?	,	;	:												
GRAPHIC SYMBOLS	○	Σ	°	△	@	×	÷	♠	←	♥	♦	♣	μ	Ω	↓	→
	%	¥	□	⊏	&	_	'	•	⊐	■	\	▒				

* Certain symbols included in the table (γ, σ, ／, ▒) cannot be printed with some models.

■ PB-700 SERIES

Hexa-decimal	0	1	2	3	4	5	6*	7	8	9	A	B	C	D	E	F
0	0	16	Space 32	Ø 48	@ 64	P 80	' 96	p 112	▁ 128	┴ 144	Space 160	ー 176	タ 192	ミ 208	三 224	× 240
1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	▂ 129	┬ 145	｡ 161	ア 177	チ 193	ム 209	上 225	円 241
2	2	(DC2) 18	" 34	2 50	B 66	R 82	b 98	r 114	▃ 130	┤ 146	「 162	イ 178	ツ 194	メ 210	下 226	年 242
3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	▄ 131	├ 147	」 163	ウ 179	テ 195	モ 211	口 227	月 243
4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	▅ 132	─ 148	、 164	エ 180	ト 196	ヤ 212	◢ 228	日 244
5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	▆ 133	┼ 149	・ 165	オ 181	ナ 197	ユ 213	◣ 229	時 245
6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	▇ 134	│ 150	ヲ 166	カ 182	ニ 198	ヨ 214	◥ 230	分 246
7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	■ 135	151	ア 167	キ 183	ヌ 199	ラ 215	◤ 231	秒 247
8	8	24	(40	8 56	H 72	X 88	h 104	x 120	▏ 136	┌ 152	イ 168	ク 184	ネ 200	リ 216	♠ 232	干 248
9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	▎ 137	┐ 153	ウ 169	ケ 185	ノ 201	ル 217	♥ 233	市 249
A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	▍ 138	└ 154	エ 170	コ 186	ハ 202	レ 218	◆ 234	区 250
B	11	(ESC) 27	+ 43	; 59	K 75	[91	k 107	{ 123	▋ 139	┘ 155	オ 171	サ 187	ヒ 203	ロ 219	♣ 235	町 251
C	12	28	, 44	< 60	L 76	¥ 92	l 108	¦ 124	▊ 140	┌ 156	ヤ 172	シ 188	フ 204	ワ 220	● 236	村 252
D	(CR) 13	29	- 45	= 61	M 77	] 93	m 109	} 125	▉ 141	┐ 157	ユ 173	ス 189	ヘ 205	ン 221	○ 237	人 253
E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	■ 142	└ 158	ヨ 174	セ 190	ホ 206	゛ 222	／ 238	▒ 254
F	(SI) 15	31	／ 47	? 63	O 79	_ 95	o 111	127	+ 143	┘ 159	ッ 175	ソ 191	マ 207	° 223	＼ 239	255

* Characters in parenthesis indicate control codes.

• Character sets

U.S.A.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	_	┴		0	@	P	`	p
1			!	1	A	Q	a	q	▁	┬	!	1	A	Q	a	q
2			"	2	B	R	b	r	▂	┤	"	2	B	R	b	r
3			#	3	C	S	c	s	▃	├	#	3	C	S	c	s
4			$	4	D	T	d	t	▄	‾	$	4	D	T	d	t
5			%	5	E	U	e	u	▅	─	%	5	E	U	e	u
6			&	6	F	V	f	v	▆	│	&	6	F	V	f	v
7			'	7	G	W	g	w	▇	┌	'	7	G	W	g	w
8			(	8	H	X	h	x	▏	┐	(	8	H	X	h	x
9			)	9	I	Y	i	y	▎	┘	)	9	I	Y	i	y
A			*	:	J	Z	j	z	▍	└	*	:	J	Z	j	z
B			+	;	K	[	k	{	▌	┼	+	;	K	[	k	{
C			,	<	L	\	l	|	▋	┌	,	<	L	\	l	|
D			-	=	M	]	m	}	▊	┐	-	=	M	]	m	}
E			.	>	N	^	n	~	▉	└	.	>	N	^	n	~
F			/	?	O	_	o		+	┘	/	?	O	_	o	

FRANCE

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	à	P	`	p	_	┴		0	à	P	`	p
1			!	1	A	Q	a	q	▁	┬	!	1	A	Q	a	q
2			"	2	B	R	b	r	▂	┤	"	2	B	R	b	r
3			#	3	C	S	c	s	▃	├	#	3	C	S	c	s
4			$	4	D	T	d	t	▄	‾	$	4	D	T	d	t
5			%	5	E	U	e	u	▅	─	%	5	E	U	e	u
6			&	6	F	V	f	v	▆	│	&	6	F	V	f	v
7			'	7	G	W	g	w	▇	┌	'	7	G	W	g	w
8			(	8	H	X	h	x	▏	┐	(	8	H	X	h	x
9			)	9	I	Y	i	y	▎	┘	)	9	I	Y	i	y
A			*	:	J	Z	j	z	▍	└	*	:	J	Z	j	z
B			+	;	K	°	k	é	▌	┼	+	;	K	°	k	é
C			,	<	L	Ç	l	ù	▋	┌	,	<	L	Ç	l	ù
D			-	=	M	§	m	è	▊	┐	-	=	M	§	m	è
E			.	>	N	^	n	¨	▉	└	.	>	N	^	n	¨
F			/	?	O	_	o		+	┘	/	?	O	_	o	

GERMANY

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	§	P	'	p	_	┴		0	§	P	'	p
1			!	1	A	Q	a	q	▁	┬	!	1	A	Q	a	q
2			"	2	B	R	b	r	▂	┤	"	2	B	R	b	r
3			#	3	C	S	c	s	▃	├	#	3	C	S	c	s
4			$	4	D	T	d	t	▄	─	$	4	D	T	d	t
5			%	5	E	U	e	u	▅	┼	%	5	E	U	e	u
6			&	6	F	V	f	v	▆	│	&	6	F	V	f	v
7			'	7	G	W	g	w	▇	┌	'	7	G	W	g	w
8			(	8	H	X	h	x	▏	┐	(	8	H	X	h	x
9			)	9	I	Y	i	y	▕	└	)	9	I	Y	i	y
A			*	:	J	Z	j	z	▔	┘	*	:	J	Z	j	z
B			+	;	K	Ä	k	ä	▉	┘	+	;	K	Ä	k	ä
C			,	<	L	Ö	l	ö	▊	┌	,	<	L	Ö	l	ö
D			-	=	M	Ü	m	ü	▋	┐	-	=	M	Ü	m	ü
E			.	>	N	^	n	ß	▌	└	.	>	N	^	n	ß
F			/	?	O	_	o		▍	┼	/	?	O	_	o	

U.K.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	'	p	_	┴		0	@	P	'	p
1			!	1	A	Q	a	q	▁	┬	!	1	A	Q	a	q
2			"	2	B	R	b	r	▂	┤	"	2	B	R	b	r
3			£	3	C	S	c	s	▃	├	£	3	C	S	c	s
4			$	4	D	T	d	t	▄	─	$	4	D	T	d	t
5			%	5	E	U	e	u	▅	┼	%	5	E	U	e	u
6			&	6	F	V	f	v	▆	│	&	6	F	V	f	v
7			'	7	G	W	g	w	▇	┌	'	7	G	W	g	w
8			(	8	H	X	h	x	▏	┐	(	8	H	X	h	x
9			)	9	I	Y	i	y	▕	└	)	9	I	Y	i	y
A			*	:	J	Z	j	z	▔	┘	*	:	J	Z	j	z
B			+	;	K	[	k	{	▉	┘	+	;	K	[	k	{
C			,	<	L	\	l	¦	▊	┌	,	<	L	\	l	¦
D			-	=	M	]	m	}	▋	┐	-	=	M	]	m	}
E			.	>	N	^	n	~	▌	└	.	>	N	^	n	~
F			/	?	O	_	o		▍	┼	/	?	O	_	o	

DENMARK

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	'	p	_	┴		0	@	P	'	p
1			!	1	A	Q	a	q	▁	┬	!	1	A	Q	a	q
2			"	2	B	R	b	r	▂	┤	"	2	B	R	b	r
3			#	3	C	S	c	s	▃	├	#	3	C	S	c	s
4			$	4	D	T	d	t	▄	¯	$	4	D	T	d	t
5			%	5	E	U	e	u	▅	─	%	5	E	U	e	u
6			&	6	F	V	f	v	▆	│	&	6	F	V	f	v
7			'	7	G	W	g	w	▇	┼	'	7	G	W	g	w
8			(	8	H	X	h	x	▏	┘	(	8	H	X	h	x
9			)	9	I	Y	i	y	▎	┐	)	9	I	Y	i	y
A			*	:	J	Z	j	z	▍	└	*	:	J	Z	j	z
B			+	;	K	Æ	k	æ	▌	┌	+	;	K	Æ	k	æ
C			,	<	L	Ø	l	ø	▋	╭	,	<	L	Ø	l	ø
D			−	=	M	Å	m	å	▊	╮	−	=	M	Å	m	å
E			.	>	N	^	n	~	▉	╰	.	>	N	^	n	~
F			/	?	O	_	o		╋	╯	/	?	O	_	o	

SWEDEN

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	É	P	é	p	_	┴		0	É	P	é	p
1			!	1	A	Q	a	q	▁	┬	!	1	A	Q	a	q
2			"	2	B	R	b	r	▂	┤	"	2	B	R	b	r
3			#	3	C	S	c	s	▃	├	#	3	C	S	c	s
4			¤	4	D	T	d	t	▄	¯	¤	4	D	T	d	t
5			%	5	E	U	e	u	▅	─	%	5	E	U	e	u
6			&	6	F	V	f	v	▆	│	&	6	F	V	f	v
7			'	7	G	W	g	w	▇	┼	'	7	G	W	g	w
8			(	8	H	X	h	x	▏	┘	(	8	H	X	h	x
9			)	9	I	Y	i	y	▎	┐	)	9	I	Y	i	y
A			*	:	J	Z	j	z	▍	└	*	:	J	Z	j	z
B			+	;	K	Ä	k	ä	▌	┌	+	;	K	Ä	k	ä
C			,	<	L	Ö	l	ö	▋	╭	,	<	L	Ö	l	ö
D			−	=	M	Å	m	å	▊	╮	−	=	M	Å	m	å
E			.	>	N	Ü	n	ü	▉	╰	.	>	N	Ü	n	ü
F			/	?	O	_	o		╋	╯	/	?	O	_	o	

ITALY

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	ù	p	_	┴		0	@	P	ù	p
1			!	1	A	Q	a	q	▁	┬	!	1	A	Q	a	q
2			"	2	B	R	b	r	▂	┤	"	2	B	R	b	r
3			#	3	C	S	c	s	▃	├	#	3	C	S	c	s
4			$	4	D	T	d	t	▄	─	$	4	D	T	d	t
5			%	5	E	U	e	u	▅	┼	%	5	E	U	e	u
6			&	6	F	V	f	v	▆	│	&	6	F	V	f	v
7			'	7	G	W	g	w	▇	┆	'	7	G	W	g	w
8			(	8	H	X	h	x	▏	┌	(	8	H	X	h	x
9			)	9	I	Y	i	y	▎	┐	)	9	I	Y	i	y
A			*	:	J	Z	j	z	▍	└	*	:	J	Z	j	z
B			+	;	K	°	k	à	▌	┘	+	;	K	°	k	à
C			,	<	L	\	l	ò	▋	┌	,	<	L	\	l	ò
D			-	=	M	é	m	è	▊	┐	-	=	M	é	m	è
E			.	>	N	^	n	ì	▉	└	.	>	N	^	n	ì
F			/	?	O	_	o		┼	/	/	?	O	_	o	

JAPAN

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	'	p	_	┴		ー	タ	ミ	=	乂
1			!	1	A	Q	a	q	▁	┬	｡	ア	チ	ム	ト	円
2			"	2	B	R	b	r	▂	┤	「	イ	ツ	メ	キ	年
3			#	3	C	S	c	s	▃	├	」	ウ	テ	モ	ヰ	月
4			$	4	D	T	d	t	▄	─	、	エ	ト	ヤ	◢	日
5			%	5	E	U	e	u	▅	┼	・	オ	ナ	ユ	◣	時
6			&	6	F	V	f	v	▆	│	ヲ	カ	ニ	ヨ	◥	分
7			'	7	G	W	g	w	▇	┆	ァ	キ	ヌ	ラ	◤	秒
8			(	8	H	X	h	x	▏	┌	ィ	ク	ネ	リ	♠	千
9			)	9	I	Y	i	y	▎	┐	ゥ	ケ	ノ	ル	♥	万
A			*	:	J	Z	j	z	▍	└	ェ	コ	ハ	レ	♦	円
B			+	;	K	[	k	{	▌	┘	ォ	サ	ヒ	ロ	♣	町
C			,	<	L	¥	l	¦	▋	┌	ャ	シ	フ	ワ	●	村
D			-	=	M	]	m	)	▊	┐	ュ	ス	ヘ	ン	o	人
E			.	>	N	^	n	~	▉	└	ョ	セ	ホ	゛	／	▒
F			/	?	O	_	o		┼	/	ッ	ソ	マ	°	\	

SPAIN

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	_	┴		0	@	P	`	p
1			!	1	A	Q	a	q	▁	┬	!	1	A	Q	a	q
2			"	2	B	R	b	r	▂	┤	"	2	B	R	b	r
3			₧	3	C	S	c	s	▃	├	₧	3	C	S	c	s
4			$	4	D	T	d	t	▄	─	$	4	D	T	d	t
5			%	5	E	U	e	u	▅	┼	%	5	E	U	e	u
6			&	6	F	V	f	v	▆	│	&	6	F	V	f	v
7			'	7	G	W	g	w	▇	╡	'	7	G	W	g	w
8			(	8	H	X	h	x	▏	┌	(	8	H	X	h	x
9			)	9	I	Y	i	y	▕	┐	)	9	I	Y	i	y
A			*	:	J	Z	j	z	▔	└	*	:	J	Z	j	z
B			+	;	K	¡	k	¨	▉	┘	+	;	K	¡	k	¨
C			,	<	L	Ñ	l	ñ	▊	┌	,	<	L	Ñ	l	ñ
D			-	=	M	¿	m	)	▋	┐	-	=	M	¿	m	)
E			.	>	N	^	n	~	▌	└	.	>	N	^	n	~
F			/	?	O	_	o		▍	┘	/	?	O	_	o	

NORWAY

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	É	P	é	p	_	┴		0	É	P	é	p
1			!	1	A	Q	a	q	▁	┬	!	1	A	Q	a	q
2			"	2	B	R	b	r	▂	┤	"	2	B	R	b	r
3			#	3	C	S	c	s	▃	├	#	3	C	S	c	s
4			¤	4	D	T	d	t	▄	─	¤	4	D	T	d	t
5			%	5	E	U	e	u	▅	┼	%	5	E	U	e	u
6			&	6	F	V	f	v	▆	│	&	6	F	V	f	v
7			'	7	G	W	g	w	▇	╡	'	7	G	W	g	w
8			(	8	H	X	h	x	▏	┌	(	8	H	X	h	x
9			)	9	I	Y	i	y	▕	┐	)	9	I	Y	i	y
A			*	:	J	Z	j	z	▔	└	*	:	J	Z	j	z
B			+	;	K	Æ	k	æ	▉	┘	+	;	K	Æ	k	æ
C			,	<	L	Ø	l	ø	▊	┌	,	<	L	Ø	l	ø
D			-	=	M	Å	m	å	▋	┐	-	=	M	Å	m	å
E			.	>	N	Ü	n	ü	▌	└	.	>	N	Ü	n	ü
F			/	?	O	_	o		▍	┘	/	?	O	_	o	

DENMARK 2

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	É	P	é	p	_	┴		0	É	P	é	p
1			!	1	A	Q	a	q	▁	┬	!	1	A	Q	a	q
2			"	2	B	R	b	r	▂	┤	"	2	B	R	b	r
3			#	3	C	S	c	s	▃	├	#	3	C	S	c	s
4			$	4	D	T	d	t	▄	‾	$	4	D	T	d	t
5			%	5	E	U	e	u	▅	─	%	5	E	U	e	u
6			&	6	F	V	f	v	▆	│	&	6	F	V	f	v
7			'	7	G	W	g	w	▇	┼	'	7	G	W	g	w
8			(	8	H	X	h	x	▏	┌	(	8	H	X	h	x
9			)	9	I	Y	i	y	▎	┐	)	9	I	Y	i	y
A			*	:	J	Z	j	z	▍	└	*	:	J	Z	j	z
B			+	;	K	Æ	k	æ	▌	┘	+	;	K	Æ	k	æ
C			,	<	L	Ø	l	ø	▋	┌	,	<	L	Ø	l	ø
D			-	=	M	Å	m	à	▊	┐	-	=	M	Å	m	à
E			.	>	N	Ü	n	ü	▉	└	.	>	N	Ü	n	ü
F			/	?	O	_	o		┼	┘	/	?	O	_	o	

CONTROL CODE TABLE

CODE	FORMAT	FUNCTIONS	PAGE
ESC 2	CHR$(27);"2";	1/6" paper feed	19
ESC A	CHR$(27);"A";CHR$(n);	n=8 → 1/9" paper feed n=12 → 1/6" paper feed	20
CR	CHR$(13);	Print/carrier return (DIP switch #1 OFF) Print/carrier return/line feed (DIP switch #1 ON)	22
LF*	CHR$(10);	Print/carrier return/line feed	23
ESC R	CHR$(27);"R";CHR$(n);	N=0~10, character set	24
SI	CHR$(15);	Condensed print set	26
DC 2	CHR$(18);	Condensed print reset	28
ESC W	CHR$(27);"W";CHR$(n);	n=1 → Double width print set n=0 → Double width print reset	29
ESC E	CHR$(27);"E";	Emphasized print set	31
ESC F	CHR$(27);"F";	Emphasized print reset	32
ESC SPACE**	CHR$(27);"␣";CHR$(n);	n=1 → 2-dot character spacing n=0 → 1-dot character spacing	33
ESC K	CHR$(27);"K";CHR$(n_1);CHR$($n_2$);	$n_1+n_2\times256$ single density bit image data items	35
ESC L	CHR$(27);"L";CHR$(n_1);CHR$($n_2$);	$n_1+n_2\times256$ double density bit image data items	39

* The LF code is not used with the PB-700 series (print/line feed is performed by CR code or LPRINT statement).

** ESC SPACE can only be used when condensed print is set. Spacing between characters is 1 dot in other print modes.

All numeric values in the table above are represented in decimal base.

SPECIFICATIONS

Model: FP-40

PRINTER

Printing method:	Thermal (non-impact)
Capacity:	40 columns standard (NORMAL) 80 columns maximum (80 CHR)
Print speed:	Approx. 0.65 lines/sec. (NORMAL)
Feed pitch:	1/6" or 1/9"
Roll paper:	Thermal paper (TRP-112) Width: 112mm Roll diameter: 30mm (max.)

CASSETTE INTERFACE

Output terminal:	MIC 3.5ϕ, output impedance approx. 40kΩ, output level 3 ~ 5mV
Input terminal:	EAR 3.5ϕ, input impedance approx. 20kΩ, input level 2.5 ~ 50V
Remote terminal:	REM 2.5ϕ, 24V, 1A or less
Recording system:	Kansas City standard (300BPS)

GENERAL

Power supply:	Rechargeable batteries (built-in)
Charger:	CHA-2
Power consumption:	14W
Battery life:	Approximately 2,500 lines (printer operation only, full charge)
Dimensions:	42.5(H) × 210(W) × 145(D)mm 1 5/8" (H) × 8 1/4"(W) × 5 3/4"(D)
Weight:	609g (1.3 lbs)

GUIDELINES LAID DOWN BY FCC RULES FOR USE OF THE UNIT IN THE U.S.A. (not applicable to other areas).

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.

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß der/die/das

Zeichendrucker, Modell FP-40

(Gerät, Typ, Bezeichnung)

in Übereinstimmung mit den Bestimmungen der

Amtsbl. Vfg. 1046/1984 der Deutschen Bundespost

(Amtsblattverfügung)

funk-entstört ist.

Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

CASIO COMPUTER CO., LTD.
2-6-1, NISHI-SHINJUKU, SHINJUKU-KU
TOKYO 163, JAPAN

(Name des Herstellers/Importeurs)

CASIO

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