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TECHNICAL SUPPORT

For technical support, please first consult with your local dealer, who is knowledgeable about the printer driver, application software as well as programming commands.

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INTRODUCTION

Argox label printers are featuring high resolution and rich diversity of fonts, bar codes and graphics. General speaking, under Windows environment, with the bundled driver, the user can already make his own desired labels by using the professional label/bar code applications e.g. CodeSoft or BarTender, or using the common applications, like MicroSoft Word, PaintBrush. And in those cases, the technical reference manual may not be necessary.

This manual explains all programming commands for Argox label printers. All of the commands except for interaction commands can be sent from the host to the printer through the Centronics or Serial (RS232C) ports. Provided that the host is PC or PC compatible, its I/O ports shall include LPT1:, LPT2:, LPT3, COM1: and COM2:, up to the configuration of the host.

To edit the command file, you may run non-document editor, e.g. PE2 and EDIT under DOS, or BASIC program. All commands are easy to program except the graphic files. (PCX, BMP and IMG formats need control codes)

For easy access of this programming language, please refer to the following table of notations for some control codes.

Notation	Decimal value	Hex value	Remark
<SOH>	1	01H	interaction commands
<STX>	2	02H	system commands
<ACK>	6	06H	acknowledge
<LF>	10	0AH	line feed
<CR>	13	0DH	carriage return
<XON>	17	11H	XON code for communication
<XOFF>	19	13H	XOFF code for communication
<NAK>	21	15H	not acknowledge
<ESC>	27	1BH	font downloading commands

With these software commands you are able to

- Change the settings
- Make the label controls
- Interact with the printer
- Format the whole label (including bar codes, texts, graphics, lines, boxes and their positions)
- Set the print attributes (transparent or exclusive OR)

PRINTER PROGRAMMING LANGUAGES

The printer programming language is a software interface between the host and printer. Through it, the external keyboard or the host can send data/commands to the printer to get the required printouts.

Basically Argox printers support two kinds of printer programming languages/emulations. But both languages cannot function at the same time, since each of them has their own features and characteristics.

PPLA

Printer Programming Language A (PPLA) is compatible with the language on the Datamax's Printers. It supports more graphic formats and resident fonts than PPLB. Most of the commands are independent of resolution.

PPLB

Printer Programming Language B (PPLB) is compatible with the language on the Eltron's Printers. Compared to PPLA, it has following different features:

- Except graphic files, the commands do not contain unprintable control codes.
- It is more suitable for stand-alone operation.
- Its commands are dependant on resolution. All units are shown in pixels.
- It supports binary raster data for Windows environment.

The sections of **A1 ~ A10** and **AA ~ AD** on the next page are for use of the **PPLA** and **B1 ~ B5** and **BA ~ BE** for **PPLB**. Check the emulation on your printer (from the LCD display or self-test printout), then select the related sections to read.

CONTENTS OF PROGRAMMER'S MANUAL

Section A: About PPLA

Section B: About PPLB

A1. COORDINATES SYSTEM

The PPLA coordinates system is depicted in Figure A1-1.

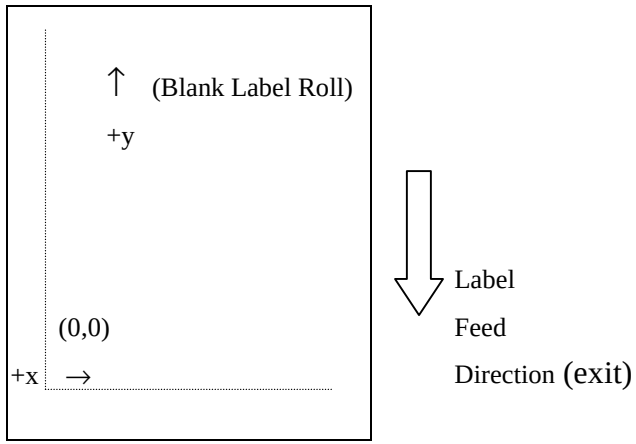


Fig. A1-1 PPLA coordinates system

The point of origin (0,0) of this coordinates system is at the left bottom corner. The origin point remains unchanged, while the texts, bar codes or other objects are being rotated. Negative coordinate value is not allowed. The ranges of X and Y coordinates are shown in the table below:

	Minimum	Maximum
X coordinate	0	about 4 inches (6 inches for G6000/7000)
Y coordinate	0	30 inches

The measurements of the X- and Y-axis of the coordinates system can be in inches or in millimeters.

A2. COMMAND CATEGORIES

According to functions, the PPLA programming commands in this manual are divided into the following five categories:

- Interaction commands
- System setting commands
- System level commands
- Label formatting commands
- Font downloading commands

Only the label formatting commands must be grouped to send, other commands can be sent separately. For example:

Command/data from host	Data from printer (RS232C)
Interaction command 0	Printer status
System level command 0	
Interaction command 1	Printer status
System level command 1	
Font downloading 0	
…	
Font downloading N	
System level command 2	
<STX>L (system command)	
Label formatting command 0	
…	
Label formatting command N	
E (Label formatting command)	

A3. INTERACTION COMMANDS

The interaction commands demand the printer's immediate interaction. But the printer only communicates a detailed status to the host via the printer's serial (RS232C) port, since only serial port supports bi-direction communication.

Upon receiving this kind of command, the printer will either perform the command or send back the corresponding data to the host so that the user and programmer can determine what to do with the next step.

Command	Description	Response from printer
<SOH>#	Resets the Printer	<XOFF> <XON> T

1. This command resets the printer like "power on" step. Resetting the Printer returns all settings to default value, except the downloaded graphics and fonts.
2. The printer sends <XOFF>, suspending the data input.
3. The printer sends <XON> and 'T', ready to resume work.
4. Since this command will delay communication for one second, if not necessary, the user is advised to send other alternative system level command instead of this one.

Command	Description	Response from printer
<SOH>A	Sends a readable status string	XXXXXXXX<CR>

This command drives the printer to retrieve an 8-byte data string followed by a <CR> to the host. Each 'X' will be 'Y' or 'N' reporting the printer status.

Byte 1	Y - firmware parser is busy. N - firmware parser is idling.
Byte 2	Y - paper out. N - paper installed.
Byte 3	Y - ribbon out. N - ribbon installed.
Byte 4	Y - printing batch file. N - others.
Byte 5	Y - at printing state. N - not at printing state.
Byte 6	Y - printer is paused and waiting for the second press. N - printer is not paused.
Byte 7	Y - label is present. N – label is not present.
Byte 8	N – always 'N'.

Command	Description	Response from printer
<SOH>B	Toggles pause condition	None

This command toggles the pause state on or off. Byte 6 generated from <SOH>A will reflect the change of the status.

Command	Description	Response from printer
<SOH>D	Disables the interaction command.	None

Interaction commands will be ignored after this command is sent.

The <SOH>D command must be sent prior to loading graphic images or fonts, since some graphic images or fonts may contain data sequences that can be misinterpreted as commands by the printer.

Command	Description	Response from printer
<SOH>E	Sends preset label to be printed	XXXX<CR>

This command drives the printer to report the numbers of labels queued to print.
This 'XXXX' is a 4-digit decimal number, e.g.

```
0020<CR>
```

(There are still 20 labels left in printer buffer waiting to be printed.)

Command	Description	Response from printer
<SOH>F	Sends one byte printer status	X<CR>

This command instructs the printer to send a single byte where each bit(1 or0) represents one of the printer's status flags, followed by a <CR>.

Bit 1	1 - firmware parser busy. 0 - firmware parser idling.
Bit 2	1 - paper out, 0 - paper installed.
Bit 3	1 - ribbon out, 0 - ribbon installed.
Bit 4	1 - printing batch file 0 - others.
Bit 5	1 - at printing state. 0 - not at printing state.

Bit 6	1 - printer is paused and waiting for the second press. 0 - printer is not paused.
Bit 7	1 - label present. 0 - label not present.
Bit 8	0 – always '0'.

A4. SYSTEM SETTING COMMANDS

System setting commands are used to control the printer configuration and will be written into the printer E^2PROM. This kind of commands will remain in effect, whenever the printer is turned on, unless the command of with different parameters to replace it.

The factory default settings are

Parameter Description	**Default Value**	**Remark**
RS232 baud rate	9600 baud	**
Print darkness	Normal darkness (H10)	
Transfer type	Thermal transfer	**
Gap length	3 ~ 5 mm (normal)	**
Cut position	Center of gap	**
Command mode	Standard control codes	**
Label length for continuous label (under Windows)	0. From top to last black pixel.	**
Symbol set for ASD smooth fonts	USASCII	
Cutter operation	Cut with back-feed	++

**: For the X2000+/X3000+/G6000/G7000, these settings are controlled by the DIP switches. No command is required.

++: Settings for X2000+/X3000+/G6000/G7000 only.

Command	Description	Parameter Range
<STX>KI7*n*	Sets transfer type	*n* : '0' for direct thermal or '1' for thermal transfer

This command should comply with other settings for printer configuration. In case that the setting is not correct, the printer may hang to work or miss-detect the gap. For instance, if the setting is thermal transfer and the ribbon is not installed, the printer will stop working and blink both LEDs.

Note: This command is for OS214/314 and X1000+ only.

Command	Description	Parameter Range
<STX>KI8*n*	Sets baud rate**	*n* : '0' – 9600, '1' – 600, '2' - 2400, '3' – 19200, '4' - 4800, '5' – 38400, '6' - 1200, '7' - 9600 baud.

Above command is used for RS232 communication. It becomes effective after the printer is being restarted. This command can be sent either through the serial port or the parallel port, provided that the host and the printer are under the same protocol (baud rate and data format).

Example: `<STX>KI83`

The above example will set baud rate to 19200 for RS232C.

***This command is not valid for X2000+/X3000+/G6000/G7000.*

Command	Description	Parameter Range
<STX>KI9*bdpt*	Sets baud rate, data length, parity and stop bit no.**	*b* : '0' - 9600, '1' – 600, '2' - 2400, '3' - 19200, '4' – 4800, '5' - 38400, '6' – 1200, '7' - 9600. *d* : '7' - 7-bit data, '8' - 8-bit data. *p* : 'N' - none parity, 'E' - even parity, 'O' - odd parity. *t* : '1' - 1 stop bit, '2' - 2 stop bits.

Example: `<STX>KI917E1`

The above example will set baud rate to 2400, bit data to 7, parity to even and stop bit to 1.

***This command is not valid for X2000+/X3000+/G6000/G7000.*

Command	Description	Parameter Range
<STX>KI<*m*	Sets symbol set for ASD smooth fonts	*m* : '0' - USASCII, '1' - United Kingdom, '2' - Spanish, '3' - Swedish, '4' - French, '5' - German, '6' - Italian, '7' - Danish/Norwegian.

Above command is used to select the European symbol set. It is for the use of ASD smooth font set, which is prevailing in Europe.

Example:
```
<STX>KI<7<CR>
<STX>L<CR>
D11<CR>
1911003001000 20Special characters: æÆÅ<CR>
E<CR>
```

Supposed you are using the Danish system and keyboard, the above command will select Danish/Norwegian symbol set and enable the printer to print some special characters.

Special characters: æÆÅ

Fig. A4-1

Command	Description	Parameter Range
<STX>KX____	Sets label length for continuous label.	____ is a 4 digit decimal value in millimeters (mm).

This command is valid for using Label Dr. driver under Windows. Without this command (setting) the label length ranges from the start printing position to the last black image (pixel).

Example: `<STX>KX0100<CR>`

Sets the continuous label length to 100 mm.

***This command is not for X2000+/X3000+/G6000/G7000.*

Command	Description	Parameter Range
<STX>KI0*n*	Sets cut mode.	*n* value: '0' : mode 0, normal mode. (cut and back-feed for the next label). '1' : mode 1, cut without back-feed.

To set to mode 1 (<stx>KI01), ensure to comply with the following conditions:

- The label length must exceed 1.5 inches.
- The printer must be X2000+/X3000+/G6000/G7000.
- The last label of a batch job cannot be cut until next label data is sent to the printer.

Command	Description	Parameter Range
<STX>K15—	Sets the gap height	— is a two digit value and in terms of millimeters.

If the gap height is more than 6 mm the command must be sent otherwise the label detection may be incorrect.

This command is for OS214/204/202/314 PPLA only.

Example: <STX>K1508

Sets the gap height to 8 mm.

Command	Description	Parameter Range
<STX>KI;*n*	Sets control code set.	*n* value : '0' : Standard control codes. '1' : Alternative control codes.

Refer to the list below for standard and alternative control codes. To exit from the alternative mode, just reset the menu on the printer panel or send the command of "!KI;1".

	Control codes	Hexadecimal value
Standard (default)	CR ESC STX	0DH 1BH 02H
Alternative	\ [!	5CH 5BH 21H

***This command is not applicable to X2000+/X3000+/G6000/G7000.*

Command	Description	Parameter Range
<ESC>KI;_	Sets offset value for cutting or peeling position.	_ is a binary signed byte in terms of pixels. 00H ~ 7FH are positive values and 80H ~ FFH are negative values.

This command set the cut position for specific labels.

***This command is not for X2000+/X3000+/G6000/G7000.*

Command	Description	Parameter Range
<ESC>KI:_	Sets horizontal shift.	_ is a binary signed byte and in terms of pixels. 00H ~ 7FH are positive and 80H ~ FFH are negative.

This command shifts the image print position in the X coordinate.

***This command is for X2000+/X3000+/G6000/G7000 only..*

Command	Description
<ESC>@0	Clears the flash memory that is used for soft fonts, forms or graphics.

This command clears the flash memory. All objects in the flash memory will be deleted after this command is sent.

A5. SYSTEM LEVEL COMMANDS

This group of commands is used to set the printing related parameters or environment for the current or subsequent labels. They will be reset after restarting the printer or by other related system level commands. Unlike system setting commands, these commands will not be saved into EEPROM.

Command	Description	Default
<STX>A	Sets date and time	

This command sets the data and time. It takes effect only when the RTC(real time clock) board is installed. In general the RTC board must be set at the first time you use it.

<STX>A*wmmddyyyyhhMMjj*

Location	Digit no.	Description
w	1	Day of week. 1 for Monday
mm	2	Month. 01 for January
dd	2	Day.
yyyy	4	Year.
hh	2	Hour in 24 hour format.
MM	2	Minutes.
jjj	3	Julian data.

Example: `<STX>A5100720001230287`

This command sets Friday Oct. 7th, 2000, 12:30, the 287 of the year.

Command	Description	Default
<STX>a	Enables label echo character	Disabled

This command enables the printer to send the control code of RS (1EH) the host through the serial port after each label is being printed.

Example: `<STX>a`
`1EH` ; 1st label printed
`1EH` ; 2nd label printed

Command	Description	Default
<STX>cxxxx	Sets continuous label length	0000

This command disables the edge sensor sensing the gap or mark between the labels and sets a page length for the printer to feed. (Otherwise the printer will feed the label for 12 inches long.)

This command will overwrite <STX>e and <STX>r commands, which are in conflict with it. The label length means the distance between the start printing position to the stop printing position.

Parameter: xxxx
4-digit decimal used to set paper length. (Maximum value: 30 inches)

Example: `<STX>c0200` (set two-inch continuous label)
Provided the print object is longer than the set paper length, the paper length will

automatically increase to cover the object. In consequence, it becomes 0200*N.

Make sure the object ready to be printed no longer than 30 inches, otherwise unexpected outcome will occur.

Command	Description
<STX>Dxxxxxxx	Dumps the memory contents

This command is used for debugging program or maintenance purpose only. It dumps the memory contents for 4 K memory and sends them to the host through the RS232 port.

Parameter: xxxxxxx
A 6 or7-digit HEX value used for specify internal memory address of the printer (7 digits For models OS314/X2000+/3000/G6000/7000 and 6 digits for models OS204/214/202/X1000+.)

```
Example: <STX>D9090000
```
Dump the memory from 9090000H for 4 K bytes.
```
Response:
9090000  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
9090010  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
…              …                          …
9090FF0  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
```

Command	Description	Default
<STX>Exxxx	Sets copy count for stored label	0001

This command should be sent in conjunction with <STX>G, as both commands are related to label storage. The stored label format is the last printed format, kept in the print buffer.

Example: `<STX>E0003<CR>`
`<STX>G<CR>`

Result: Print out 3 pieces of the last printed label format.

Command	Description
<STX>e	Selects edge sensor for gap

1. This command is used for see-through media. It sets the printer to sense the gap between labels.
2. Refer to <STX>r for reflective media.
3. Once received this command, the printer will ignore the previous command for continuous label.(<STX>cxxxx).

Command	Description
<STX>F	Feeds a label

1. This command will feed a label till where the gap is being detected, in case that the paper type is set to non-continuous.
2. The media paper will be fed for certain length, when the paper type is set to continuous.
3. Basically its function is same as pressing the “Feed” button.

Command	Description	Default
<STX>fxxx	Sets stop position and automatic back-feed for the label stock	f220

1. This command causes the label stock to stop at a position convenient for the user to tear off. When the next label format is sent to the printer, it will automatically back-feed to the start of print position.
2. Back-feed will not be activated if xxx is less than 220.
3. Under multi-copy or continuous printing, this command is valid only for the first label and last labels.

Example: `<STX>f320<CR>`

Result: Label stock feeds backward for one inch before the next label format is printed.

Command	Description
<STX>G	Prints stored label format

This command should be used in conjunction with <STX>E.

The stored label format is the last printed label format kept in the buffer.

Example:
```
<STX>L<CR>
1211000002001OOThis is a label<CR>
E<CR>
<STX>E0002<CR>
<STX>G<CR>
```

Result: Print the label 3 times (1+2 copies).

Command	Description
<STX>Imbfnn…n	Downloads the graphics file

Parameters:

m : memory module. ‘A’ for RAM module, ‘B’ for flash memory module and ‘C’ for default module (Normally, the default module is RAM module).

Remarks: Suppose you select ‘B’ flash memory and the flash module is not installed, the printer will automatically save the graphics into RAM.

*The flash memory module is an optional item.

b : ’A’ - 7-bit data image file.

f : image file format. The printer supports 4 image file formats, PCX, BMP, IMG and HEX formats. This parameter specifies graphic format type and direction.

f parameter	Image File Format	Direction
‘B’	8-bit BMP file format	Flipped
‘b’	8-bit BMP file format	
‘I’	8-bit IMG file format	Flipped
‘I’	8-bit IMG file format	
‘P’	8-bit PCX file format	Flipped
‘p’	8-bit PCX file format	
‘F’	7-bit HEX file format	

1. nn…n : file name, maximum 16 characters. The file name can be accessed with label formatting commands (Y).
2. The file name must be same as defined.
3. Refer to the appendix AA for details of the HEX format.

Example:
```
<STX>IAFhexfile<CR>
… (HEX file)
<STX>L<CR>
…
1Y1100001000100hexfile<CR>
1Y1100002000100hexfile<CR>
E<CR>
```

Result: The HEX graphics image file “`hexfile`” will print on the same label.

Command	Description	Default
<STX>J	Sets pause for each printed label	Normal

This command will pause the printer each time after a label is printed. The printer will resume working only after the ‘Feed’ button is pressed.

When the printer is at pause state, the **READY** LED will keep blinking to alert the user for pressing the “**FEED**” button (OS series) or “**PAUSE**” button (the X series).

Command	Description
<STX>j	Cancels pause

This command cancels the pause function generated by <STX>J.

Command	Description
<STX>KQ	Inquires system configuration

This command drives the printer to send the memory configuration including standard, expansion and available memory sizes to the host through the RS232C.

Example: <STX>KQ

Response from printer:


```
INTERNAL MEMORY<CR>
VER: 1.0 100198<CR>
STANDARD RAM : 524288 BYTES<CR>
EXPANSION RAM: 0 BYTES<CR>
AVAILABLE RAM : 429632 BYTES<CR>
NO. OF DL SOFT FONTS : 0<CR>
```

Command	Description
<STX>L	Enters label formatting state

The above command switches the printer into the label-formatting mode. The printer will process the label formatting commands until it receives the command to exit from this mode.

In the process of the label formatting, the system level commands will be ignored.

Example:
```
<STX>L<CR>
121100001000050THIS LABEL IS MADE BY JIMMY<CR>
E<CR>
```

Output from printer:

Fig. A5-1

Command	Description	Default
<STX>Mxxxx	Sets maximum label length	1200

Above command sets the maximum label length and the printer will search for gap or mark within the specified length accordingly. The default length is 12 inches.

Parameter: xxxx

A 4-digit decimal. (1 to 12 inches)

Example: <STX>M0300<CR>

Result: Set maximum label length to 3 inches.

Command	Description	Default
<STX>m	Sets measurement to metric	N

There are two measurements for the printer, in millimeter and in inch.

Example: <STX>m
<STX>M0600

Result: 60 mm for maximum label length

Command	Description	Default
<STX>n	Sets measurement to inches	N

Example: <STX>n
<STX>M0600

Result: 6 inches for maximum label length

Command	Description	Default
<STX>Oxxxx	Sets print start position	0220

This command sets the offset value for start print position.

The default 0220 sets the start print position exactly below the TPH (print head) line.

You may change it to meet the specific label format requirements.

This parameter will be ignored if continuous label command is sent. (<STX>cxxxx).

Command	Description
<STX>P	Enters data dump mode

This command drives the printer to dump the HEX value of the data that is transmitted to the printer afterwards.

The printer will not return to normal function, unless restarted.

Example: <STX>P

Output from printer:

```
0140 20 20 39 3A 33 30 0D 0A 1A                        9:30
0130 20 20 20 20 30 20 20 30 37 2D 32 34 2D 39 38 20     0  07-24-98
0120 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
0110 39 38 20 20 20 39 3A 32 38 0D 0A 54 20 20 20 20 98   9:28  T
0100 20 20 20 20 20 20 20 35 20 20 30 37 2D 32 34 2D        5  07-24-
00F0 4D 50 20 20 20 20 20 20 20 20 20 20 20 20 20 20 MP
00E0 32 34 2D 39 38 20 20 20 39 3A 30 31 0D 0A 44 55 24-98   9:01  DU
00D0 20 20 20 20 20 20 20 20 20 20 36 30 20 20 30 37 2D          60  07-
00C0 0A 4A 49 4D 4D 59 20 20 20 20 20 20 20 20 20 20  JIMMY
00B0 30 37 2D 32 33 2D 39 38 20 20 31 39 3A 30 36 0D 07-23-98  19:06
00A0 20 20 20 20 20 20 20 20 20 20 20 20 20 20 39 20                9
0090 30 37 0D 0A 43 4F 4E 54 20 20 20 20 20 20 20 20 07  CONT
0080 30 20 20 30 37 2D 32 33 2D 39 38 20 20 31 39 3A 0  07-23-98  19:
0070 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 36                 6
0060 46 49 47 5C 41 0D 0A 53 50 45 43 49 41 4C 20 20 FIG\A  SPECIAL
0050 79 20 6F 66 20 43 3A 5C 44 4F 43 5C 4D 41 4E 5C y of C:\DOC\MAN\
0040 2D 31 38 46 44 0D 0A 20 44 69 72 65 63 74 6F 72 -18FD   Director
0030 6C 20 4E 75 6D 62 65 72 20 69 73 20 33 44 35 41 l Number is 3D5A
0020 53 0D 0A 20 56 6F 6C 75 6D 65 20 53 65 72 69 61 S   Volume Seria
0010 64 72 69 76 65 20 43 20 69 73 20 4D 53 2D 44 4F drive C is MS-DO
0000 0D 0A 1A 0D 0A 20 56 6F 6C 75 6D 65 20 69 6E 20       Volume in
```

Fig. A5-2

Command	Description
<STX>Q	Clears memory

This command instructs the printer to clear both of the RAM and flash memory. Normally, this command is sent at the end of each job to avoid that the graphics and fonts become accumulated up and overflow the memory.

In case of the memory full, the printer will erase the first-in graphics or fonts. To avoid this situation and to save the data re-processing time, you are advised to send this command at the end of a job.

Example:

```
<STX>IAFhexfile<CR>
… (HEX file)
<STX>L<CR>
…
1Y1100001000100hexfile<CR>
E<CR>
<STX>Q<CR>
```

Command	Description
<STX>q*n*	Clears memory module

This command clears the selected memory module.

n : ‘A’ - RAM module, ‘B’ - flash memory, ‘C’ - default module.

Command	Description
<STX>r	Selects reflective sensor for gap

This command selects the reflective sensor for label detection. It is used for “Black stripe” media sensing. If the label stock is non-continuous type, refer to <STX>e for see-through media. Once this command is received, the previous continuous paper command (<STX>cxxxx) will be ignored.

Command	Description
<STX>S*n*	Sets label feed rate

This command sets the rate of the feed that the printer will feed media after the image is

printed.

Parameter: *n* (‘A’ to ‘K’)

A	1.0 ips	**E**	3.0 ips	**I**	5.0 ips
B	1.5 ips	**F**	3.5 ips	**J**	5.5 ips
C	2.0 ips	**G**	4.0 ips	**K**	6.0 ips
D	2.5 ips	**H**	4.5 ips		

Printer	Speed Range
OS214/204/202	**A ~ E**
OS314	**A ~ C**
G6000/G7000/X1000+	**A ~ G**
X2000+/X3000+	**A ~ K**

Command	Description
<STX>T	Prints test pattern

This command is used for testing the printout quality or checking the print head for debugging or maintenance purpose. Normally users do not use this command.

Example: `<STX>T`

Output from printer:

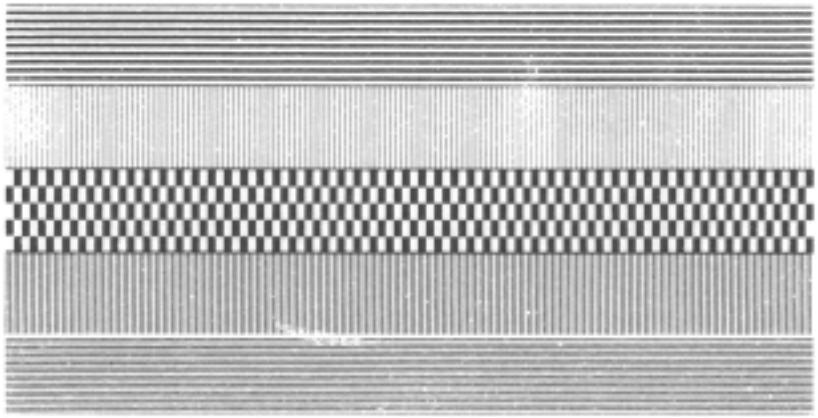


Fig. 5-3

Command	Description
<STX>U*nncccc*	Replaces the data of the specified data

Where: *nn* field number

cccc data to be replaced

This command is used to replace the field data in a form. Other data are kept the same as the previous ones.

Example:
```
<stx>L
D11
121100000100020filed 1 data
121100000400020filed 2 data
Q0001
E
```

Example: `<stx>U01NEW DATA 1`

```
<stx>E0001
<stx>G
```

Command	Description
<STX>V*n*	Sets cutter and dispenser configuration

‘0’: no cutter and peeler function

‘1’: Enables cutter and peeler function

‘4’: no cutter and peeler function

Example: `<STX>V0` ; no cutter and peeler function

`<STX>V1` ; Enables cut operation

Command	Description
<STX>v	Inquires the printer version

This command is used for maintenance purpose. It inquires the printer of the firmware version. The printer will response with version and date code through RS232C.

Example: `<STX>v`

Response with

```
Label Printer with Firmware Ver. 1.0 100198<CR>
```


Command	Description
<STX>W*n*	Inquires the graphics/fonts and memory status

The command inquires the printer of the contents of graphics/fonts/labels as well as the available RAM size. The printer will check its memory and response through RS232C.

Parameter: *n*

F : show fonts and memory status

G : show graphics and memory status

L : show stored labels and memory status

Example: `<STX>WG`

Response with

```
IMGFILE1<CR>
BMPFILE1<CR>
AVAILABLE RAM : 421632 BYTES<CR>
```

The “`IMGFILE1`” and “`BMPFILE1`” are graphics that were downloaded before.

Command	Description
<STX>xmtn…n	Releases file from memory

This command deletes the specific file from the specified memory module, evacuating memory space to load other data, further to avoid memory overflow.

Parameters: m: the memory module identification character, please refer to <STX>I command.

t : The file type identification code.

'G' for graphics

'F' for fonts

n…n : file name (maximum 16 characters)

Example:

```
<STX>IAFstar<CR>
… (HEX file)
<STX>L<CR>
…
1Y1100001000100star<CR>
E<CR>
<STX>xAGstar<CR>
```

Results:

. Download the graphics with file name "star".

. Print the graphic image.

. Delete the "star" image file.

A6. LABEL FORMATTING COMMANDS

The label formatting commands will:

. Set the print environment, margins, print modes, multi-copies, etc.

. Set cursor position and print graphics, texts, bar codes, lines and boxes

. Control the heat of the printing, label print position and user interface

. All commands after < STX> L are interpreted as Label Formatting Commands.

Different from other group commands, the label formatting commands have no leading control code, e.g. SOH, STX or ESC.

Command	Description	Default
:xxxx	Sets Cut by Amount	0001

This command is valid only when the cutter is installed. It allows a predetermined number of labels to be printed before a cut is made. Please refer to [cxx].

Example:

```
<STX>V1<CR>
<STX>L<CR>
131100002000050CHCK THE CUT FUNCTION<CR>
Q0010<CR>
:0003<CR>
E<CR>
```

Result: Enable the cutter to cut after 3 labels have been printed.

Command	Description	Default
A*n*	Sets logic image printing mode	A1

This command puts the printer on logical OR operation or XOR operation, which makes the printout more attractive.

Parameter: *n*

'1' for logical XOR(exclusive OR), '2' for logical OR. The default mode is '1'.

Example 1:

```
<STX>L
A1<CR>
151100002000050ABC<CR>
151100002000050---<CR>
E
```

Example 2:

```
<STX>L<CR>
A2<CR>
151100002000050ABC<CR>
151100002000050---<CR>
E<CR>
```


Output from printer:

Example 1:

Fig. A6-1

Example 2:

Fig. A6-2

Command	Description	Default
C<u>xxxx</u>	Sets left margin	0000

This command allows horizontal adjustment of the point where printing begins. Different margin value makes image shift to the left or right.

Parameter: <u>xxxx</u>

Example: `C0100`

Result: Set left margin to one inch

Command	Description	Default
c*xx*	Sets cut by amount	c01

This command is valid only when the cutter is installed. It instructs the printer to cut the label media after the specified numbers of labels have been printed. Its function is same as the command ":xxxx", except only a 2 digit value can be entered.

Example:
```
<STX>V1<CR>
<STX>L<CR>
131100002000050CHCK THE CUT FUNCTION<CR>
Q0010<CR>
c03<CR>
E<CR>
```

Result: Enable the cutter to cut the label media after 3 labels have been printed.

Command	Description	Default
D*wh*	Sets width and height pixel size	D22

Though the maximum resolution is up to the printer model, besides the smallest one, the other pixel sizes can be set by this command. However, reducing the resolution may cause the image pixel to be amplified and the printout get zigzagged. The minimum pixel size set by "D11" is varied from models.

Models OS204/204/X2000+/1000/G6000: 0.0049 inch (0.125 mm)
Models OS314/X3000+/G7000: 0.0033 inch (0.084 mm)

Parameter:

w – is pixel width ('1' or '2', default is '2').

h – is pixel height ('1', '2' or '3', default is '2').

Example:
```
STX>L<CR>
D23<CR>
120000002000050PIXEL SIZE FOR D23<CR>
E<CR>
```

Output:

Fig. A6-3

Command	Description
E	Ends the job and exit from label formatting mode

When the Printer is in label formatting mode and receives an "E" command, it will immediately exit from the mode and will print a label based on the data that has already been received. Even if no printable data has been received, the printer will generate and feed a label.

Command	Description
G	Stores previous data to global register
<STX>S*n*	Retrieves the global register contents

The command saves the previous data to global register and retrieves it to print only when the restore command <STX>S*n* is sent. This command may be used more than one time and the global registers are named in the order created, beginning with register 'A' and ending at register 'Z'.

Parameter: *n*

The Name of the register ranges from 'A' to 'Z'.

Example:
```
STX>L<CR>
D11<CR>
140000000800050DATA A<CR>
G<CR>
140000000800050DATA B<CR>
G<CR>
140000001000000<STX>SA<CR>
140000001300000<STX>SB<CR>
140000001600000<STX>SA<CR>
E<CR>
```

Output:

Fig. A6-4

Command	Description	Default
Hxx	Sets heat value (H02~H20)	H10

The heat value affects the darkness of the image. To get a better quality printout, some of the factors like paper media, ribbon types (wax, semi-resin and resin) and image pattern itself etc. should also be taken into consideration.

Command	Description	Default
M	Toggles the mirror mode	Normal

This command toggles the mirror mode. At mirror state the printer mirrors the following field data.

Example:
```
500000018000000NORMAL<CR>
M<CR>
150000001400100MIRROR<CR>
M<CR>
150000001000000NORMAL AGAIN<CR>
```

Output

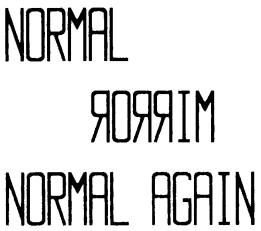


Fig. A6-5

Command	Description	Default
m	Sets measurement in metric	N

There are two measurements in the printer - metric and inch.

Command	Description	Default
n	Sets measurement in inch	N

Command	Description	Default
P*n*	Sets print speed	PC

This command controls the print speed.

A	1.0 ips	**E**	3.0 ips	**I**	5.0 ips
B	1.5 ips	**F**	3.5 ips	**J**	5.5 ips
C	2.0 ips	**G**	4.0 ips	**K**	6.0 ips
D	2.5 ips	**H**	4.5 ips		

Printer	**Speed Range**
OS214/204/202	**A** ~ **E**
OS314	**A** ~ **C**
X1000+	**A** ~ **G**
X2000+/X3000+	**A** ~ **K**

Command	Description	Default
Qxxxx	Sets the quantity of labels to print	Q0001

This command is used to set the number of the labels to be printed. If the printout contents are same or just different in certain auto increment/decrement fields, sending this command can save the communication and processing time.

Parameter: xxxx

A 4-digit decimal. The default is 0001.

Example:

```
<STX>c0060<CR>
<STX>L<CR>
D11<CR>
1300000002000002 COPIES<CR>
Q0002<CR>
E<CR>
```

Output:

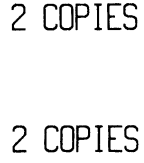


Fig. A6-6

Command	Description	Default
Rxxxx	Sets vertical offset	R0000

The command sets the vertical start point to be printed. By this command the print image can be shifted vertically.

Example: R0100

Result: Set 1 inch vertical offset.

Command	Description
rn…	Retrieves label data to printer buffer
smn…	Stores label data to printer buffer

The data of the label format can be stored in the printer memory and recalled. With 'store' commands, the printer will exit from label formatting mode.

Parameter: m: name of the memory module,
n … n : file name with maximum 16 characters.

Example:
```
<STX>L<CR>
D11<CR>
130000000200100STORED LABEL<CR>
sASLAB<CR>

<STX>L<CR>
rSLAB<CR>
130000000500100TEXT 1<CR>
E<CR>
```


Output:

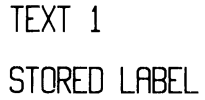


Fig. A6-7

Command	Description	Default
Tnn	Sets end-of-line code The nn is represented by HEX value	TØD

Example:
```
<STX>L<CR>
D11<CR>
T40<CR>
130000000200100ABC@E<CR>
```

Output:

Fig. A6-8

The above example changes the end-of-line code from <CR> to 40H(ASCII character: '@').

Command	Description	Default
z	Changes slash zero Ø to normal 0	slash zero

The alphanumeric fonts (font 0 to font 6) provide both normal and slash zeros (0 & 0). If this kind of fonts has been selected, the default slash zero (0) is being used. This command puts the normal zero 0 in use.

Example:
```
<STX>L<CR>
D11<CR>
130000000200100NO. 0228<CR>
E<CR>

<STX>L<CR>
D11<CR>
z<CR>
130000000200100NO. 0228<CR>
E<CR>
```

Output:

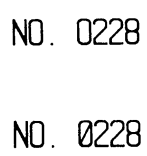


Fig. A6-9

Command	Description
+xx	Makes auto increment for numeric
>xx	Makes auto increment for alphanumeric

This command can increment field on each label printed to save the time used in communication and data processing between the host and the printer.

Parameter: xx
is a 2-digit value to specify the amount to increment the field by.

Example:
```
<STX>c0050<CR>
<STX>L<CR>
D11<CR>
130000000200100100<CR>
+10<CR>
Q0003<CR>
E<CR>
```

Output:

Fig. A6-10

Command	Description
-xx	Makes auto decrement for numeric
<xx	Makes auto decrement for alphanumeric

This command can decrement the field on each label printed to save the time use in communication and data processing between the host and the printer.

Parameter: xx

is a 2-digit value to specify the amount to increment the field by.

Example:
```
<STX>c0050<CR>
<STX>L<CR>
D11<CR>
130000000200100111<CR>
-15<CR>
Q0003<CR>
E<CR>
```

Output:

Fig. A6-11

Command	Description
^xx	Sets count by amount

An application using incrementing or decrementing fields will occasionally require that more than one label be printed with the same values before the field data is updated. This command can be applied in this situation, but it can only be sent once per label format.

Parameter: xx

is a 2-digit value to specify the number of labels to be generated before incrementing or decrementing fields on the label.

Example:
```
<STX>c0050<CR>
<STX>L<CR>
D11<CR>
130000000200020COUNT :<CR>
130000000200100123<CR>
-01<CR>
^02<CR>
Q0003<CR>
E<CR>
```

Output:

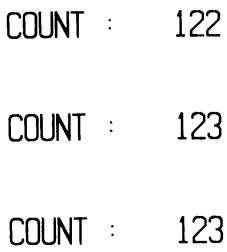


Fig. A6-12

Command	Description
<STX>T<string>	Prints date and time

This command takes effect only when the RTC board is installed. It prints current date and time. The <string> is any set of characters A ~ Z or a ~ z.

Characters	Description	Characters	Description
A	Day of week	vw	Hour, 24 format.
BCD	Day of week name	xy	Hour, 12 format.
EF	Month number	Za	Minutes.
GH..O	Month name	bc	AM or PM
PQ	Day	def	Julian data
RSTU	Year		

Example:


```
<STX>L<CR>
121100000100010<STX>TBCD GHI PQ, TU<CR>
E<CR>
```

Output from printer

```
FRI OCT 07, 00
```

A7. IMAGE EDITING COMMANDS

The following group of commands is the subset of label formatting commands. They control the position and the scale of the image and put the image directly into the frame buffer of the printer memory. All of them are led by ‘1’, ‘2’, ‘3’ ‘4’ respectively. These numbers represent the orientation or rotation direction. The image types include:

- Texts - internal hard fonts and downloadable soft fonts.
- Bar Codes - both one and two dimension (2D) bar codes.
- Graphics - PCX, BMP, IMG and HEX format files.
- Lines - solid lines.
- Boxes - variable sizes, length and thickness.

Rotation

Fig. A7-1

There are 4 print directions shown as figure A7-1. The leading character controls the direction or rotation.

1- portrait

2- reverse landscape

3- reverse portrait

4- landscape.

```
<STX>L<CR>
D11<CR>
141100000800060R1 - PORTRAIT<CR>
241100002150200R2 - REV LAND<CR>
341100002400217R3 - REV PORT<CR>
441100001030079R4 - LANDSCAP<CR>
E<CR>
```

Text

The format is:

Rthvoooyyyyxxxx[data string]

Parameters:

R : print direction. ‘1’, ‘2’, ‘3’ or ‘4’.

t : font type. Please refer the font tables in User’s Manual

t character	ooo sub font type	font type
‘0’, ‘1’, ‘2’, ‘3’, ‘4’, ‘5’, ‘6,’, ‘7’, ‘8’	‘000’	font 0 ~ font 8 respectively.
‘9’	’000’ ~ ‘007’	ASD smooth fonts. ** ‘000’ : 4 points, ‘001’ : 6 points, ‘002’ : 8 points, ‘003’ : 10 points, ‘004’ : 12 points,‘005’ : 14 points, ‘006’ : 18 points.
‘9’	’xxx’	for PCL soft font selection. xxx : A 3-digit decimal represents the soft font ID. Refer to section 8.
‘:’	‘000’ ~ ‘007’	Courier fonts, (ooo represents symbol set)++ 000 - Roman-8, 001 - ECMA-94, 002 - PC set, 003 - PC set A, 004 - PC set B, 005 - Legal, 006 – Greek and 007 - Russian.

*Notes: ***: Models* OS204/OS214/OS202/X1000+/X2000+/G6000 *do not support 4-point smooth font.*

++: Models OS314/X3000+/G7000 *does not support Courier fonts.*

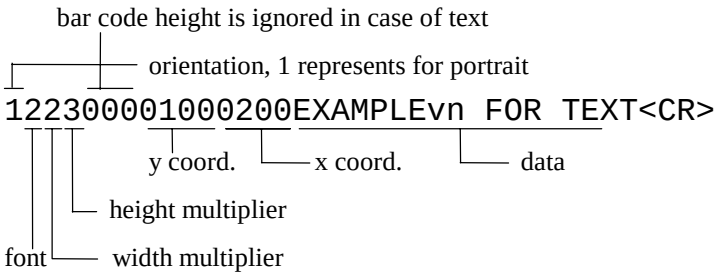
h : Horizontal scale. ‘0’ through ‘9’ and ‘A’ through ‘O’ represent scale factors. (‘A’=10, ‘B’=11, .. and ‘O’=24).

v : Vertical scale. ‘0’ through ‘9’ and ‘A’ through ‘O’ represent scale factors. (‘A’=10, ‘B’=11, .. and ‘O’=24).

yyyy : a 4-digit value for Y coordinate. The lower left corner is the origin point of the XY coordinate system and the Y value is the vertical offset from the origin point.

xxxx : a 4-digital value for X coordinate. The lower left corner is the origin point of the XY coordinate system. The X value is the horizontal offset from the origin point.

Data string: A string of printable data with maximum 255 characters in length. The data string ends with a <CR> control code or pre-defined code by Txx command.



Example:

```
<STX>L<CR>
D11<CR>
121100001000000FONT2, H=1, V=1<CR>
122100001200000FONT2, H=2, V=1<CR>
121200001400000FONT2, H=1, V=2<CR>
191100201700000SMOOTH, 8 POINTS<CR>
191100302000000SMOOTH, 10 POINTS<CR>
E<CR>
```

Output:

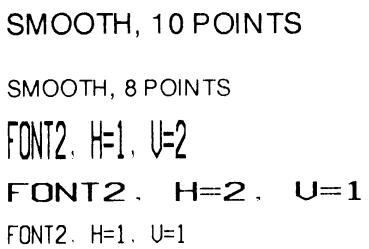


Fig. A7-2

Bar Codes

The format is:

Rthvoooyyyyxxxx[data string]

Parameters:

R : print direction. ‘1’, ‘2’, ‘3’ or ‘4’.

t : bar code type. The range can be ‘A’ through ‘T’ and ‘a’ through ‘z’, each character represents a bar code type and rule. Refer to section 10 for more details on bar codes.

h : ‘0’ through ‘9’ and ‘A’ through ‘O’ represent the width of wide bar. (‘A’=10, ‘B’=11, .. and ‘O’=24).

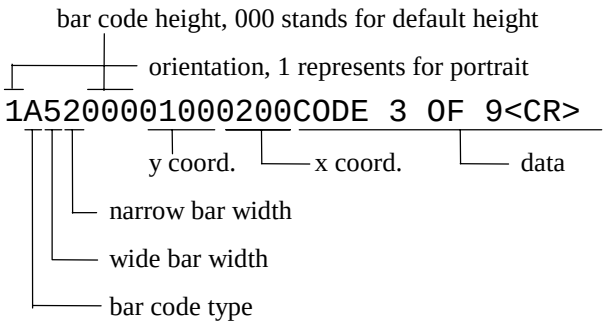
v : ‘0’ through ‘9’ and ‘A’ through ‘O’ represent the width of narrow bar. (‘A’=10, ‘B’=11, .. and ‘O’=24).

000 : A 3-digit value that represents the bar code height.

yyyy : a 4 digit value for Y coordinate. The lower left corner is the origin of the XY coordinate system. The Y value is the vertical offset from origin point.

xxxx : A 4-digit value for X coordinate. The lower left corner is the origin point of the XY coordinate system. The X value is the horizontal offset from origin point.

Data string: A string of data with maximum 255 characters in length, ended by <CR> or pre-defined EOL (end of line) code. The length of the string may be varied from the type of the bar code.



Example:

```
<STX>L<CR>
D11<CR>
1A0000000200000BC 1<CR>
1A0000500200120BC 2<CR>
1A6300000200240BC 3<CR>
E<CR>
```

Output:

Fig. A7-3

Line

The format is:

RX11000yyyyxxxxLaaabbb or RX11000yyyyxxxxlaaaabbbb

Parameters:

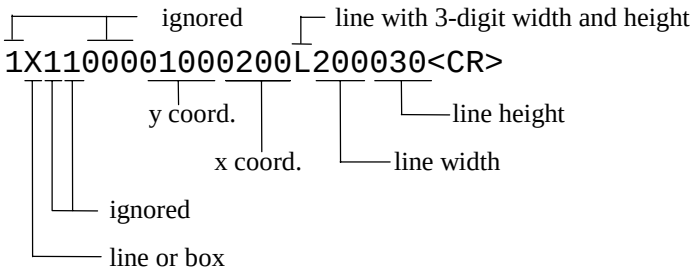
R : print direction. ‘1’, ‘2’, ‘3’ or ‘4’.

yyyy : A 4-digit value for Y coordinate. The lower left corner is the origin point of the XY coordinate system. The Y value is the vertical offset from origin point.

xxxx : A 4-digit value for X coordinate. The lower left corner is the origin of the XY coordinate system. The X value is the horizontal offset from origin point.

aaa or aaaa : A 3 or 4-digit value that specifies the width of line.

bbb or bbbb : A 3 or 4-digit value that specifies the height of line.



Example:

```
<STX>L<CR>
D11<CR>
1X1100000200000L100020<CR>
1X1100000800000l00100100<CR>
E<CR>
```

Output:

Fig. A7-4

Box

The format is:

RX11000yyyyxxxxBaaabbbtttsss or RX11000yyyyxxxxbaaaabbbbttttssss

Parameters:

R : print direction. ‘1’, ‘2’, ‘3’ or ‘4’.

yyyy : Y coordinate. A 4-digital decimal. The lower left corner is the origin of the XY coordinate system. The Y value is the vertical offset from origin.

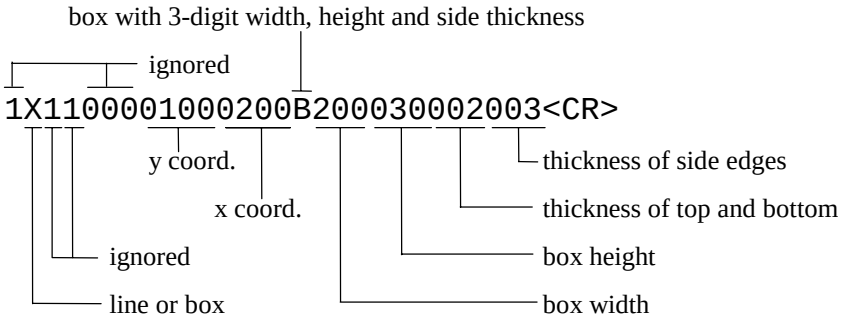
xxxx : X coordinate. A 4-digital decimal. The lower left corner is the origin of the XY coordinate system. The X value is the horizontal offset from origin.

aaa or aaaa : A 3 or 4-digit value that specifies the width of box.

bbb or bbbb : A 3 or 4-digit value that specifies the height of box.

ttt or tttt : A 3 or 4-digit value that specifies the thickness of top and bottom box edges.

sss or ssss : A 3 or 4-digit value that specifies the thickness of side edges.



Example:

```
<STX>L<CR>
D11<CR>
1X1100000200100B100040002005<CR>
1X1100000800100b0250010000030004<CR>
E<CR>
```

Output:

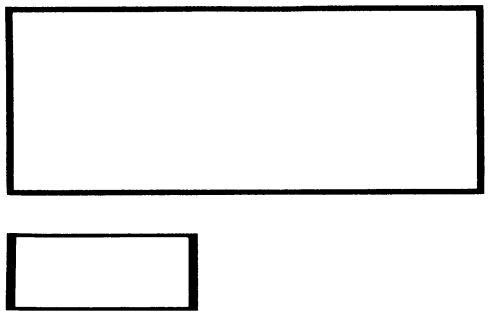


Fig. A7-5

Graphic

Before sending the graphic selection command, make sure that the graphic was already loaded into the flash memory, otherwise send the command led by <STX>I to download the graphic first.
The format is:

1Y11000yyyyxxxxn..n

Parameters:

yyyy : A 4-digit value for Y coordinate. The lower left corner is the origin point of the XY coordinate system. The Y value is the vertical offset from origin point.

xxxx : A 4-digit value for X coordinate. The lower left corner is the origin point of the XY coordinate system. The X value is the horizontal offset from origin point.

n..n : graphic file name that was downloaded. (maximum 16 characters)

Example:

```
<STX>IAFHEXFILE<CR>
802000FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF<CR>
802000FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF<CR>
802000FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF<CR>
802000FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF<CR>
8020FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00<CR>
8020FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00<CR>
```



```
8020FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00<CR>
8020FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00FF00<CR>
0000FF10<CR>
8020FFFFFF000000000000000000000000000000000000000000000000000FFFFFF<CR>
FFFF<CR>
<STX>L<CR>
D11<CR>
1Y1100001000050HEXFILE<CR>
E<CR>
```

Output:

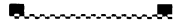


Fig. A7-6

A8. FONT DOWNLOADING COMMANDS

The following commands are used for downloading the soft fonts with the PCL bitmap format. Refer to the PCL technical manual for their descriptions. (PCL4 or PCL5).

Command	**Description**
<ESC>*c###D	Assigns the soft fonts ID number (### : 0 ~ 999)
<ESC>)s###W	Downloads font descriptor (### : length of font descriptor)
<ESC>*c###E	Sets character code (### : 1 ~ 255)
<ESC>(s###W	Downloads character descriptor and image (### : length of character descriptor and image)

For more information on the soft font format, please refer to the related PCL technical manual.

Example:

```
<ESC>*c100D
<ESC>)s26W ...
<ESC>*c33E
<ESC>(s32W ...
. . .
. . .
<STX>L
190010002000200THIS IS A TEST FOR PCL SOFT FONT.
E
```


This example downloads a PCL soft font with ID 100, then select it to print it.

A9. PROGRAMMING EXAMPLES FOR TEXTS

This section explains how to select the internal fonts to format the desired printout and generate the font styles as well as font characteristics. Please refer to the User's Manual for the symbol table of each font.

Font 0: This is a USASCII set from code 21H to 7FH.

Example: `100000000200000Font 0 : ASCII Character Set<CR>`

Fig. A9-1

Font 1: This is a USASCII and extension set.

Example:

`110000000400000Font 1 : ASCII+Extension Character Set<CR>`

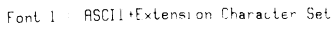


Fig. A9-2

Font 2: This is a USASCII and extension set.

Example:

`120000000600000Font 2 : ASCII+Extension Character Set<CR>`

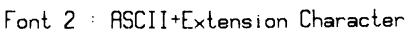


Fig. A9-3

Font 3: This font includes numeric and uppercase letters

Example:

`130000000900000Font 3 : Alphanumeric Uppercase font<CR>`

Fig. A9-4

Font 4: This font includes numeric and uppercase letters

Example:

`140000001200000Font 4 : Alphanumeric Uppercase font<CR>`

FONT 4 : ALPHANUMERIC UPPERCASE FONT

Fig. A9-5

Font 5: This font includes numeric and uppercase letters

Example:

```
150000001600000Font 5 : Alphanumeric Uppercase font<CR>
```

FONT 5 : ALPHANUMERIC UPPERCASE FONT

Fig. A9-6

Font 6: This font includes numeric and uppercase letters

Example:
```
160000001000000Font 6 : Alphanumeric<CR>
160000000500000       Uppercase font<CR>
```

FONT 6 : ALPHANUMERIC UPPERCASE FONT

Fig. A9-7

Font 7: This font includes OCR-A ASCII characters.

Example:
```
170000001500000Font 7 : OCR-A font<CR>
```

Font 7 : OCR-A font

Fig. A9-8

Font 8: This font includes numeric and some special characters only. It is an OCR-B set.

Example:
```
170000002000000Font 8 : OCR-B font<CR>
180000002000200123456789<><CR>
```

Font 8 : OCR-B font 0123456789<>

Fig. A9-9

ASD smooth font Set

The smooth font set includes USASCII and the extension characters with multiple point sizes. The font type is ‘9’ for a smooth font and the height field represents the point size.

Example: `190000100400000ASD : 6 Points. ABCabc<CR>`

`190000200600000ASD : 8 Points. ABCabc<CR>`

`190000300800000ASD : 10 Points. ABCabc<CR>`

`190000401100000ASD : 12 Points. ABCabc<CR>`

`190000501500000ASD : 14 Points. ABCabc<CR>`

`190000601900000ASD : 18 Points. ABCabc<CR>`

ASD : 18 Points. ABCabc

ASD : 14 Points. ABCabc

ASD : 12 Points. ABCabc

ASD : 10 Points. ABCabc

ASD : 8 Points. ABCabc

ASD : 6 Points. ABCabc

Fig. A9-10

Courier Fonts

The Courier font includes 7 symbol sets with 15 points. It is for models OS204/ OS214/X2000+ only. The font type is ':' and the height field represents the symbol set.

Height	Symbol set
000	Roman 8
001	ECMA 94
002	PC
003	PC-A
004	PC-B
005	Legal
006	PC437 (Greek)
007	Russian

Example: `1:0000000200000Courier : Roman 8 : [\]^{|}~<CR>`

`1:0000100500000Courier : ECMA-94 : [\]^{|}~<CR>`

`1:0000200800000Courier : PC : <03H><04H><05H>[\]^<CR>`

`1:0000501100000Courier : Legal  : [\]^{|}~<CR>`

`1:0000601400000Courier : PC 437 (GREEK)<CR>`

Courier : PC 437 (GREEK)

Courier : Legal : [®]©§¶†™

Courier : PC : ♥♦♣[\]^

Courier : ECMA-94 : [\]^{|}~

Courier : Roman 8 : [\]^{|}~

Fig. A9-11

A10. PROGRAMMING EXAMPLES FOR BAR CODES

This printer supports 22 bar code types, including 20 of one dimension and 2 of two dimension bar codes. The functions of parameters are varied from the specific bar codes. The bar code cannot be printed out, if the input code is invalid or its length is not up to the specification.

Bar code A: Code 3 of 9

Length	Check sum	Type for readable string	Type for non-readable string	Valid codes	Bar ratio
variable	no	'A'	'a'	0 ~ 9, A ~ Z, $%*+-./ and space	2 : 1 ~ 3 : 1

Example: `130000001320000BAR CODE A : 3 OF 9<CR>`
`1A300000080010519450228<CR>`

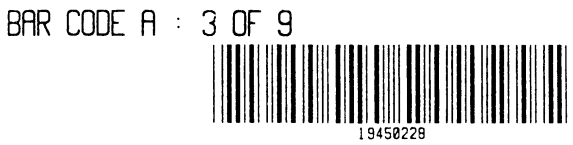


Fig. A10-1

Bar code B: UPC-A

Length	Check sum	Type for readable string	Type for non-readable string	Valid codes	Bar ratio
12 digits (11+1)	yes	'B'	'b'	0 ~ 9	2 : 3 : 4

Example: `130000002000000BAR CODE B : UPC-A<CR>`
`1B000000180015502281234567<CR>`

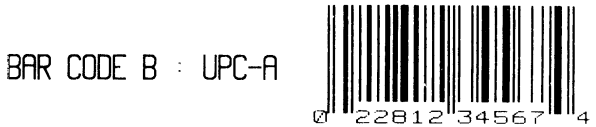


Fig. A10-2

Bar code C: UPC-E

Length	Check sum	Type for readable string	Type for Non-readable string	Valid codes	Bar ratio
7 digits (6+1)	yes	'C'	'c'	0 ~ 9	2 : 3 : 4

Example: `130000001000000BAR CODE C : UPC-E<CR>`
`1C000500080016065432 1<CR>`

BAR CODE C : UPC-E 

Fig. A10-3

Bar code D: Interleaved 2 of 5 (I25)

Length	Check sum	Type for readable string	Type for non-readable string	Valid Codes	Bar ratio
variable	no	'D'	'd'	0 ~ 9	2 : 1 ~ 3 : 1

The digit count should be an even number otherwise a '0' will be automatically entered at the first position.

Example: `130000002200000BAR CODE D :<CR>`
`130000002000000INTERLEAVED 2 of 5<CR>`
`1D5308001800170135792468<CR>`

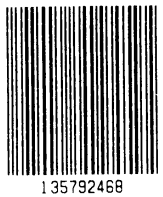
BAR CODE D :
INTERLEAVED 2 OF 5 

Fig. A10-4

Bar code E: Code 128 including subset A, B and C

The default code subset is B. To select subset A, place an ASCII 'A' (decimal 65 or hex 41) before the data to be encoded. To select subset C, place an ASCII 'C'(DEC67, HEX43) before the data to be encoded. Subset C can only encode numeric data with even byte count.

Length	Check sum	Type for readable string	Type for non-readable string	Valid codes	Bar ratio
variable	yes	'E'	'e'	from code 0 to 127 (128 codes)	2 : 3 : 4

Example: `130000001100000BAR CODE E :<CR>`
`130004000900000CODE 128<CR>`
`1E0004000800140TO JIMMY<CR>`

BAR CODE E :
CODE 128 

Fig. A10-5

The following example will print "24681357" by Code 128 subset C.

1E0004000800160C24681357

Bar code F: EAN-13

Length	Check sum	Type for readable string	Type for non-readable string	Valid codes	Bar ratio
13 digits (12+1)	yes	’F’	’f’	0 ~ 9	2 : 3 : 4

Example: `130000002060000BAR CODE F : EAN-13<CR>`
`1F000500180016013579246822 8<CR>`

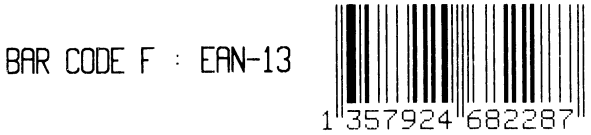


Fig. A10-6

Bar code G: EAN-8

Length	Check sum	Type for readable string	Type for non-readable string	Valid codes	Bar ratio
8 digits (7+1)	yes	’G’	’g’	0 ~ 9	2 : 3 : 4

Example: `130000001100000BAR CODE G : EAN-8<CR>`
`1G300000080016002280 01<CR>`

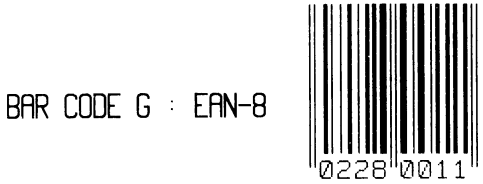


Fig. A10-7

Bar code H: HBIC

Health Industry Bar Code (HBIC) is same as bar code A (code 3 of 9), except that it includes an additional modulo 43 checksum.

Length	Check sum	Type for readable string	Type for non-readable string	Valid codes	Bar ratio
variable	Yes	’H’	’h’	0 ~ 9, A ~ Z, $%*+-./ and space	2 : 1 ~ 3 : 1

Example: `130000002400000BAR CODE H : HBIC<CR>`
`1H0000001800120HEALTH<CR>`

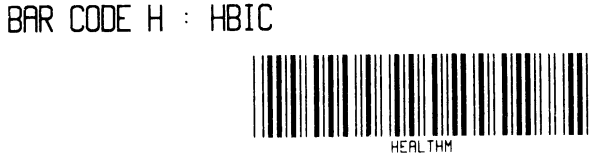


Fig. A10-8

Bar code I: Coda bar

Length	Check sum	Type for readable string	Type for non-readable string	Valid codes	Bar ratio
at least 3 characters	No	'I'	'i'	0 ~ 9, A ~ D, $+-. And /	2 : 1 ~ 3 : 1

Example:
```
130000000900000BAR CODE I : <CR>
130000001100000CODA BAR<CR>
1I00000008000090ABCD0123456789<CR>
```

Fig. A10-9

Bar code J: Interleaved 2 of 5 with a modulo 10 checksum

Same as bar code D (Interleaved 2 of 5), except that it includes an additional modulo 10 checksum.

Length	Check sum	Type for readable string	Type for non-readable string	Valid codes	Bar ratio
Variable	Yes	'J'	'j'	0 ~ 9	2 : 1 ~ 3 : 1

Example:
```
130000002100000BAR CODE J : I25<CR>
130000001900000WITH CHECKSUM<CR>
1J000000180016019970701<CR>
```

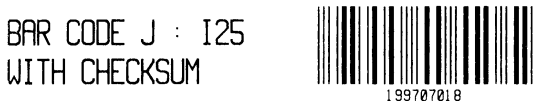


Fig. A10-10

Bar code K: Plessey

An additional checksum will be added to the bar code string where '+' character is inserted.

Length	Check sum	Type for readable string	Type for non-readable string	Valid codes	Bar ratio
1 ~ 14 digits	Yes	'K'	'k'	0 ~ 9	2 : 1 ~ 3 : 1

Example:
```
130000001100000BAR CODE K :<CR>
130000000900000PLESSEY<CR>
1K000000080012050381978<CR>
```

BAR CODE K :
PLESSEY

Fig. A10-11

Bar code L: Interleaved 2 of 5 with a modulo 10 checksum and shipping bearer bars

Same as bar code D (Interleaved 2 of 5) except that it includes a modulo 10 checksum and the horizontal shipping bearer bars.

Length	Check sum	Type for readable string	Type for non-readable string	Valid codes	Bar ratio
Variable	Yes	'L'	'l'	0 ~ 9	2 : 1 ~ 3 : 1

The horizontal bearer bars exist only when the input digit count is 13.

Example: 130000002300000BAR CODE L : I25<CR>
130000002100000WITH CHECKSUM &<CR>
130000001900000BEARER<CR>
1L000600180014019970701873 91<CR>

BAR CODE L : I25
WITH CHECKSUM &
BEARER

Fig. A10-12

Bar code M: UPC2

Length	Check sum	Type for readable string	Type for non-readable string	Valid codes	Bar ratio
2 digits	No	'M'	'm'	0 ~ 9	2 : 3 : 4

Example: 130000000900000BAR CODE M : UPC2<CR>
1M000500060016038<CR>

BAR CODE M : UPC2

Fig. A10-13

Bar code N: UPC5

Length	Check sum	Type for readable string	Type for non-readable string	Valid codes	Bar ratio
5 digits	No	'N'	'n'	0 ~ 9	2 : 3 : 4

Example: 130000002000000BAR CODE N : UPC5<CR>
1N000500180016002280<CR>

Fig. A10-14

Bar code O: Code 93

Length	Check sum	Type for readable string	Type for non-readable string	Valid codes	Bar ratio
Variable	Yes	'O'	'o'	0 ~ 9, A ~ Z, $%+-./ and space	2 : 3 : 4

Example: 130000001100000BAR CODE O :<CR>
130000000900000CODE 93<CR>
1O00000000800120CODE 93 OK<CR>

Fig. A10-15

Bar code P: Postnet

Length	Check sum	Type for readable string	Type for Non-readable string	Valid codes
Variable	Yes	Not defined	'p'	0 ~ 9

Example: 130000002100000BAR CODE P :<CR>
130000001900000POSTNET<CR>
1p00060018001201997O7<CR>

Fig. A10-16

Bar code Q: UCC/EAN Code 128

Length	Check sum	Type for readable string	Type for non-readable string	Valid codes	Bar ratio
20 digits (19+1)	Yes	'Q'	'q'	0 ~ 9	2 : 3 : 4

Example: 130000001300000BAR CODE Q<CR>
130000001100000: UCC/EAN<CR>
130000000900000128<CR>
1Q0007001000085781298908999089999 8<CR>

Fig. A10-17

Bar code R: UCC/EAN Code 128 K-MART

Length	Check sum	Type for readable string	Type for non-readable string	Valid codes	Bar ratio
18 digits	yes	'R'	'r'	0 ~ 9	2 : 3 : 4

Example: 130000002300000BAR CODE R<CR>
130000002100000: UCC/EAN<CR>
130000001900000128 K<CR>
1R000600200008319970701194502280O<CR>

Fig. A10-18

Bar code T: Telepen

Length	Check sum	Type for readable string	Type for non-readable string	Valid codes	Bar ratio
Variable	Yes	'T'	't'	From 0 to 127	2 : 3 : 4

Example: 130000000900000BAR CODE T :<CR>
130000000700000TELEPEN<CR>
1T0005000600120ABC!-=.<CR>

Fig. A10-19

Bar code V: FIM (Facing Identification Mark)

Length	Check sum	Type for readable string	Type for non-readable string	Valid codes
1 character	No	Not defined	'v'	A, B, C and D

Example: 130000000900000BAR CODE V :<CR>
130000000700000FIM<CR>
1v0000000600160B<CR>

BAR CODE V :
FIM

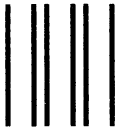


Fig. A10-20

Bar code U: UPS MaxiCode

This is a two dimensional bar code defined by UPS and AIM International. It applies the Reed-Solomon encoding rule. The bar code's data stream consists of 5 different sections:

- a 5-digit primary zip code
- a 4-digit secondary zip code
- a 3-digit country code
- a 3-digit class of service code
- a data string that can not exceed 84 characters

Example: `130000002100000BAR CODE U :<CR>`
`130000001900000MAXICODE<CR>`
`1u000000150016032987444484O555TO JIMMY<CR>`

BAR CODE U :
MAXICODE

Fig. A10-21

Bar code Z: PDF-417

This is a two dimensional bar code defined by AIM International. It applies the Reed-Solomon encoding rule and includes all ASCII characters. It provides the function of multiple-level error detection and correction. The bar code's data stream consists of 6 different sections:

Length	Description
1	F : normal, T : truncated
1	0 ~ 8 : security level
2	00 ~ 99 : aspect ratio, 00 stands for 1:2
2	03 ~ 90 : row number, 00 for best fit
2	01 ~ 30 : column number, 00 for best fit
Variable	Data string

Example: `130000002100000BAR CODE Z :<CR>`
`130000001900000PDF-417<CR>`
`1z4900001800140F0001002ARGOXINFO<CR>`

BAR CODE Z :
PDF-417

Fig. A10-22

Bar code W: DataMatrix

The Datamatrix is a two dimensional bar code too.

Command for DataMatrix

1 W 1c c d eee ffff gggg 200 0 jjj kkk ddddddddd...dd

1 W 1c : They are fixed data for DataMatrix. Do not change them.
c : horizontal multiplier for module size
d : vertical multiplier for module size
eee : always 000
ffff : Y coordinate
gggg : X coordinate
200 0 : Constant
jjj : A 3 digit even number (or 000) of rows requested.
000 causes rows to be automatically determined.
kkk : A 3 digit even number (or 000) of columns requested.
000 causes columns to be automatically determined.
ddddd...dd : data to be encoded and printed.

Example:

```
1W1c230000050003120000000000DATA MATRIX
```

Encode the data "DATA MATRIX".
horizontal multiplier: 2, vertical multiplier: 3
Y coordinate : 50, X coordinate : 31

APPENDIX AA: HEX GRAPHIC FORMAT

Unlike the PCX, BMP and IMG formats, the HEX format is a proprietary one.
It consists of 3 types of records.

Record type	Format	Description
Data	80xx[…]	xx : hex value, stands for byte count. […] : image data, 2 hex digits represent one byte raster image.
Repeat	0000FFxx	xx: repeat count. The repeated data will appear at the subsequent data record. The maximum value is 255 (FFH). If the actual repeat count is more than 255, split it to fit the range.
End	FFFF	End the HEX file

APPENDIX AB: HOW TO SEND THE COMMANDS TO PRINTER

The way to send a command file edited under MS-DOS in PC system is subject to your environment:

1. Suppose you connect the serial cable to COM1:

- Set the baud rate and data format (the default baud rate under DOS is 2400)
- Copy the command file to COM1 port

```
>MODE COM1:9600,N,8,1,P
>COPY/B CMDFILE COM1:
```

2. Suppose you connect the Centronics cable to LPT1:

- Just copy the command file to LPT1: port

```
>COPY/B CMDFILE LPT1:
```

3. Suppose you connect the serial cable to COM1: and use Quick Basic

- Open a device file and set related parameters
- Run the Basic program

Basic example program:


```
1   ' Continuous label(2 inches), direct thermal
2   ' Print a bar code and text string
3   ' 2 copies
5   PRINT "A TEST FOR COM PORT"
10  OPEN "COM1:9600,N,8,1" FOR RANDOM AS #1
20  PRINT #1, CHR$(2) + "KI7" + CHR$(0) ' for direct thermal
30  ' CHR$(2) + "KI7" + CHR$(1)  : for thermal transfer
40  PRINT #1, CHR$(2) + "c0200"    ' continuous, 2-inch height
55  PRINT #1, CHR$(2) + "L"
60  PRINT #1, "D11"              ' Resolution
70  PRINT #1, "1A5200000400095ARGOX"    ' Bar code A: C39
80  PRINT #1, "131100000050030THIS IS A TEST FOR SERIAL PORT."
85  PRINT #1, "Q0002"      ' Copy count
90  PRINT #1, "E"         ' FEED
100 END
```

APPENDIX AC: FONT SELECTION FROM FONT BOARD

The special font board is used for special font styles or different language like Chinese. And the commands for extension fonts are similar to those of standard fonts (font 0 ~ font 9).

The font type is ';' and the sub font (barcode height) field represents its order in font ROM.

Example:

```
1;1100201000200THIS IS FONT 2 IN FONT BOARD
```

The above command specifies

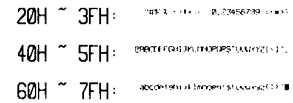
- '1' - portrait orientation.
- ';' - selects font from font board.
- '11' - both width multiplier and height multiplier are 1.
- '002' - font order.
- '0100' - Y coordinate.
- '0200' - X coordinate.

APPENDIX AD: FONTS AND BAR CODES FOR PPLA

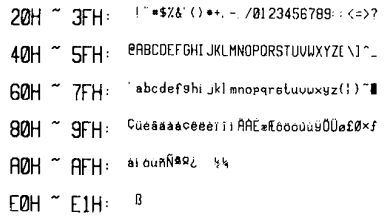
Internal Fonts

Fonts 0 ~ 8 have single symbol set.

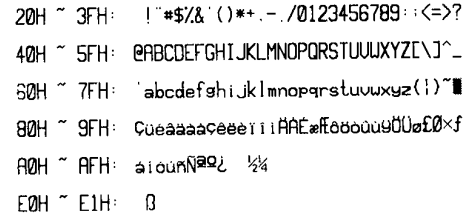
Font 0



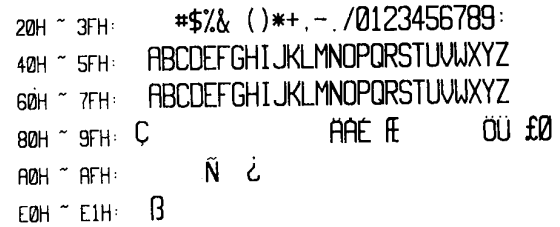
Font 1



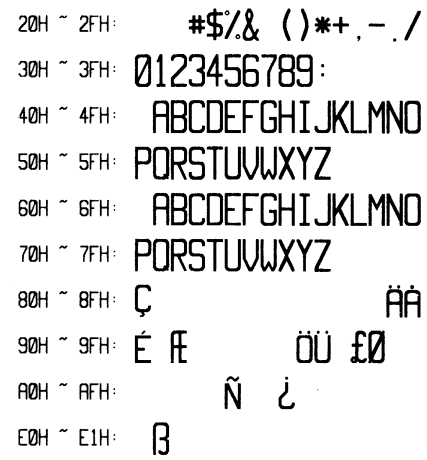
Font 2



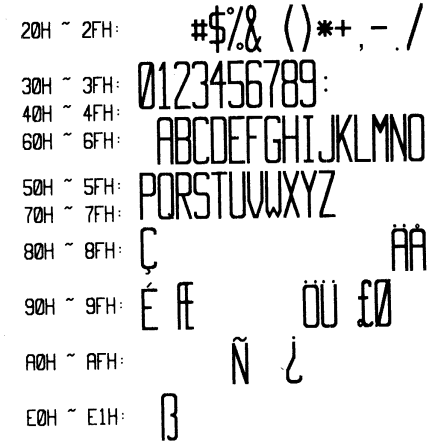
Font 3



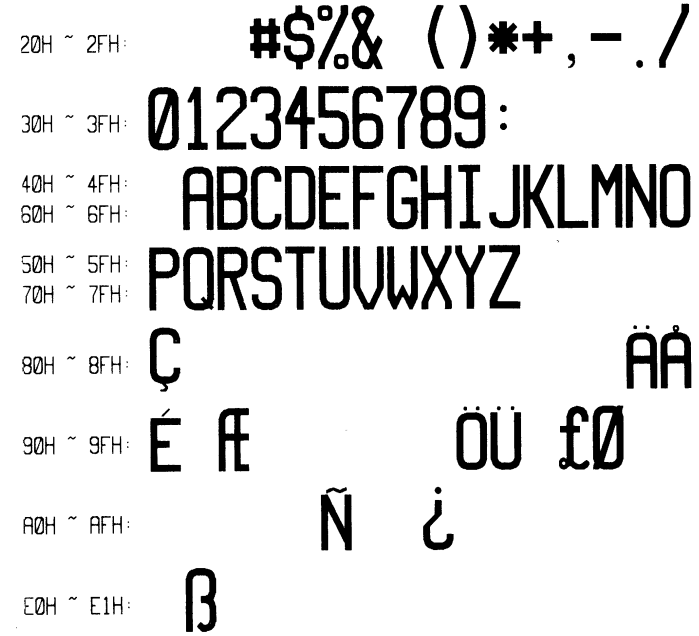
Font 4



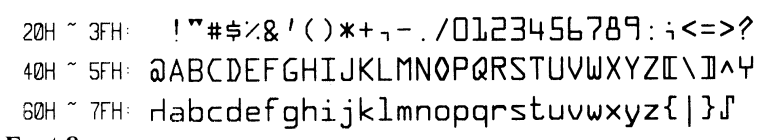
Font 5



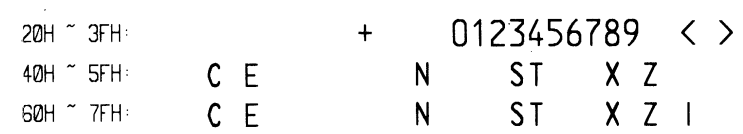
Font 6



Font 7



Font 8



Font 9

Font 9 (ASD smooth font set) includes 8 symbol sets, USASCII, UK, German, French, Italian, Spanish, Swedish, and Danish/Norwegian.

The sizes are 4, 6, 8, 10, 12, 14 and 18 points. The 4-point font is for the model OS-314 only.

4 points

20H ~ 3FH: !"#$%&'()*+,-./0123456789:;<=>?
40H ~ 5FH: @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
60H ~ 7FH: `abcdefghijklmnopqrstuvwxyz{|}~
A0H ~ BFH: áíóúñÑªº¿®½¼¡ ÁÂÀ© ¢¥
C0H ~ DFH: ãÃ ðÐÊËÈıÍÎÏ Ì
E0H ~ FFH: ÓßÔÒõÕµþÚÛÙýÝ ± ¾ ÷ ¸°¨·

6 points

20H ~ 3FH: !"#$%&'()*+,-./0123456789:;<=>?
40H ~ 5FH: @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
60H ~ 7FH: `abcdefghijklmnopqrstuvwxyz{|}~
A0H ~ BFH: áíóúñÑªº¿®½¼¡ ÁÂÀ© ¢¥
C0H ~ DFH: ãÃ ðÐÊËÈıÍÎÏ Ì
E0H ~ FFH: ÓßÔÒõÕµþÚÛÙýÝ ± ¾ ÷ ¸°¨·

8 points

20H ~ 3FH: !"#$%&'()*+,-./0123456789:;<=>?
40H ~ 5FH: @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
60H ~ 7FH: `abcdefghijklmnopqrstuvwxyz{|}~
A0H ~ BFH: áíóúñÑªº¿®½¼¡ ÁÂÀ© ¢¥
C0H ~ DFH: ãÃ ðÐÊËÈıÍÎÏ Ì
E0H ~ FFH: ÓßÔÒõÕµþÚÛÙýÝ ± ¾ ÷ ¸°¨·

10 points

20H ~ 3FH: !"#$%&'()*+,-./0123456789:;<=>?
40H ~ 5FH: @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
60H ~ 7FH: `abcdefghijklmnopqrstuvwxyz{|}~
A0H ~ BFH: áíóúñÑªº¿®½¼¡ ÁÂÀ© ¢¥
C0H ~ DFH: ãÃ ðÐÊËÈıÍÎÏ Ì
E0H ~ FFH: ÓßÔÒõÕµþÚÛÙýÝ ± ¾ ÷ ¸°¨·

12 points

20H ~ 3FH: !"#$%&'()*+,-./0123456789:;<=>?
40H ~ 4FH: @ABCDEFGHIJKLMNO
50H ~ 5FH: PQRSTUVWXYZ[\]^_
60H ~ 7FH: `abcdefghijklmnopqrstuvwxyz{|}~
A0H ~ BFH: áíóúñÑªº¿®½¼¡ ÁÂÀ© ¢¥
C0H ~ DFH: ãÃ ðÐÊËÈıÍÎÏ Ì
E0H ~ FFH: ÓßÔÒõÕµþÚÛÙýÝ ± ¾ ÷ ¸°¨·

14 points

21H ~ 3FH: !"#$%&'()*+,-./0123456789:;<=>?
40H ~ 4FH: @ABCDEFGHIJKLMNO
50H ~ 5FH: PQRSTUVWXYZ[\]^_
60H ~ 7FH: `abcdefghijklmnopqrstuvwxyz{|}~
A0H ~ BFH: áíóúñÑªº¿®½¼¡ ÁÂÀ© ¢¥
C0H ~ DFH: ãÃ ðÐÊËÈıÍÎÏ Ì
E0H ~ FFH: ÓßÔÒõÕµþÚÛÙýÝ ± ¾ ÷ ¸°¨·

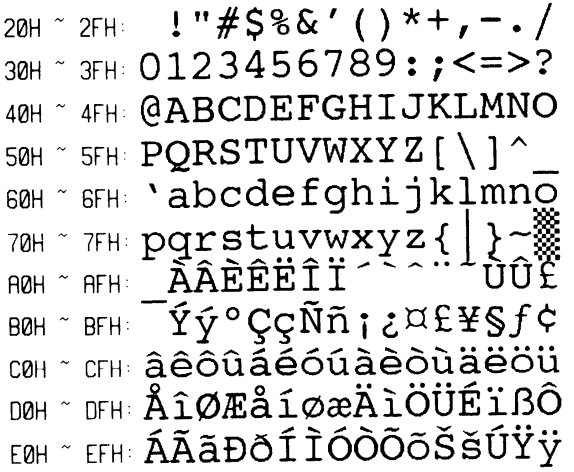
18 points

20H ~ 2FH: !"#$%&'()*+,-./
30H ~ 3FH: 0123456789:;<=>?
40H ~ 4FH: @ABCDEFGHIJKLMNO
50H ~ 5FH: PQRSTUVWXYZ[\]^_
60H ~ 6FH: `abcdefghijklmno
70H ~ 7FH: pqrstuvwxyz{|}~
A0H ~ AFH: áíóúñÑªº¿®½¼¡
B0H ~ BFH: ÁÂÀ© ¢¥
C0H ~ CFH: ãÃ
D0H ~ DFH: ðÐÊËÈıÍÎÏ Ì
E0H ~ EFH: ÓßÔÒõÕµþÚÛÙýÝ
F0H ~ FFH: ± ¾ ÷ ¸°¨·

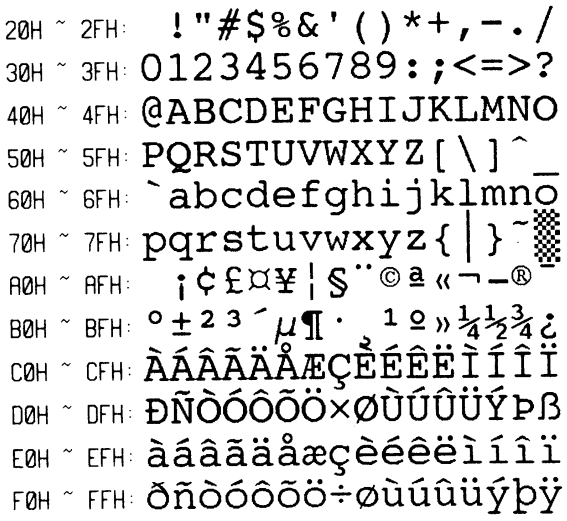
Courier Font Set

The Courier font set is for the models OS-214/204 only. It includes Roman-8, PC, PC-A, PC-B, EAMA-94, Legal, Greek and Russian symbol sets.

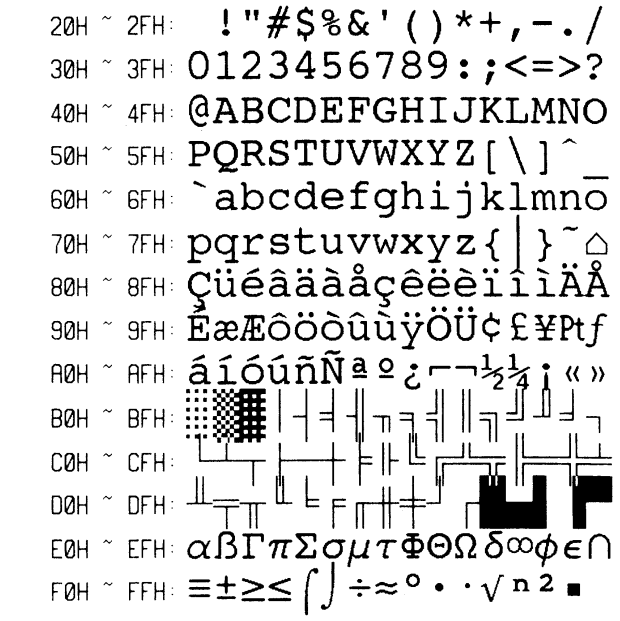
Roman-8



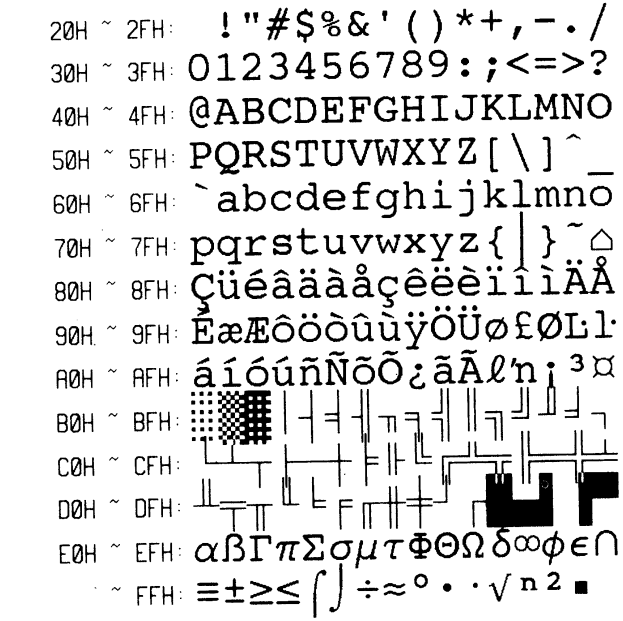
ECMA-94



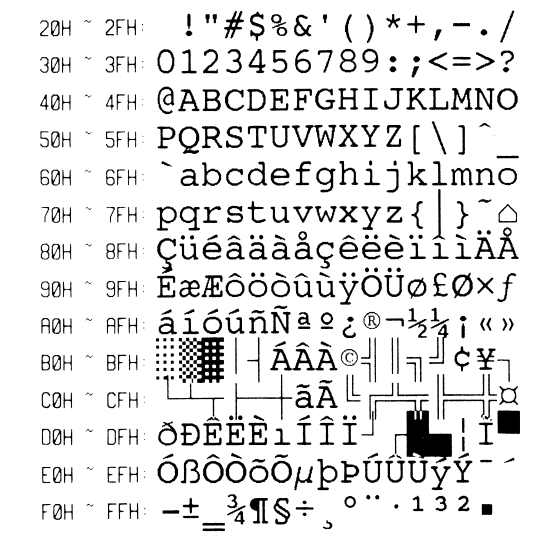
PC



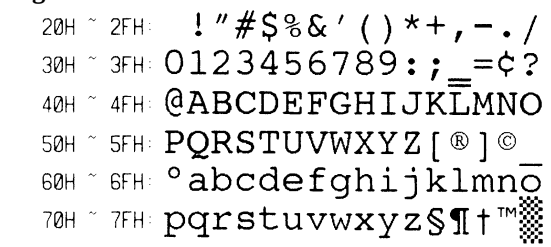
PC-A



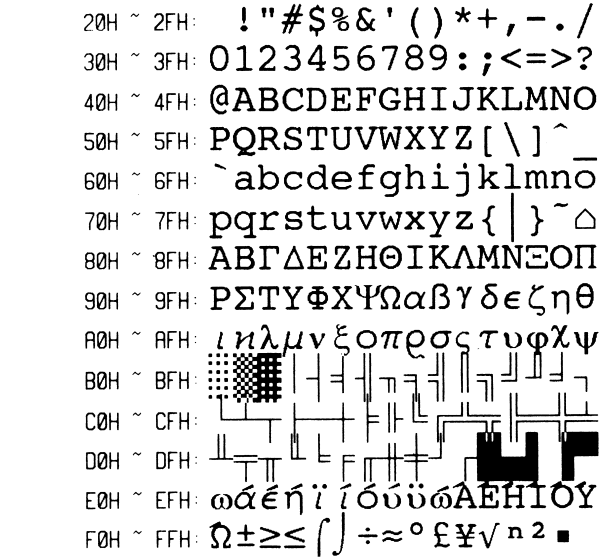
PC-B



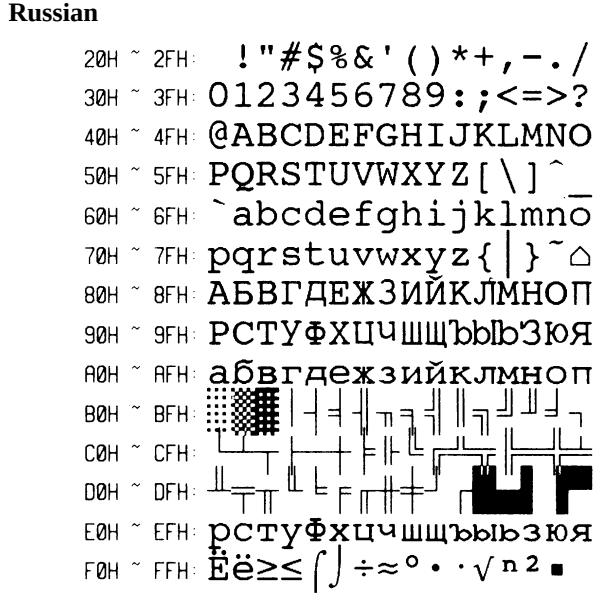
Legal



Greek



Russian



Internal Bar Codes

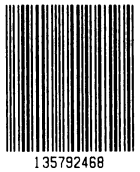
This PPLA supports 20 one dimensional bar codes and 2 two dimensional bar codes.

BAR CODE A : 3 OF 9

BAR CODE B : UPC-A

BAR CODE C : UPC-E

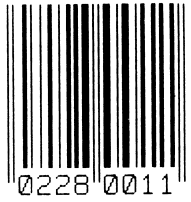
BAR CODE D :
INTERLEAVED 2 OF 5



BAR CODE E :
CODE 128

BAR CODE F : EAN-13

BAR CODE G : EAN-8



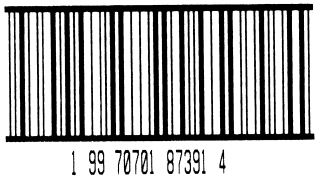
BAR CODE H : HBIC

CODA BAR
BAR CODE I

BAR CODE J : I25
WITH CHECKSUM

BAR CODE K :
PLESSEY

BAR CODE L : I25
WITH CHECKSUM &
BEARER



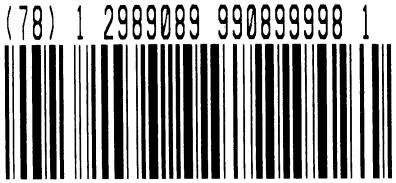
BAR CODE M : UPC2

BAR CODE N : UPC5

BAR CODE P :
POSTNET

BAR CODE O :
CODE 93

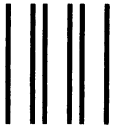
BAR CODE Q
: UCC/EAN
128



BAR CODE R
: UCC/EAN
128 K

BAR CODE T :
TELEPEN

BAR CODE V :
FIM



BAR CODE U :
MAXICODE

BAR CODE Z :
PDF-417

B1. COORDINATE SYSTEM

The PPLB coordinates system is depicted in Figure B1-1.

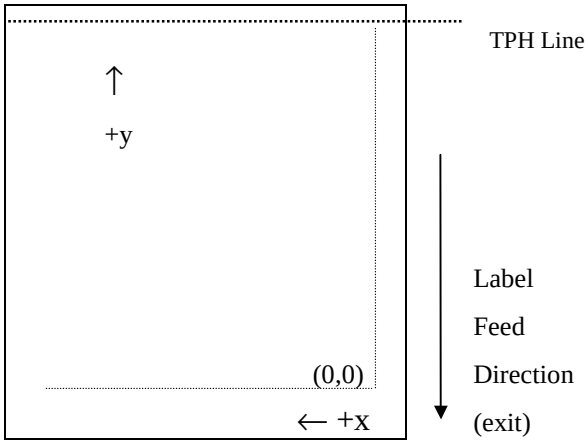


Fig. B1-1 Default Coordinate system

The origin point (0,0) of the coordinates system is at the bottom right corner under default condition (ZT). The origin point remains unchanged, while the texts, bar codes or other objects are being rotated. Negative coordinate value is not accepted. The ranges of X and Y coordinates are:

	Minimum	Maximum
X coordinate	0	811 (for 203 DPI models), or 1299 (for 300 DPI models) around 4 inches
Y coordinate	0	8728(43 inches for 203 DPI models, or 30 inches for 300 DPI models).

The measurements of the X- and Y-axis of the coordinates system are by pixels or scanned lines.

B2. COMMAND SYNTAX

All the commands of PPLB consist of one or two alpha characters to identify the specific function and some of them may require one or more additional parameters to supply the printer with sufficient information to complete the command. Each command line must be terminated with a LF (0AH) control code and no space is allowed within it, except in the section of the data string.

Basic Command Syntax

- Syntax I: commands with no parameters

Leading characters	Description
A<LF>	Command with single alpha character
AB<LF>	Command with two alpha characters

- Syntax II: commands with fixed number of parameters

Leading characters	Description
Ap_1,p_2,p_3,…,p_n<LF>	Command with single leading alpha character
ABp_1,p_2,p_3,…,p_n<LF>	Command with two leading alpha characters

- Syntax III: commands with optional parameters

A[p_1,p_2,p_3,…,p_n]<LF>

String

This printer language uses data string under the following conditions.

Name	for graphics, soft fonts and forms
Data	for fonts and barcodes
Prompt	An ASCII text that can be transmitted to the KDU (Keyboard Device Unit) or LCD display for X series.

The data string is led and ended by the character (“). The back slash character (\) designates that the character following is a literal and will encode into the data field. Refer to the following examples:

To print	Enter into Data Field
“	\“
\	\\

Notes:

1. *The printer ignores <CR> and ctrl-Z (1AH) control codes. Many non -document editors on PC based system send CR and LF when the enter key is pressed. The carriage return (CR) code cannot be used in place of LF.*

2. *All commands and alpha character command, parameters are case sensitive.*

B3. FONTS

This printer language defines three types of fonts according to their stored media.

- Internal Fonts
- Soft Fonts
- Cartridge Fonts

Internal Fonts

Five internal fonts are resident in the printer's ROM and each of them has a unique ID number. Different from the soft fonts, these fonts cannot be deleted.

ID number	*Font Size*	*Remark*
1	20 pitches, 6 points.	
2	17 pitches, 7 points.	
3	14.5 pitches, 10 points.	
4	13 pitches, 12 points.	
5	5.6 pitches, 24 points.	Upper case characters only

Soft Fonts

The soft fonts can be downloaded from the host by means of some utility or application software. Once the internal fonts cannot fulfill your requirements, soft fonts may be good solutions.

The advantages of using soft fonts:

- Save memory space (Graphics occupies more memory.)
- Have better performance (They can be called repeatedly.)
- Enable the Auto increment and decrement function
- Same as internal fonts, they can be scaled, rotated or reversed.
- They can be saved into either RAM or flash memory (permanent memory).
- They can be deleted, if no use or the memory space is full.

You can download the numbers of characters as many as you need.
Each soft font also has a unique ID number. By the ID number, the soft font can be downloaded, selected or deleted.

The soft font ID number may range from A to Z.

Cartridge Fonts

The font board or font cartridge is an optional item. The ID numbers reserved for extension cartridge fonts are 7 ~ 10. 7 and 8 are for Chinese fonts, 9 and 10 for Korean fonts.

Symbol Set

The code map (table) can be redefined to another symbol set or code page. Please refer to the user's manual for the code tables, defined by this printer language.

	8-bit Character	*7-bit Character*
Symbol sets	Code page 437, Code page 850, Code page 852, Code page 860, Code page 863 and Code page 865.	USASCII, British, Danish, French, German, Italian, Spanish, Swedish and Swiss

B4. COMMAND SET

The PPLB command sets can be categorized into the following four groups, according to functions and memory allocations.

- Setting commands
- Label formatting commands
- Interaction commands (through RS232)
- Objet Downloading commands

Quick Reference

Command	Description	Command	Description
A	Prints Text	N	Clear Frame Buffer
B	Prints Bar Code	O	Select Options**
b	Prints 2D Bar Code	P	Print Label
C	Counter	PA	Print Automatic
D	Heat Setting**	Q	Set Label and Gap Length**
EI	Prints Soft Font Names	q	Set Label Width**
EK	Deletes Soft Font	R	Set Origin Point**
ES	Downloads Soft Font	S	Set Print Speed**
FE	Ends Form Store	TD	Define Date Layout
FI	Prints Form Names	TS	Set Real Time Clock
FK	Deletes Form	TT	Define Time Layout
FR	Executes Form	U	Print Configuration
FS	Saves Form	UN	Disable Error Report

GG	Prints Graphics	US	Enable Error Report
GI	Prints Graphic List	V	Define Variable
GK	Deletes Graphics	X	Draw Box
GM	Stores Graphics	Y	Setup Serial Port[++]
GW	Prints Immediate Graphics	Z	Set Print Direction
I	Selects Symbol Set[**]	ZS	Enable Store-to-Flash
JB	Disables Back Feed[**]	ZN	Disable Store-to-Flash
JF	Enables Back Feed[**]	?	Download Variables
LE	Lines Draw by Exclusive	d	Horizontal Shift
LO	Lines Draw by OR		
LW	Draws White Line		

Notes:

[**] *The parameter can be saved into permanent memory E^2PROM, that is, it will remain after the printer is restarted, until it is replaced by different parameter through command.*

[++] *The command is not valid for X series.*

B5. COMMAND REFERENCE

This section lists all of the commands and their descriptions in alphabetical order.

A	**Prints Text**

Syntax

$Ap_1,p_2,p_3,p_4,p_5,p_6,p_7,$"DATA"↵

$Ap_1,p_2,p_3,p_4,p_5,p_6,p_7,C_n$↵

$Ap_1,p_2,p_3,p_4,p_5,p_6,p_7,V_n$↵

$Ap_1,p_2,p_3,p_4,p_5,p_6,p_7,$"DATA"$C_n$ ↵

$Ap_1,p_2,p_3,p_4,p_5,p_6,p_7,$"DATA"$V_n$ ↵

Description Prints a text string, counter or variable.

Parameters p_1: X coordinate in dots. p_2: Y coordinate in dots.

p_3: Orientation or Print Direction.

p_3 value	*Description*
0	No rotation (portrait)
1	90^o rotation
2	180^o rotation
3	270^o rotation

p_4: ID number for font selection

p_4 value	*Description*
1~5	Selects resident fonts, font number 1 ~ 5. Refer to the startup self-test printout to see the font list.

A ~ Z	Downloaded soft fonts, A ~ Z. Before selecting a soft font, first download it.

p_5: Horizontal scale factor.

p_6: Vertical scale factor.

The acceptable values for both p_5 and p_6 are from 1 to 24.

p_7: N for normal text or R for reverse text image.

"DATA": A text string

Cn: A counter value. Refer to C command.

Vn: A variable string. Refer to V command.

Example

```
N↵
A50,30,0,1,1,1,N,"This is font 1." ↵
A50,70,0,2,1,1,N,"This is font 2." ↵
A50,110,0,3,1,1,N,"This is font 3." ↵
A50,150,0,4,1,1,N,"This is font 4." ↵
A50,200,0,5,1,1,R,"FONT 5"↵
P1↵
```

Output

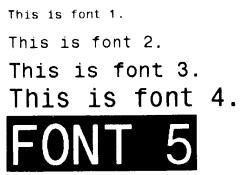


Fig. B5-1

Notes :

1. All PPLB samples in this manual are printed from the 300 DPI printers.

2. The sub-string of counter and variable can be applied to the A command.

   Syntax V*n*[st,len]

   C*n*[st,len]

   Where : *n* is the counter or variable ID.

   st is the start location (the first location is 0),

   len is the length of the sub-string.

   Example V00[0,3] ; A sub-string of variable 0, starting from 0 and length is 3.

B	Prints Bar Code

Syntax

$Bp_1,p_2,p_3,p_4,p_5,p_6,p_7,p_8,$"DATA"↵

$Bp_1,p_2,p_3,p_4,p_5,p_6,p_7,p_8,C_n$↵

$Bp_1,p_2,p_3,p_4,p_5,p_6,p_7,p_8,V_n$↵

$Bp_1,p_2,p_3,p_4,p_5,p_6,p_7,p_8,$"DATA"$C_n$ ↵

$Bp_1,p_2,p_3,p_4,p_5,p_6,p_7,p_8,$"DATA"$V_n$ ↵

Description Prints a specific bar code.

Parameters p_1: X coordinate in dots. p_2: Y coordinate in dots.

p_3: Orientation or print direction.

p_3 value	*Description*
0	No rotation (portrait)
1	90^o rotation
2	180^o rotation
3	270^o rotation

p_4: Bar code selection

p_4 Value	*Bar Code Type*
0	Code 128 UCC (shipping container code)
1	Code 128 subset A, B and C
1E	UCC/EAN
2	Interleaved 2 of 5
2C	Interleaved 2 of 5 with check sum digit
2D	Interleaved 2 of 5 with human readable check digit
2G	German Postcode

2M	Matrix 2 of 5
2U	UPC Interleaved 2 of 5
3	Code 3 of 9
3C	Code 3 of 9 with check sum digit
9	Code 93
E30	EAN-13
E32	EAN-13 2 digit add-on
E35	EAN-13 5 digit add-on
E80	EAN-8
E82	EAN-8 2 digit add-on
E85	EAN-8 5 digit add-on
K	Codabar
P	Postnet
UA0	UPC-A
UA2	UPC-A 2 digit add-on
UA5	UPC-A 5 digit add-on
UE0	UPC-E
UE2	UPC-E 2 digit add-on
UE5	UPC-E 5 digit add-on

p_5: Narrow bar width in pixels. $^{++}$

p_6: Wide bar width in pixels. $^{++}$

p_7: Bar code height in pixels.

p_8: N - No text is printed or B – The human readable text is printed.

"DATA": A text string.

Cn: A counter value. Refer to C command.

Vn: A variable string. Refer to V command.

Notes: ++According to the bar ratio, the bar codes can be classified into two categories.

Type	*Ratio*	*Narrow vs Wide (p5 vs p6)*	*Bar code*
B2	1:2 ~ 1:3	narrow < wide	Code 3 of 9, Codabar, Interleaved 2 of 5, Matrix 2 of 5, Postnet and German Postcode.
B3	2 : 3 : 4	narrow=wide. 2 x narrow, 3 x narrow and 4 x narrow.	Code 93, Code 128, EAN8, EAN 13, UPC-A, UPC-E, UCC/EAN and Code 28UCC.

Example

```
N↵
B20,20,0,E80,3,3,41,B,"0123459"↵
B20,120,0,K,3,5,61,B,"A0B1C2D3"↵
B190,300,2,1,2,2,51,B,"0123456789"↵
B20,330,0,UA0,2,2,41,B,"13579024680"↵
P1↵
```

Output

Fig. B5-2

Note:

The sub-string of counter and variable can be applied to the B command.

Syntax V*n*[st,len]

C*n*[st,len]

Where : *n* is the counter or variable ID.

st is the start location (the first location is 0),

len is the length of the sub-string.

Example C00[1,2] ; A sub-string of counter 0, starting from 1 and length is 2.

b	**Prints 2D Bar Code**

Syntax $bp_1,p_2,p_3,$[specific parameters and data]↵

Description Prints a specific 2D bar code.

Parameters p_1: X coordinate in dots. p_2: Y coordinate in dots.

p_3: 2D bar code type.

p_3 Value	*Bar Code*
P	PDF-417
M	Maxi Code

Maxi Code ["CL,CC,PC,Data"]

CL: Class code, 3 digits.

CC: Country code. 3 digits.

PC: Post code, 4 or 5 digits for USA and 6 characters for other countries.

Data: Up to 84 characters.

PDF-417 [w,v,s,c,p,x,y,r,l,t,o],"Data"

w: Maximum print width in dots.

v: Maximum print height in dots.

s: Error correction level, 0 ~ 8.

c: Data compression level, 0 or 1. The default value is 0.

x: Module width, 2 ~ 9 in dots.

y: Module height, 4 ~ 99 in dots.

r: Maximum row count.

l: Maximum column count.

t: Truncation flag, 0=normal and 1=truncated.

o: Rotation. 0-0°, 1-90°, 2-180° and 3-270°.

Note: The specifications of PDF-417 and Maxi Code are released by AIM International, Inc..

Example

```
N↵
b10,10,P,400,300,s0,x3,y7,r10,l2,t0,
→"ARGOXINFO"↵
A10,150,0,3,1,1,N,"ARGOXINFO"↵
P1↵
```

Output

ARGOXINFO

Fig. B5-3

C	Counter

Syntax $Cp_1,p_2,p_3,p_4,$"MSG"↵

Description This command defines a counter variable. It is useful in printing the labels numbered in sequence. In general, it will be used together with the Form function.

To print the contents of the counter, you may use A (print text) or B (print bar code) commands.

Parameters

p_1: Counter ID. Acceptable value ranges from 00 to 99.

p_2: Maximum digit number. Acceptable values are from 1 to 29.

p_3: Justification code. L for left justification, R for right justification, N for no justification and C for centralization.

p_4: Amount to increment or decrement the field by. There should be a + or - sign before the step value.

"MSG": A text string that will be sent to KDU or host.

Example

```
N↵
FK"TEST"↵
FS"TEST"↵
C0,6,N,+1,"Enter Code:" ↵
A100,100,0,4,1,1,N,"Label: "↵
A300,100,0,4,1,1,N,C0↵
FE↵
```


Above example stores a form to the printer. If you retrieve this form and enter the counter value like the following way, the printer will print two labels by the input counter value.

```
FR"TEST"↵
? ↵
1000↵
P2↵
```

Output

```
Label:   1000

Label:   1001
```

Fig. B5-4

D	Sets Darkness

Syntax Dp_1↵

Description This command is used to set the print darkness. In general, the proper darkness value is depending on the media, print-out pattern and speed.

Parameters p_1: Darkness. Acceptable values ranges from 0 to 15. The default darkness value is 8.

Example

```
N↵
D10↵
A100,100,0,3,1,1,N,"DARKNESS=10"↵
P1↵
```


EI	**Prints Soft Font List**

Syntax EI↵

Description This command causes the printer to print the list of soft fonts that have been downloaded to RAM or flash memory from the host.

Parameters None

Example EI↵

Output If no soft font exists, the output will be

```
Soft Font Information:
No Soft Font Stored
```

Fig. B5-5

If soft fonts with ID C, D, E, F and G are stored in the printer, the output will be

```
Soft Font Information:
C
D
E
F
G
```

Fig. B5-6

EK	Deletes Soft Font

Syntax EK”ID”↲
EK”*”↲

Description This command causes the printer to delete the soft fonts that are currently stored in RAM or flash memory.

Once a soft font is deleted, it cannot be selected or printed out, unless downloaded again.

Parameters ID Font ID, A ~ Z.
* All fonts will be deleted from RAM or flash memory.

Example EK″B″↲
This causes printer to delete a soft font with ID B.

ES	Downloads Soft Font

Syntax ES”ID”…<font data>…

Description This command is used to download a soft font and store it in RAM or flash memory. The soft font can be deleted by EK command. If it is stored in RAM, it will be automatically cleared when the printer is turned off. The soft fonts can remain, if you store it in the flash memory.

Refer to the A command for selecting a soft font and printing it.

Parameters ID One upper case letter from A to Z.
…<font data>…
The basic format of a soft font is

Font Descriptor
Character 0
…
Character N-1

Font Descriptor

Byte 0	0
Byte 1	No. of characters to be downloaded
Byte 2	0
Byte 3	Image height, IV
Byte 4	Width in pixels for space code
Byte 5	0
Byte 6 ~ 0FH	0

Character Parameters and Image

Byte 0	Movement in pixel
Byte 1	Character width in bytes, BW
Byte 2 ~	Image data, the length is BW*IV

Note: No line separator (LF) is required.

Example

```
EK"A" ↵
ES"A"…
N↵
A50,30,0,A,1,1,N,"SOFT FONT A" ↵
P1↵
```


FE	**Ends Form Store**

Syntax FE↵

Description This command is used to end a form store sequence. When the printer receives such command, it will save the form data into RAM or flash memory. The form data is started by FS command and ended by FE command.

Parameters None.

Example

```
FS"FORMA" ↵
   …
FE↵
```

FI	Prints Form List

Syntax FI↵

Description This command causes the printer to print the list of forms that have been downloaded to RAM or flash memory from the host.

Parameters None

Example FI↵

Output If no form exists the output will be

```
Form Information:
No Form Stored
```

Fig. B5-7

If the forms with names FORMA, FORMB and FORMC are stored in printer the output will be

```
Form Information:
FORMA
FORMB
FORMC
```

Fig. B5-8

FK	Deletes Form

Syntax FK”FORMNAME”↵

FK”*”↵

Description This command causes the printer to delete forms currently stored in RAM or flash memory.

Once a form is deleted it can not be retrieved and printed except it is reloaded again.

Parameters FORMNAME: Form name with a maximum of 16 characters.

*: All forms will be deleted from RAM or flash memory.

Example FK″*″↵

This causes the printer to delete all forms stored in RAM or flash memory.

FR	Executes Form

Syntax FR”FORMNAME”↵

Description This command is used to retrieve a form that is currently saved in printer and execute it.

The major advantage of using form is that you may retrieve and execute at any time as long as it exists in printer.

Parameters FORMNAME Form name with a maximum of 16 characters.

Example

```
FK”FRMA”↵            ; delete form “FRMA”
FS”FRMA”↵            ; start loading a new form
A50,30,0,4,1,1,N,"THIS IS FRMA." ↵
FE↵                  ; end form store

FR”FRMA”↵            ; retrieve and execute
P1↵                  ; a copy of form “FRMA”
```

Output

```
THIS IS FRMA.
```

Fig. B5-9

FS	Stores Form

Syntax FS”FORMNAME”↵

Description This command begins a form store sequence until the FE command is received.

The destination of storing depends on ZS or ZN command. If flash memory is enabled(ZS) the form will be saved to flash memory, otherwise it is saved to RAM.

Parameters FORMNAME Form name with a maximum of 16 characters.

Notes:

1. *When updating a form with the same form name, use the FK command to delete the old one before storing the new one.*

2. *Refer to the example at FR command for the whole form related commands.*

GG	Prints Graphics

Syntax GGp_1,p_2,"GNAME"↵

Description This command is used to print a graphic with PCX format that has been previously downloaded and saved in printer.

Parameters p_1: X coordinate in dots.
p_2: Y coordinate in dots.
GNAME: Graphic name with a maximum of 16 characters.

Example
```
N↵
GG100,50,"PCXGRAPH"↵
P1↵
```


GI	Prints Graphic List

Syntax GI↵

Description This command causes the printer to print the list of graphics that had been download to RAM or flash memory from host.

Parameters None.

Example
```
GI↵
```

Output If no PCX graphics exist the output will be

```
Graphics Information:
No Graphics Stored.
```

Fig. B5-10

If the graphics with names GRAPHA, GRAPHB and GRAPHC are stored in printer the output will be

```
Graphics Information:
GRAPHA
GRAPHB
```

Fig. B5-11

GK	Deletes Graphics

Syntax GK”GNAME”↵
GK”*”↵

Description This command causes the printer to delete graphics currently stored in RAM or flash memory.

Once a graphic is deleted it can not be retrieved and printed except it is reloaded again.

Parameters GNAME: Graphic name with a maximum of 16 characters.
*: All graphics will be deleted from RAM or flash memory.

Example GK”*”↵

This causes printer to delete all graphics stored in RAM or flash memory.

GM	Stores Graphics

Syntax GM”GNAME”p_1↵
PCX file

Description This command causes the printer to store graphics object in RAM or flash memory.

The destination of storing depends on ZS or ZN command. If flash memory is enabled(ZS) the graphics will be saved to flash memory, otherwise it is saved to RAM.

Note: To verify that the graphic was successfully stored you may send a GI command after downloading.

Parameters GNAME: Graphic name with a maximum of 16 characters.
p_1: The size (decimal) in bytes of PCX files.
PCX file: The graphics should be in PCX format.

Refer to the appendix for the specification of PCX graphics.

Example
```
GK”PCXA”↵
GM”PCXA”3858↵
…[PCX file for PCXA graphics]…
N↵
A30,30,0,4,1,1,R,"PCXA..." ↵
GG30,100,"PCXA"↵
```

```
P1↵
GK"*"↵
```

First delete PCXA graphics, download a new one, print some texts and the PCXA. After printing, delete all graphics stored in printer.

Output

Fig. B5-12

GW	**Prints Immediate Graphics**

Syntax GWp_1,p_2, p_3,p_4,[…raster image…]↵

Description This command is used to print a graphic with binary format. Note that the graphic format is not a PCX one. You should send row by row without compression. The '1' represents blank pixel and '0' for black pixel.

After printed the graphic image will be cleared immediately. You can not recall or reprint it again.

Parameters p_1: X coordinate in dots.

p_2: Y coordinate in dots.

p_3: Byte count in width of a row.

p_4: Height in pixels.

I	Selects Symbol Set

Syntax Ip_1,p_2,p_3↵

Description This command is used to select the proper symbol set.

The factory default symbol set is Code page 437 (English).

Parameters p_1: data bit number. 8 for 8-bit data and 7 for 7-bit data.

p_2: Symbol set.

p_3: KDU country code.

8 bit data (p_1=8)	Symbol Set (Code page)	7 bit data (p_1=7)	Symbol set
0	English(437)	0	USASCII
1	Latin 1(850)	1	British
2	Slavic(852)	2	German
3	Portugal(860)	3	French
4	Canadian/French (863)	4	Danish
5	Nordic(865)	5	Italian
		6	Spanish
		7	Swedish
		8	Swiss

Note: See the code table list in the User's manual for additional information, symbols and codes.

Example

```
N↵
I7,5,001↵
A50,30,0,3,1,1,N,"£100"↵
P1↵
```

This example selects 7 bit data, Italian symbol set.

Output

```
£100
```

Fig. B5-13

JB/JF	Disables/Enables Back Feed

Syntax JB↵

JF↵

Description This command is used to adjust the stop position. The back feed action is disabled at factory settings. After JF the printer will feed about one more inch so that the user can see the whole label.

Parameters None.

LE	Line Draw by Exclusive OR Operation

Syntax LEp_1,p_2,p_3,p_4↵

Description This command is used to draw a line by an “exclusive OR” operation.

Parameters p_1: X coordinate in dots.

p_2: Y coordinate in dots.

p_3: Horizontal length in dots.

p_4: Vertical height in dots.

Example

```
N↵
LE50,30,100,10↵
LE100,20,5,110↵
P1↵
```

Output

Fig. B5-14

LO	Line Draw by OR Operation

Syntax LOp_1,p_2,p_3,p_4↵

Description This command is used to draw a line by an “OR” operation.

Parameters p_1: X coordinate in dots.
p_2: Y coordinate in dots.
p_3: Horizontal length in dots.
p_4: Vertical height in dots.

Example
```
N↵
LO50,30,100,10↵
LO100,20,5,110↵
P1↵
```

Output

Fig. B5-15

LW	Draws White Line

Syntax LWp_1,p_2,p_3,p_4↵

Description This command is used to draw a white line, so it may erase previous image.

Parameters p_1: X coordinate in dots.
p_2: Y coordinate in dots.
p_3: Horizontal length in dots.
p_4: Vertical height in dots.

Example
```
N↵
LE50,30,100,10↵
LE50,60,100,10↵
LE50,90,100,10↵
LE50,120,100,10↵
LW100,20,5,110↵
P1↵
```

Output

Fig. B5-16

N	Clears Image Buffer

Syntax N↵

Description This command is used to clear the image buffer before filling any image.

Parameters None.

Note: Since this printer automatically clears the image buffer after a P command is execute, the N command may not be necessary. But for other compatible printers, this command can be accepted to clear the image buffer.

O	Selects Options

Syntax O[D,C,N]↵

Description This command is used to select various printer options. In general, it depends on the configuration of your printer.

Parameters D: Enable Direct thermal (without ribbon).
C: Enable cutter.
N: Enable dispenser.

Every time when the printer is started up, the defaults are cutter disabled, and dispenser disabled.

Example

```
O↵          ; thermal transfer, disables cutter
              and dispenser

OD↵         ; direct thermal, disables cutter and
            ; dispenser

OC↵         ; thermal transfer, enables cutter and
            ; disables dispenser
```

Notes:

1. *The cutter and dispenser cannot be enabled at the same time.*

2. *nce the options are incorrectly selected, the LEDs at panel may become blinking after printing. Please refer to the trouble-shooting section to correct the errors.*

3. For X series the thermal transfer and direct thermal are set via DIP switches, not by this command.

P	**Prints Label**

Syntax $Pp_1[,p_2]$↵

Description This command is used to output the contents of the image buffer.

Parameters p_1: Number of label sets, 1 ~ 65535.
p_2: Number of copies per label, 1 ~ 65535.

Example

```
FK"TEST"↵
FS"TEST"↵
C0,6,N,+1,"Enter Start No.:" ↵
A20,50,0,4,1,1,N,"Label: "↵
A120,50,0,4,1,1,N,C0↵
FE↵

N↵
Q20,0↵
FR"TEST"↵
? ↵
100↵
P2,3↵
```

This example downloads a form and prints 2 label sets with 3 pieces per set.

Output

```
Label:  100

Label:  100

Label:  100

Label:  101

Label:  101

Label:  101
```

Fig.B5-17

PA	**Prints Automatically**

Syntax PAp_1[,p_2]↵

Description This command is used for form application. It prints the form, as soon as all variable data have been input.

Parameters p_1: Number of label sets, 1 ~ 65535.
p_2: Number of copies per label, 1 ~ 65535.

Example

```
FK"TEST1"↵
FS"TEST1"↵
C0,6,N,+1,"Enter Start No.:" ↵
A20,50,0,4,1,1,N,"Label: "↵
A120,50,0,4,1,1,N,C0↵
PA2↵
FE↵

N↵
Q20,0↵
FR"TEST1"↵
? ↵
100↵
```

Output

```
Label: 100

Label: 101
```

Fig. B5-18

Q	**Sets Label and Gap Length**

Syntax Qp_1,p_2↵

Description This command is used to set the label and gap length.

Parameters p_1: Form length after the last image line.

p_2: Gap length. For continuous media(without gap), this field should be set to 0.

Example

```
N↵
Q100,20↵
A20,30,0,2,1,1,N,"Q command:" ↵
A20,60,0,2,1,1,N,"Label with gap"↵
A20,90,0,2,1,1,N,"Gap length: 20 dots"↵
P1↵
```

Note: If the label size is not properly set, the printer may print off the edge of the label or tag and onto the backing or platen roller, while showing error message.

q	Sets Label Width

Syntax qp$_1$↵

Description This command sets the label width. This command is an alternative to sending the R command for center labels that are narrower than the print head.

Parameters p$_1$: Label width in dots.

Example

```
N↵
q250↵
A20,30,0,2,1,1,N,"q command:"↵
A20,60,0,2,1,1,N,"Label width: 250 dots"↵
P1↵
```

Note: This command will automatically set the left margin. The incorrect label width will cause the image shift to the left or right, even lost.

R	Sets Origin Point

Syntax R p$_1$,p$_2$↵

Description This command moves the origin point for the X and Y axes. After this command is sent, all coordinates are set according to the new origin.

Parameters p$_1$: Horizontal margin measured in dots.
p$_2$: Vertical margin measured in dots.

The print direction commands(ZB and ZT) will affect the location of the origin point. Refer to the Z command for details.

S	Sets Print Speed

Syntax Sp_1↵

Description This command is used to set a particular speed for a label or batch of labels to be printed.

Parameters p_1: A single character (0 to 6) representing a particular speed setting. The range depends on your printer model.

p_1 Value	Speed
0 or 1	1 ips (25 mmps)
2	2 ips (50 mmps)
3	3 ips (75 mmps)
4	4 ips (100 mmps)
5	5 ips (125 mmps)
6	6 ips (150 mmps)

Example S2↵

The sample above sets the printer to a speed of 2 ips.

TD	Defines date format

Syntax TD[p1][p2][p3]↵

Description This command defines the date format for printing. You may define special characters as separators.

Parameters p1 : y2 or y4.
p2 : me (month displayed as 3 letters) or mn (2 letters).
p3 : dd (day).

Example

```
TDdd-me-y4↵          ; 07-OCT-2000
TDdd,mn,y4↵          ; 07,10,2000
```

TT	Defines time format

Syntax TT[p1][p2][p3]↵

Description This command defines the time format for printing. You may define special characters as separators.

Parameters p1 : h (hours). If a '+' exists the hour is in 12 hour format and 'PM' or 'AM' will be printed.
p2 : m (minutes).
p3 : s (seconds).

Example

```
TTh:m:s↵          ; 13:30:20
TTh/m↵            ; 13/30
```


TS	Sets RTC

Syntax TSp1,p2,p3,p4,p5,p6↵

Description This command is used to set the RTC if it is installed.

Parameters p1 : Month, 01 ~ 12.
p2 : Day, 01 ~ 30.
p3 : Year, 00 ~ 99.
p4 : Hour in 24 hour format. 00 ~ 23.
p5 : Minutes, 00 ~ 59.
p6 : Seconds, 00 ~ 59.

Example

```
TS10,06,00,12,30,00↵    ; Sets the time to
                        ; Oct. 6, 00
                        ; 12:30:00 PM
```

U	Prints Configuration

Syntax U↵

Description This command is used to print the printer configuration including settings, firmware version, accessories, etc..

Parameters None.

Example U↵

Output

```
Label Printer with Firmware PPLB S3B0-1.00 072498 13
STANDARD RAM: 524288 BYTES       7 bit data: Italian
EXPANSION RAM: 0 BYTES
AVAILABLE RAM: 357248 BYTES
DIRECT THERMAL
NO. OF DL SOFT FONTS : 0
H. POSITION ADJUST.: 0000
RS232: 8, N, 1P,  9600
CHECKSUM: 0000  0000

This is internal font 1. 0123456789 ABCabcXyz
This is internal font 2. 0123456789 ABCabcXyz
This is internal font 3. 0123456789 ABCabcXyz
This is internal font 4. 0123456789 ABCXYZ
THIS IS INTERNAL FONT 5
```

Fig. B5-19: Printout from OS Series (*The printout pattern depends on the models.*)


```
Label Printer with Firmware PPLB X2B0-0.5 071898
STANDARD RAM: 2097152 BYTES  8 bit data:
AVAILABLE RAM: 1942080 BYTES Code Page 437
LABEL COUNT: 106
FLASH MEMORY: NONE
H. POSITION ADJUST.: 0000
CHECKSUM: 0000
LAB LEN(TOP TO TOP): 41 mm.  2
MEDIA SENSOR LEVEL: 5

DIP SWITCH CONFIGURATION:
```

BIT	ON..OFF	DESCRIPTION
1	X	DIRECT THERMAL
2	X	EURO MARK DISABLED
3	X	WITHOUT CUTTER
4	X	WITH NORMAL GAP OR CONT.
5	X	RESERVED
6	X	9600: N, 8, 1P. SCANNER
7	X	
8	X	

```
This is internal font 1. 0123456789 ABCabcXyz
This is internal font 2. 0123456789 ABCabcXyz
This is internal font 3. 0123456789 ABCabcXyz
This is internal font 4. 0123456789 ABCXYZ
THIS IS INTERNAL FNT5
```

Fig. B5-20: Printout from X series

UN/US	Disables/Enables Error Reporting

Syntax UN↵

US↵

Description This command is used to enable/disable the feedback from the printer. The printer send its feedback through the RS232 port. The default is disabled.

Parameters None.

Example

```
US↵
```

If an error occurs the printer will send a NACK(15H), followed by the error number to the host. If no error, the printer will echo an ACK(06H), after a P command is received. For major problems, e.g. media out, the LEDs on the panel of the printer will blink.

Error Code	Description
01	Command parser error
03	Data error for bar code
04	Memory full
06	RS232 error
07	Media or ribbon out

V	Defines Variable

Syntax Vp_1,p_2,p_3,"MSG"↵

Description This command defines the variable in forms. This command is useful to print labels numbered in sequence.

To print the contents of the variable, you may use A (print text) or B (print bar code) commands.

Parameters

p_1: Variable ID. Acceptable values from 00 to 99.

p_2: Maximum digit number for the variable. Acceptable value ranges from 1 to 99. If you use KDU, the length should be limited under 16.

p_3: Justification code. L for left justification, R for right justification, N for no justification and C for center alignment.

"MSG": A text string that will be sent to KDU or host.

Example

```
N↵
FK"TEST2"↵
FS"TEST2"↵
V0,16,L,"Enter Title:" ↵
C0,6,N,+1,"Enter Code:" ↵
A100,100,0,4,1,1,N,V0↵
A400,100,0,4,1,1,N,C0↵
FE↵
```

This example stores a form to the printer, if you retrieve the form and enter the counter and variable with the following procedure, the printer will print two labels with the input data.

```
Q100,0↵
FR"TEST2"↵
?↵
Part Number:↵
1234↵
P1,2↵
```

Output

```
Part Number: 1234

Part Number: 1234
```

Fig. B5-21

X	**Draws Box**

Syntax Xp_1,p_2,p_3,p_4,p_5↵

Description This command is used to draw a box by an “OR” operation.

Parameters

p_1: X coordinate of start point in dots.

p_2: Y coordinate of start point in dots.

p_3: Thickness of four edges.

p_4: X coordinate of end point in dots.

p_5: Y coordinate of end point in dots.

Example

```
N↵
A50,30,0,4,1,1,R,"BOXES"↵
X50,120,5,250,150↵
X120,100,3,180,280↵
P1↵
```

Output

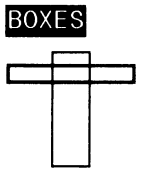


Fig. B5-22

Y	Sets Serial Port

Syntax Yp_1,p_2,p_3,p_4↵

Description This command is used to setup the serial port on the printer for matching with the host. The protocol between the host and the printer should be same otherwise unpredictable results will occur.

Parameters p_1: Baud rate. Acceptable values are:

p_1 Value	Speed
38	38,400 baud
19	19,200 baud
96	9,600 baud
48	4,800 baud
24	2,400 baud

p_2: Parity. O - odd parity, E - even parity and N - none parity.

p_3: Data bit number, 7 or 8.

p_4: Stop bit number, 1 or 2.

Notes:

1. *For some printers p2, p3 and p4 are ignored. The data format for such printers is always 8 bit data, none parity and 1 stop bit.*
2. *The factory defaults for RS232 are 9600 baud, 8 data bits, none parity and 1 stop bit.*
3. *This command is not used for those model with DIP switches, For X2000+/X3000+, you can set baud rate via the DIP switches on the rear of the printer.*

Example Y19,N,8,1↵

Z	Sets Print Direction

Syntax Zp_1↵

Description This command is used to set the print direction for all graphics, texts, bar codes, lines and boxes.

Parameters p_1: Direction. Acceptable values are B or T. The graphics, images or texts etc. that are sent from the top are diagonally symmetrical with those sent from the bottom. The default value is T.

Example

```
N↵
ZT↵
A50,30,0,4,1,1,R,"ZT"↵
P1↵
```

ZN/ZS	Disables/Enables Flash Memory

Syntax ZN↵

ZS↵

Description This command is used to disable/enable the flash memory. Every time when the printer is turned on, the flash memory is disabled. To enable the flash memory, first install the flash memory board, then send the ZS command.

All PCX graphics, soft fonts and forms can be stored to RAM or flash memory. But the objects that are stored in RAM will be cleared after the printer is turned off.

Example

```
ZS↵
FK"TEST3"↵
FS"TEST3"↵
A100,100,0,4,1,1,N,”Test Flash”↵
FE↵
```

If the flash memory is installed and you send the example file, then restart the printer and retrieve the form. The printer will print out the correct result.

```
FR"TEST3"↵
P1↵
```


?	Downloads Variables and Counters

Syntax ?↵

Description This command is used to inform the printer that the data following are input variables or counter values.

This command is used to send data variables or counters to the printer after a form is stored. The amount of data following the question mark and LF must exactly match with the total number and order of variables and counters in that specific form.

Refer to the C and V commands for examples.

APPENDIX BA: PCX SPECIFICATION

This section contains the basic PCX format that will be accepted by your printer. The raster image data at PCX file are compressed. It reduces the file size and saves the time for communication between the host and the printer.

Note that all of the word (16 bits) or long word (32 bits) data are in Intel formats, i.e. the most significant byte is at highest address.

PCX Header (128 bytes)
First raster line
…
Last raster line

Header

The header includes 128 byte data.

Location	*Contents*
0H	0AH, PCX mark
1H	Version
2H	0
3H	Bits per pixel, this should be 1.
4H ~ 5H	X coordinate at upper left point, 0.
6H ~ 7H	Y coordinate at upper left point, 0.
8H ~ 9H	X coordinate at lower right point
0AH ~ 0BH	Y coordinate at lower right point

0CH ~ 0DH	Horizontal resolution. Ignored.
0EH ~ 0FH	Vertical resolution. Ignored.
10H ~ 3FH	All 0s
40H	0
41H	Plane no., this should be 1.
42H ~ 43H	Bytes per raster line
44H ~ 45H	0
46H ~ 47H	Horizontal pixel count - 1
48H ~ 49H	Vertical pixel count - 1
4AH ~ 7FH	All 0

Note: The alignment of word or long word for PCX file is at Intel format. That is the most significant bytes is located at highest location and least significant byte is located at lowest location.

Raster Data

There are two types of raster data.

- CC, pattern0
- pattern1

The control byte must be greater than C0H and pattern1 is less than C0H.

rep=CC & 3FH

rep represents the repeat count of pattern0 after expansion. For example, a raster line data,

3AH, C0H, C1H, 41H, 41H, 41H, 41H, 41H

After compression, they become

3AH, **C1H**, C0H, **C1H**, C1H, **C5H**, 41H

1 at pattern byte stands for white pixel and 0 for black pixel. If the width in pixels is not a multiple of 8, the bits of "1"must be filled at the end of each row to form an integral part of bytes.

APPENDIX BB: HOW TO SELECT A FONT FROM FONT BOARD

The font IDs for fonts at font board are 7 ~ 10. 7 and 8 are for Chinese fonts, 9 and 10 for Korean fonts.

Example:

```
A50,30,0,7,1,1,N,"FONT AT FONT BOARD." ↵
```

Note: For two-byte language, like Chinese a character is composed of two bytes.

APPENDIX BC: HOW TO MAKE A FORM

In general a form contains texts, bar codes and graphics. Some of the fields are fixed, while the others are subject to change. While making a form, you may need to perform some of the following tasks:

- Download graphics
- Download a form
- Define variables and counters
- Set positions for texts, bad codes and graphics
- Retrieve and execute a form

Download graphics

```
GK"LOGO"↵                ; delete the previous one if it exists
GM"LOGO"1024↵            ; start pcx graphics. 1024 is the total
                           size of the graphics
…graphics…               ; 1024 does not include LF code, ↵.
```

Refer to the appendix BA for the PCX specification.

Download a Form

```
FK"TICKET"↵              ; delete the previous one if it exists
FS"TICKET"↵              ; start the form store sequence of the
                           form "TICKET"
FE↵                      ; end a form sequence
```


Define Variables and Counters

```
V00,15,N,"Start From"↵   ; variable 00 with a maximum length of 15
V01,15,N,"Destination"↵  ; variable 01 for destination
C0,6,N,+1,"Ticket no."↵  ; counter 0, stepped by +1
```

Set Positions

The positions are depending on the label dimension and the output format.

```
q700↵                    ; set label width
ZT↵                      ; set print direction
GG50,100,"LOGO"↵         ; place "LOGO" to position x=50, y=100
A100,150,0,4,1,1,N,"From"↵   ; fixed text at x=100, y=150, font 4
A250,150,0,4,1,1,N,"to"↵ ; fixed text at x=250, y=150, font 4
A200,150,0,3,1,1,N,V00↵  ; variable at x=200, y=150, font 3
A415,150,0,3,1,1,N,V01↵  ; variable at x=415, y=150, font 3
B250,200,0,1,3,3,96,B,C0↵ ; counter using code 128 with bar code
                           height 96, print digits too
```

Retrieve and Execute

```
FR"TICKET"↵              ; retrieve form "TICKET"
?↵                       ; start download of variables and counter
New York↵                ; V00 value
Mexico↵                  ; V01 value
100200↵                  ; C0 value
P3,1↵                    ; print 3 label sets, 1 copy of each label
```

Once a form or graphics is stored, you can print labels just by sending a few commands.

GK"LOGO"↵
GM”LOGO”1024↵
…graphics…
FK"TICKET"↵
FS"TICKET"↵

V00,15,N,"Start From"↵
V01,15,N,"Destination"↵
C0,6,N,+1,"Ticket no." ↵

q700↵
ZT↵
GG50,100,”LOGO”↵
A100,150,0,4,1,1,N,"From"↵
A350,150,0,4,1,1,N,"to"↵
A200,150,0,3,1,1,N,V00↵
A415,150,0,3,1,1,N,V01↵
B250,200,0,1,3,3,96,B,C0↵
FE↵

FR"TICKET"↵
? ↵
New York↵
Mexico↵
100200↵
P3,1↵

APPENDIX BD: ADDITIONAL COMMANDS

There are some extra PPLB commands for special functions on OS, X and G series printers. Their characteristics are

- They can be saved in the printer permanently, unless to be changed or reset via the panel.
- Once the emulation is changed, you had better reset them to factory defaults via the panel.
- They are pseudo commands.
- They are not defined in all printer models. You can set them via panel or DIP switches on X2000+/X3000+/G6000/G7000 printers.

Command	Description	Models
d0,1↵ d0,0↵	Enables Euro mark. [++] Disables Euro mark.	OS214/204/202/X1000+[*] [*] Default: d0,0
d1,__ ↵	Horizontal shift. Where __ is a positive or negative integer, e.g. –100. It is in terms of pixels.	OS214/204/202/X1000+/ 2000+/3000+/G6000/ 7000 Default: d1,0

d5,0↵ d5,1↵	Normal cut (with back-feed). Cut without back-feed.	X2000+/3000+/G6000/ 7000 Default: d5,0
<esc>KX____	Label length of continuous labels when using Label Dr. under Windows. ____ is a 4 digit integer and in terms of pixels.	OS214/204/202/X1000+** Default: <esc>KX0000
<esc>KI;_	Cut or peel offset. Where _ is a signed byte and in term of pixels.	OS214/204/202/X1000+** Default: <esc>KI;<00H>
<esc>@0	Clears the flash memory that contains forms, soft fonts or graphics.	OS214/204/202/X1000+/ 2000+/3000+/G6000/ 7000

** : For X2000+/X3000+/G6000/G7000, these functions can be set via panel or DIP switches.

++ : Once the Euro dollar sign is enabled the '_' will be replaced by Euro dollar symbol.

APPENDIX BE: HOW TO SEND THE COMMANDS TO THE PRINTER

If you are using a PC system to edit a command file under MS-DOS, at final stage, you may send it to the printer to get the printout. However, the way that you send the revised file is varied from the computer environment.

1. Suppose you connect the serial cable to COM1:

- Set the baud rate and data format (the default baud rate under DOS is 2400)
- Copy the command file to COM1 port

```
>MODE COM1:9600,N,8,1,P
>COPY/B CMDFILE COM1:
```

2. Suppose you connect the Centronics cable to LPT1:

- Just copy the command file to LPT1: port

```
>COPY/B CMDFILE LPT1:
```

3. Suppose you connect the serial cable to COM1: and use Quick Basic

- Open a device file and set related parameters
- Run your Basic program

Basic program example:

```
10     OPEN "LPT1" FOR RANDOM AS #1
20     PRINT #1, "q480"                    ' Label width
30     PRINT #1, "Q40,30"                  ' Label with gap
40     PRINT #1, "N"
50     PRINT #1, "D8"                      ' Darkness
60     PRINT #1, "B55,80,0,2,3,7,50,N,";    ' Barcode I25
70     PRINT #1, CHR$(34)+"000851802807"+CHR$(34)
75     '    bar code data="000851802807"
80     PRINT #1, "A110,140,0,3,1,1,N,";     ' Text="0008"
90     PRINT #1, CHR$(34)+"0008"+CHR$(34)
100    PRINT #1, "A220,140,0,3,1,1,N,";     ' Text="518028"
110    PRINT #1, CHR$(34)+"518028"+CHR$(34)
120    PRINT #1, "A50,10,0,4,1,1,R,";     ' Text="Printout:"
130    PRINT #1, CHR$(34)+"Printout:"+CHR$(34)
140    PRINT #1, "P1"                    ' Single copy
150    END
```

Appendix BF：FONTS AND BAR CODES FOR PPLB

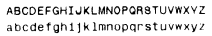
Internal Fonts

There are 5 internal fonts for the PPLB emulation**.**

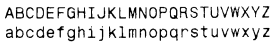
Each has 6 eight-bit and 9 seven-bit symbol sets. Font 5 does not contain any lower-case characters.

8 bit symbol sets	Code page 437,850,852,860,863 and 865
7 bit symbol sets	USA, British, German, French, Danish, Italian, Spanish, Swedish and Swiss

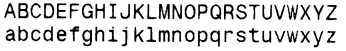
Font 1



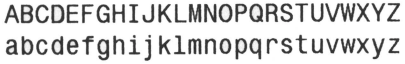
Font 2



Font 3



Font 4



Font 5

Symbol

```
Code Page 437
20-3F:  !"#$%&'()*+,-./0123456789:;<=>?
40-5F: @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
60-7F: `abcdefghijklmnopqrstuvwxyz
80-9F: ÇüéâäàåçêëèïîìÄÅÉæÆôöòûùÿÖÜ¢£  ƒ
A0-BF: áíóúñÑªº¿  ½¼¡
E0-FF:  ß      μ
```

```
Code Page 850
20-3F:  !"#$%&'()*+,-./0123456789:;<=>?
40-5F: @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
60-7F: `abcdefghijklmnopqrstuvwxyz
80-9F: ÇüéâäàåçêëèïîìÄÅÉæÆôöòûùÿÖÜø£Ø ƒ
A0-BF: áíóúñÑªº¿  ½¼¡        ÁÂÀ     ¢
C0-DF:        ãÃ            ÊËÈ ÍÎÏ      Ì
E0-FF: ÓßÔÒõÕμ  Ú Ù         =¾¶§  °
```

```
Code Page 852
20-3F:  !"#$%&'()*+,-./0123456789:;<=>?
40-5F: @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
60-7F: `abcdefghijklmnopqrstuvwxyz
80-9F: Çüéâä  ç ë  î Ä É  ôö     ÖÜ
A0-BF: áíóú                     ÁÂ
C0-DF:                        Ë  ÍÎ
E0-FF: ÓßÔ      Ú             §  °
```

```
Code Page 860
20-3F:  !"#$%&'()*+,-./0123456789:;<=>?
40-5F: @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
60-7F: `abcdefghijklmnopqrstuvwxyz
80-9F: ÇüéâãàÁçêÊèÌÔìÃÂÉÀÈôõòÚùÌÕÜ¢£Ù Ó
A0-BF: áíóúñÑªº¿Ò ½¼
E0-FF:  ß      μ
```

```
Code Page 863
20-3F:  !"#$%&'()*+,-./0123456789:;<=>?
40-5F: @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
60-7F: `abcdefghijklmnopqrstuvwxyz
80-9F: ÇüéâÂà¶çêëèïî=À§ÉÈÊôËÏûú ÔÜ¢£Ù ƒ
A0-BF:   óú    Î  ½¼¾
E0-FF:  ß      μ
```

```
Code Page 865
20-3F:  !"#$%&'()*+,-./0123456789:;<=>?
40-5F: @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
60-7F: `abcdefghijklmnopqrstuvwxyz
80-9F: ÇüéâäàåçêëèïîìÄÅÉæÆôöòûùÿÖÜø£Ø ƒ
A0-BF: áíóúñÑªº¿  ½¼
E0-FF:  ß      μ                     °
```

```
USASCII
20-3F:  !"#$%&'()*+,-./0123456789:;<=>?
40-5F: @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
60-7F: `abcdefghijklmnopqrstuvwxyz
```

```
UK
20-3F:  !"£$%&'()*+,-./0123456789:;<=>?
40-5F: @ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
60-7F: `abcdefghijklmnopqrstuvwxyz
```

```
German
20-3F:  !"#$%&'()*+,-./0123456789:;<=>?
40-5F: §ABCDEFGHIJKLMNOPQRSTUVWXYZÄÖÜ^_
60-7F: `abcdefghijklmnopqrstuvwxyzäöüß¯
```

```
French
20-3F:  !"£$%&'()*+,-./0123456789:;<=>?
40-5F: àABCDEFGHIJKLMNOPQRSTUVWXYZ°ç§^_
60-7F: `abcdefghijklmnopqrstuvwxyzéùè"¯
```

```
Danish
20-3F:  !"#$%&'()*+,-./0123456789:;<=>?
40-5F: @ABCDEFGHIJKLMNOPQRSTUVWXYZÆØÅÜ_
60-7F: `abcdefghijklmnopqrstuvwxyzæøåü¯
```

```
Italian
20-3F:  !"£$%&'()*+,-./0123456789:;<=>?
40-5F: §ABCDEFGHIJKLMNOPQRSTUVWXYZ^çé^_
60-7F: ùabcdefghijklmnopqrstuvwxyzàòèì


Spanish
20-3F:  !"!$%&'()*+,-./0123456789:;<=>?
40-5F: ¡ABCDEFGHIJKLMNOPQRSTUVWXYZÑñ¿ü_
60-7F: áabcdefghijklmnopqrstuvwxyzéíóú


Swedish
20-3F:  !"#$%&'()*+,-./0123456789:;<=>?
40-5F: ÉABCDEFGHIJKLMNOPQRSTUVWXYZÄÖÅÜ_
60-7F: éabcdefghijklmnopqrstuvwxyzäöåü


Swiss
20-3F:  !"£$%&'()*+,-./0123456789:;<=>?
40-5F: §ABCDEFGHIJKLMNOPQRSTUVWXYZàçè^_
60-7F: `abcdefghijklmnopqrstuvwxyzäöüé
```


Internal Bar Codes

The PPLB support 26 one dimensional bar codes and 2 two dimensional bar codes.

** Code 39 **

** Code 93 **

** Code 128UCC shipping container **

** Code 128 **

** Codabar **

** EAN-8 **

** EAN-8 2 add-on **

** EAN-8 5 add-on **

** EAN-13 **

** EAN-13 2 add-on **

** EAN-13 5 add-on **

** German postcode **

** Int 2 of 5 **

** Postnet **

** UCC/EAN **

** UPC-A **

** UPC-A 2 add-on **

** UPC-A 5 add-on **

** UPC-E **

** UPC-E 2 add-on **

** UPC-E 5 add-on **

** UPC I25 **

** Maxi Code **

** PDF-417 **