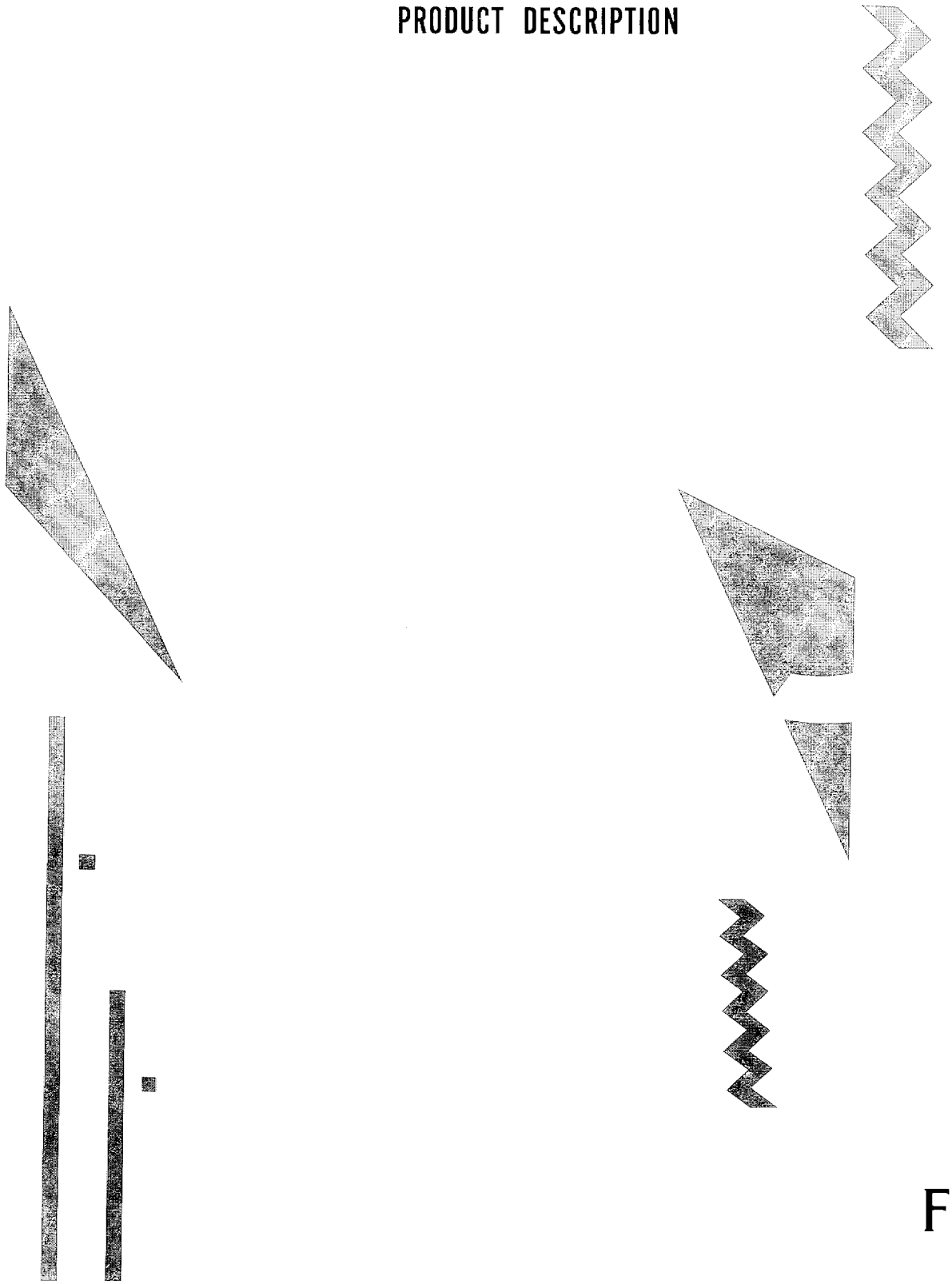
C147-C008-01EN

DL6400Pro/DL6600Pro

DOT MATRIX PRINTER

PRODUCT DESCRIPTION



FUJITSU

DL6400Pro/DL6600Pro
DOT MATRIX PRINTER
PRODUCT DESCRIPTION

FUJITSU LIMITED

Communications and Electronics

Tokyo, Japan

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PREFACE

This manual contains the product specifications of the DL6000Pro series dot matrix printer. The manual provides the necessary engineering specifications to prospective customers.

Chapter 1: describes the main features of the DL6000Pro series.

Chapter 2: describes the model configuration and equipment structure. Further classification is based on the automatic paper thickness control (APTC), host-controlled paper path (HCPP), and power supply specifications.

Chapter 3: describes the printer specifications for functional, physical, electrical and environmental conditions. It also describes paper specifications.

Chapter 4: describes the control panel and summarizes the functions and operations of switches and indicator on the control panel.

Chapter 5: describes the electrical interface, and its hardware and software specifications. It also summarizes command sets.

Chapter 6: describes maintenance.

Chapter 7: describes the options and supplies.

Appendixes: give information on character sets, resident fonts, and printer dimensions and the logo.

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ILLUSTRATIONS AND TABLES

CHAPTER 1 FEATURES

The DL6000Pro series is new conceptual and high-performance printer. Newly adopting ESC/P2 emulation, and multiple paper path mechanism which enables smooth paper handling and various type paper use.

Its letter quality print is nearly equal to that of daisy wheel printers, thanks to 360 (h) × 180 (v) dpi print resolution by its 24-wire print head.

Multiple print modes enable word processing with more flexibility than daisy wheel printers do.

Nine bitmap fonts (including draft fonts) and nine scalable fonts are resident in the printer.

Up to 128K bytes of user-designed character fonts can be stored in the download RAM. This enables users to design character sets. Characters such as Arabic, Chinese, Hangul, and Japanese can also be printed.

In addition to the formal correspondence use, the DL6000Pro series has a high-speed mode for data processing and a medium speed mode for in-house correspondence use. The print quality is not as good at higher speeds, but it remains easy to read.

8-bit and 24-bit graphics are both available. The dot density is up to 1/360 x 1/360 inch. 8 types of bar code printing is also available.

Automatic paper loading/unloading and continuous forms parking functions facilitate paper handling, including rapid switching between continuous forms and cut sheets. The front feed mechanism enables the use of label sheets, especially for bar code printing. By the front guide table cut sheet is loaded with ease.

Software or panel controlled paper path switching function is standard.

For the host interface Centronics parallel and RS-232C serial are prepared. The Fujitsu DPL24C PLUS, IBM ProPrinter XL24E and EPSON ESC/P2 are resident in the printer.

Ribbon life is very long 18 million characters, and subcassette method is economical and conserves natural resources.

1.1 Multiple Print Modes and Resolutions

The DL6000Pro series uses a new release-type print head with 24 thin wires, each 0.2 mm (0.008 inch) in diameter.

A single pass of the head provides resolution up to 360 (h) × 180 (v) dpi. Double-pass printing (bidirectional) puts dots up to 360 × 360 dpi for higher resolution graphics. Natural curves and very fine lines can be printed clearly, enabling bar code printing. Single-pass printing increases the print speed and maintains the print alignment.

The quality of the printing is classified as letter, report (correspondence), or draft. Letter quality has the highest resolution and is comparable with that of daisy wheel printer characters. The draft quality has the lowest resolution but is easy to read and its print speed is the highest. The user can choose the print quality that suits each application.

Quality	Resolution (h × v)	Speed			
		DL6400Pro		DL6600Pro	
		at 12 cpi	at 10 cpi	at 12 cpi	at 10 cpi
Letter	360 × 180 dpi	168 cps	140 cps	216 cps	180 cps
Report	180 × 180 dpi	336 cps	280 cps	432 cps	360 cps
Draft	120 × 180 dpi	504 cps	420 cps	648 cps	540 cps

The DL6000Pro series has the following print modes and line spacings that make word processing software concise and provide more flexibility.

Print modes: Bold, shadow, double-width, double-height, condensed, superscript, subscript, underline, justify, and proportional. Other modes, such as italics, multi-size, and outlined and shaded are available depending on the emulation used.

Line spacings: 25.4 mm (1 in), 12.7 mm (1/2 in), 8.5 mm (1/3 in), 6.4 mm (1/4 in), 5.1 mm (1/5 in), 4.2 mm (1/6 in), 3.6 mm (1/7 in) and 3.2 mm (1/8 in)

The DL6000Pro series has fifteen resident letter-quality fonts:
Courier 10, Pica 10, Prestige Elite 12, Boldface PS, OCR-B 10, and OCR-A 10 —— Bitmap fonts
Courier, Nimbus Sans, Timeless (Upright, Italic, Bold) ———— Scalable fonts

It also has the following resident fonts.
- Correspondence
- Compression
- Draft

Figure 1.1 shows some print samples.

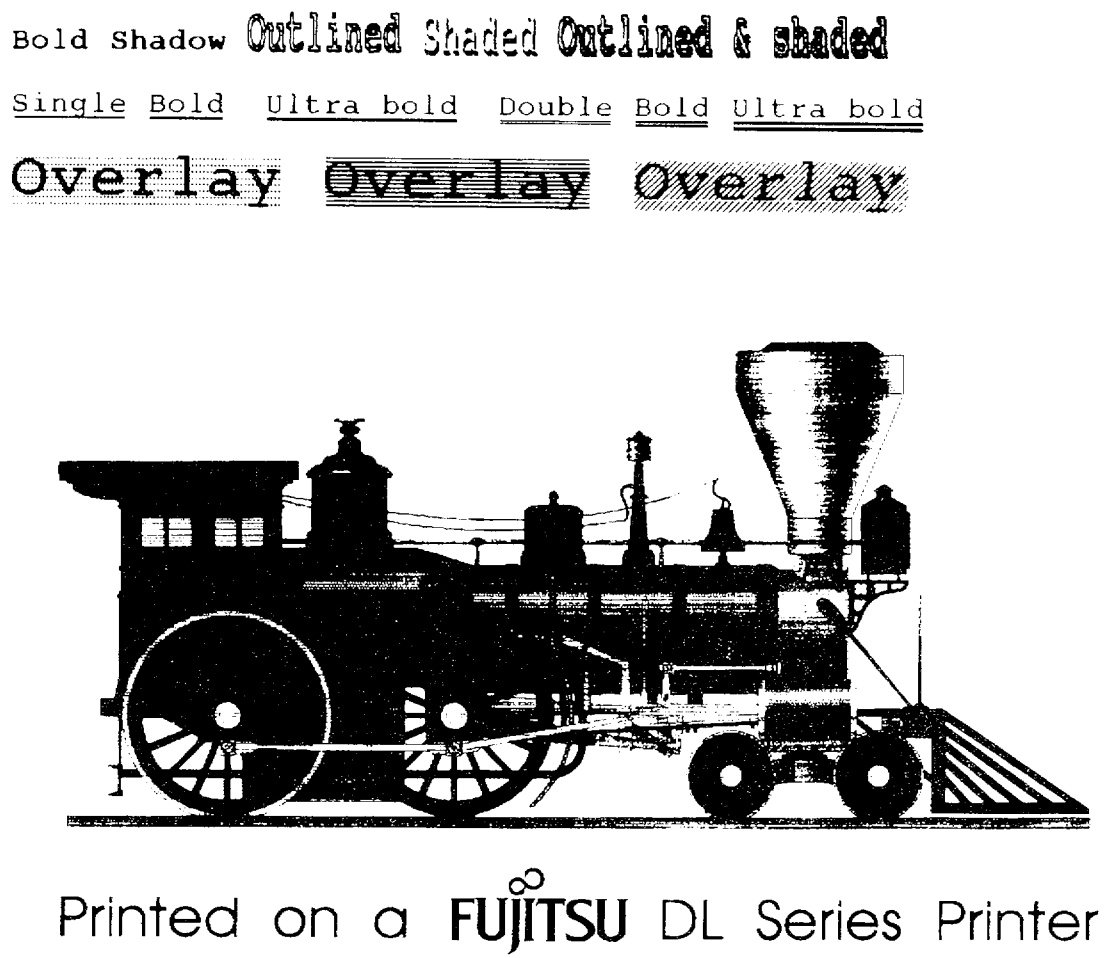


Figure 1.1 Print samples

1.2 Printing Speed

The following are details of DL6000Pro series printing speeds.

The text print speed is:

Quality	DL6400Pro		DL6600Pro	
	at 12 cpi	at 10 cpi	at 12 cpi	at 10 cpi
Letter (LQ)	168 cps	140 cps	216 cps	180 cps
Report (RQ)	336 cps	280 cps	432 cps	360 cps
Draft (DQ)	504 cps	420 cps	648 cps	540 cps

cps: characters per second

Note:
The DL6600Pro printing speeds for the DQ mode depend on printing start and end positions.

	Printing positions	DQ
Pica	8 to 129	540 cps
	1 to 136	450 cps
Elite	9 to 155	648 cps
	1 to 163	540 cps

The line feed speed is less than 50 millisecond for 6 lines per inch (lpi) and the forms feed speed is 9 inches per second (ips) for front feed, 6 inches per second (ips) for rear feed (optional).

The DL6000Pro series buffer control enables data to be received while other data is printing. Other features, such as logic seeking, bidirectional printing, horizontal and vertical tabulations, also improve the DL6000Pro series throughput.

1.3 Multi-emulation

The DL6000Pro series emulates printers from other makers as well as Fujitsu DL series printers. These emulations are in the resident ROM.

Resident: Fujitsu DPL24C PLUS including bar code commands
IBM Proprinter XL24E emulation
Epson ESC/P2

The user can run a lot of application software without changing the host system or application software, just by selecting one of them from the front panel.

1.4 Compatibility with IBM PC Printers

When the IBM Proprinter XL24E emulation is selected, not only the command set but also the aspect ratio of the graphics output is exactly the same as the IBM Proprinters if the alternate graphics mode (AGM) is selected from the printer control panel in setup mode.

Often 24-wire printers produce graphics of a different aspect ratio from other maker's printers because of different pitches of print head wires between them. This printer creates the same aspect ratio as the IBM PC printers including 9-wire printers. This offers the advantage of full compatibility with the graphics software for IBM printers.

1.5 Automatic Paper Loading/Unloading

Paper path can be chosen automatically by operating the switch on the control panel. It is not necessary to handle the platen knob or some select lever.

If the operator wants to switch from continuous forms to cut sheets, pressing the LOAD/UNLOAD switch retracts the continuous forms from the platen to the parking position (forms tractor position). After setting the paper select lever to the cut sheet position, pressing the LOAD/UNLOAD switch loads a cut sheet onto the platen. After printing on cut sheets, the continuous forms can be loaded again by operating the paper select lever and the switch. With this function, the operator does not have to reach out to the back cover to operate continuous forms. For example, this function is very useful when multi-users share the printer.

1.6 Automatic Print Head Gap Adjustment (APTC Option)

Two versions are available for adjusting the print head gap. One automatically adjusts the gap between the print head and the platen according to paper thickness by using the APTC (automatic paper thickness control) option. It consists of a switch that detects paper thickness and a motor that adjusts the gap between the head and the paper. This is a factory option and useful for users who often change paper types.

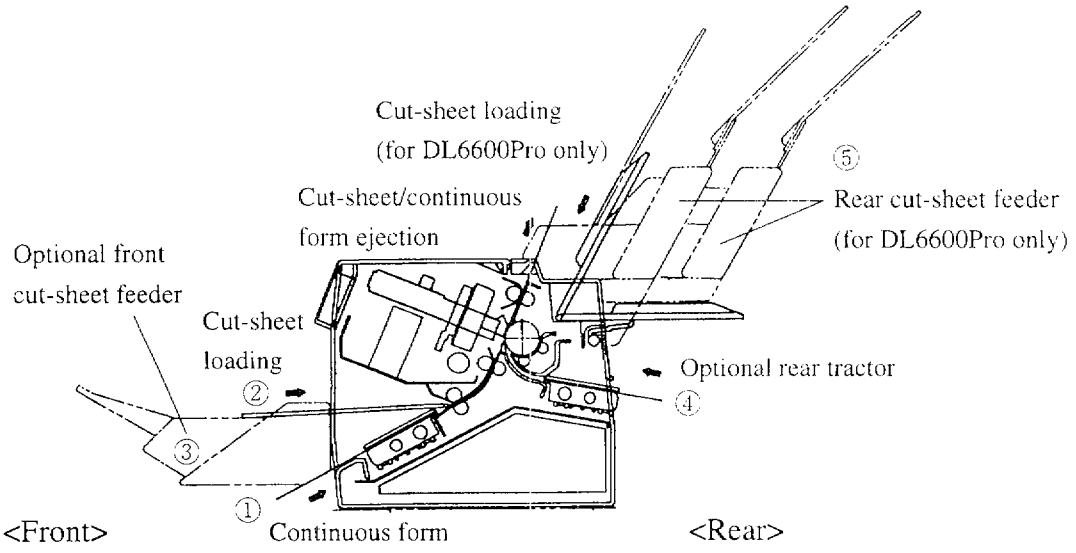
The other has a paper thickness lever that is operated manually. When the paper thickness lever is moved one notch, the print head moves about 0.05 mm, so that each notch of movement corresponds to about one sheet of 10-pound paper.

1.7 Switching Paper Types by Software (HCPP Standard)

The HCPP (host-controlled paper path) changes the paper feed path for continuous forms or cut sheets according to the Paper Selection command from the computer or the "paper path select" function of the control panel. When switching from a cut sheet to continuous forms, the cut sheet on the platen is ejected, the paper feed path is switched, and continuous forms are loaded from the park position. When switching from continuous forms to a cut sheet, the continuous forms are unloaded to the park position and the paper feed path is switched, but a cut sheet is must be loaded by the operator by pressing the LOAD/UNLOAD switch. This mechanism is useful for users who often change paper types.

1.8 Various Paper Path and Paper Type Selectable

Paper for the DL6000Pro series can be loaded from the front of the mechanism. It reduces the excessive bending of paper around the platen so that the printer can handle special types of continuous forms, especially label sheets by the front push tractor. When the optional cut sheet feeder is used various type of papers are feedable smoothly. Another optional rear tractor enables two types of continuous forms set at a time and each form is selectable and loaded automatically by control panel or host computer.



① Continuous form: front tractor
② Manual insert
③ Cut-sheet feeder: optional
④ Continuous form: optional rear tractor
⑤ Cut-sheet feeder: for DL6600Pro only

Figure 1.2 Front and rear feed routes

For the DL6600Pro, the single paper path from the rear is added. Up to two bins of rear cut-sheet feeder can be mounted on DL6600Pro for feeding the A3 paper of 420 mm wide.
The front cut-sheet feeder and rear cut-sheet feeder cannot be mounted at the same time.

1.9 Control Panel

1.9.1 LED type

The control panel consists of push-button switches and LED indicators.

The control panel can function in two modes: basic menu and setup. The basic menu consists of functions that are frequently used. In setup mode, the user can easily select setup conditions such as an emulation, line spacing, character pitch, type style, baud rate, protocol, and interface. The display guides the user in setting these conditions without troublesome DIP switch settings. (There are no DIP switches for these selections.)

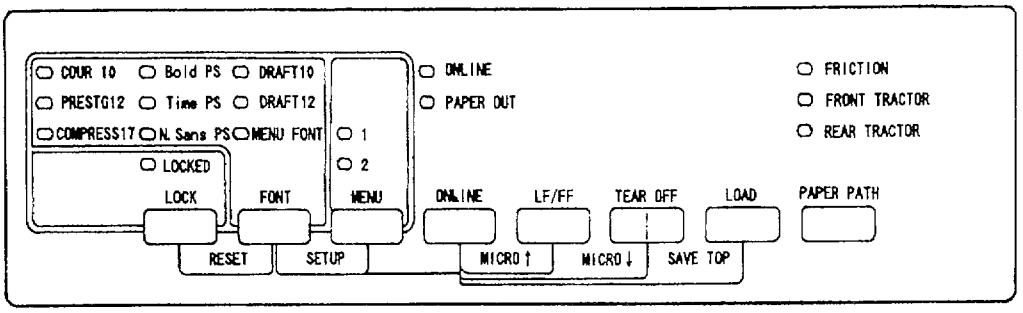


Figure 1.3 Control panel (LED type)

DL menu is prepared for an optional floppy disc.

The user can set conditions using personal computer display easily with DL menu method.

Another method for setup menu is available. The setup menu is printed on the paper. The operator selects the menu shown through the indicator window.

1.9.2 LCD type

The control panel consists of push-button switches, LED indicators, and a liquid crystal display (LCD). The LCD has a 2-line x 24-column alphanumeric display. The three switches below the LCD have various functions, which are shown by the corresponding part of the display. The LCD also displays readable messages and status information which helps in operating.

The control panel can function in two modes: basic menu and setup. The basic menu consists of functions that are frequently used. In setup mode, the user can easily select setup conditions such as an emulation, line spacing, character pitch, type style, baud rate, protocol, and interface. The display guides the user in setting these conditions without troublesome DIP switch settings. (There are no DIP switches for these selections.)

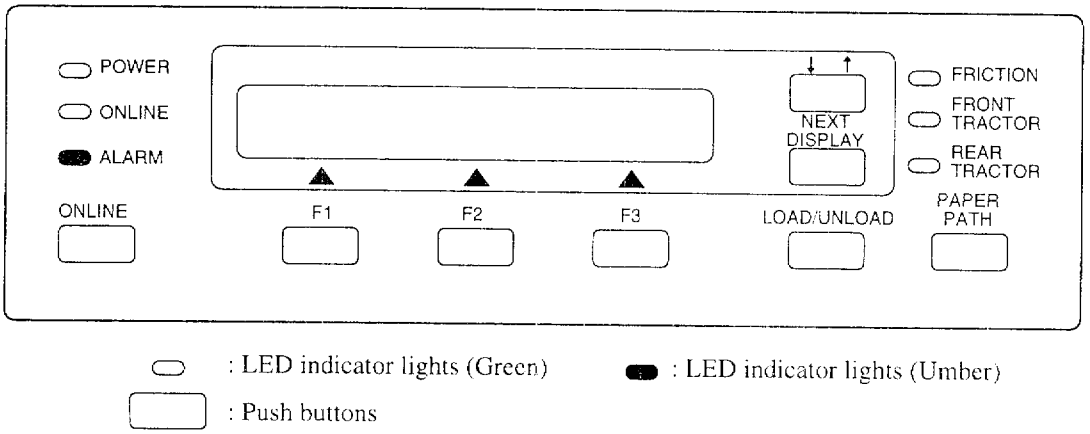


Figure 1.4 Control panel (LCD type)

1.10 Paper Feeders

The DL6000Pro series has a friction feed platen and front-feed push-type tractor as the standard paper feed mechanism. Both cut sheets and continuous forms can be used. A bidirectional tractor is not required for the DL6000Pro series. The mechanism design and control method enable bidirectional feed in spite of the front feed push-type tractor.

An optional rear feed push-type tractor is available. It is used when two type of continuous forms are necessary. An optional front path stand is also available to raise the printer when continuous forms are fed from under the front of the printer.

HPCC enables users those continuous forms selectable with ease.

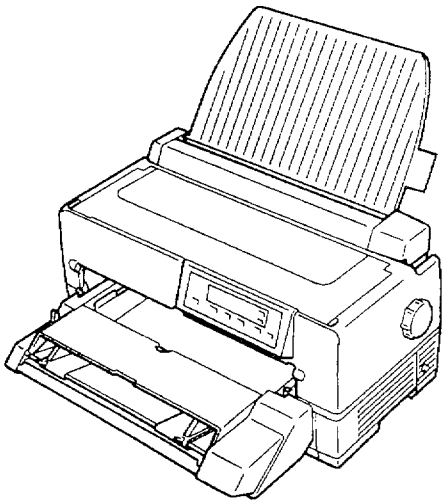


Figure 1.5 Optional cut-sheet feeder and stacker unit

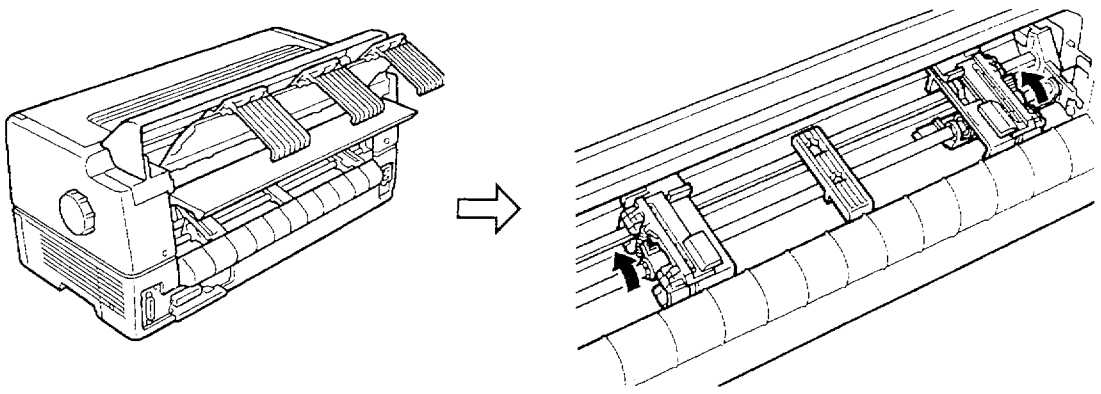


Figure 1.6 Optional rear-feed push type tractor

For the DL6600Pro, up to two bins of rear cut-sheet feeder can be mounted.

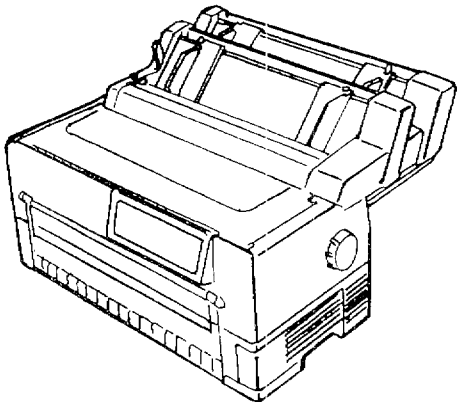


Figure 1.7 Optional rear cut-sheet feeder with two bins

1.11 High Reliability and Easy Maintenance

The DL6000Pro series is composed of two main parts: the printer mechanism and the controller. The design of both has been simplified, enhancing reliability and maintainability. The controller consists of the bottom cover on which the power supply board, mother PC board, and memory board are mounted. It integrates functions to reduce the number of moving parts.

The printer mechanism can be easily opened to access the interior for maintenance. It can be removed from the printer controller by disconnecting the connectors.

The integrated self-diagnostic functions make maintenance easy.

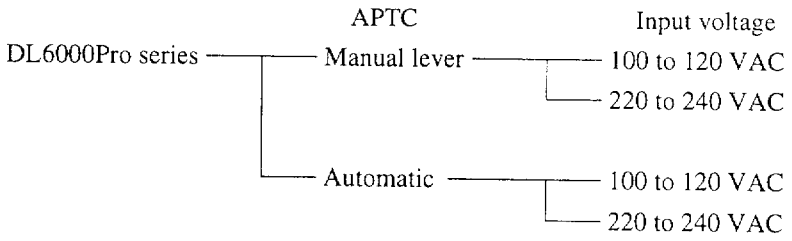
The DL6000Pro series is easy for end users and those who reconfigure printers to use. The MTBF is 8000 power-on hours at 25% duty cycle of 50% page density.

CHAPTER 2 MODEL CONFIGURATION AND EQUIPMENT STRUCTURE

This chapter describes model configuration and equipment construction. The DL6000Pro series has three factory options, that is, the components relating to host-controlled paper path (HCPP), automatic paper thickness control (APTC), and power supply input voltage. The model configuration varies with the combination of these components. Other components are the same in all versions.

This document covers all models. An understanding of the model configuration is helpful for relating the information in this chapter to a particular model.

2.1 Model Configuration



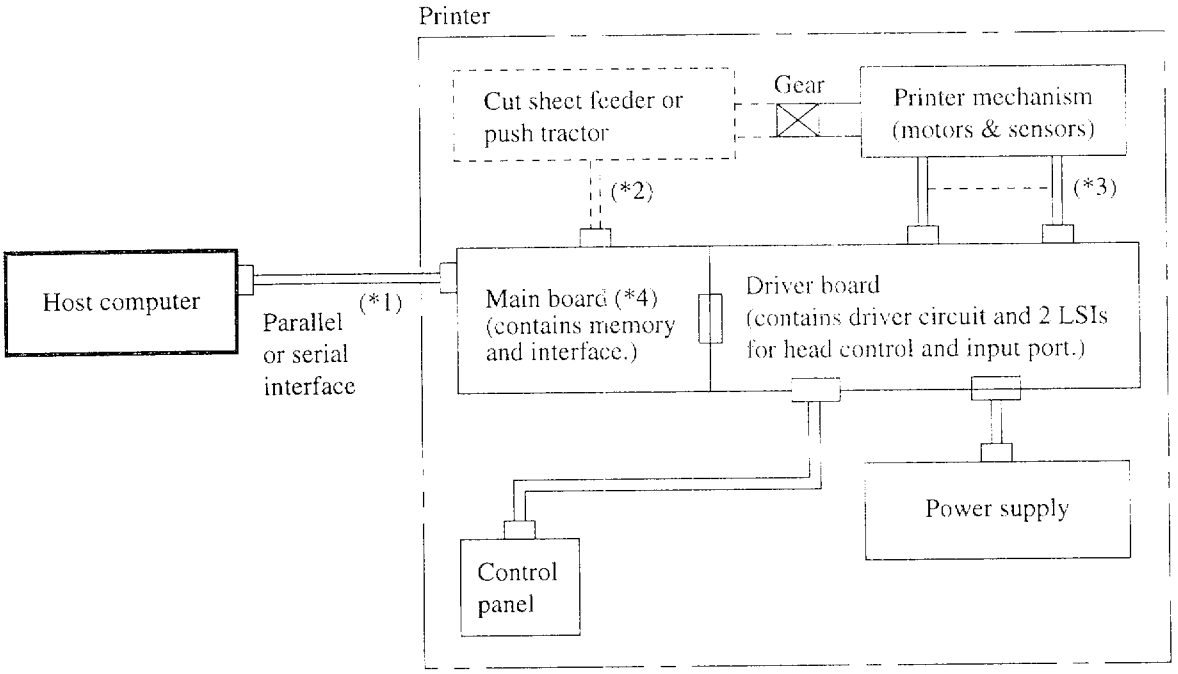
Notes:

1. The following three emulations are standard for all versions.
   DPL24C PLUS: Fujitsu original command set, including bar code commands, plus extended commands.
   IBM Proprinter XL24E
   Epson ESC/P2

2. The following two type interfaces are set.
   Centronics and RS-232C
   Centronics only

2.2 Block Diagram

Figure 2.1 is a block diagram of the DL6000Pro series printer.



*1. One of the two interfaces is connected.
*2. The connection is for a cut sheet feeder.
*3. Some sensors output signals to the driver board and power supply.
*4. Main board
2 types are prepared as follows:
① Centronics only
② Centronics & RS232C
[ ] indicates an option.

Figure 2.1 Printer block diagram

(1) Printing mechanism

The DL6000Pro series printer mechanism consists of a print head and its carriage, a paper feed mechanism, a ribbon feed mechanism, and HCPP mechanism. It also has optional mechanisms for adjusting the print head gap.

It includes motors for driving the mechanisms and sensors for perceiving their positions and conditions.

(2) Main board

The main board controls the host interfaces, printer mechanism, control panel, and optional cut sheet feeder. And this board contains Interface Driver/Receiver circuit, a ROM of the resident fonts and a ROM of firmware, including the resident emulation program.

The IC socket of IC2 is a service socket for additional font etc.

Two types of main boards are prepared. One has the Centronics parallel interface only and the other has the Centronics parallel interface and the RS-232C serial interface. In the case of the main board having the two interfaces, both connectors can be connected to different computers at the same time and the printer can automatically select the proper interface to be communicated.

(3) Driver board

This board has driver circuit, which supplies Power to the motors and magnets. It also receives state signals from the sensors.

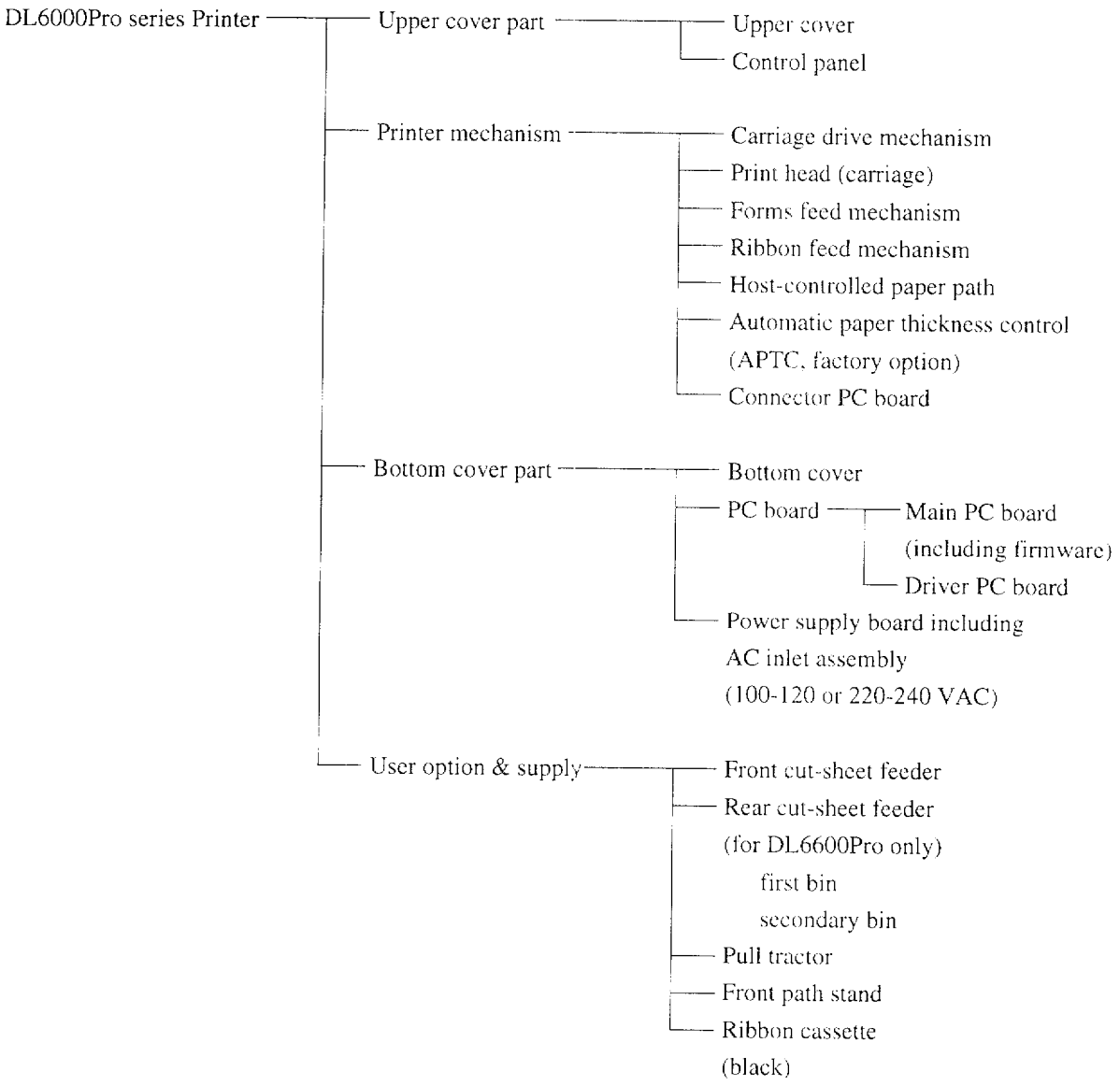
(4) Control panel

The operator uses the control panel to change or feed the paper, reset the printer, and select the operating conditions in setup mode. It informs the operator of messages and printer statuses.

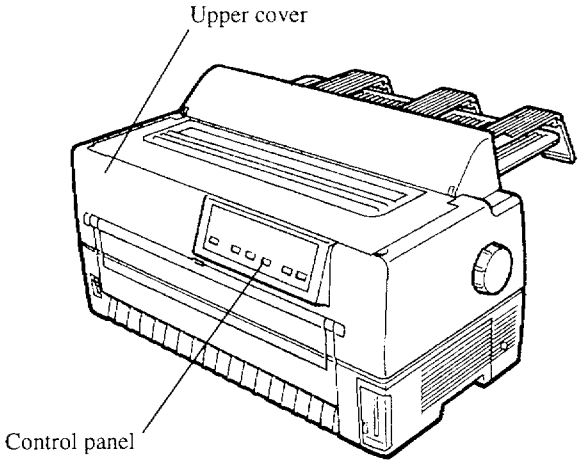
(5) Cut-sheet feeder or push tractor (optional)

The gear on the platen shaft of the printer drives them.
Signals from the main board control the cut sheet feeder pick roller motor.

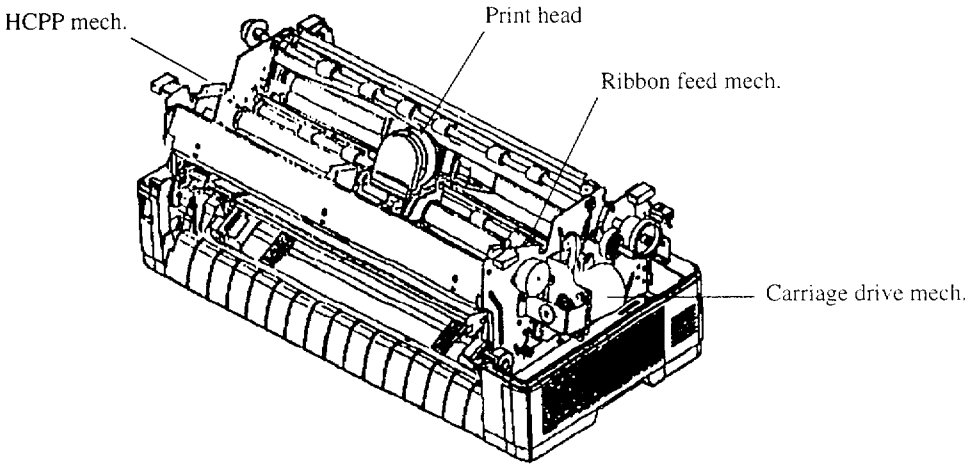
2.3 Structure



[Printer]



[Upper cover removed]



[Printer mechanism removed]

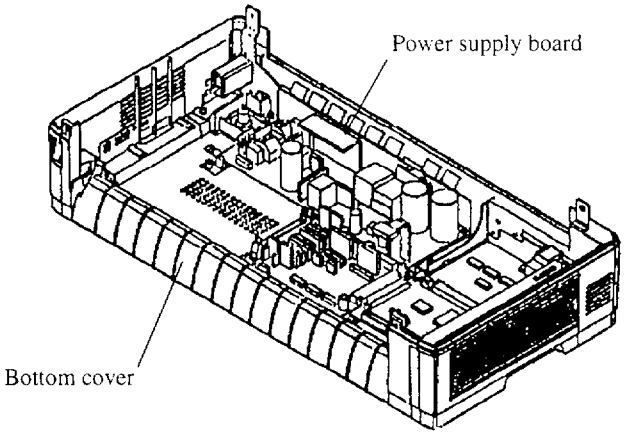


Figure 2.2 Printer equipment structure

2.3.1 Upper cover part

The two screws at the rear of the cover fasten the upper cover to the bottom cover.

(1) Upper cover

The upper cover includes the top cover, rear-cover acoustic cover front table, front cover, and paper guides, all plastic, light and solid.

The top cover can be opened for replacement of the ribbon.

The rear cover must be removed for installing an optional stacker unit.

The front cover can be opened for set of the continuous paper to the tractor or set the front cut sheet feeder.

The front table can be pull down for a cut sheet insert.

The interface cable does not obstruct the paper feed path because the connectors are located at the rear right as seen from the front.

(2) Control panel

The control panel is consists of several switches and indicators.

The operator uses the control panel to easily change setup conditions of the printer, for example, character pitch, line spacing, language selection, font style, protocols, baud rate, and interface type.

2.3.2 Printer mechanism

Dampers support the printer mechanism on the bottom cover and the two screws at the rear of the mechanism fasten it to the bottom cover. The printer mechanism can be opened for access to the main boards.

(1) Carriage drive mechanism

The mainstay shaft and substay shaft support the carriage, and the stepping motor and timing belt move it horizontally.

(2) Print head

A release type (stored energy type) head is mounted on the carriage.

(3) Forms feed mechanism

The stepping motor through the timing belt and gears drives the platen or tractors that feed the forms.

(4) Host-controlled paper path mechanism (HCPP)

This mechanism switches the paper feed path between cut sheets and continuous forms. It determines whether the forms are fed by the platen or by the tractor.

Switching is possible through software or by using the control panel. The paper on the platen is unloaded or ejected and the paper feed path is switched; when changing from a cut sheet to continuous forms, the continuous forms are automatically loaded to the print position.

(5) Ribbon feed mechanism

The carriage drive motor drives the ribbon drive unit which feed the ribbon in one direction.

(6) Automatic paper thickness control mechanism (APTC)
When paper is loaded, the print head is pressed against the platen and the sensor measures the paper thickness (the gap when stopped).

The print head is then returned by a certain distance and the gap is properly adjusted regardless of the paper thickness.

2.3.3 Bottom cover part

The bottom cover supports the printer mechanism.

(1) Bottom cover

The bottom cover is made of plastic.

(2) PC boards

The printer control circuit consists of the main PC board, memory PC board and the interface board which has connectors for the computer and cut sheet feeder.

The memory PC board contains firmware ROMs for controlling the printer, emulating multisets of commands and resident fonts.

(3) Power supply board

The power supply unit outputs constant voltage regardless of input AC line voltage within 100 to 120 or 220 to 240 volt ranges. It is located at the rear part in the printer and includes the AC line switch and noise filter.

2.3.4 User options and supply

(1) Front cut-sheet feeder

CA02464-0051 is adopted from front side. Not only ordinary cut sheet but also envelop or copy papers are available. (for CANADA CA02464-0052)

(2) Rear cut-sheet feeder

Rear cut-sheet feeders for DL6600Pro only first bin CA02464-0001 and secondary bin CA02464-0031 are adopted from upper-rear side.

(3) Rear push tractor

The rear push tractor enables feeding of continuous forms that are loaded from rear side.

(4) Stacker unit

CA02464-0081 is adopted from upper-rear side. The front path stand is available for feeding continuous forms from under the front of the printer. The stacker unit is recommended to use with the cut sheet feeder.

(5) Ribbon cassette

The ribbon cassette is stationary with an endless inked ribbon.

The subcassette is available for repacking the ribbon.

CHAPTER 3 SPECIFICATIONS

This chapter is a main part of this document. It contains detailed specifications of the DL6000Pro series.

Functional specifications, such as printing, line feeding, and carriage spacing, are described first. Electrical specifications, such as input voltage and power consumption, follow. Environmental specifications are also described.

3.1 General Specifications

3.1.1 Print head and carriage related

Printing method:	24-wire dot matrix	
Wire diameter:	0.2 mm	
Wire pitch (vert):	1/180 inch (0.141 mm)	
Printing direction:	Bidirectional logic seeking (shortest distance printing by automatically deciding on a forward or backward direction)	
Character matrix: (horiz × vert)	Letter quality	36 × 24 (Courier 10) 30 × 24 (12 cpi)
	Report quality	18 × 24
	Draft quality	12 × 24

Printing speed:

	DL6400Pro	DL6600Pro
Letter quality	140 cps (10 cpi)	180 cps (10 cpi)
	168 cps (12 cpi)	216 cps (12 cpi)
	252 cps (18 cpi)	324 cps (18 cpi)
Report quality	280 cps (10 cpi)	360 cps (10 cpi)
	336 cps (12 cpi)	432 cps (12 cpi)
Draft quality	420 cps (10 cpi)	540 cps (10 cpi)
	504 cps (12 cpi)	648 cps (10 cpi)

cps : characters per second

Resolution: (horiz × vert)	Letter quality	360 × 180 dots/inch
	Report quality	180 × 180 dots/inch
	Draft quality	120 × 180 dots/inch
	24-wire graphics	360 × 360, 360 × 180, 180 × 180, 120 × 180, 90 × 180, 60 × 180 dots/inch
	9-wire graphics 1	240 × 72, 120 × 72, 90 × 72, 80 × 72, 72 × 72, 60 × 72 dots/inch
	9-wire graphics 2	200 × 60, 100 × 60, 90 × 60, 200/3 × 60, 60 × 60, 50 × 60 dots/inch
Character spacing:	2.5, 3, 5, 6, 10, 12, 15, 17.1, 18, and 20 characters per inch (cpi) and proportional spacing Programmable in 1/120, 1/180, or 1/360 inch increments	
Character expansion:	Double or quadruple width and height (control panel) Multi width and height (DPL24C PLUS printer command)	
Printed columns:	136 columns at 10 cpi 163 columns at 12 cpi 204 columns at 15 cpi 232 columns at 17.1 cpi 244 columns at 18 cpi 272 columns at 20 cpi	

3.1.2 Forms feed related

Feeding method:	Front push tractor (continuous forms) Friction platen (cut sheets) Optional rear push tractor (continuous forms) Optional front cut sheet feeder (CSF)
Feed direction:	Bidirectional Unidirectional for CSF feeding
Line spacing:	1, 1/2, 1/3, 1/4, 1/5, 1/6, 1/7, and 1/8 inch Programmable in 1/60, 1/180 or 1/360 inch increments
Line feed speed:	Less than 50 ms/line (at 1/6-inch line spacing)
Forms feed speed:	9 inches per second (for front tractor) 9 inches per second (for rear tractor)

3.1.3 Character fonts

Character sets:	DPL24C+/XL24E	IBM PC character sets 1 and 2
		IBM PS/2 character sets (code pages) and other national character sets (57 languages in total)
		Fujitsu character set (691 characters)
	ESC/P2	Italic character set
		Graphics character sets 1 and 2
		IBM PS/2 character sets (code pages) and other national character sets (61 languages in total)
National character sets: (All emulations)		USA (=code page 437), United Kingdom, German, Swedish, ISO 8859-1, ECMA 94, Code pages 437, 850, 852, 855, 860, 863, 865, and 866, Hungarian, Slovenian, Polish, Mazowian, Latin 2, Kamenicky, Turkish, Cyrillic, IBM 437, IBM 851, ELOT 928, Latin Polish, ISO Latin, Lithuanian 1, Lithuanian 2, MIK, Macedonian, ABG, ABY, Code page MAC, ELOT 927, DEC Greek, Greek 11, Code page 862, Hebrew Old, Hebrew DEC, and ISO Turkish
		Note: Some national character sets do not support some resident fonts. See Appendix A for details.
Resident fonts:	Letter quality	
	Bitmap fonts	6 fonts
		Courier 10, Pica 10, Prestige Elite 12, Boldface PS, OCR-B 10, and OCR-A 10
	Scalable fonts	9 fonts
		Courier (upright, italic, bold)
		Nimbus Sans (upright, italic, bold)
		Timeless (upright, italic, bold)
	Correspondence (*1)	1 font
	*1 The correspondence font has the same print quality but higher printing speed compared to letter quality fonts.	
	Draft quality	1 font
	Compressed	1 font
	Note: Italic, shadow, bold, outlined, screened, enlarged, and super/subscript can be specified by commands.	

3.1.4 Forms

Paper width:	3.5 to 16.5 inches (cut sheet) 4 to 16.5 inches (continuous forms)
Paper length:	3.5 to 16.5 inch (cut sheet)
Paper thickness:	Up to 0.025 inch (0.65 mm) max. (front path) Up to 0.017 inch (0.42 mm) max. (rear path option)

See also Section 3.7 for details of the above.

Paper thickness control:	Manual lever or APTC (automatic), optional With the APTC feature, the head-platen gap can be also controlled by software, but cannot be guaranteed beyond 0.031 inch (0.80 mm) thickness.
Paper loading:	Auto loading for continuous forms and cut sheets
Paper parking:	When unloaded, continuous forms stay at the parking position (tractor position) and stand by for the next loading. It enables loading of cut sheets without removing continuous forms from the printer.
Paper selection:	HCPP (standard) With the HCPP feature, the paper feed path can be controlled by software or the control panel; for switching to continuous forms, paper loading automatically follows.
Cut sheet feeder (Optional):	Front single bin feeder capable of envelopes or copy papers. Stacker unit is recommended with front cut sheet feeder.
Paper cut:	1-inch margin tear off
Paper detection:	Continuous paper near end sensor Cut sheet paper near end sensor
Paper entry:	No obstruction such as connectors in the paper path

3.1.5 Other printing capability

Multicopies:	Original + 7 copies (for front feed) Original + 5 copies (for optional rear feed)
Inked ribbon:	Monochrome (Black ribbon cassette)

3.1.6 Acoustic noise

55 dBA	DL6400Pro
56 dBA	DL6600Pro
Measuring condition:	ECMA-74 Section IV, ISO7779, Bystander Position, Front
Printing condition:	60 g/m^2 thick, 15 inch wide, continuous stationary folded paper. Letter quality printing

3.1.7 Interfaces

Types:	Centronics parallel + RS-232C serial/Centronics parallel
Parallel:	Bi-directional, complying with the IEEE 1284 standard (nibble mode)
RS-232C:	150, 300, 600, 1200, 2400, 4800, 9600, and 19200 baud X-ON/X-OFF (DC1/DC3), and DTR, RC protocols. The ETX/ACK protocol is not applicable to IBM character set 2.
Input buffer:	0, 256, 2K, 8K, 24K, 32K, 96K, or 128K bytes

3.1.8 Emulation

Resident:	DPL24C PLUS IBM Proprinter XL24E Epson ESC/P2

3.1.9 Control panel

LED control panel	
Switch:	Eight push-button switches LOCK, FONT, MENU, ONLINE, LF/FF, TEAR OFF, LOAD, PAPER PATH
Indicator:	17 LED indicator lights
See also Chapter 4.	

LCD control panel	
Switch:	Eight push-button switches ONLINE, F1, F2, F3, LOAD/UNLOAD, ↑ ↓, NEXT DISPLAY, PAPER PATH
Indicator:	6 LED indicator lights
See also Chapter 4.	

3.2 Electrical Conditions

Input voltage: 100 to 120 VAC ±10%
220 to 240 VAC +6% -10%

Frequency: 50 or 60 Hz +2% -4%

Insulation resistance: AC-FG 10 MΩ or more

Dielectric strength: AC-FG 1 minute or more at 1 kVAC

Power consumption:

		Input voltage		Remarks
		100–120 VAC	220–240 VAC	
DL6400Pro	Ave. Max.	330 VA 790 VA	360 VA 860 VA	Text print
DL6600Pro	Ave. Max.	390 VA 1,000 VA	420 VA 1,060 VA	Text print

3.3 Environmental Conditions

Temperature:	Operating	5 to 38°C (41 to 100°F)
	Nonoperating	0 to 50°C (32 to 122°F)
	In transit	–20 to 60°C (–4 to 140°F)
	Gradient	15°C/h or less
Humidity:	Operating	30 to 80% RH
	Nonoperating	10 to 80% RH (no condensation)
	Gradient	30% RH/day or less
	Max. wet bulb	29°C (84°F)
Altitude:	12,000 m (40,000 feet)	
Vibration:	Operating	0.2 G
	Nonoperating	0.5 G
	Packaged	1.25 G (5 to 55 Hz, Vertical 2 min/cycle 30 min)
		0.75 G (5 to 55 Hz, Horizontal 2 min/cycle 30 min)
Shock:	Operating	3 G (Printer is not damaged, but printing quality is not guarded.)
	Packaged	Withstanding 20 inch drop test.
Tilt:	Operating	5°

Electrostatic strength: 9 kV minimum when executing test printing without errors by the contact method (10 Hz, 3 min) (measuring condition: resistor, capacitor; 330 Ω, 150 pF)

Safety:

Model	Regulation	Region
100-120 VAC	UL 1950 (NRTL)	United States
	CSA C22.2/950	Canada
220-240 VAC	TÜV EN 60 950	Germany

EMC:

Model	Regulation	Region
100-120 VAC	FCC Part 15B class B	United States
	ICES-003 class B	Canada
220-240 VAC	EN 55022 class B EN 50082-1	Europe
100-120 VAC	CNS 13438 class B	Taiwan

3.4 Physical Specifications

Dimensions:	Width	600 mm (23.6 inches)
	Depth	300 mm (11.8 inches)
	Height	325 mm (12.8 inches)
Weight:	Approx.	25 kg (55 lb)

3.5 Reliability

MTBF: 8,000 h

Running condition:

- Power on time: 10 hours/day
- Printing: 45 minutes/day
- Use: 21 days/month

MTTR: 0.5 hours

Printer service life: 5 million lines or 5 years

Expendable supplies Service life:

Print head	400 million strokes for each wire. This life corresponds to approximately 300 million characters in draft mode or 180 million characters in letter mode.
Inked ribbon	18 million characters (black ribbon 60 m)
Platen roller	100 million characters

3.6 Protection and Limitations

3.6.1 Protection

To protect the print head, control unit, and power supply, the following conditions are checked:

- Thermal check and driver check of the print head
- Driver check of carriage motor, line feed motor, ribbon motor, and cut sheet feed motor
- Over voltage check of +40 V
- Fan alarm check

To assure the print quality, if any of the following conditions is detected, the 24 dot wires of the print head are divided into three groups, and 3-pass unidirectional printing is done.

- The +40 V power falls below the predetermined voltage.
- The print head thermal sensor activates.

Overload does not occur under the condition lighter than printing 66 lines at 30% duty.

3.6.2 Limitations

To make the printer durable, avoid the following line spacing or character spacing:

- Do not perform continuous line feeding for more than 3 minutes.
- Do not perform continuous character spacing without printing or continuous printing of lines with up to 5 characters (pica pitch) for more than 5 minutes.

  Note:
  If the above limits are exceeded, the printer's service life may be shortened remarkably.

3.7 Paper Specification Details

This printer can use a variety of paper: letter paper, typewriter paper, copy paper, business stock forms, transparencies, label sheets, and ordinary envelopes. This section gives general specifications for continuous forms and cut sheets. Before using paper, be sure to check if it satisfies the requirements shown below. However, for unusual paper such as envelopes and label sheets; paper of different size or thickness; cut sheets for auto-feeding using cut sheet feeders; or other specific problems, ask Fujitsu whether the paper can be used with this printer.

3.7.1 Paper size and thickness

Table 3.1 Paper size and thickness

Item	Requirements	
Width	Cut sheet: Continuous forms:	90 to 419 mm (3.5 to 16.5 inch) 102 to 419 mm (4 to 16.5 inch)
Length	Cut sheets: Continuous forms:	90 to 420 mm (3.5 to 16.5 inch) 102 mm (4 inch) or longer for folded sheets
Thickness (*)	Single-play: Multi-ply:	46 to 81 g/m^2 (12 to 22 lbs/bond). 34 g/m^2 (9 lbs/bond) to the weight corresponding to the number of copies and plies listed in the tables on the next page.
	Notes: 1. Multi-ply paper with thickness or ply count different from the specifications must be tested before using. 2. The total thickness of multi-ply paper must not exceed the following values depending on the type of paper and where the paper is fed from. • 0.65 mm (0.025 in) for front path • 0.42 mm (0.017 in) for rear path Each ply must be uniform in thickness.	

* The thickness of paper is indicated by the weight of the paper, in grams per square meter or in pounds per bond.

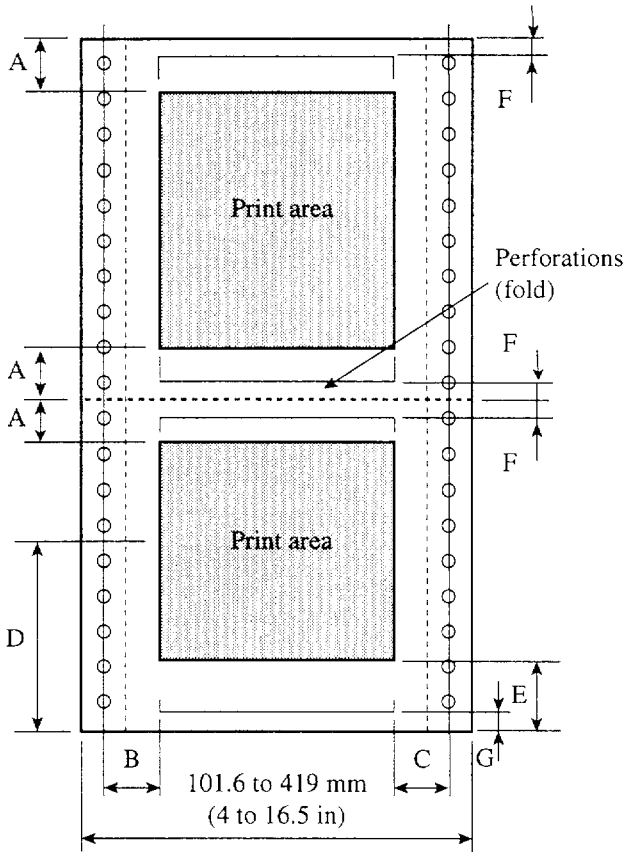
Table 3.1 -- continued

<table>
<tr><th>Item</th><th>Requirements</th></tr>
<tr><td>Number of copies and thickness
Cut sheet:</td><td>
Carbonless/carbon-backed
<table>
<tr><th rowspan="2">Number of copies</th><th colspan="2">Thickness: g/m² (lb/bond)</th></tr>
<tr><th>Front path</th><th>Rear path (DL6600Pro)</th></tr>
<tr><td>2 plies</td><td>39 to 64 (11 to 17)</td><td>39 to 64 (11 to 17)</td></tr>
<tr><td>3 plies</td><td>39 to 50 (11 to 13)</td><td>39 to 50 (11 to 13)</td></tr>
<tr><td>4 plies</td><td>39 (11)</td><td>39 (11)</td></tr>
<tr><td>5 plies</td><td>39 (11)</td><td>39 (11)</td></tr>
<tr><td>6 plies</td><td>39 (11)</td><td>39 (11)</td></tr>
<tr><td>7 plies</td><td>39 (11)</td><td>—</td></tr>
<tr><td>8 plies</td><td>39 (11)</td><td>—</td></tr>
</table>
Multi-part carbon-backed
<table>
<tr><th rowspan="2">Number of copies</th><th colspan="2">Thickness: g/m² (lb/bond)</th></tr>
<tr><th>Front path</th><th>Rear path (DL6600Pro)</th></tr>
<tr><td>2 plies</td><td>35 to 64 (9 to 17)</td><td>35 to 64 (9 to 17)</td></tr>
<tr><td>3 plies</td><td>39 to 50 (11 to 13)</td><td>39 to 50 (11 to 13)</td></tr>
<tr><td>4 plies</td><td>39 (11)</td><td>39 (11)</td></tr>
<tr><td>5 plies</td><td>39 (11)</td><td>39 (11)</td></tr>
<tr><td>6 plies</td><td>39 (11)</td><td>39 (11)</td></tr>
<tr><td>7 plies</td><td>39 (11)</td><td>—</td></tr>
<tr><td>8 plies</td><td>39 (11)</td><td>—</td></tr>
</table>
Notes:
1. 6- to 8-ply paper varies greatly in quality. Try each type of paper before use to determine that it can be used satisfactorily.
2. Do not make multi-ply cut sheets from carbon-interleaved paper.
</td></tr>
<tr><td>Continuous form:</td><td>
Carbonless/carbon-backed
<table>
<tr><th rowspan="2">Number of copies</th><th colspan="2">Thickness: g/m² (lb/bond)</th></tr>
<tr><th>Front path</th><th>Rear path (option)</th></tr>
<tr><td>2 plies</td><td>35 to 64 (9 to 17)</td><td>35 to 64 (9 to 17)</td></tr>
<tr><td>3 plies</td><td>39 to 50 (11 to 13)</td><td>39 to 50 (11 to 13)</td></tr>
<tr><td>4 plies</td><td>39 (11)</td><td>39 (11)</td></tr>
<tr><td>5 plies</td><td>39 (11)</td><td>39 (11)</td></tr>
<tr><td>6 plies</td><td>39 (11)</td><td>39 (11)</td></tr>
<tr><td>7 plies</td><td>39 (11)</td><td>—</td></tr>
<tr><td>8 plies</td><td>39 (11)</td><td>—</td></tr>
</table>
Notes:
1. 6- to 8-ply paper varies greatly in quality. Try each type of paper before use to determine that it can be used satisfactorily.
2. 7 and 8-ply paper can be used for front paper path only.

Carbon-interleaved
<table>
<tr><th rowspan="2">Number of copies</th><th colspan="2">Thickness: g/m² (lb/bond)</th></tr>
<tr><th>Top to bottom plies</th><th>Bottom ply only</th></tr>
<tr><td>2 plies</td><td>35 to 52 (9 to 14)</td><td>64 to 81 (17 to 22)</td></tr>
<tr><td>3 plies</td><td>35 to 46 (9 to 12)</td><td>52 to 64 (14 to 17)</td></tr>
</table>
Notes:
1. Carbon-interleaving applies to continuous forms only.
2. Because carbon inserted between sheets of paper counts as one ply and is liable to adversely affect printing quality, the number of copies must be less than three.
</td></tr>
</table>

3.7.2 Printing areas

Continuous forms:



Print-inhibited areas

Front tractor

A	4.2 mm (0.17 in) (*1)
B	5.08 to 30 mm (0.2 to 1.18 in) (*2)
C	5.08 mm or more (0.2 in or more) (*3)
D	152 mm (6.0 in) (*4)
E	About 29 mm (1.1 in) (*5)
F	3.5 mm (0.14 in) (*6)
G	4.2 mm (0.17 in)

Rear tractor

A	8.5 mm (0.33 in) (*1)
B	5.08 to 30 mm (0.2 to 1.18 in) (*2)
C	5.08 mm or more (0.2 in or more) (*3)
D	100 mm (3.9 in) (*4)
E	About 85 mm (3.3 in) (*5)
F	3.5 mm (0.14 in) (*6)
G	8.5 mm (0.33 in)

*1 Characters printed in this area may not be neat. A line spacing of 4.2 mm (1/6 in) or more prevents characters on adjacent lines from overlapping.

*2 Depending on the paper width, this varies as follows:
101.6 to 119.4 mm (4 to 4.7 in) wide: 5.08 to 9 mm (0.2 to 0.35 in)
388.6 to 419 mm (15.3 to 16.5 in) wide: 15 to 30 mm (0.6 to 1.18 in)

*3 This varies with the paper width and number of print columns, but must be at least 5.08 mm (1/5 in).

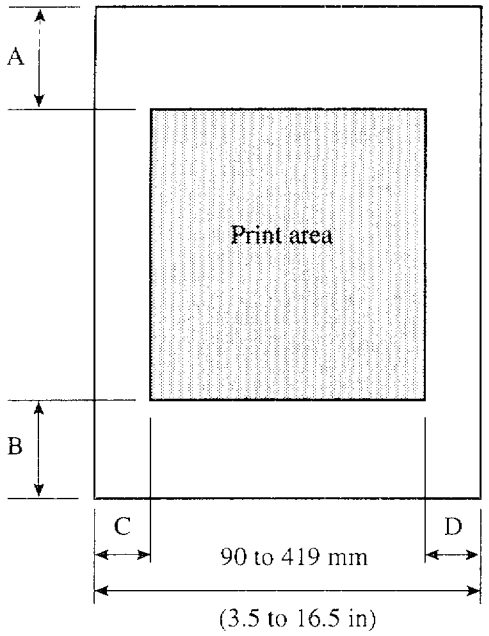
*4 This feeds off the tractors and prevents reverse line feed.

*5 Value E indicates the paper end detection point.

*6 Do not move the printing unit horizontally in this area as paper may be smeared by the ink ribbon or the printing unit may be caught at bulges.

Figure 3.1 Print area on continuous forms

Cut sheet paper:



Print-inhibited areas

A	Front 4.2 mm (0.17 in) Rear 8.5 mm (0.33 in) (DL6600Pro only)
B	Front 4.2 mm or more (0.17 in or more) Rear 8.5 mm or more (0.33 in or more) (DL6600Pro only)
C	5.1 to 38 mm or more (0.2 to 1.5 in or more) (*1)
D	5.1 mm or more (0.2 in or more)

*1 For wide paper, this specification is:
406.4 mm (16 in) wide: 22.5 to 38.5 mm (0.9 to 1.5 in)
419 mm (16.5 in) wide: 36 to 38.5 mm (1.4 to 1.5 in)

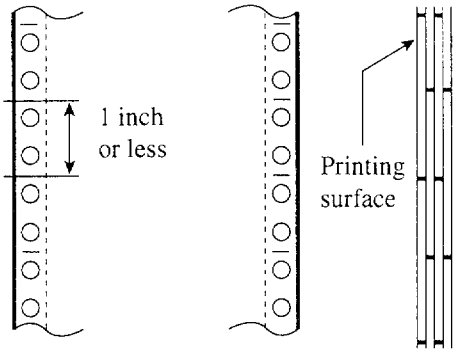
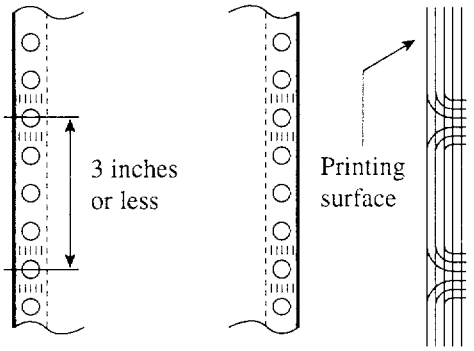
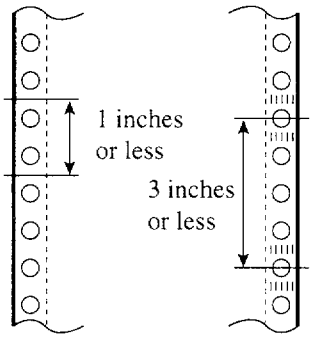
Figure 3.2 Print area on cut sheet paper

3.7.3 Multi-ply paper binding and perforations

When using multi-ply paper, note the following to avoid paper jams.

Binding continuous forms:

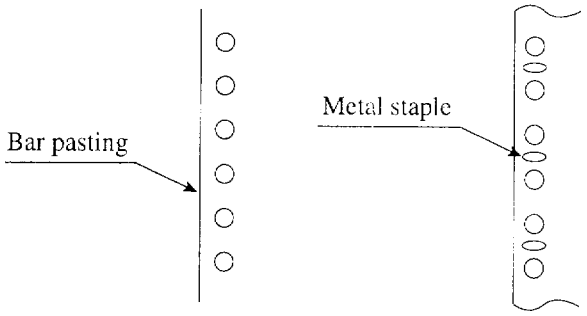
Multi-ply paper must be pasted or crimped (paper-stapled) at margins only. Metal staples and bar pasting must not be used. Improper multi-ply paper may reduce print quality and make paper folding difficult.

(1) Point-pasting on both sides (Zigzag pasting) 	Best for the following reasons: • Forms remain flexible. • Copy plies do not displace each other.
(2) Crimping on both sides (Double-gathered) 	• The greater the number of copies, the greater the displacement. • The print area for color printing becomes narrower, compared with (1), above.
(3) Point-pasting on one side and crimping on the other 	Combination of (1) and (2): • The print are for color printing becomes narrower, compared with (1), above.

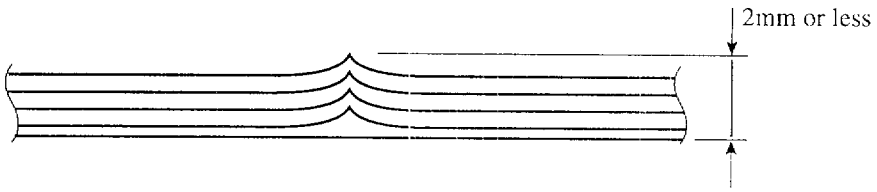
Notes:

1. The following should be avoided to prevent paper jams:

   a. Bar-pasting: Makes forms stiff.
   b. Metal staples: Make forms liable to catch in the paper feed path. The print head may also be damaged by accidentally printing on staples.

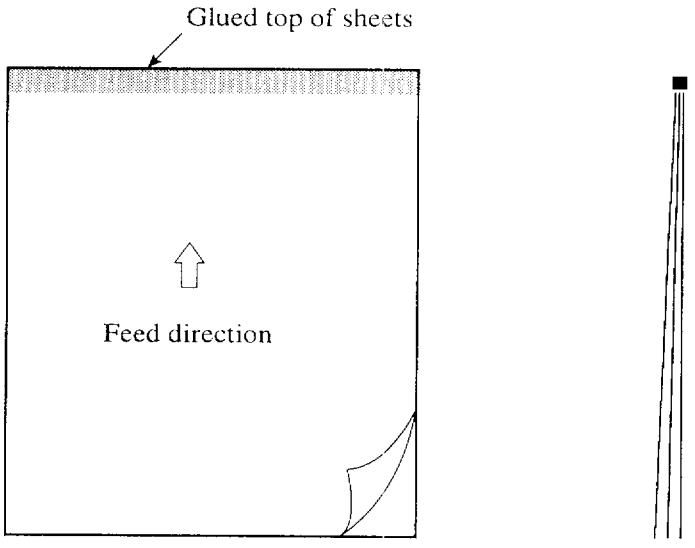


2. The raised part at the perforation (fold) must be 1 mm or less, with the bottom layer pressed, as shown below.



Binding cut sheets:

When using carbonless or carbon-backed paper for multicopying, be sure forms are pasted at the top. Paste must be applied evenly to the paper and must not cause wrinkles, creases, or discoloration.



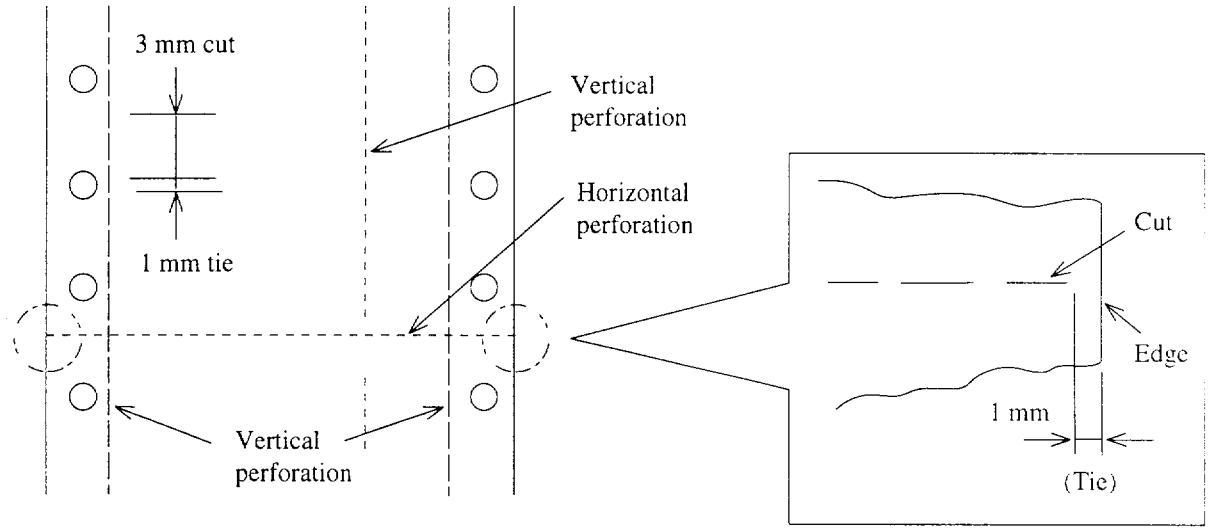
Binding carbon-interleaved multi-ply paper (continuous forms only):

When using carbon-interleaved multi-ply paper, put the carbons in the two ways:

(1) Paste each carbon to the paper at the left and right margins at spots other than sprocket hole areas.
(2) Paste each carbon to the paper at the left and right margins including the sprocket hole areas while aligning the carbon's sprocket holes with those of the paper.

Perforations:

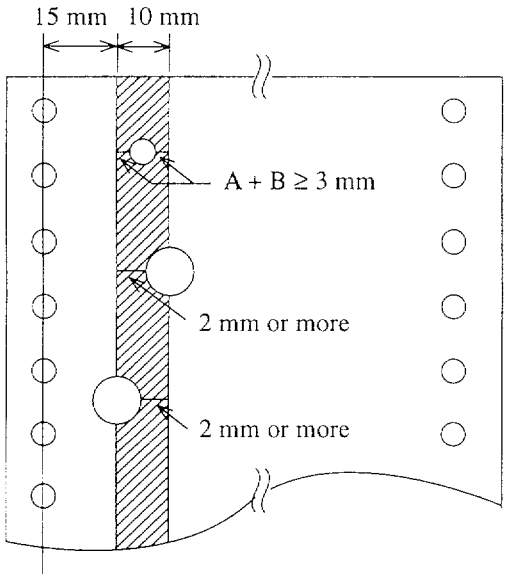
Weak horizontal and vertical perforations cause paper jams. Therefore, the tie to cut ratio for both types of perforation must be 1 to 3.



3.7.4 Binding holes and preprinting on cut sheets

To ensure that paper is detected, do not let binding holes come in the hatched area below. For cut sheets, preprinting on these areas is also restricted. Preprinting of a light reflection ratio below 60%, bold black lines for example, may cause misdetection.

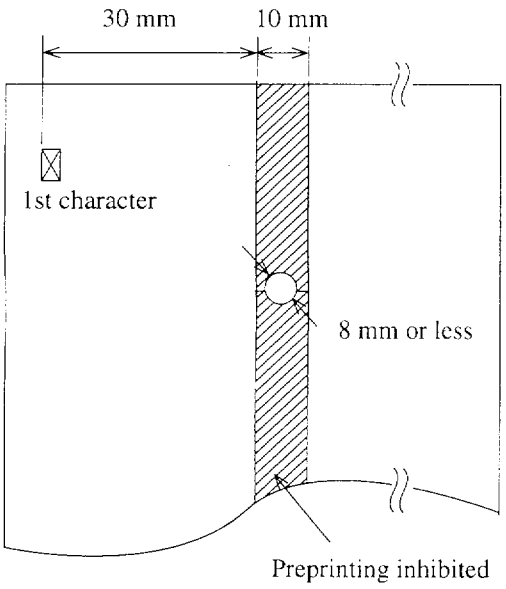
Continuous forms:



Leave areas uncut for at least 2 mm in total.

When the above condition is satisfied, hole diameter is not restricted.

Cut sheets:



Binding holes must be less than 8 mm in diameter.

If preprinting in this area is needed, horizontal bold lines must be less than 8 mm thick and spaced more than 8 mm apart. Spacing can be reduced up to 4 mm for lines thinner than 0.5 mm.

A vertical line must be less than 0.5 mm thick and only one line is allowed in this area.

Character printing is inhibited. Check preprinted paper beforehand.

3.7.5 Other precautions

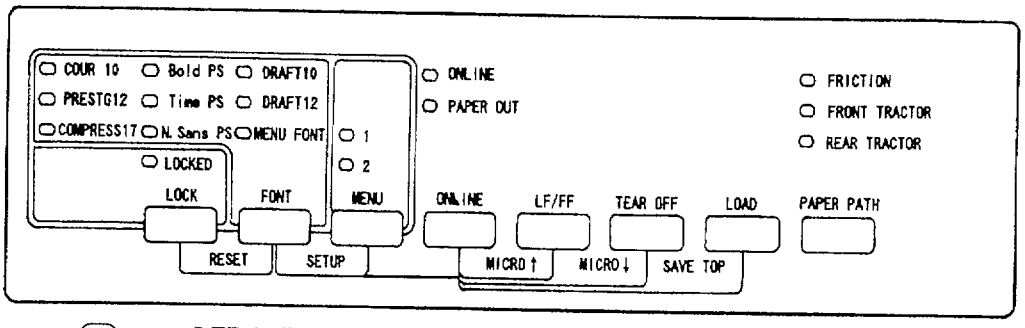
Use high-quality paper. For cut sheets, the light reflection ratio must be higher than 60%.
Make sure that cut sheet paper is not curled.
Handle and store forms carefully. Make sure that they are not deformed or damaged.
Never store forms under high humidity environments.

CHAPTER 4 CONTROL PANEL AND SETUP MODE

4.1 Control Panel Layout

4.1.1 LED type

The control panel has eight push-buttons and 17 LED indicators (Figure 4.1). The indicators show basic printer status, the selected paper path, the selected setup menu number, and the selected resident font. The buttons control ordinary printing operations in normal mode. They are also used to select parameters in setup mode where the printer prints the setup menu and the button guide that shows how to use the buttons to select parameters. Specific resident fonts are selected by a touch of a button.



LED indicators : Green

: Umber

Push-buttons

Indicators

ONLINE, PAPER OUT: Printer status

1 and 2: Active setup menu number

COUR 10, ·····, and Compress 17: Active resident font

MENU FONT: Font specified by the active setup menu

LOCKED: Resident font selection locked

FRICTION, FRONT TRACTOR, REAR TRACTOR Paper path

Buttons

ONLINE: Online or offline selection

LF/FF, TEAR OFF, and LOAD: Paper feed control

MENU: Active setup menu selection

FONT: Resident font selection

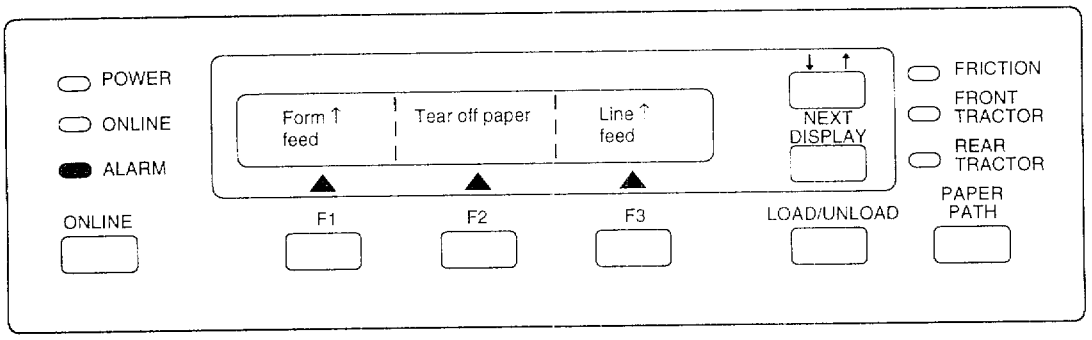
LOCK: Resident font selection lock

PAPER PATH: Paper path selection

Figure 4.1 Control panel (LED type)

4.1.2 LCD type

The control panel has a 2-line x 24-character alphanumeric LCD (liquid crystal display), eight push-buttons, and six LED indicators as shown in Figure. The display, featuring this printer, gives readable and informative status and messages thanks to the 48-character display. It also shows selected parameters in setup mode and valid functions of the three function buttons below the display. The indicators show the basic status of the printer. The push-buttons control the printer operation, display movement, and setup parameter selection.



: LED indicator lights (Green) : LED indicator lights (Umber)

: Push-buttons

Indicators

POWER, ONLINE, ALARM: Printer status

FRICTION, FRONT TRACTOR, REAR TRACTOR: Paper path

Buttons

ONLINE, ↑ ↓, NEXT DISPLAY, LOAD/UNLOAD, PAPER PATH: Dedicated function buttons.

F1, F2, F3: Programmable function buttons.

Figure 4.2 Control panel (LCD type)

4.2 Operation

4.2.1 LED type

Control panel operations are divided into normal and setup modes. Normal mode is set when printer power is turned on. Setup mode is set when the MENU and FONT buttons are pressed in offline status until the buzzer sounds or when printer power is turned on with the MENU and FONT button pressed and held down until the buzzer beeps. Operations in the two modes are as follows:

Normal mode

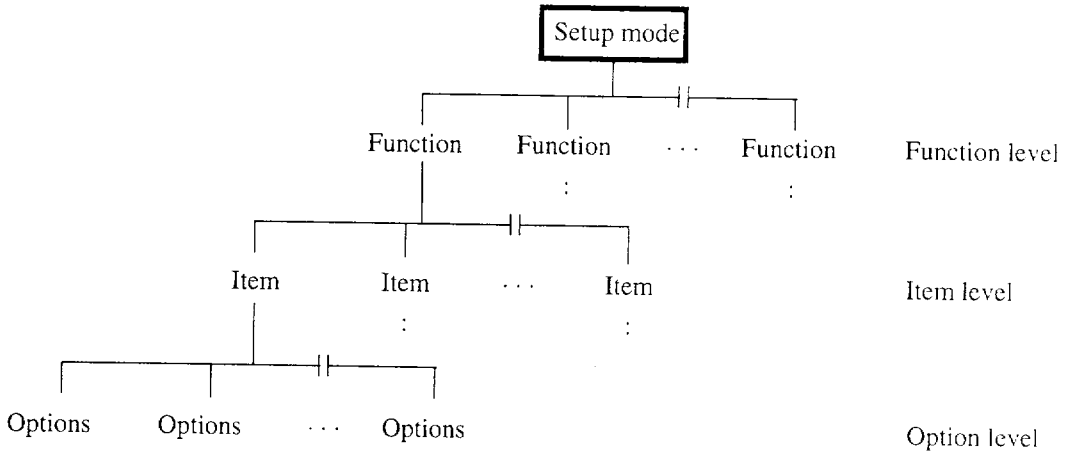
Operations are clear and easy.

- This mode enables basic operations such as buttoning online and offline, selection paper path, feeding and cutting paper, loading and unloading forms, selecting setup menus, and selecting resident fonts.
- The function of a button is marked on its top. Some buttons perform a different function when pressed in pairs.

Setup mode

Operations are easy enough that the user's manual need not be referenced once the user is familiar with the printer.

- This mode enables options to be set to suit the printer to the environment: computer and interface, application programs, and the document to be printed. It provides other useful operations such as self-test printing and a hexadecimal dump.
- Setup mode has the following menus consisting of functions, items, and options arranged in a three-level hierarchy. The highest level is assigned to a set of functions, the next highest to sets of items, and the lowest to sets of options. Some functions do not involve items and options.



- Functions and options are printed in menus and selected using four buttons: MENU, FONT, ONLINE, and LOCK. A "help" table, printed when the printer enters the setup mode or the function level, shows how to use buttons to select functions and options.
- The yellow arrow on the print head indicates the active position. The selected function or item is underlined. Items are selected in sequence.

4.2.2 LCD type

The three function buttons and 48-character display improve the operation of this printer control panel. Each function button is assigned specific functions like the programmable function keys on personal computer keyboards. The valid function is shown in the display, corresponding to each button.

The display is divided into the three areas that correspond to the three function buttons. So, up to three functions are available with the same display. Multiple displays form a menu. The menu has two operation groups as shown below:

(1) Basic menu: Enables everyday basic operations such as paper feeding, paper tearing off, paper path selecting, TOF setting, font selecting, printer resetting, setup mode entering, and setup menu selecting.

This mode is to be selected when the printer is offline or online without data in the buffers.

(2) Setup menu: Enables setting of printer's features (equivalent to DIP switch setting on ordinary printers) so that the printer meets user's environments, the host computer, user's application program, and the document to be printed. It has other useful operations, such as test printing.

The printer can enter the setup mode from a function in basic menu.

The operator controls operations of the printer mainly by using the three function buttons under the guidance of the message display.

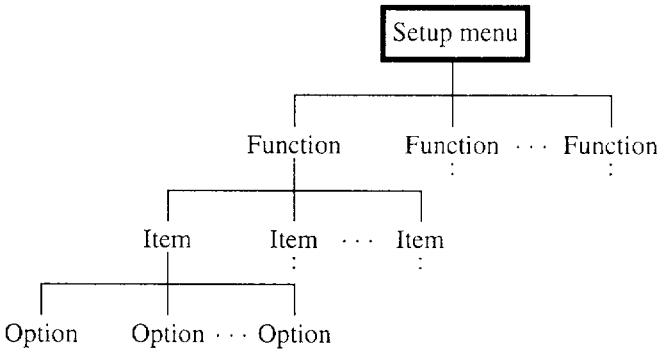
Basic menu selection

Whenever the display shows | From ↑ feed | Tear off paper | Line ↑ feed | , pressing the NEXT DISPLAY button allows the user to select a function in the basic menu. Each time the NEXT DISPLAY button is pressed the menu advances with three menu items displayed. A menu item is selected or executed when a function button F1 to F3 below the desired item display is pressed.

Push-buttons	Function
ONLINE	Switches the printer online or offline.
F1, F2, and F3	Scrolls through printer's menu items to select setup functions, items, and options. Other specific functions are assigned by the setup functions selected.
↑↓	The invert arrows button reverses the direction of the up or down arrows shown on the display. For example, pressing this button changes the forward line feed to reverse line feed.
NEXT DISPLAY	Displays the printer's four basic menus.
LOAD/UNLOAD	Loads paper to the top-of-form position for printing. Unloads (retracts) continuous forms paper to the tractor or ejects cut-sheet paper.
PAPER PATH	Selects the friction, front tractor, or optional rear tractor for feeding paper.

Setup menu selection

The setup menu includes so many functions and setup items that they are arranged in a three-level hierarchical structure. The highest level is assigned to a set of functions. The next higher level is assigned to sets of items, and the lowest level to sets of options.



When the display shows "Enter setup" in the basic menu, pressing the F1 button sets the printer to the setup mode. The setup function, item, and option can be selected and set by using the F1, F2, and F3 buttons under the guidance of the control panel display. (The setup mode can be entered even when the printer is printing or data is in the buffer. Pressing the ONLINE button stops the printing and sets the printer offline idle.)

The basic functions of function buttons in setup mode are as follows:

F1: Advances the function display. The function displayed when the F2 or F3 button is operated is selected or executed.
F2: Advances the item display in the selected function. The currently displayed item is valid for selecting an option.
F3: Advances the option display in the selected item. The option selected when another button is operated is made valid.
ONLINE: Returns the printer to online.

The functions in basic menu and setup menu modes are as follows:

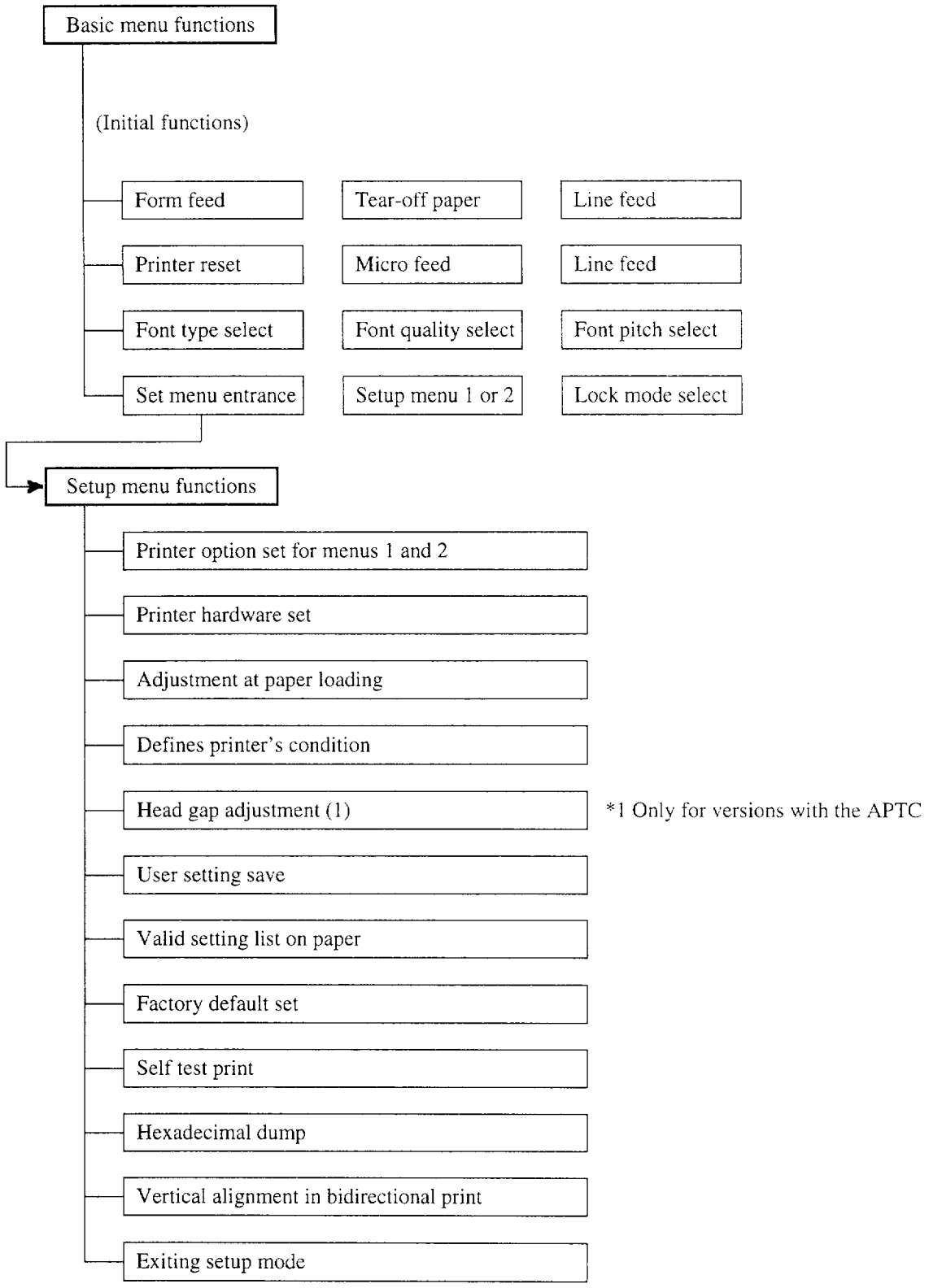


Figure 4.3 Control panel functions (LCD type)

The following is a summary of the functions in the setup mode:

Menu 1 or 2:	Selects options of the printer's features for font styles, page format, command compatibility, etc. Two sets of menus are available.
Hardware set:	Selects options of the printer's features for the hardware conditions of the printer itself.
TOF adjustment:	Adjusts the top-of-form position.
Configuration set:	Define primary printer's conditions.
Head gap adjustment:	Adjustment the gap between the print head and platen.
Save:	Stores the selected options into non-volatile memory.
List print:	Prints the selected options on the paper.
Default set:	Restores the printer's features to their factory default values.
Self test:	Performs self test printing.
Hex dump:	Prints the received data and commands in hexadecimal.
Vertical alignment:	Prints vertical bars for adjusting print positions in bidirectional printing.
Exit:	Exits the setup mode.

The printer's features specifiable from the control panel are as follows:

(1) Features specifiable in the menu 1 or 2 function

Emulation, Font Style, Print Quality, Character Pitch, Line Spacing, Character Width, Character Height, Character Attribute, Page Length, Left End Position Offset, Top Margin, Language, Character Set, Perforation Skip, Paper Width, Zero Character Font, DC1/DC3 Code Specification, CR Code Definition, LF Code Definition, and Right End Auto CR, etc.

There are two sets of menus in which the operator can set different options for each feature.

(2) Features specifiable in the hardware function

Paper Out Detection, Print Direction, Buzzer Activation, Word Length, Input Buffer Allocation, Interface Type, Serial Data Format, Baud Rate, Protocol, DSR Signal Control, Duplex Mode, CTS Signal Control, CD Signal Control.

Table 4.1 Control panel functions

Normal mode

Button	Description	
ONLINE	Switches between online and offline.	
LF/FF	Advances one line when pressed. Advances one page when pressed more than three seconds.	
TEAR OFF	Advances the perforation of paper to the tear-off edge.	
LOAD	Loads paper or retracts continuous forms to the parking position.	
MENU	Selects one of the two setup menus.	Enters setup mode.
FONT	Selects one of the seven resident fonts.	
LOCK	Locks the current resident font.	
PAPER PATH	Selects the path through which paper fed.	

Setup mode

Function(*1)	Description
SAVE & END	Stores selected options in nonvolatile memory and exits setup mode.
MENU 1 or 2	Selects options for font styles, page format, command compatibility, etc. See the next page. Two menus are provided.
HARDWRE	Selects options for hardware conditions such as input buffer capacity selection. See the next page.
ADJUST	Adjusts the top-of-form location where paper is loaded.
CONFIG	Defines the printer's primary condition such as tearing off continuous forms.
DEFAULT	Restores printer features to their factory defaults.
LIST	Prints out currently saved setup options in table form.
SELF-TST	Prints firmware versions and self-test pages.
HEX DUMP	Prints received data and commands in hexadecimal.
V-ALMNT	Prints vertical bars for aligning printing locations between odd and even lines in bidirectional printing.
GAP-ADJ	Adjust the gap between the print head and paper.

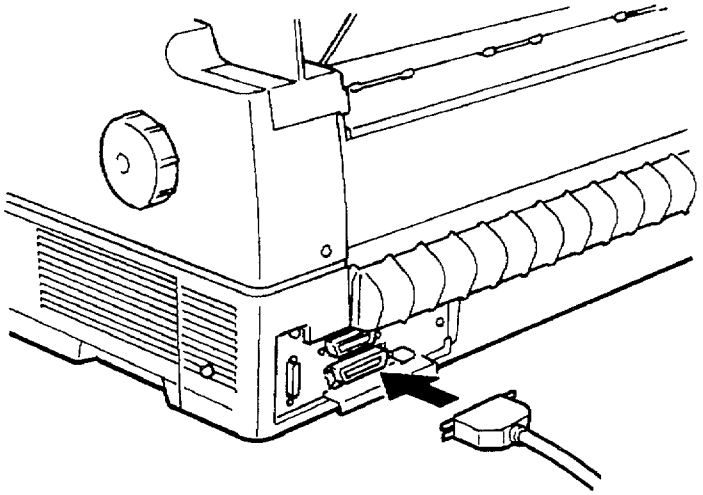
*1 Selected using the LOCK, FONT, and MENU buttons.

CHAPTER 5 INTERFACE INFORMATION

5.1 General

The DL6000Pro series printer can communicate with a computer through a Centronics parallel or RS-232C serial interface.

Parallel selected for use



Serial selected for use

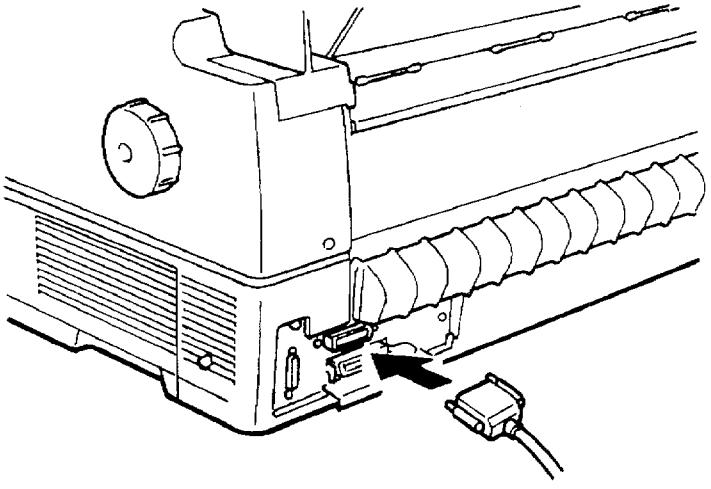


Figure 5.1 Interface connectors

5.2 Parallel Interface Specifications

5.2.1 Hardware requirements

Signal levels:

TTL-compatible

0.0 to +0.4 V for low level

+2.4 to +5.0 V for high level

Output circuit:

SN74LS07 or equivalent

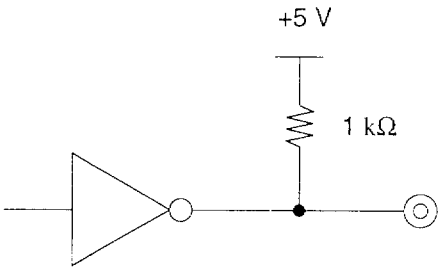


Figure 5.2 Parallel interface output circuit

Input circuit:

SN74LS14 or equivalent

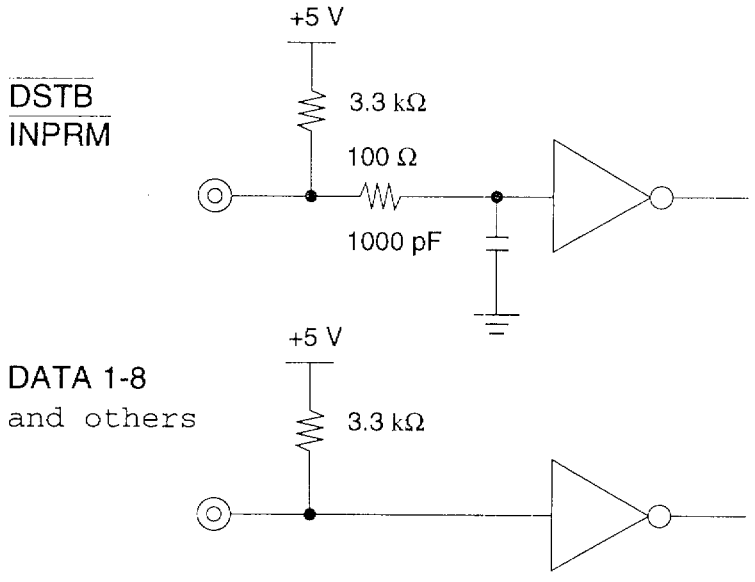


Figure 5.3 Parallel interface input circuit

5.2.2 Connector pin assignment

Connector (cable):

Amphenol DDK 57FE-30360 shielded male connector or equivalent

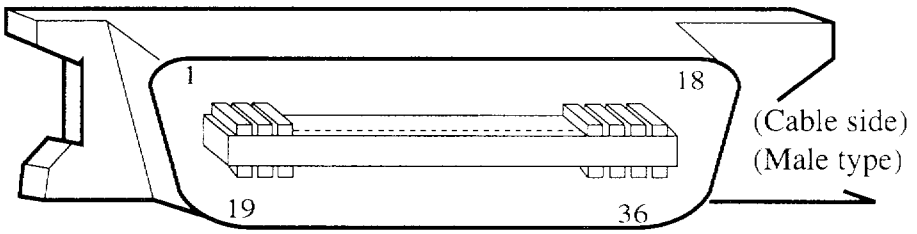


Figure 5.4 Parallel interface connector

Signals:

Table 5.1 Parallel interface signals

Connector pin number	Return line pin number	Signal Compati mode Nibble mode	Direction	Description
1	19	Data Strobe (DSTB)	Input	• Strobe pulse for reading data (Data 1 to Data 8). The printer reads data when this signal is low. • The pulse width must be 1 µs or more at the printer's receiving terminal.
		Host Clock		This signal is set high when the host requests the reverse data transfer phase (nibble mode).
2	20	Data 1	Input	• Data 1 to Data 8 signals correspond to parallel data bits 1 to 8. • Data 8 is the most significant bit, but is not used in the 7-bit ASCII mode. • All signals must go high at least 1 µs before the falling edge of the Data Strobe signal, and must stay high for at least 1 µs after the rising edge.
3	21	Data 2	Input	
4	22	Data 3	Input	
5	23	Data 4	Input	
6	24	Data 5	Input	
7	25	Data 6	Input	
8	26	Data 7	Input	
9	27	Data 8	Input	
10	28	Acknowledge (ACK)	Output	• Pulse signal indicating data reception completed (or data reception enabled) status • Issued when the printer switches from offline to online
		Printer Clock		Reverse data transfer phase: This signal goes high when data being sent to the host is established. Reverse idle phase: This signal is set low then goes high to interrupt the host, indicating that data is available.

Table 5.1 Parallel interface signals (continued)

Connector pin number	Return line pin number	Signal Compati mode Nibble mode	Direction	Description
11	29	Busy	Output	Data cannot be received when this signal is high, e.g., if the buffer is full or an error occurs.
		Printer Busy		Reverse data transfer phase: Data bit 3, data bit 7, then forward path (host to printer) busy status
12	30	Paper Empty (PE)	Output	This signal goes high if paper runs out.
		Ack Data Req		Reverse data transfer phase: Data bit 2, then data bit 6 Reverse idle phase: This signal is set high until the host requests data and, after that, follows the Data Available signal.
13	–	Select (SLCT)	Output	This signal goes high when the printer is selected (online), and goes low when the printer is deselected (offline).
		X Flag		Reverse data transfer phase: Data bit 1, then data bit 5
14	–	$\overline{\text{Auto Feed XT}}$	Input	Not used
		Host Busy		Reverse data transfer phase: This signal is set low when the host can receive data, and goes high when the host has received data. Following a reverse data transfer, the interface enters the reverse idle phase when the Host Busy signal goes low and the printer has no data. Reverse idle phase: This signal goes high when the Printer Clock signal goes low so that the interface re-enters the reverse data transfer phase. If it goes high with the 1284 Active signal low, the 1284 idle phase is aborted and the interface returns to the compatibility mode.
15	–	–	–	No connection
16	–	Signal Ground (SG)	–	Logic ground level (0 V)
17	–	Frame Ground (FG)	–	Printer chassis ground line FG and SG are connected.
18	–	+5V	Output	+5 V source (up to 300 mA)
19 to 30	–	Signal Ground (SG)	–	Twisted-pair return lines
31	–	$\overline{\text{Input Prime}}$ ($\overline{\text{IN PRM}}$)	Input	If this signal is low for more than 50 µs, the printer is reset to initial status and placed online.

Table 5.1 Parallel interface signals (continued)

Connector pin number	Return line pin number	Signal Compati mode Nibble mode	Direction	Description
32	–	$\overline{\text{Fault}}$	Output	This signal goes low under the following printer conditions: (1) Offline (2) Paper out (3) Cut-sheet feeder error (4) Other printer error
		$\overline{\text{Data Available}}$		Reverse data transfer phase: This signal is set low when the printer is ready to send data to the host. During the data transfer, it is used as data bit 0 (LSB), then data bit 4. Reverse idle phase: This signal is used to indicate that data is available.
33	–	Signal Ground (SG)	–	Logical ground level (0 V)
34	–	–	–	No connection
35	–	+5 VR	Output	Pulled up to +5 V through a 3.3 kΩ resistor
36	–	$\overline{\text{SLCT-IN}}$	Input	Not used
		1284 Active		This signal goes high to cause the printer to enter the reverse data transfer phase (nibble mode).

Notes:

1. Left-aligned signal names are in compati mode and right-aligned ones are in nibble mode.
2. The direction (input and output) refers to the printer.
3. Return line: Twisted-pair return line connected to the signal ground level

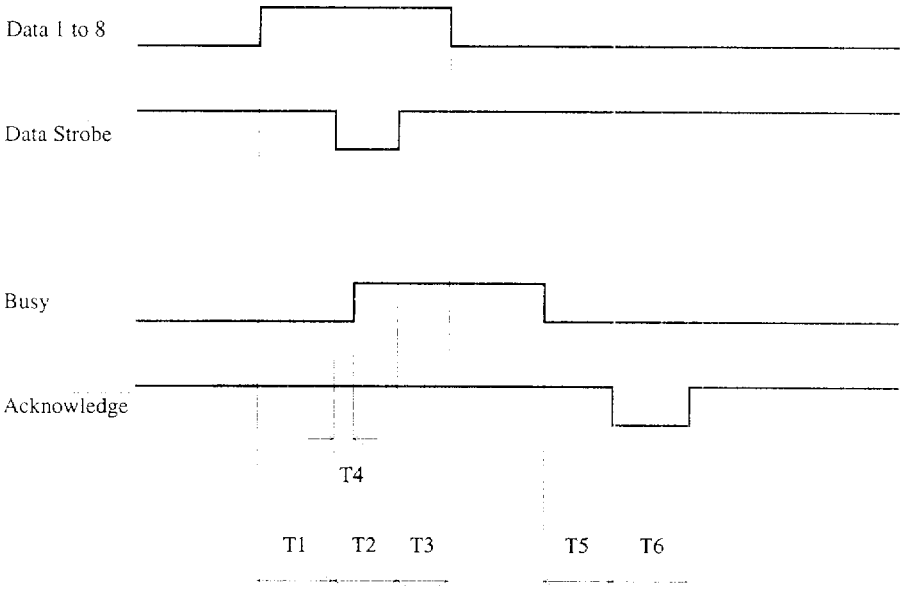
5.2.3 Data transmission timing

The DL6400Pro/6600Pro uses a bi-directional parallel interface complying with IEEE 1284. This interface is also compatible with the conventional Centronics interface. Data transfer from host to printer is performed according to Centronics standard, called compatible mode. Data transfer from printer to host, it is performed according to the IEEE 1284 standard, called nibble mode.

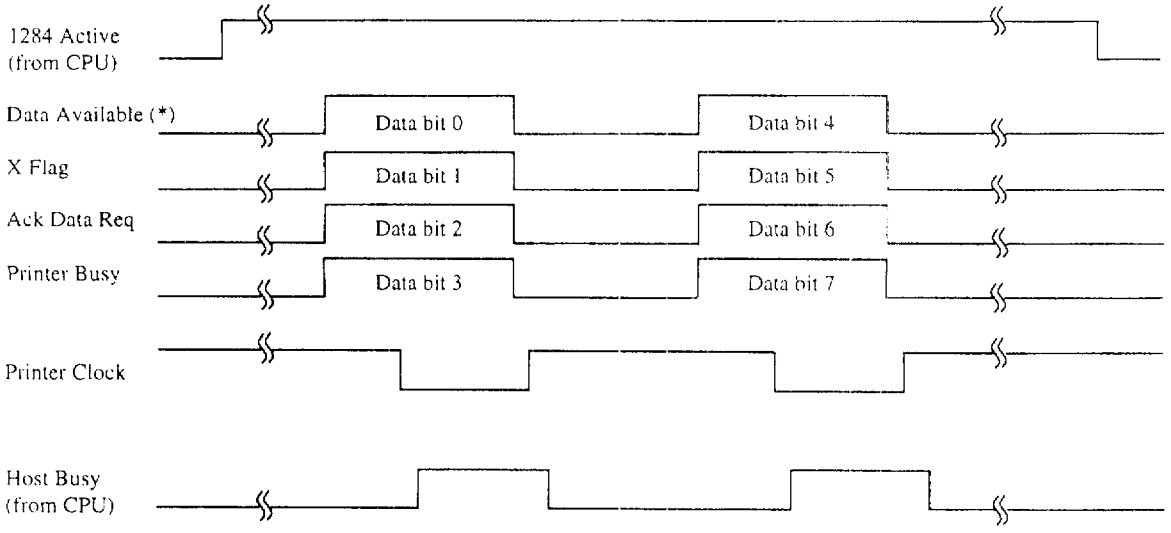
In compatible mode, the printer receives data from the computer in handshaking mode based on the Busy and $\overline{\text{Acknowledge}}$ signals from the printer and the $\overline{\text{Data Strobe}}$ signal from the computer. For the $\overline{\text{Data Strobe}}$ and $\overline{\text{Acknowledge}}$ signals, the timing of the Busy signal must be as shown in the compatible mode of Figure 5.5.

To send data from the printer to the host, the interface enters the nibble mode where data is sent in units of four bits (nibble) using four output signal lines as data paths. The data transfer sequence in nibble mode involves negotiation phase, reverse idle phase, reverse data transfer phase, and termination phase. Figure 5.5 shows the reverse data transfer phase where data is sent.

Compatible mode (data transfer from host to printer)



Reverse data transfer phase in nibble mode (data transfer from printer to host)



* Data Available is assigned for the cable.

Figure 5.5 Data transmission timing

5.3 Serial Interface Specifications

Transmission mode:

Asynchronous

Full-duplex or half-duplex (selectable)

Speed:

150, 300, 600, 1200, 2400, 4800, 9600, or 19200 baud (selectable)

Data bits:

7 or 8 bits (selectable)

Parity bit:

Odd, even, mark, space, or none (selectable)

Start bit:

1 bit

Stop bit:

1 or 2 bits (selectable)

Protocol:

- XON/XOFF (DC1/DC3)
- Data Terminal Ready (DTR)
- Reverse Channel (RC)

Buffer size:

256, 2K, 8K, 24K, 32K or 128K bytes (selectable)

5.3.1 Hardware requirements

Signal levels:

–3 V or lower for a mark condition (logical 1)

+3 V or higher for a space condition (logical 0)

Input circuit:

A μPD4712 is used to convert signals from the RS-232C level to the TTL level.

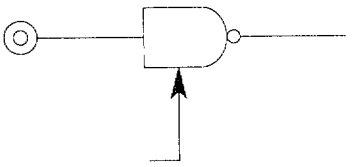


Figure 5.6 Serial interface input circuit

Output circuit:

A μPD4712 is used to convert signals from the TTL level to the RS-232C level. A 1000 pF capacitor suppresses noise on the output signal line.

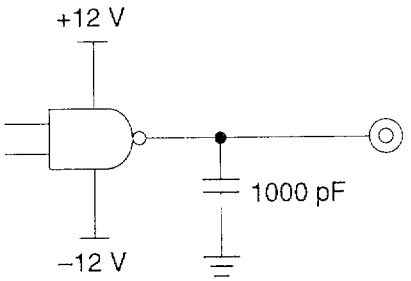


Figure 5.7 Serial interface output circuit

5.3.2 Connector pin assignment

Connector (cable):

D-subminiature Canon or Cinch DB-25 male connector or equivalent that conforms to EIA standards

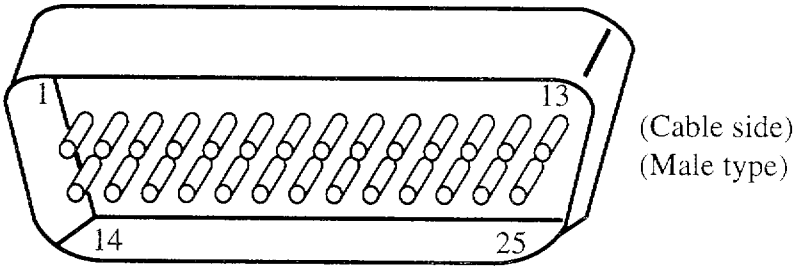


Figure 5.8 Serial interface connector

Table 5.2 Serial interface signals

Pin number	Designation	Direction	Description
1	FG	–	Frame/chassis Ground This pin is the safety/protective ground.
2	TD	Output	Transmitted Data This pin carries information from the printer to the computer.
3	RD	Input	Received Data This pin carries information from the computer to the printer.
4	RTS	Output	Request to Send Spaces are sent when the printer is ready to transmit data.
5	CTS	Input	Clear to Send Spaces are sent when the computer is ready to receive data.
6	DSR	Input	Data Set Ready Spaces are sent when the computer is ready (the printer can receive or transmit data).
7	SG	–	Signal Ground This pin is the common return.
8	CD	Input	Carrier Detect Spaces are sent when the computer lets the printer receive data.

Table 5.2 Serial interface signals (continued)

Pin number	Designation	Direction	Description
11	RC	Output	Reverse Channel This signal is used instead of the DTR signal in the RC protocol. Spaces are sent when the printer is ready to receive or transmit data.
20	DTR	Output	Data Terminal Ready Spaces are sent when the printer is on and ready to receive or transmit data.

Notes:

1. The space state corresponds to the high level of the interface signal.
2. The direction (output or input) refers to the printer.

5.3.3 Serial data format

The serial data format -- 10 or 11 bits long -- consists of a start bit, data bits, a parity bit, and stop bits. A bit is in the mark state when not in transmission. Data bits start with the least significant bit (LSB). The character K (hexadecimal 4B), for example, is transmitted as shown below (7 data bits, even parity).

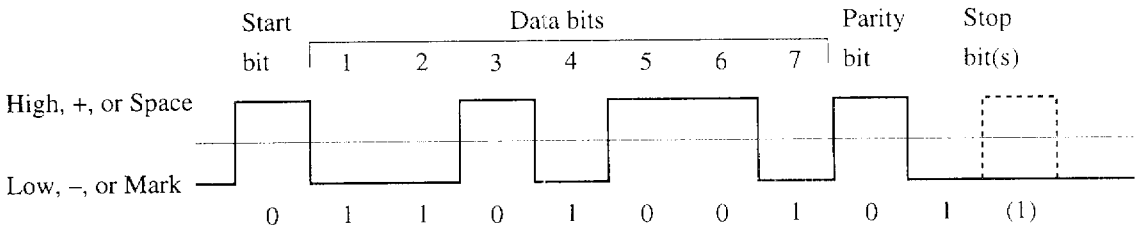


Figure 5.9 Serial data format

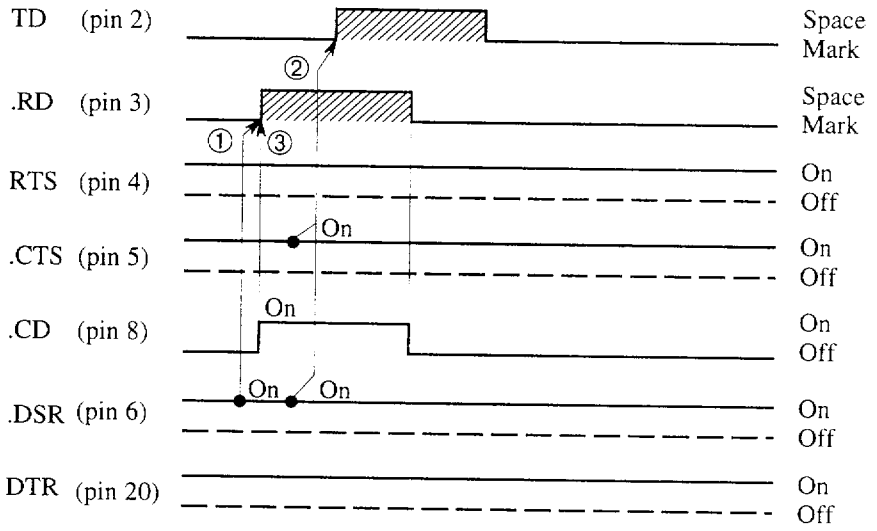
5.3.4 Timing diagram and cable configuration

The printer enables or disables input control signals for the printer linked with the RS-232C interface, enabling communication via the RS-232C interface as well as more simple communication.

There are mainly two ways to connect the RS-232C interface:

- Full-wire
- 3-wire

(1) Full-duplex full-wire control mode
Timing diagram:



Notes:
Signals prefixed by a dot (.) are input to the printer.

① DSR must be high (on) when the printer receives data in this mode. Otherwise, received data is ignored.

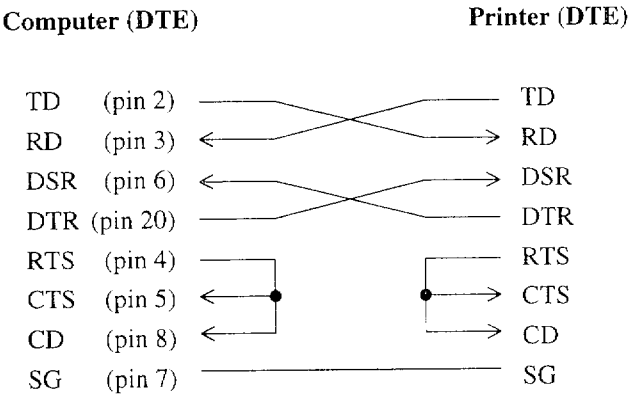
② If both DSR and CTS are on when the printer has data to be transmitted to the computer in this mode, the printer transmits the data immediately. If either DSR or CTS is off, data is not transmitted until both signals go high (on).

③ In this mode, CD is "don't care."

Example of cable configuration:

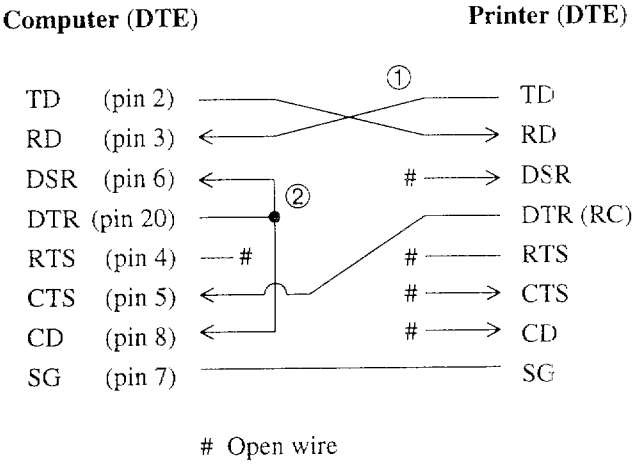
- To DCE (data circuit terminating equipment)
  Use the "straight-through" cable.

- To DTE (data terminal equipment)
  Use the "cross-patched" cable below.



(2) Full-duplex 3-wire control mode

This mode enables more simple communication than the above mode.
Example of cable configuration:



Open wire

Notes:
1. Wire ① is not necessary for the DTR (or RC) protocol.
2. Some computers may not require wire ②.

5.3.5 Data protocols

The following four protocols are used for the RS-232C serial interface, depending on the computer hardware.

- XON/XOFF or DC1/DC3
- DTR
- RC

These protocols prevent overflow of the print data receive buffer when interface data transmission is faster than buffer data printing. The printer uses specific character codes or an interface signal for each protocol to inform the computer of buffer status.

Selecting IBM character set 1 validates the ETX/ACK protocol, regardless of the emulation used.

(1) XON/XOFF or DC1/DC3 protocol

The XOFF (DC3) code (hexadecimal 13) is transmitted from the printer when less than 255[*1] bytes remains in the buffer. The XON (DC1) code (hexadecimal 11) is transmitted when less than 255 bytes of data remains in the buffer.

*1 This value is 63 bytes when the print buffer is configured for 256 BYTE in setup mode.

Data processing cannot be guaranteed if data is transmitted to the printer but sufficient buffer space is not available after the XOFF code has been transmitted.

When the printer is first turned on, the DTR signal is set to the space state (ready) and an XON (DC1) code is transmitted from the printer. When the printer is placed offline, the XOFF code is transmitted even if the buffer is not full. The XON code is transmitted when the printer is placed online again.

If paper runs out, a NAK code (hexadecimal 15) is sent from the printer.

(2) DTR protocol

The DTR signal (pin 20) is set off (low). That is, the Busy signal is issued when 255[*1] bytes of data remain in the buffer. When the printer is placed offline, the DTR signal becomes inactive.

*1 This value is 63 bytes when the print buffer is configured for 256 BYTE in setup mode.

The computer must stop transmission within 255 bytes after the DTR signal is set off (low).

Valid data cannot be guaranteed if data exceeding the buffer capacity is transmitted without regard to the DTR signal.

Buffer-full recovery timing:

Data transmission is suspended when the DTR signal is set off (low). Even in this state, printing continues. When the data length of the available area in the buffer exceeds 255 bytes, the DTR signal is on (high). That is, a "ready" signal is issued.

(3) RC protocol

The RC protocol is the same as the DTR protocol, except that it uses the Reverse Channel signal (pin 11) instead of the Data Terminal Ready signal (pin 20).

5.4 Command Sets

5.4.1 Outline

This section contains an overview of the DL6000Pro printer's command sets. It may not provide the command details and programming examples necessary for modifying software packages or writing user programs.

This printer can use four types of command set as the resident emulation shown below:

DPL24C PLUS command set: Fujitsu DL series printers
IBM Proprinter XL24E emulation: IBM Proprinters X24, XL24, XL24E
Epson ESC/P2 (LQ-1170) emulation: Epson printers using the ESC/P2 command set

The next three sections list all the commands for each emulation.

Note:

1. The values or small letters enclosed in parentheses are represented by 1-byte data. (1) and (0) can be represented not only 01 Hex and 00 Hex but also ASCII "1" (31 Hex) and "0" (30 Hex). (n) may be regarded as a value. The effective range of the value is shown in the programmer's manual.

5.4.2 DPL24C PLUS command set

This section lists command codes used for Fujitsu DL series printers.

	Function	Command
1.	Print mode control	
	Double-strike (bold) printing on	ESC G
	Double-strike (bold) printing off	ESC H
	Emphasized (shadow) printing on	ESC E
	Emphasized (shadow) printing off	ESC F
	Italic printing on	ESC 4
	Italic printing off	ESC 5
	Select character style and screening	ESC e S (n1) (n2)
	n1 = 0: Normal	
	1: Outlined	
	2: Shaded	
	3: Outlined and shaded	
	4: Thin outlined	
	5: Thin shaded	
	6: Thin outline and shaded	
	n2 = 0: Transparent	
	1: Light dot matrix	
	2: Heavy dot matrix	
	3: Vertical bars	
	4: Horizontal bars	
	5: Slants	
	6: Back slants	
	7: Lattice	
	One-line double-width characters on	SO or ESC SO
	One-line double-width characters off	DC4
	Double-width characters on/off	ESC W (n)
	(on: n = 1, off: n = 0)	
	Double-height characters on/off	ESC V (n)
	(on: n = 1, off: n = 0)	
	This command does not adjust line spacing.	
	Multiple width and height printing	ESC u (n) (h1) (h2) (v1) (v2)
	n = 0: Not adjusted	
	1: Character pitch multiplied	
	2: Line spacing multiplied	
	3: Character pitch and line spacing multiplied	
	h1: Tens digit of horizontal multiple	
	h2: Units digit of horizontal multiple	
	v1: Tens digit of vertical multiple	
	v2: Units digit of vertical multiple	
	($0 \leq$ h1 h2 or v1 v2 ≤ 11)	
	Condensed characters on	SI or ESC SI
	Condensed characters off	DC2

	Function	Command
1.	Subscript or superscript printing on (subscript: n = 1, superscript: n = 0)	ESC S (n)
	Subscript and superscript printing off	ESC T
	Select underline type n = 0: Single line 1: Bold single line 2: Extremely bold single line 3: Double line 4: Bold double line 5: Extremely bold double line	ESC e U (n)
	Underline on/off (on: n = 1, off: n = 0)	ESC – (n)
	Overline on/off (on: n = 1, off: n = 0)	ESC e o (n)
	Select printing style This command combines printing styles. The value of n is the sum of the values of the styles to be combined. n = 0: Pica pitch 1: Elite pitch 4: Condensed 8: Shadow 16: Bold 32: Double width 64: Proportional	ESC ! (n)
	Select image overlay type This command overlays a pattern on characters. n = 1: Light dot matrix 2: Heavy dot matrix 3: Vertical bars 4: Horizontal bars 5: Slants 6: Back slants 7: Lattice	ESC e I (n)
	Image overlay printing on/off (on: n = 1, off: n = 0)	ESC e L (n)
2.	Horizontal control	
	Space	SP
	Backspace	BS
	Carriage return	CR
	Elite pitch (12 cpi)	ESC M
	Pica pitch (10 cpi)	ESC P
	Proportionally spaced characters on/off (on: n = 1, off: n = 0)	ESC p (n)
	Set character pitch to (n-1)/120 inch ($1 \leq n \leq 127$)	ESC US (n)
	Set character pitch to n/180 inch ($0 \leq n \leq 255$)	ESC h (n)
	Set intercharacter offset to n/120 inch Canceled by CR or ESC x. ($0 \leq n \leq 63$) ($64 \leq n \leq 127$)	ESC DC1 (n)
	Set character pitch to n/360 inch ($1 \leq n1\ n2\ n3 \leq 999$) n1, n2, and n3 are the hundreds, tens, and ones digits.	ESC e H (n1) (n2) (n3)

	Function	Command
3.	Vertical control	
	Line feed	LF
	Reverse line feed	ESC LF
	Form feed	FF
	Advance paper n/180 inch ($0 \leq n \leq 255$)	ESC J (n)
	Reverse paper n/180 inch ($0 \leq n \leq 255$)	ESC j (n)
	Advance paper n/360 inch ($1 \leq n1\ n2\ n3 \leq 999$) n1, n2, and n3 are the hundreds, tens, and ones digits.	ESC e J (n1) (n2) (n3)
	Reverse paper n/360 inch ($1 \leq n1\ n2\ n3 \leq 999$) n1, n2, and n3 are the hundreds, tens, and ones digits.	ESC e j (n1) (n2) (n3)
	Set line spacing to 1/8 inch (8 lpi)	ESC 0
	Set line spacing to n/180 inch ($0 \leq n \leq 255$)	ESC 3 (n)
	Set line spacing to 7/60 inch	ESC 1
	Set line spacing to n/60 inch ($0 \leq n \leq 127$)	ESC A (n)
	Set line spacing to 1/6 inch (6 lpi) or to the value preset with the ESC A command. The preset line spacing command is ESC A (n).	ESC 2
	Set line spacing to n/360 inch ($1 \leq n1\ n2\ n3 \leq 999$) n1, n2, and n3 are the hundreds, tens, and ones digits.	ESC e V (n1) (n2) (n3)
	Set line spacing to n/360 inch ($1 \leq n \leq 255$)	FS 3 (n)
4.	Tabulation	
	Horizontal tab execution	HT
	Set horizontal tabs The values of n1 to nk in this command are the ASCII values of the print columns (at the current character width) where tabs are to be set. ($1 \leq n \leq 255$) ($1 \leq k \leq 255$)	ESC D (n1) ... (nk) NUL
	Move to print column n ($1 \leq n \leq 255$)	ESC HT (n)
	Move to dot column n/360 inch ($n = n1 + n2 \times 256$) The value below is for 136-column printers. ($0 \leq n1 \leq 255$) ($0 \leq n2 \leq 19$) ($0 \leq (n2\ 2\ \ 256 + n1) \leq 4895$)	ESC S (n1) (n2)
	Horizontal relative move by n/360 inch ($-999 \leq n1\ n2\ n3 \leq +999$) n1, n2, and n3 are the hundreds, tens and ones digits of the distance. s is a plus or minus (+ or -) sign.	ESC e R (s) (n1) (n2) (n3)
	Vertical tab execution	VT
	Set vertical tabs The values of n1 to nk, etc., in this command are the ASCII values of the lines (at the current line spacing) where tabs are to be set. ($1 \leq n \leq 255$) ($1 \leq k \leq 64$)	ESC B (n1) ... (nk) NUL
	Move to line n ($1 \leq n \leq 255$)	ESC VT (n)

	Function	Command
5.	Page formatting	
	Set right margin ($0 \leq n \leq 255$)	ESC Q (n)
	Set left margin ($0 \leq n \leq 255$)	ESC ℓ (n)
	Set perforation skip by n lines ($1 \leq n \leq 127$)	ESC N (n)
	Perforation skip off	ESC O
	Set page length to n lines ($1 \leq n \leq 127$)	ESC C (n) or ESC e c (n) or ESC FF (n)
	Set page length to n inches ($1 \leq n \leq 22$)	ESC C NUL (n) or ESC e c NUL (n) or ESC FF NUL (n)
	Set page length to n/360 inch ($n = n1 \times 256 + n2$) ($0 \leq n1, n2 \leq 255$) ($1 \leq n1 \times 256 + n2 \leq 7920$)	ESC e f (n1) (n2)
6.	Character set control	
	Select character set 1 See Appendix A.	ESC 7
	Select character set 2 See Appendix A.	ESC 6
	Select international character set n = 0: USA 1: France 2: Germany 3: United Kingdom 4: Denmark 1/Norway 5: Sweden/Finland 6: Italy 7: Spain 8: Denmark 2	ESC R (n)
	Clear input buffer	CAN
	Select printer	DC1
	Deselect printer (ignore input)	DC3
	Force most significant bit to 1	ESC >
	Force most significant bit to 0	ESC =
	Cancel control over most significant bit	ESC #
	Select code table n = 0: Code page 437 1: Code page 850 2: Code page 860 3: Code page 863 4: Code page 865 5: ISO 8859-1/ECMA 94	ESC e C (n)
	Select extended character by character number ($0 \leq n1\ n2\ n3 \leq 664$) n1, n2, and n3 are the hundreds, tens, and ones digits.	ESC e E (n1) (n2) (n3)
7.	Wordprocessing	
	Reset all wordprocessing features	ESC x

	Function	Command
8.	Font selection and downloading	
	Select font m with source and style set by n • m (bits 0 and 1: Font device select)	ESC % (m) (n)

Bit 1	Bit 0	Selection of font
0	0	Resident font
0	1	Download font
1	0	Resident font

• m (bits 2 and 3: Specification of print quality)

Bit 3	Bit 2	Print quality
0	0	Original quality of font
0	1	Letter quality (360 dpi)
1	0	Correspondence quality (180 dpi)
1	1	Draft quality (120 dpi)

• n (bit 0 to 2: Specification of font number)

(1) Resident fonts

n	m = 0, 0	m = 1, 0
0	Courier 10	OCR-B
1	Prestige elite 12	OCR-A
2	Draft	
3	Compression	
4	Boldface PS	
5	Pica 10	
6	Correspondence	
7	High-speed draft	

(2) Download fonts
n = 0: Download font 0
1: Download font 1

Select print quality (font attributes) — ESC e q (n)
n = 0: Letter (360 × 180 dpi)
1: Correspondence (180 × 180 dpi)
2: Draft (120 × 180 dpi)
3: High-speed draft (90 × 180 dpi)

Select spacing mode (font attributes) — ESC e s (n)
n = 0: Fixed pitch font
1: Proportional spacing font

	Function	Command
8.	Select character pitch (n/360 inch font attributes) (0 ≤ n1 ≤ 255) (0 ≤ n2 ≤ 255) (n = n1 × 256 + n2) Ex. n = 36: 10 pitch 30: 12 pitch 24: 15 pitch 21: 17 pitch	ESC e p (n1) (n2)
	Condense/enlarge vertically (font attributes) n = 1: Executed 0: Not executed	ESC e A (n)
	Select point size (n/1200 inch font attributes) (0 ≤ n1 ≤ 255) (0 ≤ n2 ≤ 255) (n = n1 × 256 + n2) Ex. n = 166: 10 point	ESC e v (n1) (n2)
	Select character style (font attributes) n = 0: Upright 1: Italic	ESC e i (n)
	Select stroke weight (font attributes) n = 249: –7 (Reserved) 251: –5 (Reserved) 253: –3 (Light) 0: 0 (Medium) 3: 3 (Bold) 5: 5 (Black) 7: 7 (Ultra black)	ESC e w (n)
	Select type-face (font attributes) n = 1: Pica 3: Courier (bitmap) 4: Nimbus Sans® 5: Timeless 6: Gothic 8: Prestige 23: Boldface 130: OCR-A 131: OCR B 134: Courier (scalable)	ESC e t (n)
	Select font by ID (font attributes)	ESC e F (n)

n	Quality	Spacing	Pitch	Point	Typeface
1	LQ	Fixed	10 cpi	12 pt	Courier (bitmap)
2	LQ	Fixed	12 cpi	10 pt	Prestige
3	LQ	PS	—	12 pt	Boldface
4	LQ	Fixed	10 cpi	12 pt	Pica
9	LQ	Fixed	10 cpi	12 pt	OCR-A
10	LQ	Fixed	10 cpi	12 pt	OCR-B
32	CQ	Fixed	10 cpi	12 pt	Courier (bitmap)
34	DQ	Fixed	12 cpi	11 pt	Gothic
128	LQ	PS	—	10 pt	Timeless
129	LQ	PS	—	10 pt	Timeless Italic
130	LQ	PS	—	10 pt	Timeless Bold
132	LQ	PS	—	10 pt	Nimbus Sans®
133	LQ	PS	—	10 pt	Nimbus Italic
134	LQ	PS	—	10 pt	Nimbus Bold
140	LQ	Fixed	10 cpi	10 pt	Courier (scalable)
141	LQ	Fixed	10 cpi	10 pt	Courier Bold (scalable)
142	LQ	Fixed	10 cpi	10 pt	Courier Italic (scalable)

	Function	Command
8.	LQ: Letter quality CQ: Correspondence quality PS: Proportional spacing DQ: Draft quality Copy resident font to download area m = 0: Courier 10 1: Prestige Elite 12 2: Draft 3: Compression 4: Boldface PS 5: Pica 10 6: Correspondence 7: High-speed draft n = 0: Download font 0 1: Download font 1	ESC : NUL (m) (n)
	Create download font • m (bits 4 and 5: Specifies the quality of characters to be registered)	ESC & (m) (Cs) (Ce) (data)

Bit 5	Bit 4	Selection of font quality
0	1	Letter (360 dpi)
1	0	Correspondence (180 dpi)
1	1	Draft (120 dpi)

• m (bit 0: Specifies external font number to be registered)

Bit 0	Font number selection	Remarks
0	Download font 0	At power-on, resident font 0 is automatically downloaded.
1	Download font 1	At power-on, resident font 1 is automatically downloaded.

• m (bits 1, 2, 3, 6, 7) Not used (don't care)
• Cs (Download start character of ASCII code)
• Ce (Download end character of ASCII code)

Decimal	$0 \leq Cs, Ce \leq 255$
Hex	$00 \leq Cs, Ce \leq FF$

Precaution: $Ce \geq Cs$

• data (Data of more than one byte containing bit map data) (Reserved)	ESC e D (data)

	Function	Command
9.	Bit image graphics	
	Graphics type m graphics	ESC * (m) (n1) (n2) (data)
	Graphics type m graphics	ESC e b (m) (n1) (n2) (data) or ESC e B (m) (n1) (n2) (data)
	Single-density graphics	ESC K (n1) (n2) (data)
	Double-density graphics	ESC L (n1) (n2) (data)
	High-speed double-density graphics	ESC Y (n1) (n2) (data)
	Quadruple-density graphics	ESC Z (n1) (n2) (data)
	360 dot per inch 24-pin graphics	FS Z (n1) (n2) (data)
10.	Cut-sheet feeder control	
	Feed a sheet from bin 1	ESC EM 1
	Feed a sheet from bin 2	ESC EM 2
	Feed a sheet from bin 3	ESM EM E
	Eject a page from the printer	ESC EM R
	Select bin 1 for following pages	/ / 1 / /
	Select bin 2 for following pages	/ / 2 / /
	Select bin 3 for following pages	/ / E / /
	Eject sheet at end of current page	/ / R / /
	Change bins at next page	/ / C / /
11.	Initialize printer	
	Reset printer	ESC @
	Reset printer	ESC CR P
	Initialize printer	ESC SUB I
12.	Bar code printing	
	Print bar code b: Total number of parameters R: (fixed) c: Type of bar code	ESC DC4 (b) R (c) (w) (h) (a) (ch1) ... (chn)

ASCII	Decimal	Hex	Type of bar code
1	49	31	Codabar (nw-7)
2	50	32	EAN 13
3	51	33	EAN 8
4	52	34	Code 3 to 9
5	53	35	Industrial 2 of 5
6	54	36	Interleaved 2 of 5
7	55	37	Matrix 2 of 5
A	65	41	UPC type A
B	66	42	Code 128
a	97	61	UPC type A with checkdigit printing

w: Width of narrow bar in 1/1440-inch units
h: Height of bar code
a: Defines check characters and OCR characters
ch1 ... chn: Bar code characters

	Function	Command
13.	Print option control	
	Select friction feed	//F//
	Select rear tractor feed	//T//
	Select front tractor feed	//M//
	Cut sheet feed selection	//S//
	Select paper path by HCPP (host controlled paper path) n= F: Friction (platen) T: Rear tractor M: Front tractor	ESC e T (n)
	Fixed print head gap for APTC (automatic paper thickness control) *1	ESC e P (n1) (n2) (n3) (n4)
14.	Miscellaneous	
	Sound bell	BEL
	Enable paper-out sensor	ESC 9
	Ignore paper-out sensor	ESC 8
	Typewriter mode on/off (on: n = 1, off: n = 0)	ESC i (n)
	Move print head to home position	ESC <
	Unidirectional printing on/off (on: n = 1, off: n = 0)	ESC U (n)
	Select CR code definition n = 0: CR = CR only 1: CR = CR + LF	ESC e r (n)
	Select LF code definition n = 0: LF = LF only 1: LF = LF + CR	ESC e ℓ (n)
	Enter online setup mode	ESC e ONLINE (data)
	Move print head (unit: 1/180 inch) $(0 \leq n1 \leq 255)$ $(0 \leq n2 \leq 255)$	ESC e h (n1) (n2)
	Message display on LCD *2	ESC e M (n1) (n2) $D_1 \cdots D_n$
	Message display time control *2	ESC e W (n1) (n2)

*1 : The A.P.T.C control command is available only for a printer with the APTC feature.

*2 : This command is available only for a printer with the LCD control panel.

5.4.3 IBM Proprinter XL24E emulation command set

This section lists command codes for IBM Proprinter XL24E emulation.
Asterisks in the "Function" column indicate extended commands not supported by the original printer.

	Function	Command
1.	Print mode control	
	Double-strike (bold) printing on	ESC G
	Double-strike (bold) printing off	ESC H
	Emphasized (shadow) printing on	ESC E
	Emphasized (shadow) printing off	ESC F
	One-line double-width characters on	SO or ESC SO
	One-line double-width characters off	DC4
	Double-width characters on/off (on: n = 1, off: n = 0)	ESC W (n)
	Double-height/double-width characters n1 = 4, n2 = 0, m1 = 0, m2 = 0 m3 controls character height and line spacing.	ESC [@ (n1) (n2) (m1) ... (m4)

m3	Height	Spacing
0	Unchanged	Unchanged
1	Normal	Unchanged
2	Double	Unchanged
16	Unchanged	Single
17	Normal	Single
18	Double	Single
32	Unchanged	Double
33	Normal	Double
34	Double	Double

m4 controls character width.

m4	Width
0	Unchanged
1	Normal
2	Double

Condensed characters on	SI or ESC SI
Condensed and elite characters off	DC2
Subscript or superscript printing on (subscript: n = 1, superscript: n = 0)	ESC S (n)
Superscript and subscript printing off	ESC T
Underline on/off (on: n = 1, off: n = 0)	ESC - (n)
Overline on/off (on: n = 1, off: n = 0)	ESC _ (n)

	Function	Command
2.	Horizontal control	
	Space	SP
	Backspace	BS
	Carriage return	CR
	Elite characters on	ESC :
	Proportionally spaced characters on/off (on: n = 1, off: n = 0)	ESC P (n)
3.	Vertical control	
	Line feed	LF
	Form feed	FF
	Advance paper n/216 inch ($1 \leq n \leq 255$)	ESC J (n)
	Advance paper n/180 inch ($1 \leq n \leq 255$) [in AG mode]	ESC J (n)
	Set line spacing to 1/8 lines	ESC 0
	Set line spacing to 7/72 inch	ESC 1
	Set line spacing to n/216 inch ($0 \leq n \leq 255$)	ESC 3 (n)
	Set line spacing to n/180 inch ($0 \leq n \leq 255$) [in AG mode]	ESC 3 (n)
	Preset line spacing to n/72 inch ($1 \leq n \leq 255$)	ESC A (n)
	Preset line spacing to n/60 inch ($1 \leq n \leq 255$) [in AG mode]	ESC A (n)
	Set line spacing to 1/6 inch or to the value preset by line spacing command ESC A (n).	ESC 2
	Change graphics line spacing base to 1/216 or 1/180 inch (for ESC J and ESC 3) m1 = 4, m2 = 0 $0 \leq t1 \leq 255$, $0 \leq t2 \leq 255$, t3=0 t4 = 180 or 216	ESC [\ (m1) (m2) (t1) ... (t4)
4.	Tabulation	
	Horizontal tab execution	HT
	Set horizontal tabs The values of n1 to nk in this command are the ASCII values of the print columns (at the current character width) where tabs are to be set. ($1 \leq n \leq 255$) ($1 \leq k \leq 28$)	ESC D (n1) ... (nk) NUL
	Clear all horizontal tabs	ESC D NUL
	Move print position right by n/120 inch ($0 \leq n1, n2 \leq 255$) ($n = n1 + n2 \times 256$)	ESC d (n1) (n2)
	Vertical tab execution	VT
	Set vertical tabs The values of n1 to nk in this command are ASCII values of the lines (at the current line spacing) where tabs are to be set. ($1 \leq n \leq 255$) ($1 \leq k \leq 64$)	ESC B (n1) ... (nk) NUL
	Clear all vertical tabs	ESC B NUL
	Reset tabs to default values	ESC R

	Function	Command
5.	Page formatting	
	Set left margin at column n and right margin at column m (0 ≤ n, m ≤ 255)	ESC X (n) (m)
	Set perforation skip by n lines (1 ≤ n ≤ 255)	ESC N (n)
	Perforation skip off	ESC O
	Set page length to n lines (1 ≤ n ≤ 255)	ESC C (n)
	Set page length to n inches (1 < n < 22)	ESC C NUL (n)
	Set top of form	ESC 4
6.	Character set control	
	Select character set 1 See Appendix A.	ESC 7
	Select character set 2 See Appendix A.	ESC 6
	Print n1 + n2 × 256 characters from all-character set (chars.: codes of characters to print, 0 ≤ chars, ≤ 255)	ESC \ (n1) (n2) (chars.)
	Print a character from all-character set (char.: a code of character to print, 0 ≤ chars, ≤ 255)	ESC ^ (char.)
	Select code page table n (0 ≤ n1, n2 ≤ 255) (n = n1 + n2 × 255)	ESC [T (n1) (n2) 0 0 (c1) (c2)
	Clear input buffer	CAN
	Select printer	DC1
	Deselect printer (ignore input)	ESC Q #
7.	Downloading	
	Select resident or downloaded font Ex. n = 0: Resident normal 2: Resident bold 4: Downloaded normal 6: Downloaded bold	ESC I (n)
	Create download font	ESC = (n1) (n2) ID (m1) (m2) (data)

c1	c2	Code page ID
0	0	Ignore command
1	181	Code page 437
3	82	Code page 850
3	92	Code page 860
3	95	Code page 863
3	97	Code page 865

	Function	Command
8.	Bit image graphics	
	Single-density graphics	ESC K (n1) (n2) (data)
	Double-density graphics	ESC L (n1) (n2) (data)
	High-speed double-density graphics	ESC Y (n1) (n2) (data)
	Quadruple-density graphics	ESC Z (n1) (n2) (data)
	High-resolution graphics	ESC [g (n1) (n2) (m) (data)
	Select graphics mode [in AG mode only]	ESC * (m) (c1) (c2) (data)
9.	Cut-sheet feeder control *	
	Feed a sheet from bin 1 *	ESC EM 1
	Feed a sheet from bin 2 *	ESC EM 2
	Feed a sheet from bin 3 *	ESM EM E
	Eject a page from the printer *	ESC EM R
	Select bin 1 for following pages *	/ / 1 / /
	Select bin 2 for following pages *	/ / 2 / /
	Select bin 3 for following pages *	/ / E / /
	Eject sheet at end of current page *	/ / R / /
	Change bins at next page *	/ / C / /
10.	Printer option control	
	Select friction feed	/ / F / /
	Select rear-tractor feed	/ / T / /
	Select front-tractor feed	/ / M / /
	Cut sheet feed selection	/ / S / /
11.	Miscellaneous	
	Sound the bell	BEL
	Unidirectional printing on/off (on: n = 1, off: n = 0)	ESC U (n)
	Add a carriage return to all line feeds (on: n = 1, off: n = 0)	ESC 5 (n)
	Printer offline	ESC j
	Enter online setup mode *	ESC e ONLINE (data)
	Select default settings	ESC [K (n1) (n2) (i) (ID) (p1) (p2)

5.4.4 Epson ESC/P2 emulation command set

This section lists command codes for Epson ESC/P2 printer emulation.

Asterisks in the "Function" column indicate extended commands not supported by the original printer.

	Function	Command
1.	Print mode control	
	Double-strike (bold) printing on	ESC G
	Double-strike (bold) printing off	ESC H
	Emphasized (shadow) printing on	ESC E
	Emphasized (shadow) printing off	ESC F
	Italic printing on	ESC 4
	Italic printing off	ESC 5
	Select character style n = 0: Normal 1: Outlined 2: Shaded 3: Outlined and shadowed	ESC q (n)
	One-line double-width characters on	SO or ESC SO
	One-line double-width characters off	DC4
	Double-width characters on/off (on: n = 1, off: n = 0)	ESC W (n)
	Double-height characters on/of (on: n = 1, off: n = 0)	ESC w (n)
	Condensed characters on	SI or ESC SI
	Condensed characters off	DC2
	Subscript or superscript printing on (subscript: n = 1, superscript: n = 0)	ESC S (n)
	Subscript and superscript printing off	ESC T
	Underline on/off (on: n = 1, off: n = 0)	ESC - (n)
	Select line n1 = 3, n2 = 0, d1 = 1 d2 = 0: Ignore command 1: Underline 2: Strike through 3: Overscore d3 = 0 or 4: Cancel line selection 1: Single line 2 or 3: Double line 5: Single-dotted line 6 or 7: Double-dotted line	ESC (- (n1) (n2) (d1) (d2) (d3)
	Select printing style This command combines printing styles. The value of n is the sum of the values of the styles to be combined. n = 0: Pica pitch 1: Elite pitch 2: Proportional space 4: Condensed 8: Shadow 16: Bold 32: Double-width 64: Italics 128: Underline	ESC ! (n)

	Function	Command
2.	Horizontal control	
	Space	SP
	Backspace	BS
	Carriage return	CR
	Set elite pitch	ESC M
	Set pica pitch	ESC P
	Set 15 CPI	ESC g
	Proportionally spaced characters on/off (on: n = 1, off: n = 0)	ESC p (n)
	Set inter-character space to n/120 inch (for draft) or n/180 inch (for letter and proportional) (0 < n < 127)	ESC SP (n)
	Set character pitch to (n1 + n2 × 256)/360 inch (0 ≤ n1 ≤ 255) (0 ≤ n2 ≤ 4)	ESC c (n1) (n2)
	Select character pitch (specify unit pitch) n1 = 1, n2 = 0 d = 10 to 19: 10/3600 inch = 1/360 inch d = 20 to 29: 20/3600 inch = 1/180 inch d = 30 to 39: 30/3600 inch = 1/120 inch d = 40 to 49: 40/3600 inch = 1/90 inch d = 50 to 59: 50/3600 inch = 1/72 inch d = 60 to 69: 60/3600 inch = 1/60 inch	ESC (U (n1) (n2) (d)
3.	Vertical control	
	Line feed	LF
	Form feed	FF
	Advance paper n/180 inch (1 ≤ n ≤ 255)	ESC J (n)
	Set line spacing to 1/8 inch	ESC 0
	Set line spacing to n/180 inch (0 ≤ n ≤ 255)	ESC 3 (n)
	Set line spacing to n/60 inch (0 ≤ n ≤ 127)	ESC A (n)
	Set line spacing to 1/6 inch	ESC 2
	Set line spacing to n/360 inch (0 ≤ n ≤ 255)	ESC + (n)
4.	Tabulation	
	Horizontal tab execution	HT
	Set horizontal tabs The values of n1 to nk in this command are the ASCII values of the print columns (at the current character width) where tabs are to be set. (1 ≤ n ≤ 255) (1 ≤ k ≤ 32)	ESC D (n1) ... (nk) NUL
	Move print position n/120 [*1] inch (for draft) or n/180 [*1] inch (for letter) right from left margin (n = n1 + n2 × 256)	ESC $ (n1) (n2)
	Move print position n/120[*1] inch (for draft) or n/180[*1] inch (for letter) left or right from the current position (n = n1 + n2 × 256)	ESC \ (n1) (n2)
	Vertical tab execution	VT
	Set vertical tabs The values of n1 to nk in this command are the ASCII values of the lines (at the current line spacing) where tabs are to be set. (1 ≤ n ≤ 255) (1 ≤ k ≤ 16)	ESC B (n1) ... (nk) NUL

*1 The valve depends on the pitch set by the ESC (U command.

	Function	Command
4.	Move to dot line $(d_1 + d_2 \times 256)/360^{(*1)}$ inch n1 = 2, n2 = 0 $(0 \leq d1 \leq 255)$ $(0 \leq d2 \leq 127)$ Vertical relative move by $(d1 + d2 \times 256)/360^{(*1)}$ inch n1 = 2, n2 = 0 $(0 \leq d1 \leq 255)$ $(0 \leq d2 \leq 127)$ $-32768 \leq d1 + d2 \times 256 \leq 32768$	ESC (V (n1) (n2) (d1) (d2) ESC (v (n1) (n2) (d1) (d2)
5.	Page formatting Set right margin to column n $(1 \leq n \leq 255)$ Set left margin to column n $(0 \leq n \leq 255)$ Set top and bottom margins from top of page n1 = 4, n2 = 0 • Top margin = $(t1 + t2 \times 256)/360^{(*1)}$ inch $(0 \leq t1 \leq 255)$ $(0 \leq t2 \leq 127)$ • Bottom margin = $(b1 + b2 \times 256)/360^{(*1)}$ inch $(0 \leq b1 \leq 255)$ $(0 \leq b2 \leq 127)$ Set perforation skip by n lines $(1 \leq n \leq 127)$ Perforation skip off Set page length to n lines $(1 \leq n \leq 127)$ Set page length to n inches $(1 \leq n \leq 22)$ Set page length to $(d1 + d2 \times 256)/360^{(*1)}$ inch n1 = 2, n2 = 0 $(0 \leq d1 \leq 255)$ $(0 \leq d2 \leq 127)$	 ESC Q (n) ESC ℓ (n) ESC (c (n1) (n2) (t1) (t2) (b1) (b2) ESC N (n) ESC O ESC C (n) ESC C NUL (n) ESC (C (n1) (n2) (d1) (d2)
6.	Character set control Select character set 1 Select character set 2 Select character set table n = 0: Italics character set 1: Graphics character set 2: Download character set 3: Graphics character set Select international character set n = 0: USA 1: France 2: Germany 3: United Kingdom 4: Denmark 1 5: Sweden 6: Italy 7: Spain 1 8: Japan 9: Norway 10: Denmark 2 11: Spain 2 12: Latin America 13: Korea 64: Legal	 ESC 7 ESC 6 ESC t (n) ESC R (n)

*1 The value depends on the pitch set by the ESC (U command.
The default is 1/360 inch.

	Function	Command
6.	Assign a character set to active character set number 0 to 3 n1 = 3, n2 = 0 d1 = 0: Active character set no. 0 1: Active character set no. 1 2: Active character set no. 2 3: Active character set no. 3 d2 = 0: Italic 1: PC 437 (USA) 3: PC 850 (Multilingual) 7: PC 860 (Portugal) 8: PC 863 (Canada-French) 9: PC 865 (Norway) d3 = 0	ESC (t (n1) (n2) (d1) (d2) (d3)
	Print n1 + n2 × 256 characters from all-character set (0 ≤ n1 ≤ 255) (0 ≤ n2 ≤ 127) (0 ≤ n1 + n2 × 256 ≤ 255)	ESC (^ (n1) (n2) (character codes)
	Clear input buffer	CAN
	Delete a character	DEL
	Force most significant bit to 1	ESC >
	Force most significant bit to 0	ESC =
	Cancel control over most significant bit	ESC #
7.	Font selection and downloading	
	Select font n = 0: Resident character set 1: Download character set	ESC % (n)
	Select letter or draft quality n = 0: Draft 1: Letter	ESC x (n)
	Select type style Bitmap font: n = 0: Courier 1: Courier 2: Courier 3: Prestige 4: Courier 5: OCR-B 6: OCR-A 7: Courier 8: Courier 9: Courier Scalable font: n = 0: Timeless 1: Nimbus Sans® 2: Courier 3: Timeless 4: Timeless 5: Timeless 6: Timeless 7: Timeless 8: Timeless 9: Timeless	ESC k (n)
	Set scalable font mode • m sets character pitch. m = 0: Keep previous pitch 1: Set proportional space mode m ≥ 5: Select character pitch (m/360 inch) (Reset proportional space mode) • n1 and n2 set point size of font. Point size = (n1 + n2 × 256) × 0.5 point (0 ≤ n1 ≤ 255) (0 ≤ n2 ≤ 127)	ESC X m (n1) (n2)
	Copy resident character set to download area	ESC : NUL (n) (s)
	Create download font	ESC & NUL (n1) (n2) (d0) (d1) (d2) (data)

	Function	Command
8.	Bit image graphics	
	Graphics type m graphics	ESC * (m) (n1) (n2) (data)
	Bit image mode definition	ESC ? (s) (n)
	Single-density graphics	ESC K (n1) (n2) (data)
	Double-density graphics	ESC L (n1) (n2) (data)
	High-speed double-density graphics	ESC Y (n1) (n2) (data)
	Quadruple-density graphics	ESC Z (n1) (n2) (data)
	Select raster image graphics n1 = 1, n2 = 0 d = 1: Raster image graphics mode	ESC (G (n1) (n2) (d)
	Print raster image graphics	ESC . (c) (v) (h) (m) (n1) (n2) (data)
9.	Cut-sheet feeder control	
	Feed a sheet from bin 1	ESC EM 1
	Feed a sheet from bin 2	ESC EM 2
	Feed a sheet from bin 3 *	ESC EM E
	Eject a page from the printer	ESC EM R
	Select bin 1 for following pages *	/ / 1 / /
	Select bin 2 for following pages *	/ / 2 / /
	Select bin 3 for following pages *	/ / E / /
	Eject sheet at end of current page *	/ / R / /
	Change bins at next page *	/ / C / /
10.	Printer option control	
	Select friction feed *	/ / F / /
	Select rear-tractor feed *	/ / T / /
	Select front-tractor feed *	/ / M / /
	Cut sheet feed selection *	/ / S / /
11.	Miscellaneous	
	Sound bell	BEL
	Move print head to home position	ESC <
	Unidirectional printing on/off (on: n = 1, off: n = 0)	ESC U (n)
	Initialize printer	ESC @
	Enter online setup mode *	ESC e ONLINE (data)

*1 Indicates extended commands not supported by the original printer.

CHAPTER 6 MAINTENANCE

6.1 Overview

The DL6000Pro series printer, with its simple mechanism and latest electronics technique, has high reliability and maintainability. The units of this printer have very few adjustments, and are easily replaced.

6.2 Preventive Maintenance

No scheduled maintenance is required. However, it is recommended to keep the printer clean to increase the service life and MTBF.

6.3 Maintenance Philosophy

The printer is designed and produced to make maintenance as infrequent as possible.
No periodic lubrication is required.
To assure the quality of the printer, the following are done at the factory.

- Every unit is checked and tested before assembly.
- All products go through a full inspection.

6.4 Diagnostics

6.4.1 ROM/RAM checking

At power up, the ROM sum and RAM write/read check are done automatically.

6.4.2 Error display

Operating conditions are checked during printer operation and, when an error is detected, the error status is displayed by the PAPER OUT lamps and one of the resident font lamps on the control panel.

6.5 Test Functions for Maintenance

This printer has test functions for adjustment and check at maintenance.

The major functions are as follows:

6.5.1 Self test

The self-test function prints test pattern pages without the help of the host processor. The operator or a maintenance service man can easily check the electrical and mechanical states of the printer. When printing is in error, the self-test can distinguish between printer errors and host processor errors. The self-test can also confirm correct operation after an error recovery.

6.5.2 Hexadecimal dump

The printer can print received data including commands in terms of the hexadecimal code. This is especially helpful when a software problem is encountered.

6.5.3 Vertical alignment

This function prints full lines of vertical bars in bidirectional printing. It enables fine adjustment of the print positions between forward and backward printing so that vertical bars of each print line form straight lines. This adjustment is necessary for printing vertical rules or graphics.

6.5.4 Top-of-form adjustment

This function adjusts the position of the top of the paper when the paper is loaded on the platen. This adjustment is necessary for formatted or ruled paper.

6.6 Recommended Spare Parts

The following parts can be replaced.

Platen unit	CA04298-F375		
Stacker sensor unit	CA02129-F498		
SP motor assembly	CA02129-G202		
RF motor assembly	CA02129-G288		
OP cable	CA02129-G783		
Tension unit	CA02393-F205		
RF unit	CA02393-F280		
3rd roller unit	CA04298-F301		
MGCS unit	CA02393-F521	Manual	
Carrier cable assembly	CA02393-G255	APTC	
Carrier cable assembly	CA02393-G257	Manual	
Carrier PCA	CA02393-G261		
Card guide assembly	CA02393-G565	APTC	
Card guide assembly	CA04298-G545	Manual	
OC switch unit	CA02464-F365		
RT switch unit	CA02464-F368		
Front tractor unit	CA02464-F382		
TR2 switch unit	CA02464-F478		
APTC unit	CA02464-F501	APTC	
PIS assembly	CA02464-G343		
PSS 1 assembly	CA02464-G345		
PSS 2 assembly	CA02464-G347		
LF motor unit	CA02464-G431		
MG unit	CA04298-G451		
RTRPE PCA	CA02464-G475		
AC switch subassembly	CA02464-G776		
Interlock switch unit	CA02515-F210		
Printer mechanism unit	CA04298-E121	Manual	DL6400Pro
Printer mechanism unit	CA04298-E221	APTC	DL6400Pro
Printer mechanism unit	CA04299-E101	Manual	DL6600Pro
Printer mechanism unit	CA04299-E201	APTC	DL6600Pro
Control panel assembly	CA04298-F751	LED panel (English)	
Control panel assembly	CA04298-F752	LED panel (Chinese)	
Control panel assembly	CA02515-F756	LCD panel (English)	
Power supply unit	CA04298-F810	100 to 120 VAC	
Power supply unit	CA04298-F815	220 to 240 VAC	
ROM board	CA04298-J101	with LHC97AA (Centronics)	
ROM board	CA04298-J201	with LHC97BA (Centro+RS)	
ROM board	CA04298-J228	with LHC97BA (Centro+RS)	for FTL
ROM board	CA04299-J101	with LHC97AA (Centronics)	
ROM board	CA04299-J201	with LHC97BA (Centro+RS)	
ROM board	CA04299-J228	with LHC97BA (Centro+RS)	for FTL
ROM board	CA04299-J401	with LHC97BA (Centro+RS)	
Connector board	CA04298-F835	Manual	DL6400Pro
Connector board	CA04298-F830	APTC	DL6400Pro
Connector board	CA20196-B52X	Manual	DL6600Pro
Connector board	CA20196-B51X	APTC	DL6600Pro
Driver board	CA20267-B55X		DL6400Pro
Driver board	CA20267-B56X		DL6600Pro
Timing belt	CA81003-1001		
Fan	CA81003-1010		
Fan	CA81003-1013		DL6600Pro
LF belt 1	CA98001-1206		
LF belt 2	CA98001-2337		

CHAPTER 7 OPTIONS AND SUPPLIES

7.1 Options

Front cut-sheet feeder (CA02464-0051)
Rear cut-sheet feeder first bin (CA02464-0001) for DL6600Pro only
Rear cut-sheet feeder secondary bin (CA02464-0031) for DL6600Pro only
Stacker unit (CA02464-0081)
Rear tractor unit (CA02464-E602)

7.2 Supplies

(1) Ribbon cassette: Black ribbon (CA02460-D115)

(2) Ribbon subcassette: Black ribbon (CA02460-D215)

(3) Print head (D86B-1138-C363) for DL6400Pro
(D86B-1138-C369) for DL6400Pro with APTC
(D86B-1138-C353) for DL6600Pro
(D86B-1138-C359) for DL6600Pro with APTC

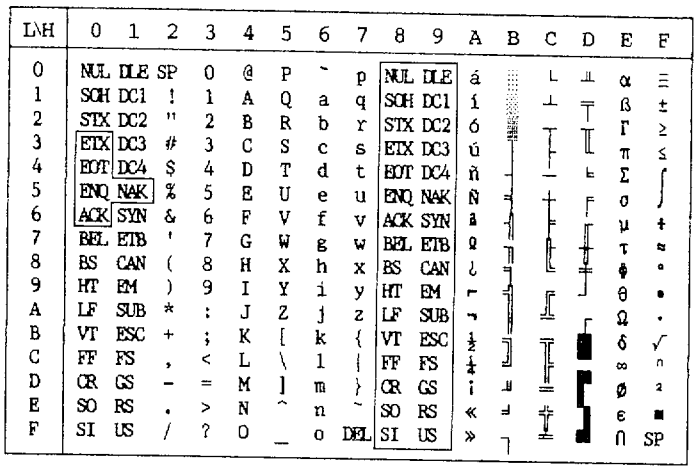
(4) Publications: User's manual (C147-E041-01EN)
Maintenance manual (C147-F017-01EN)
Illustrated parts catalogue (C147-G010-01EN)
Schematic diagrams (C147-F018-01EN)

APPENDIX A CHARACTER SETS

(1) Basic character sets for DPL24C PLUS and IBM XL24E emulation

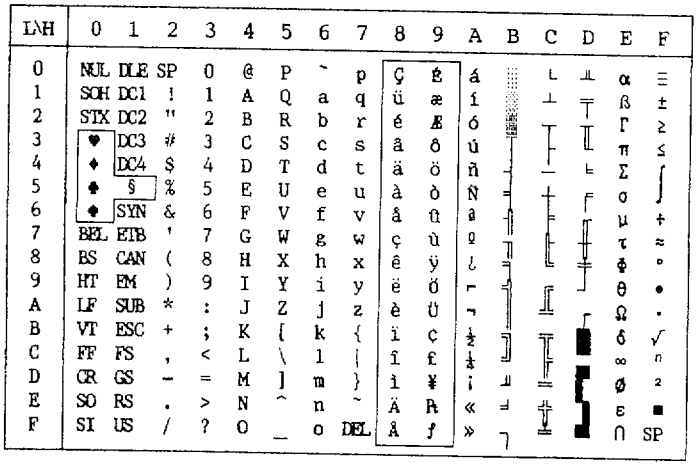
The two basic character sets for the DPL24C PLUS command set and the IBM Proprinter XL24E emulation. are shown below. These are USA character sets. Character set 2 is the same as code page 437 in IBM PS/2 character sets. Characters in boxes differ for sets 1 and 2. Those of set 2 also vary with the national character set.

IBM PC character set 1



L\H	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p	NUL	DLE	á	▒	└	╨	α	≡
1	SOH	DC1	!	1	A	Q	a	q	SOH	DC1	í	┴	┬	╤	ß	±
2	STX	DC2	"	2	B	R	b	r	STX	DC2	ó	┼	├	╥	Γ	≥
3	ETX	DC3	#	3	C	S	c	s	ETX	DC3	ú	├	─	╙	π	≤
4	EOT	DC4	$	4	D	T	d	t	EOT	DC4	ñ	┤	┼	╘	Σ	⌠
5	ENQ	NAK	%	5	E	U	e	u	ENQ	NAK	Ñ	╡	╞	╒	σ	⌡
6	ACK	SYN	&	6	F	V	f	v	ACK	SYN	ª	╢	╟	╓	µ	÷
7	BEL	ETB	'	7	G	W	g	w	BEL	ETB	º	╖	╫	╫	τ	≈
8	BS	CAN	(	8	H	X	h	x	BS	CAN	¿	╕	╪	┘	Φ	°
9	HT	EM	)	9	I	Y	i	y	HT	EM	⌐	╣	┘	┌	Θ	∙
A	LF	SUB	*	:	J	Z	j	z	LF	SUB	¬	║	╔	▒	Ω	·
B	VT	ESC	+	;	K	[	k	{	VT	ESC	½	╗	╩	▒	δ	√
C	FF	FS	,	<	L	\	l	|	FF	FS	¼	╝	╦	▒	∞	n
D	CR	GS	-	=	M	]	m	}	CR	GS	¡	╜	═	▒	ø	²
E	SO	RS	.	>	N	^	n	~	SO	RS	«	╛	╬	▒	ε	■
F	SI	US	/	?	O	_	o	DEL	SI	US	»	┐	╧	▒	∩	SP

IBM PC character set 2



L\H	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1	SOH	DC1	!	1	A	Q	a	q	ü	æ	í	┴	┬	╤	ß	±
2	STX	DC2	"	2	B	R	b	r	é	Æ	ó	┼	├	╥	Γ	≥
3	♥	DC3	#	3	C	S	c	s	â	ô	ú	├	─	╙	π	≤
4	♦	DC4	$	4	D	T	d	t	ä	ö	ñ	┤	┼	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	╞	╒	σ	⌡
6	♠	SYN	&	6	F	V	f	v	å	û	ª	╢	╟	╓	µ	÷
7	BEL	ETB	'	7	G	W	g	w	ç	ù	º	╖	╫	╫	τ	≈
8	BS	CAN	(	8	H	X	h	x	ê	ÿ	¿	╕	╪	┘	Φ	°
9	HT	EM	)	9	I	Y	i	y	ë	Ö	⌐	╣	┘	┌	Θ	∙
A	LF	SUB	*	:	J	Z	j	z	è	Ü	¬	║	╔	▒	Ω	·
B	VT	ESC	+	;	K	[	k	{	ï	¢	½	╗	╩	▒	δ	√
C	FF	FS	,	<	L	\	l	|	î	£	¼	╝	╦	▒	∞	n
D	CR	GS	-	=	M	]	m	}	ì	¥	¡	╜	═	▒	ø	²
E	SO	RS	.	>	N	^	n	~	Ä	₧	«	╛	╬	▒	ε	■
F	SI	US	/	?	O	_	o	DEL	Å	ƒ	»	┐	╧	▒	∩	SP

(2) Basic character sets for ESC/P2 emulation

The three basic character sets available for ESC/P2 emulation are shown below. The characters for decimal codes 128 to 255 (hex 80 to FF) differ for each set.

Italic Character Set

L/H	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p	NUL	DLE	SP	*0*	*@*	*P*	*`*	*p*
1	SOH	DC1	!	1	A	Q	a	q	SOH	DC1	*!*	*1*	*A*	*Q*	*a*	*q*
2	STX	DC2	"	2	B	R	b	r	STX	DC2	*"*	*2*	*B*	*R*	*b*	*r*
3	ETX	DC3	#	3	C	S	c	s	ETX	DC3	*#*	*3*	*C*	*S*	*c*	*s*
4	EOT	DC4	$	4	D	T	d	t	EOT	DC4	*$*	*4*	*D*	*T*	*d*	*t*
5	ENQ	NAK	%	5	E	U	e	u	ENQ	NAK	*%*	*5*	*E*	*U*	*e*	*u*
6	ACK	SYN	&	6	F	V	f	v	ACK	SYN	*&*	*6*	*F*	*V*	*f*	*v*
7	BEL	ETB	'	7	G	W	g	w	BEL	ETB	*'*	*7*	*G*	*W*	*g*	*w*
8	BS	CAN	(	8	H	X	h	x	BS	CAN	*(*	*8*	*H*	*X*	*h*	*x*
9	HT	EM	)	9	I	Y	i	y	HT	EM	*)*	*9*	*I*	*Y*	*i*	*y*
A	LF	SUB	*	:	J	Z	j	z	LF	SUB	*	*:*	*J*	*Z*	*j*	*z*
B	VT	ESC	+	;	K	[	k	{	VT	ESC	+	*;*	*K*	*[*	*k*	*{*
C	FF	FS	,	<	L	\	l	|	FF	FS	,	<	*L*	**	*l*	*/*
D	CR	GS	-	=	M	]	m	}	CR	GS	-	=	*M*	*]*	*m*	*}*
E	SO	RS	.	>	N	^	n	~	SO	RS	.	>	*N*	^	*n*	~
F	SI	US	/	?	O	_	o	DEL	SI	US	/	?	*O*	_	*o*	SP

Graphics Characer Set 1

L/H	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p	NUL	DLE	á	▒	└	╨	α	≡
1	SOH	DC1	!	1	A	Q	a	q	SOH	DC1	í		┴	╤	ß	±
2	STX	DC2	"	2	B	R	b	r	STX	DC2	ó		┬	╔	Γ	≥
3	ETX	DC3	#	3	C	S	c	s	ETX	DC3	ú		├	╘	π	≤
4	EOT	DC4	$	4	D	T	d	t	EOT	DC4	ñ		─	╒	Σ	⌠
5	ENQ	§	%	5	E	U	e	u	ENQ	NAK	Ñ		┼	╓	σ	⌡
6	ACK	SYN	&	6	F	V	f	v	ACK	SYN	ª		╞	╫	µ	÷
7	BEL	ETB	'	7	G	W	g	w	BEL	ETB	º		╟	╪	τ	≈
8	BS	CAN	(	8	H	X	h	x	BS	CAN	¿		╚	┘	Φ	°
9	HT	EM	)	9	I	Y	i	y	HT	EM	⌐		╔	┌	Θ	•
A	LF	SUB	*	:	J	Z	j	z	LF	SUB	¬		╩	▄	Ω	·
B	VT	ESC	+	;	K	[	k	{	VT	ESC	½		╦	▌	δ	√
C	FF	FS	,	<	L	\	l	|	FF	FS	¼		═	▐	∞	n
D	CR	GS	-	=	M	]	m	}	CR	GS	¡		╬	▀	ø	2
E	SO	RS	.	>	N	^	n	~	SO	RS	«		╧	■	ε	■
F	SI	US	/	?	O	_	o	DEL	SI	US	»		╤	▌	∩	SP

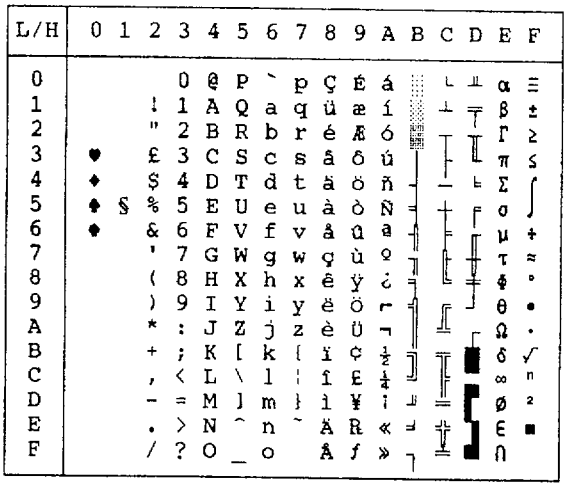
Graphics Character Set 2

L/H	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	DLE	SP	0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1	SOH	DC1	!	1	A	Q	a	q	ü	æ	í		┴	╤	ß	±
2	STX	DC2	"	2	B	R	b	r	é	Æ	ó		┬	╔	Γ	≥
3	ETX	DC3	#	3	C	S	c	s	â	ô	ú		├	╘	π	≤
4	EOT	DC4	$	4	D	T	d	t	ä	ö	ñ		─	╒	Σ	⌠
5	ENQ	§	%	5	E	U	e	u	à	ò	Ñ		┼	╓	σ	⌡
6	ACK	SYN	&	6	F	V	f	v	å	û	ª		╞	╫	µ	÷
7	BEL	ETB	'	7	G	W	g	w	ç	ù	º		╟	╪	τ	≈
8	BS	CAN	(	8	H	X	h	x	ê	ÿ	¿		╚	┘	Φ	°
9	HT	EM	)	9	I	Y	i	y	ë	Ö	⌐		╔	┌	Θ	•
A	LF	SUB	*	:	J	Z	j	z	è	Ü	¬		╩	▄	Ω	·
B	VT	ESC	+	;	K	[	k	{	ï	ç	½		╦	▌	δ	√
C	FF	FS	,	<	L	\	l	|	î	£	¼		═	▐	∞	n
D	CR	GS	-	=	M	]	m	}	ì	¥	¡		╬	▀	ø	2
E	SO	RS	.	>	N	^	n	~	Ä	₧	«		╧	■	ε	■
F	SI	US	/	?	O	_	o	DEL	Å	ƒ	»		╤	▌	∩	SP

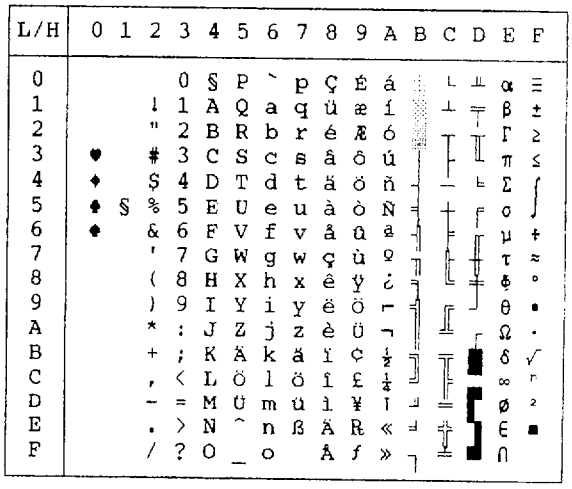
(3) National character sets available for all emulations

The 50 national character sets available for all emulations are shown below. They support different characters and symbols specific to different languages. Note that these tables are for a resident Courier 10 font. Some national character sets do not have some characters and symbols and may not be usable depending on resident fonts. See Item (6) for details.

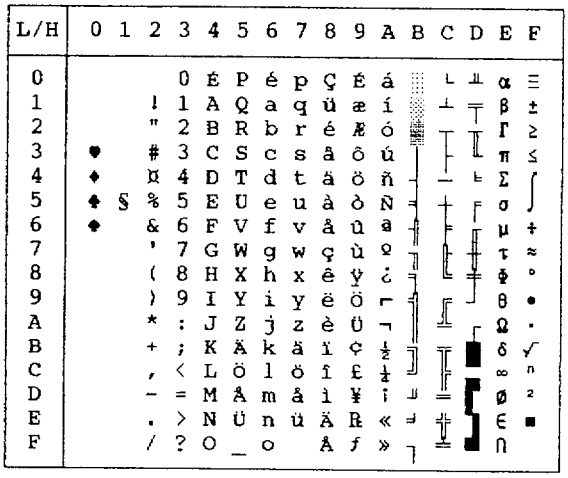
UK (British English)



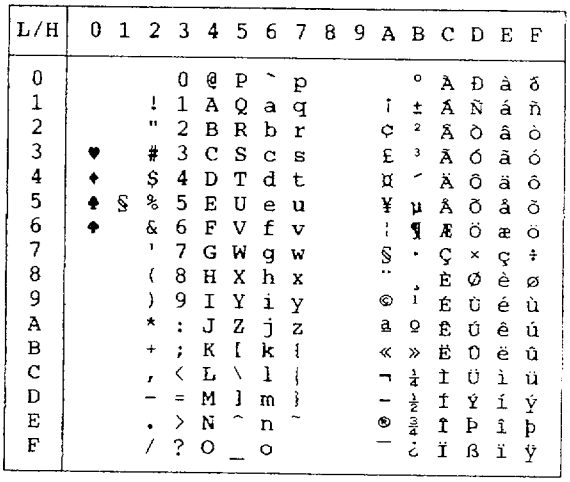
GERMAN (German)



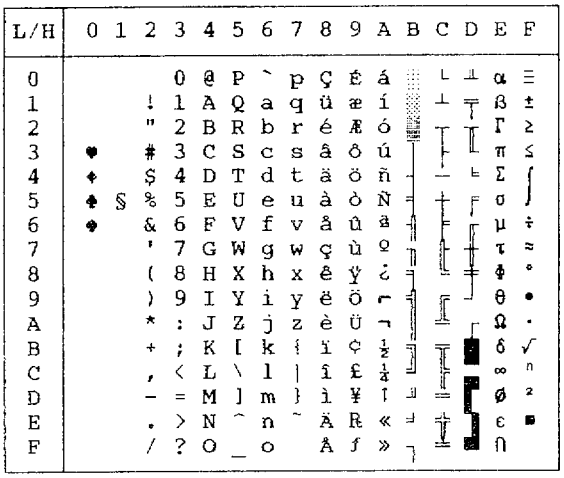
SWEDISH (Swedish)



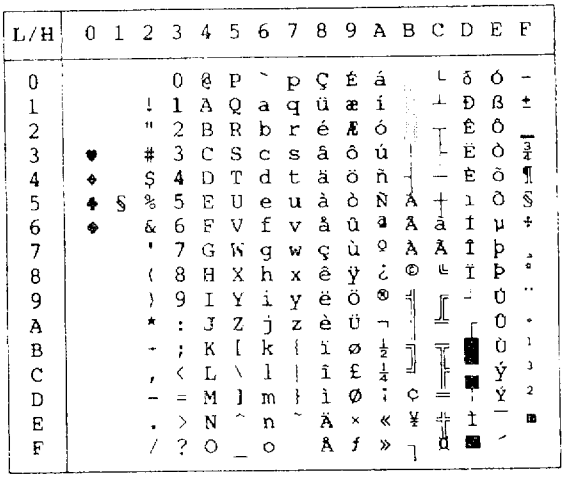
ISO8859/ECMA94 (ISO 8859-1/ECMA94)



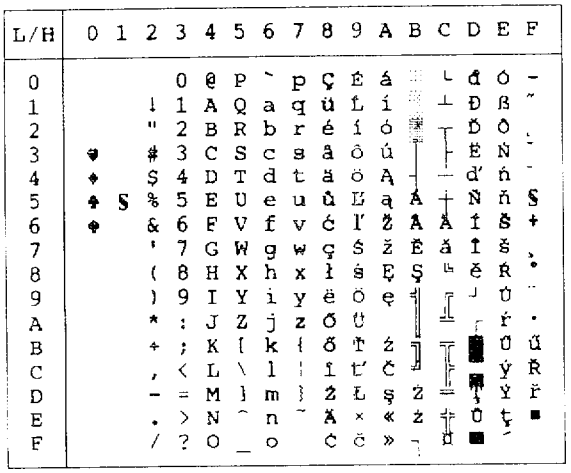
PAGE437/USA (Code Page 437/USA)



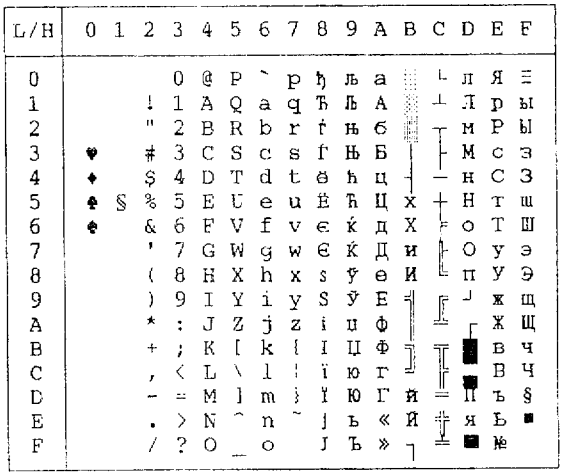
PAGE850 (Code Page 850 (Multilingual))



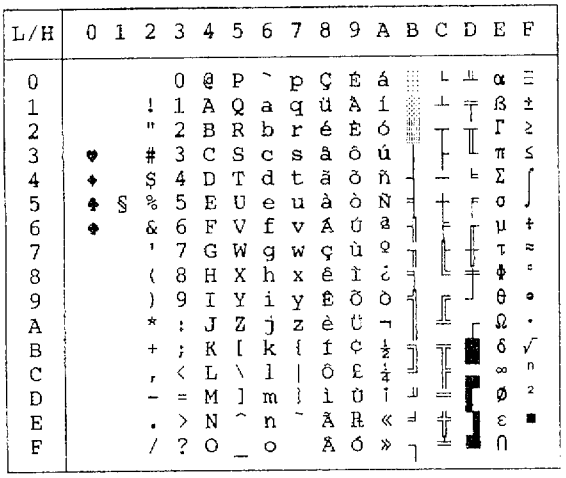
PAGE852/PAGE852-T (Code Page 852)



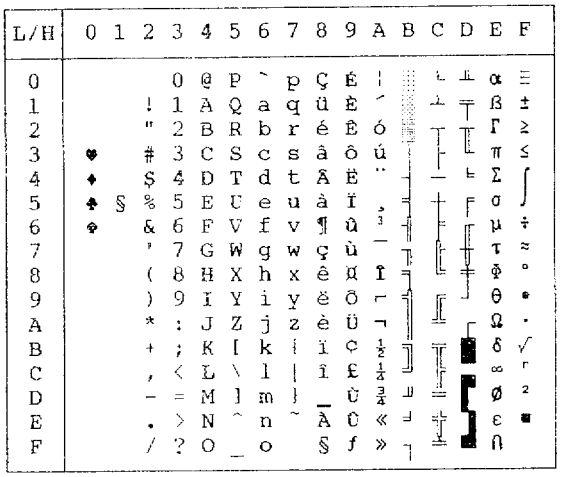
PAGE855 (Code Page 855)



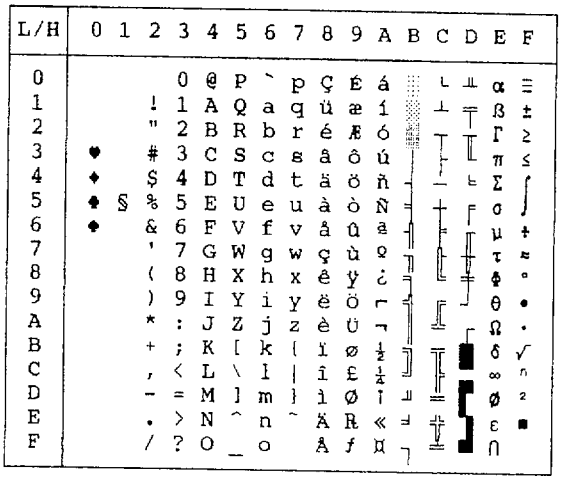
PAGE860 (Code Page 860 (Portugal))



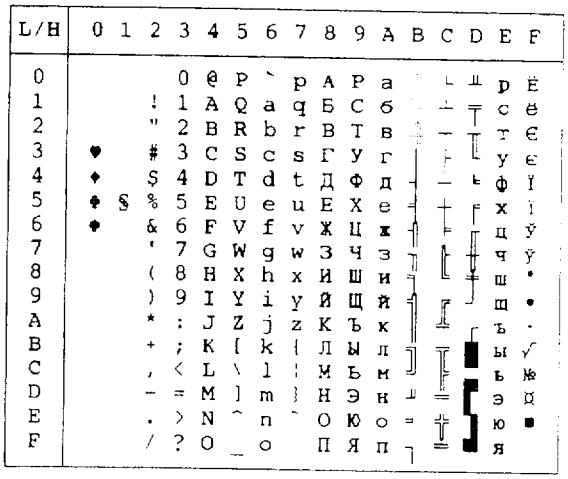
PAGE863 (Code Page 863 (Canada-French))



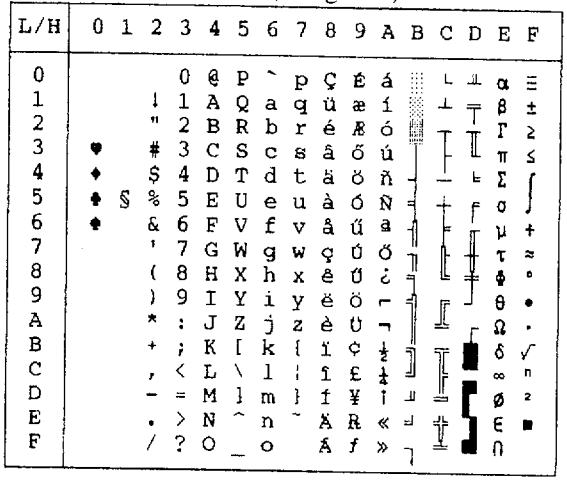
PAGE865 (Code Page 865 (Nordic))



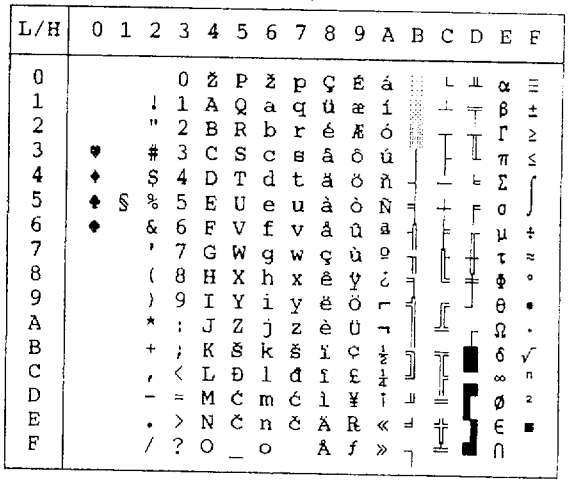
PAGE866 (Code Page 866 (Cyrillic))



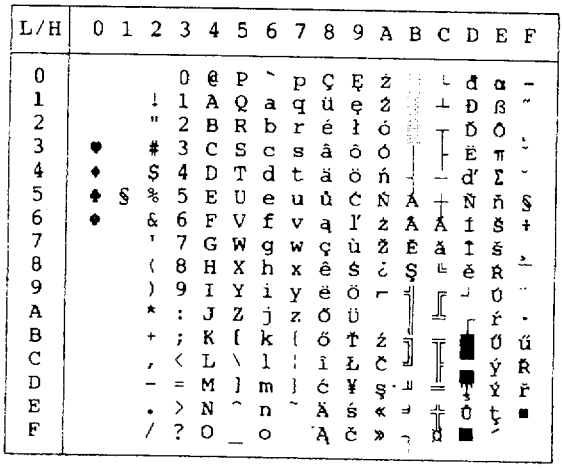
HUNGARY/HUNG-T (Hungarian)



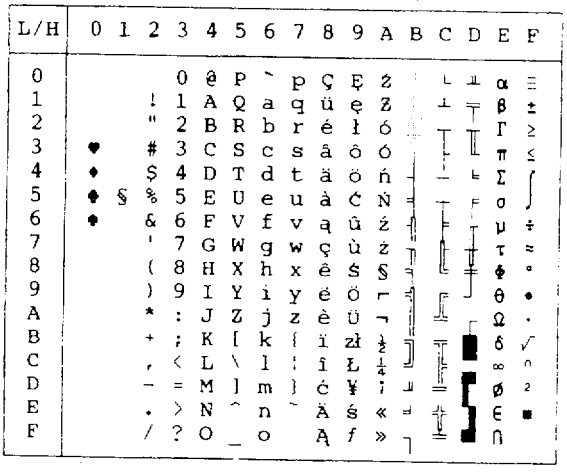
SLOV/SLOV-T (slovenian)



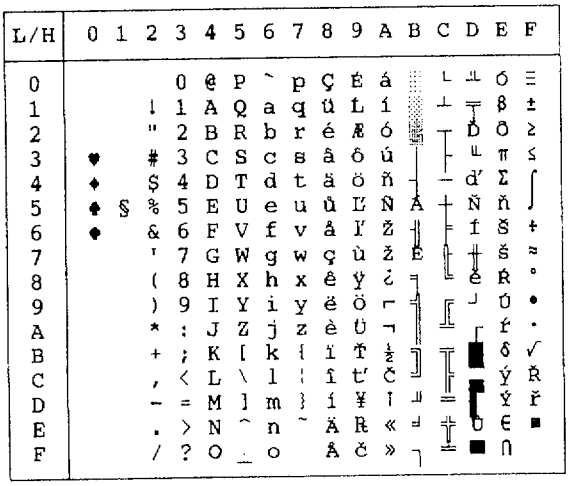
POLISH/POLISH-T (Polish)



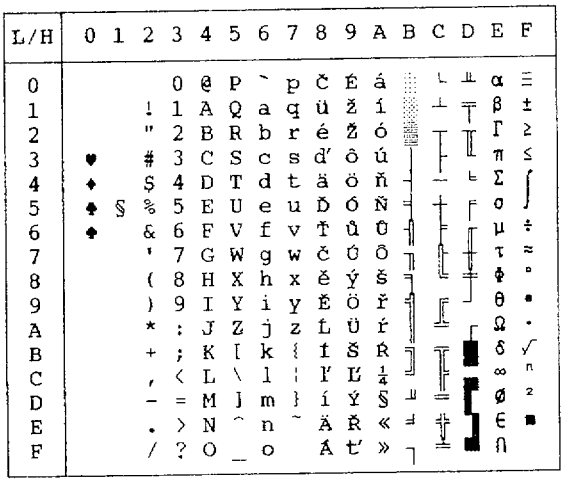
MAZOWIA/MAZOW-T (Mazowian)



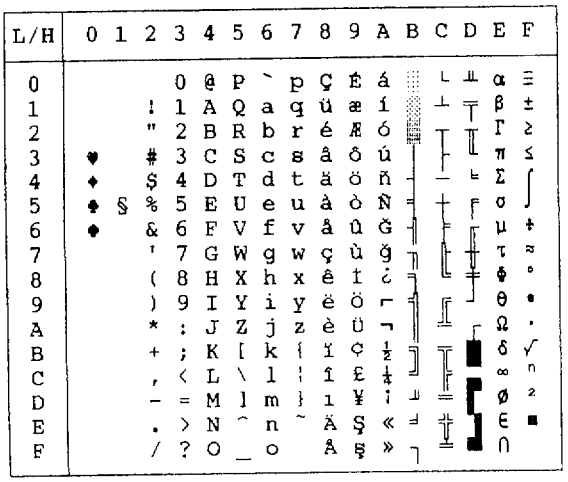
LATIN2/LATN2-T (Latin2)



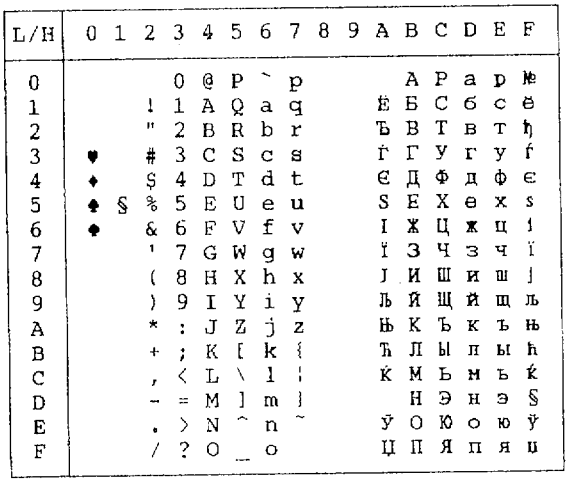
KAMENIC/KAMEN-T (Kamenicky)



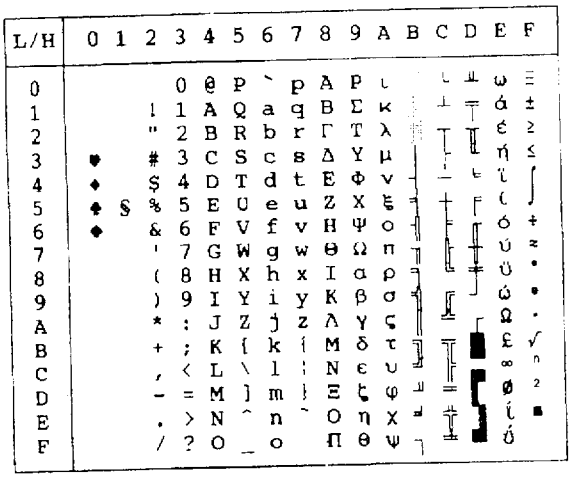
TURKY/TURKY-T (Turkish)



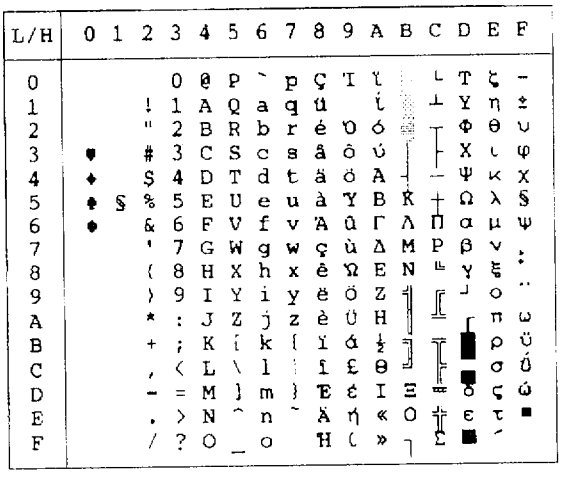
CYRILIC (Cyrillic)



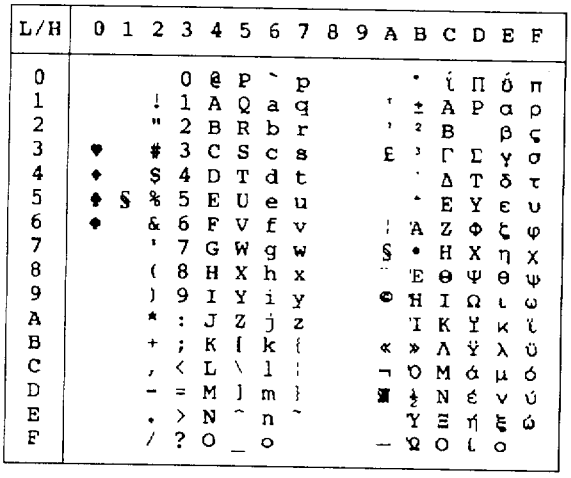
IBM437 (IBM 437)



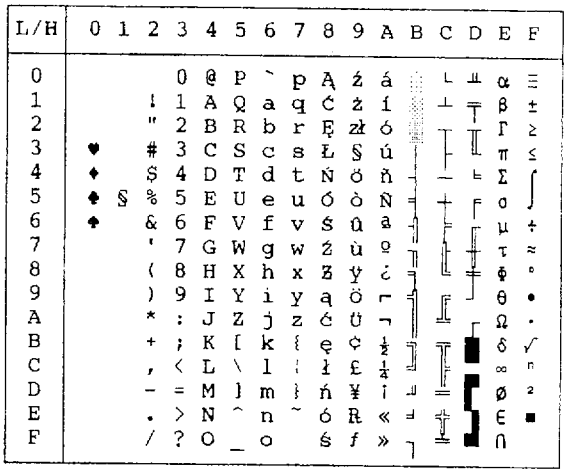
IBM851 (IBM 851)



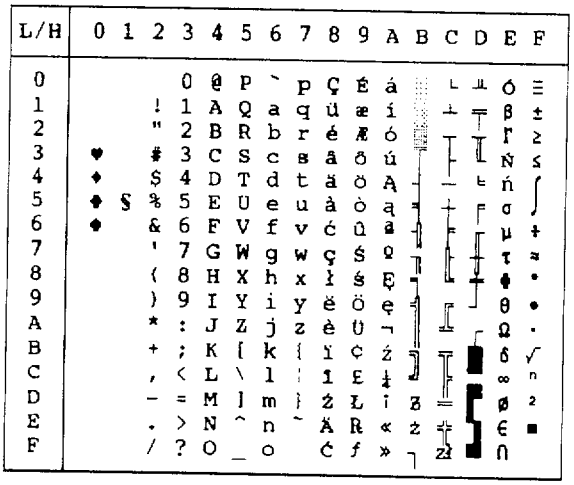
ELOT928 (ELOT 928)



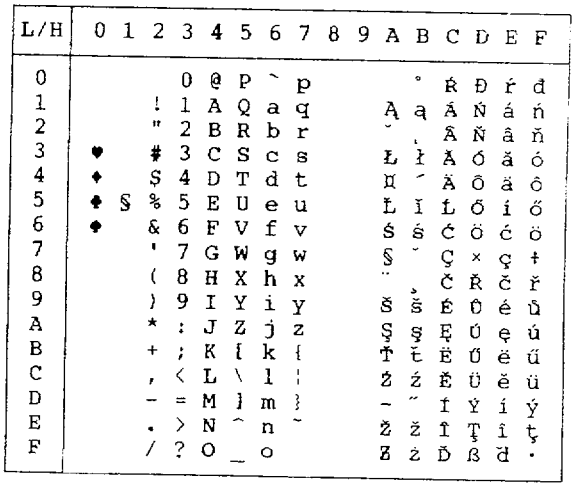
PG-DHN (Code Page DHN)



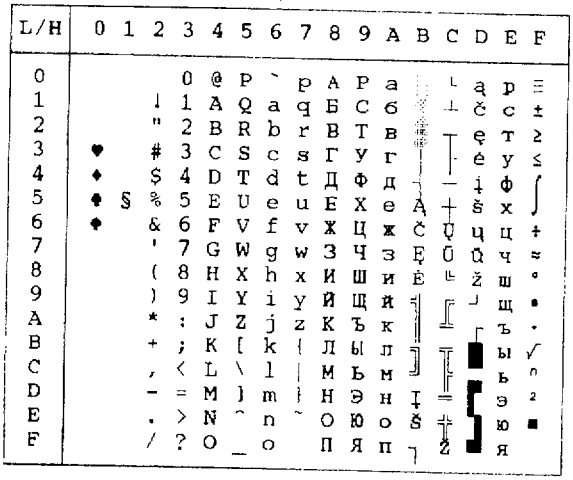
LATIN-P (Latin Polish)



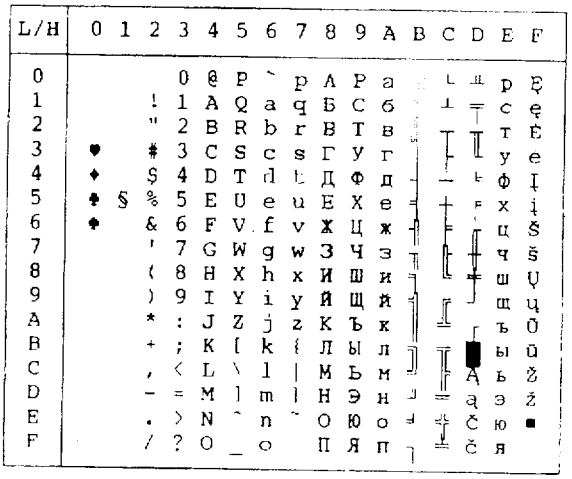
ISO-LTN (ISO Latin)



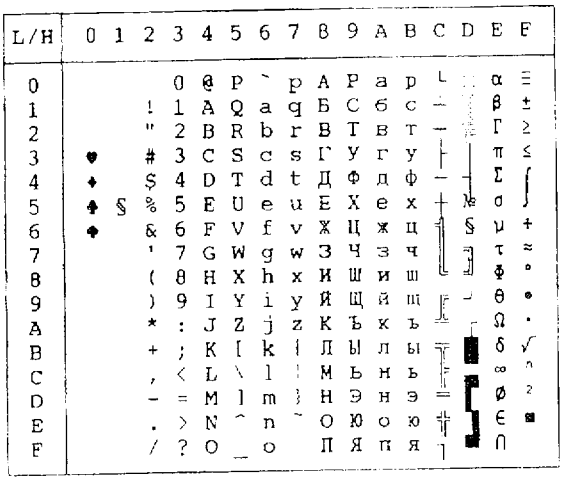
LITHUA1 (Lithuanian1)



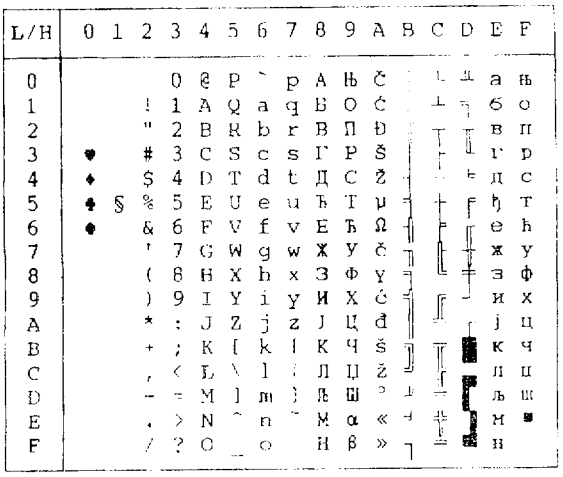
LITHUA2 (Lithuanian2)



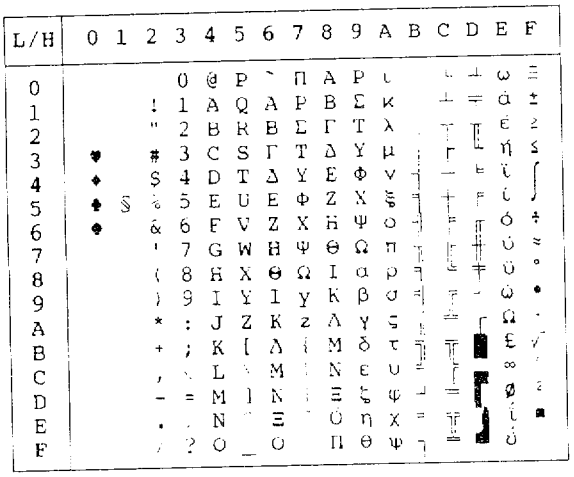
MIK



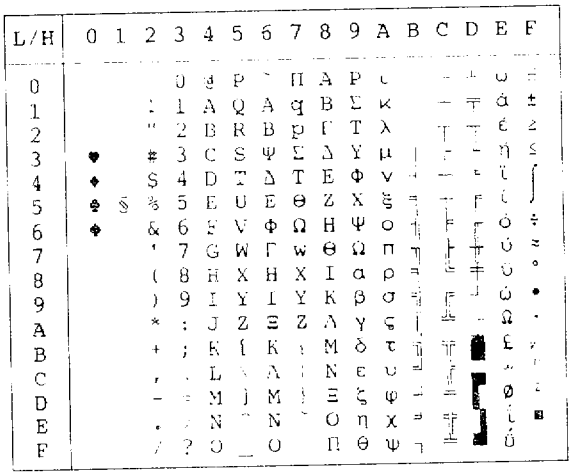
MACEDON (Macedonian)



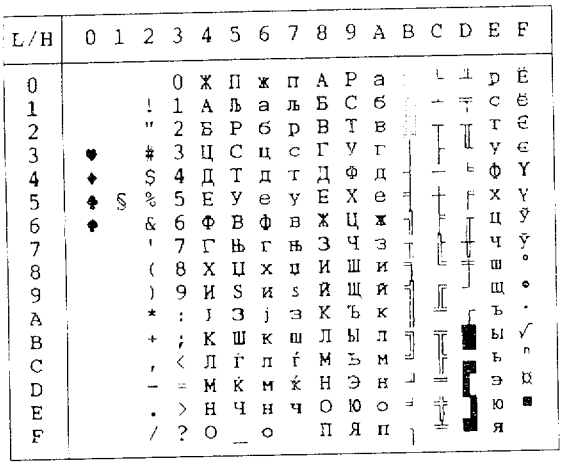
ABG



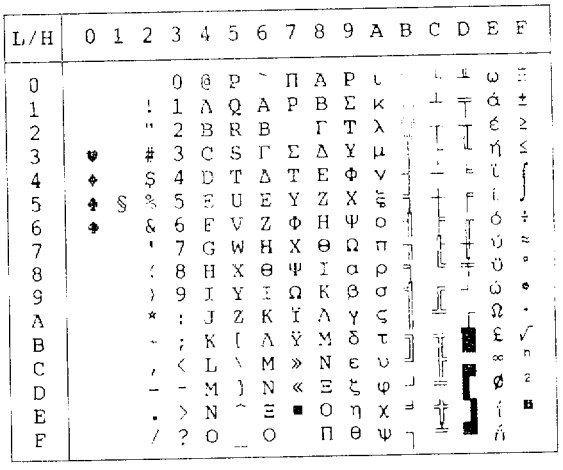
ABY



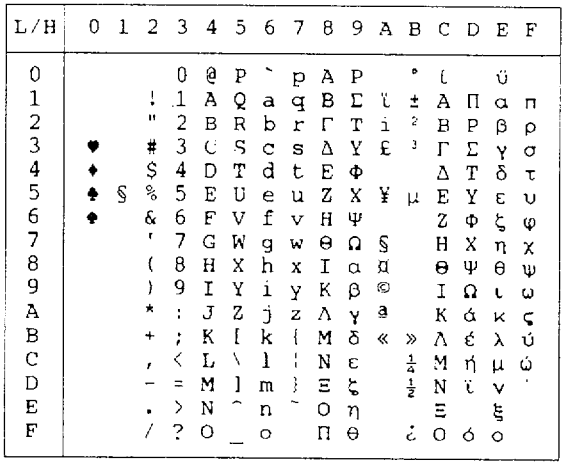
PG-MAC (Code Page MAC)



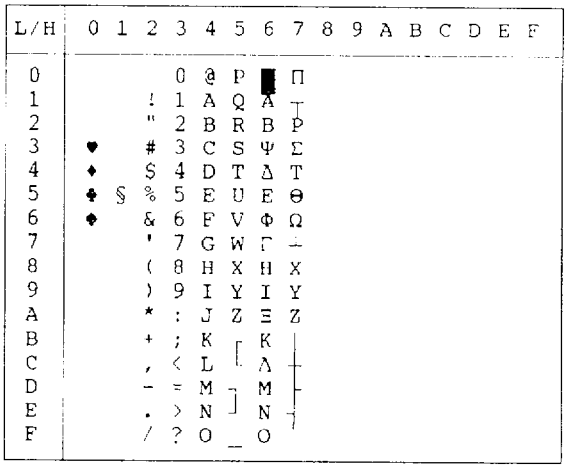
ELOT 927



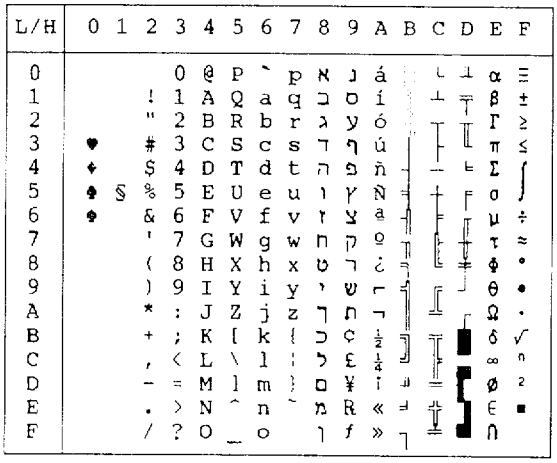
DEC GR (DEC Greek)



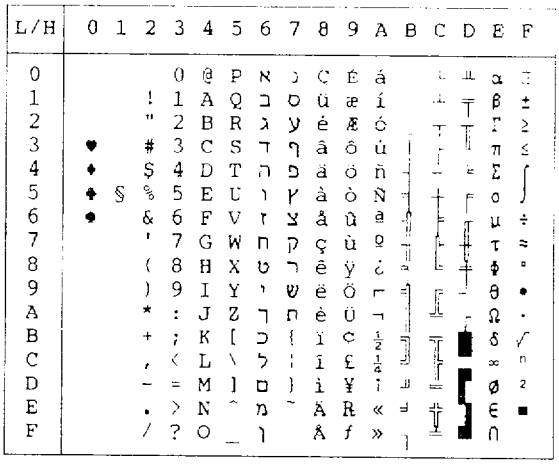
GREEK 11 (Greek 11)



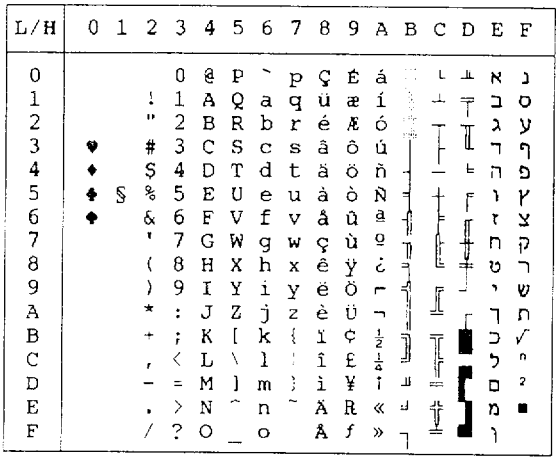
Page 862 (Code Page 862)



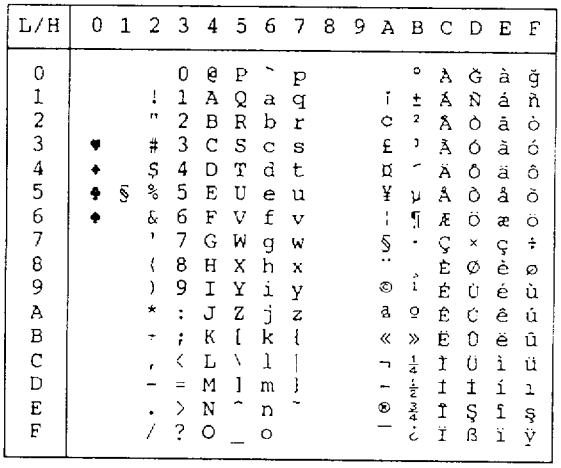
HBR OLD (Hebrew Old)



HBR DEC (Hebrew DEC)



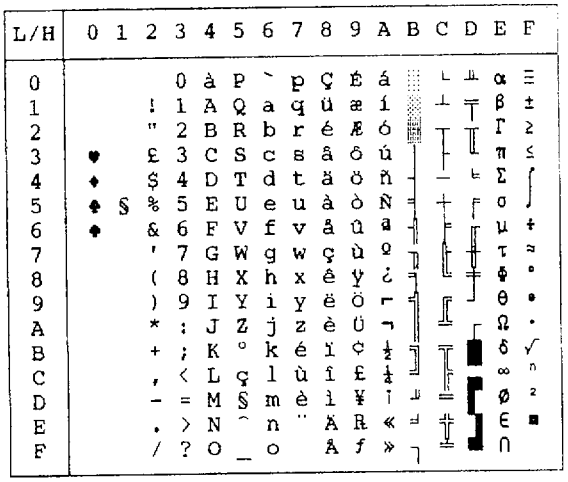
ISO-TUK (ISO Turkish)



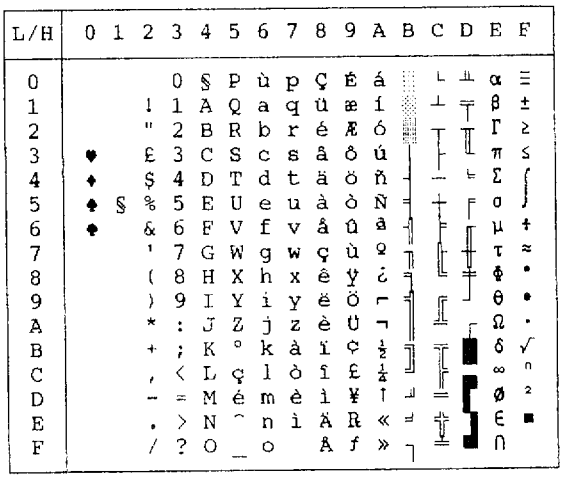
(4) National character sets available for DPL24C PLUS and IBM XL24E emulation

National character sets available in the DPL24C PLUS command set and the IBM Proprinter XL24E emulation are shown below. These are based on Code Page 437 (USA) and modified proper for the language.

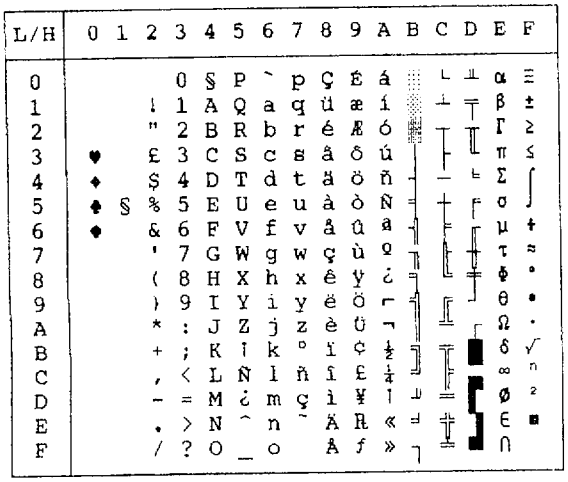
FRENCH (French)



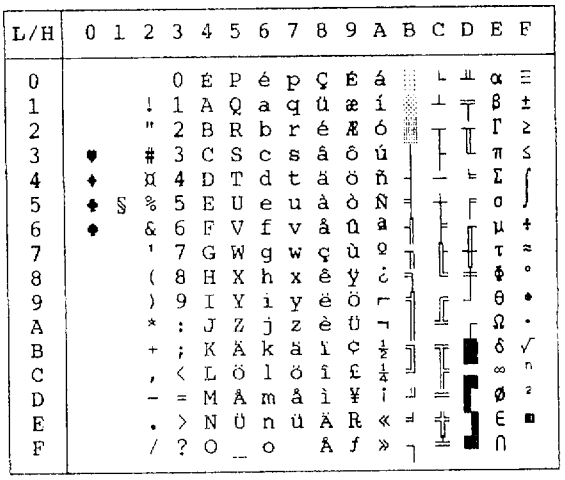
ITALIAN (Italian)



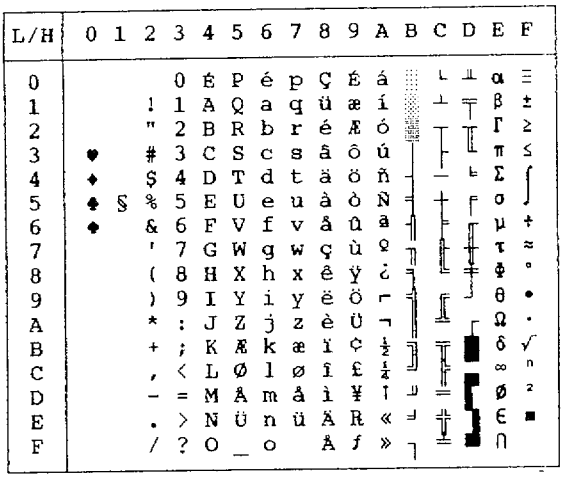
SPANISH (Spanish)



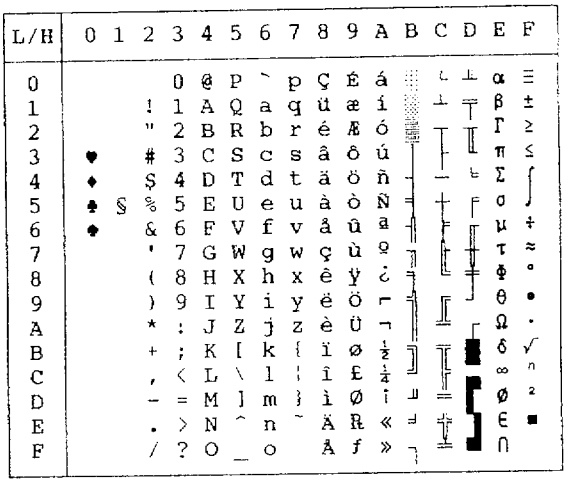
FINNISH (Finnish)



DANISH1/NORWEGN (Danish1/Norwegian)



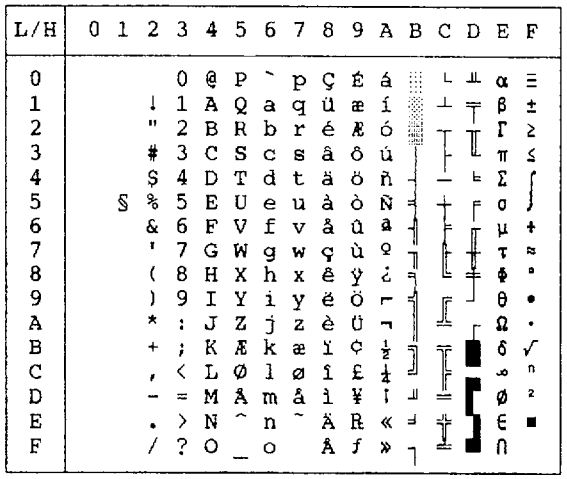
DANISH2 (Danish2)



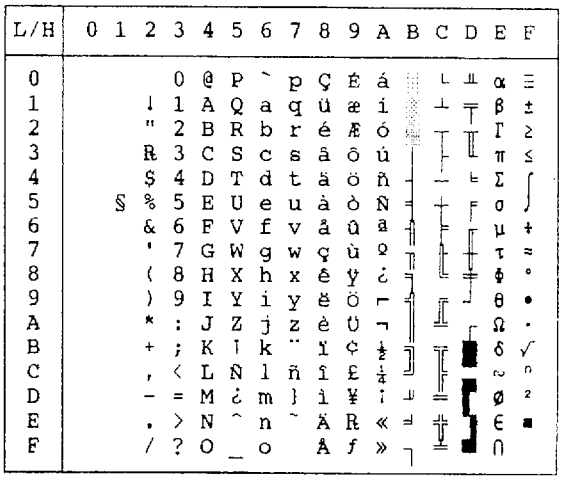
(5) National character sets available for ESC/P2 emulation

National character sets available for the Epson ESC/P2 emulation are shown below. These are are based on Graphics character set 2 and modified proper for the language.

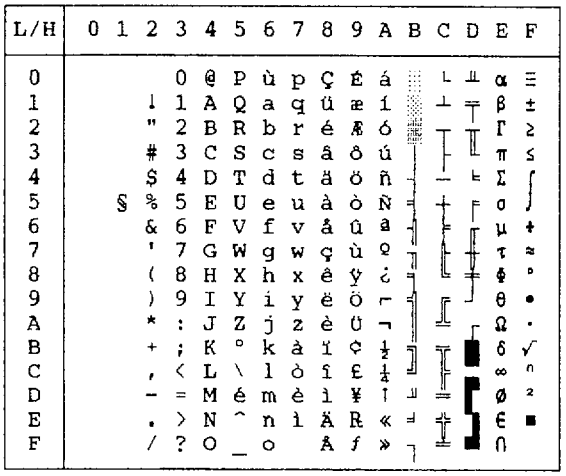
DANISH1 (Danish1)



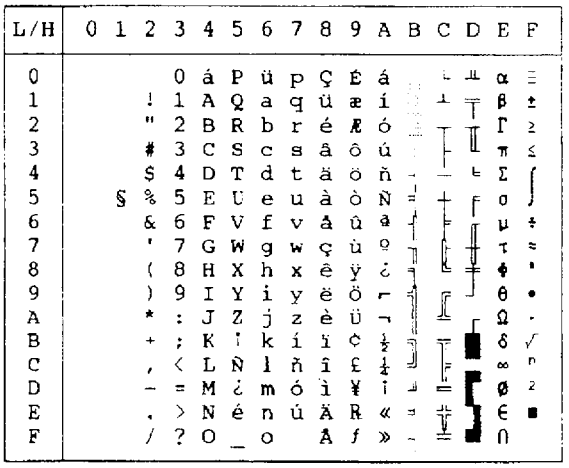
SPANISH1 (spanish1)



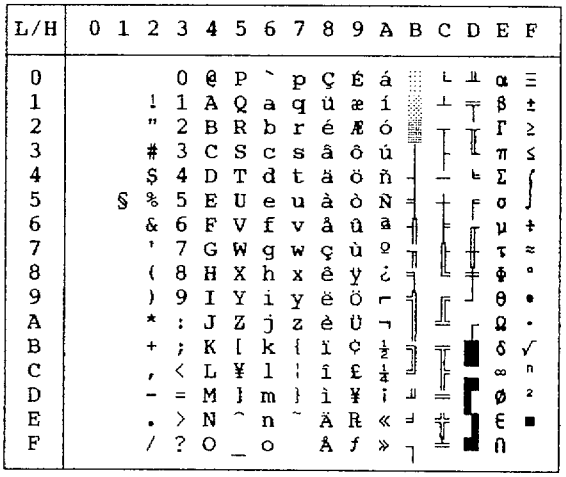
ITALIAN (Italian)



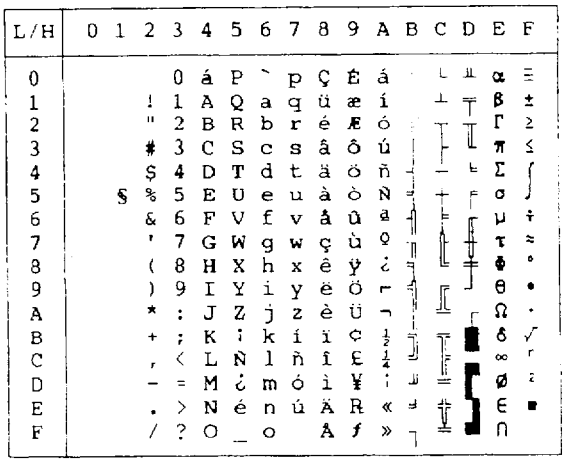
SPANISH2 (Spanish2)



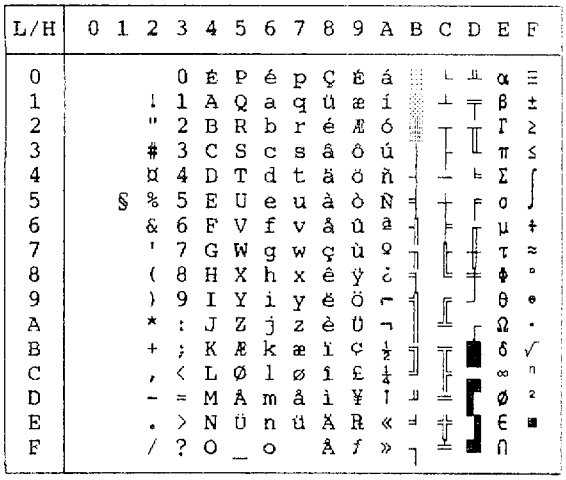
JAPAN (Japanese)



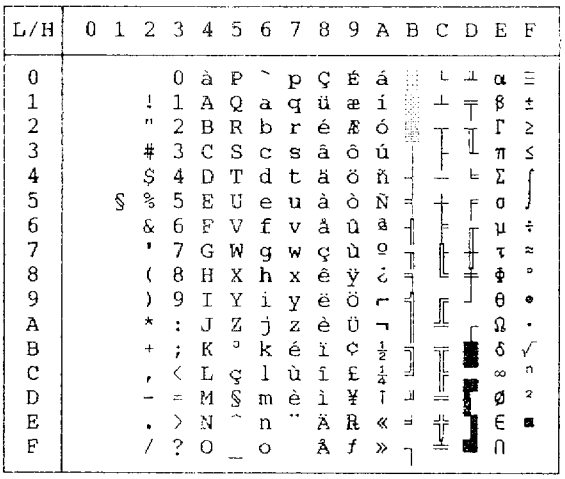
LATIN A (Latin American)



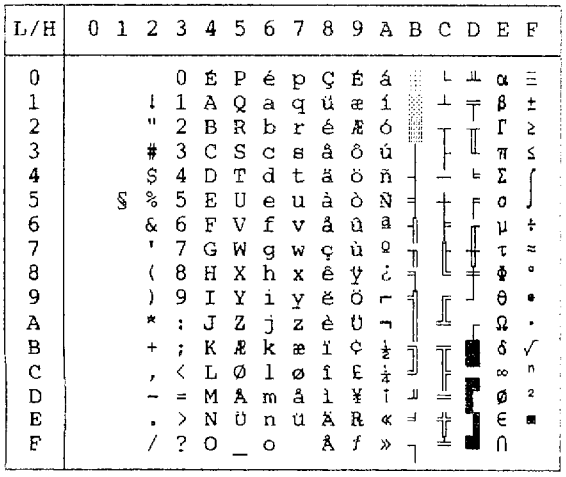
NORWEGN (Norwegian)



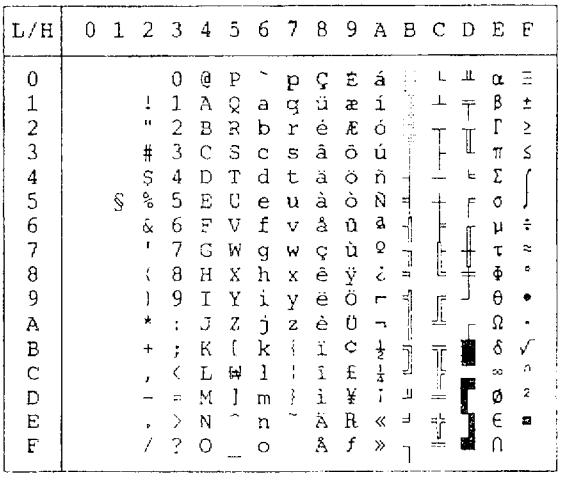
FRENCH (French)



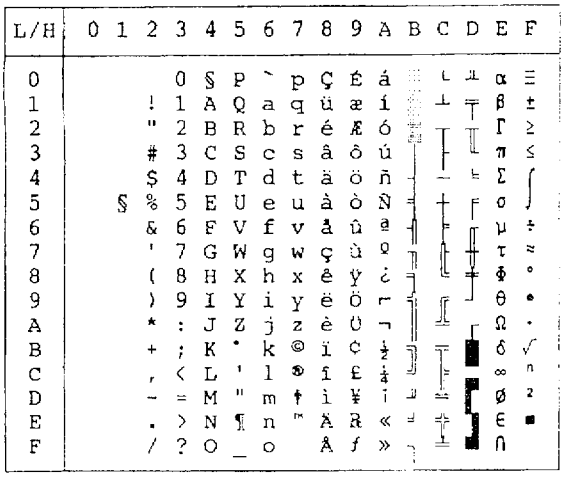
DANISH2 (Danish2)



KOREA (Korea)



LEGAL (Legal)



(6) Restrictions on national character sets supported in all emulations

In all emulations, this printer supports 50 national character sets for characters and symbols specific to different languages. Some national character sets, however, do not have specific characters and symbols and may not be usable, depending on resident fonts. The following table shows which resident fonts are supported for each national character set:

National character set	Name in setup menu	Courier 10	Elite 12	Compress	Draft	Bold PS	Pica 10	Courier scalable (*1)	Timeless (*1)	Nimbus Sans (*1)	Correspondence	OCR-B	OCR-A
USA (*2)	USA	√	√	√	√	√	√	√	√	√	√	√	√
United Kingdom	UK	√	√	√	√	√	√	√	√	√	√	√	
German	GERMAN	√	√	√	√	√	√	√	√	√	√	√	
Swedish	SWEDISH	√	√	√	√	√	√	√	√	√	√	√	
ISO 8859-1	ISO8859	√	√	√	√	√	√	√	√	√	√	√	
ECMA 94	ECMA94	√	√	√	√	√	√	√	√	√	√	√	
Code Page 437 (*2)	PAGE437	√	√	√	√	√	√	√	√	√	√	√	√
Code Page 850	PAGE850	√	√	√	√	√	√	√	√	√	√	√	
Code Page 852	PAGE852	√	√	√	√	√	√	√	√	√	√		
Code Page 852 two-pass	PAGE852-T	√	√	√	√	√	√	√	√	√	√		
Code Page 855	PAGE855	√	√	√	√			√	√	√			
Code Page 860	PAGE860	√	√	√	√	√	√	√	√	√	√	√	
Code Page 863	PAGE863	√	√	√	√	√	√	√	√	√	√	√	
Code Page 865	PAGE865	√	√	√	√	√	√	√	√	√	√	√	
Code Page 866	PAGE866	√	√	√	√			√	√	√			
Hungarian	HUNGARY	√	√	√	√	√	√	√	√	√	√		
Hungarian two-pass	HUNG-T	√	√	√	√	√	√	√	√	√	√		
Slovenian	SLOV	√	√	√	√	√	√	√	√	√	√	√	
Slovenian two-pass	SLOV-T	√	√	√	√	√	√	√	√	√	√		
Polish	POLISH	√	√	√	√	√	√	√	√	√	√		
Polish two-pass	POLSH-T	√	√	√	√	√	√	√	√	√	√		
Mazowian	MAZOWIA	√	√	√	√	√	√				√		
Mazowian two-pass	MAZOW-T	√	√	√	√	√	√				√		
Latin 2	LATIN2	√	√	√	√	√	√	√	√	√	√		
Latin 2 two-pass	LATN2-T	√	√	√	√	√	√	√	√	√	√		
Kamenicky	KAMENIC	√	√	√	√	√	√	√	√	√	√		
Kamenicky two-pass	KAMEN-T	√	√	√	√	√	√	√	√	√	√		
Turkish	TURKY	√	√	√	√	√	√	√	√	√	√		
Turkish two-pass	TURKY-T	√	√	√	√	√	√	√	√	√	√		
Cyrillic	CYRILIC	√	√	√	√			√	√	√			
IBM 437	IBM437	√	√	√	√			√	√	√			
IBM 851	IBM851	√	√	√	√			√	√	√			
ELOT 928	ELOT928	√	√	√	√								
Code Page DHN	PG-DHN	√	√	√	√	√	√				√		
Latin Polish	LATIN-P	√	√	√	√	√	√				√		
ISO Latin	ISO-LTN	√	√	√	√	√	√				√		
Lithuanian 1	LITHUA1	√	√	√	√								
Lithuanian 2	LITHUA2	√	√	√	√								

*1 These are scalable and provided with upright, italic, and bold as resident fonts.
*2 USA is the same as Code Page 437.
√ Supported

Resident font		Courier 10	Elite 12	Compress	Draft	Bold PS	Pica 10	Courier scalable (*1)	Timeless (*1)	Nimbus Sans (*1)	Correspondence	OCR-B	OCR-A
National character set	Name in setup menu												
MIK	MIK	√	√	√	√			√	√	√			
Macedonian	MACEDON	√	√	√	√			√	√	√			
ABG	ABG	√	√	√	√			√	√	√			
ABY	ABY	√	√	√	√			√	√	√			
Code Page MAC	PG-MAC	√	√	√	√			√	√	√			
ELOT 927	ELOT 927	√	√	√	√			√	√	√			
DEC Greek	DEC GR	√	√	√	√			√	√	√			
Greek 11	GREEK 11	√	√	√	√			√	√	√			
Code Page 862	PG 862	√	√	√	√	√	√						
Hebrew Old	HBR-OLD	√	√	√	√	√	√						
Hebrew DEC	HBR-DEC	√	√	√	√	√	√						
ISO Turkish	ISO-TUK	√	√	√	√	√	√						

*1 These are scalable and provided in upright, italic, and bold as resident fonts.
√ Supported

APPENDIX B RESIDENT FONTS

The DL6000Pro series has the following 18 fonts resident in ROM. The last four fonts print faster than the letter-quality fonts but have lower resolution.

This appendix gives examples of resident fonts.

- 15 letter-quality fonts
  - 6 bitmap fonts
    - Courier 10
    - Pica 10
    - OCR-B 10
    - OCR-A 10
    - Prestige Elite 12
    - Boldface PS
  - 9 scalable fonts
    - Courier (upright, italic, bold)
    - Nimbus Sans (upright, italic, bold)
    - Timeless (upright, italic, bold)
- Correspondence font
- Compression font
- Draft-quality font

The printer can produce italic, condensed, shadow, and bold characters by software, based on control panel specifications. Various print modes are also available using printer commands.

Courier 10

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Pica 10

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Prestige Elite 12

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Bold face PS

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

OCR-B 10

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

OCR-A 10

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Courier Upright

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Courier Bold

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Courier Italic

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Nimbus Sans Upright

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Nimbus Sans Bold

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Nimbus Sans Italic

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Timeless Upright

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Timeless Bold

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Timeless Italic

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Correspondence

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Draft

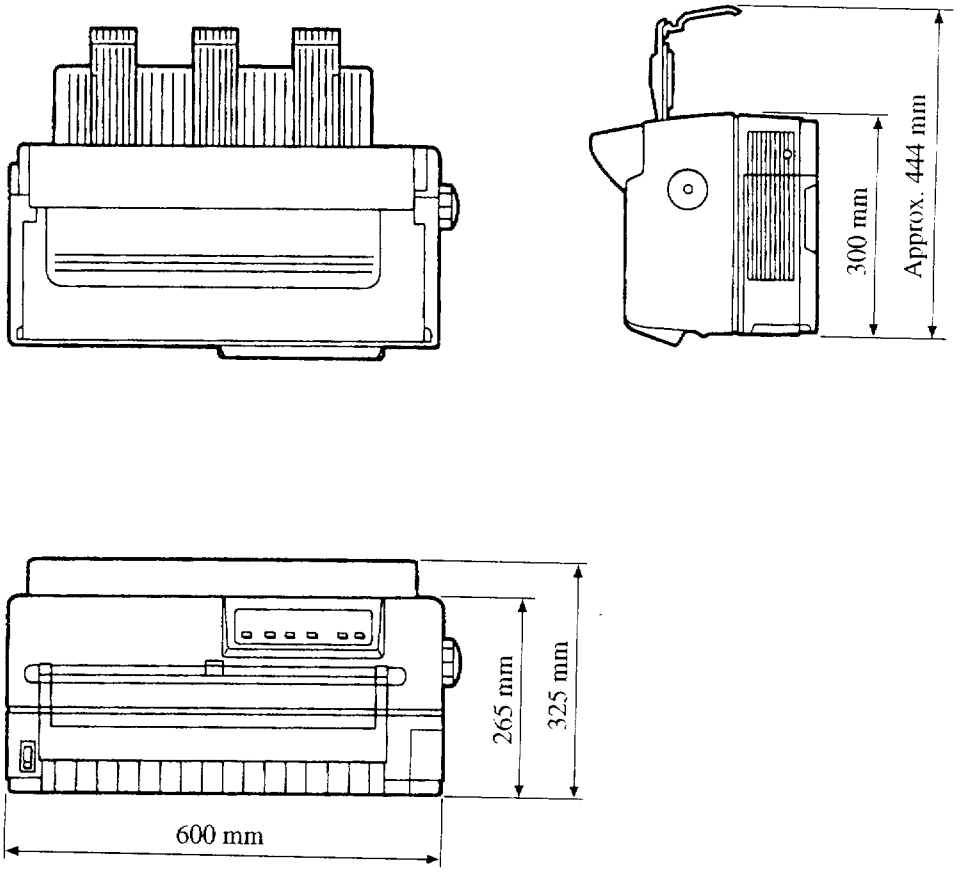
The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

Compressed

The 24-wire dot-matrix printer prints quality characters and symbols using a variety of sizes and fonts.

APPENDIX C PRINTER DIMENSIONS AND LOGO

(1) Dimensions



(2) Table of logo and labels

Logogram and Labels	Position
Logo	front side
Regulation Approved Label	rear side
Specifications, Number and Revision Label	rear side


FUJITSU