

Operating Instructions

Impact Dot Matrix Printer

KX-P1124*i*



Panasonic

Before operating this unit, please read these instructions completely

FOR USE IN U.K.

IMPORTANT:

The wires in the main leads are coloured in accordance with the following code:

| | |
|-------------------|---------|
| Green and yellow: | Earth |
| Blue: | Neutral |
| Brown: | Live |

As the colours of the wires in the main lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

- The wire which is coloured green and yellow must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol \perp or coloured green or green-and yellow.
- The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
- The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

WARNING: This apparatus must be earthed.

- This equipment is produced to BS800: 1988.

Any details given in these Operating Instructions are subject to change without notice.

WARNING

- Power source voltage of this unit is listed on the nameplate. Do not fail to plug the printer into an outlet with the proper voltage.
- To prevent fire or shock hazard, do not expose this product to rain or any type of moisture.
- When you operate this equipment, the socket-outlet shall be near the equipment and shall be easily accessible.

The serial number of the unit may be found on the label on the rear of the unit. For your convenience, note this number below, and retain this book, along with your proof of purchase, to serve as a permanent record of your purchase in the event of a theft, or for future reference.

MODEL NO. KX-P1124i NAME OF DEALER _____

SERIAL NO. _____ DATE OF PURCHASE _____

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Proprinter is a trademark of International Business Machines Corporation.

Microsoft is a registered trademark of Microsoft Corporation.

Apple is a registered trademark of Apple Computer, Inc.

Epson is a registered trademark of Seiko Epson Corporation.

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


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1. Introduction

1.1 Product Overview

This printer is a versatile, high quality 24-pin dot matrix printer which is designed to meet the needs of your office.

This printer features the EZ Set Operator Panel that lets you control a wide variety of printing conditions quickly and conveniently from the panel. The EZ Set Operator Panel has 7 switches, 3 indicators and a 16-character Liquid Crystal Display (LCD) to guide you through the operations.

The EZ Set Operator Panel allows you to control more than 20 functions including:

- Font selections including 3 Draft, 7 Letter Quality (LQ) and 1 Super Letter Quality (SLQ) fonts
- Pitch selections including 5, 6, 7.5, 8.5, 10, 12, 15, 17, 20 cpi (characters per inch) and PS (Proportional Spacing)
- Lines Per Inch selections including 1~12 LPI
- Form Length selections including 0.1~14.9 inches
- Setting Left/Right and Top/Bottom margins
- Setting Quiet mode which reduces printing noise
- Load and Save the MACROs which store the printing condition
- P.CUT which raises the perforation to the tear bar; eliminates paper waste and maximizes printable area
- Setting Top of Form which stores the top margin according to the paper path used
- Display language selections including 5 languages
- And more . . .

The printer has landscape insertion capability (up to 11.7 inches) and 3 paper paths; front, rear and bottom.

The KX-P1124i offers burst speeds up to 300 cps (characters per second) in Draft-Micron pitch or 100 cps in LQ (Letter Quality)-Micron pitch.

The printer is equipped with an internal 12K buffer. An optional 32K buffer is available which expands the total buffer size to 44K. The entire buffer area can be used as a receiving buffer or a portion can be used as a download font area. The buffer area assignment is selected through EZ Set Operator Panel.

For software compatibility, this printer has two command sets: Epson LQ-850 and IBM Proprinter X24E. Either set can be selected from the EZ Set Operator Panel.

1.2 Specifications

| | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------|---|---------------------|---------------------|--|----------------------------------|--|--|--|-------|----|-----|-------------------------|--------|---------|---------|---------------------|---------------------|---------------------|---------------------|--------|---------------------|---------------------|---------------------|
| Power requirements: | Refer to the nameplate located on the rear of the printer. | | | | | | | | | | | | | | | | | | | | | | |
| Frequency: | | | | | | | | | | | | | | | | | | | | | | | |
| Current: | | | | | | | | | | | | | | | | | | | | | | | |
| Interface: | Centronics parallel RS-232C/Serial interface board [KX-PS10, KX-P19] (option) | | | | | | | | | | | | | | | | | | | | | | |
| Print fonts: | 3 Draft (Pica, Elite, Micron) 7 Letter Quality (Courier, Prestige, Bold PS, Script, Sans Serif, Orator, Roman) 1 Super Letter Quality (Roman) | | | | | | | | | | | | | | | | | | | | | | |
| Software Emulation: | Epson LQ-850, IBM Proprinter X24E | | | | | | | | | | | | | | | | | | | | | | |
| Character sets: | 96 ASCII characters, 96 Italic ASCII characters, 33 International characters —14 language sets+ Legal, 33 Italic International characters —14 language sets+ Legal, 158 IBM-PC special characters—sets 1 & 2, 38 Multilingual characters | | | | | | | | | | | | | | | | | | | | | | |
| Dot configuration: | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"></td> <td colspan="3" style="text-align: center;">1/127 inch (0.2 mm) dot diameter</td> </tr> <tr> <td></td> <td style="text-align: center;">Draft</td> <td style="text-align: center;">LQ</td> <td style="text-align: center;">SLQ</td> </tr> <tr> <td>Matrix (Hor. × Ver.)</td> <td style="text-align: center;">9 × 24</td> <td style="text-align: center;">30 × 24</td> <td style="text-align: center;">30 × 48</td> </tr> <tr> <td>Dot pitch (Hor.)</td> <td style="text-align: center;">1/120" (0.21 mm)</td> <td style="text-align: center;">1/360" (0.07 mm)</td> <td style="text-align: center;">1/360" (0.07 mm)</td> </tr> <tr> <td>(Ver.)</td> <td style="text-align: center;">1/180" (0.14 mm)</td> <td style="text-align: center;">1/180" (0.14 mm)</td> <td style="text-align: center;">1/360" (0.07 mm)</td> </tr> </table> | | | | 1/127 inch (0.2 mm) dot diameter | | | | Draft | LQ | SLQ | Matrix (Hor. × Ver.) | 9 × 24 | 30 × 24 | 30 × 48 | Dot pitch (Hor.) | 1/120" (0.21 mm) | 1/360" (0.07 mm) | 1/360" (0.07 mm) | (Ver.) | 1/180" (0.14 mm) | 1/180" (0.14 mm) | 1/360" (0.07 mm) |
| | 1/127 inch (0.2 mm) dot diameter | | | | | | | | | | | | | | | | | | | | | | |
| | Draft | LQ | SLQ | | | | | | | | | | | | | | | | | | | | |
| Matrix (Hor. × Ver.) | 9 × 24 | 30 × 24 | 30 × 48 | | | | | | | | | | | | | | | | | | | | |
| Dot pitch (Hor.) | 1/120" (0.21 mm) | 1/360" (0.07 mm) | 1/360" (0.07 mm) | | | | | | | | | | | | | | | | | | | | |
| (Ver.) | 1/180" (0.14 mm) | 1/180" (0.14 mm) | 1/360" (0.07 mm) | | | | | | | | | | | | | | | | | | | | |

Introduction

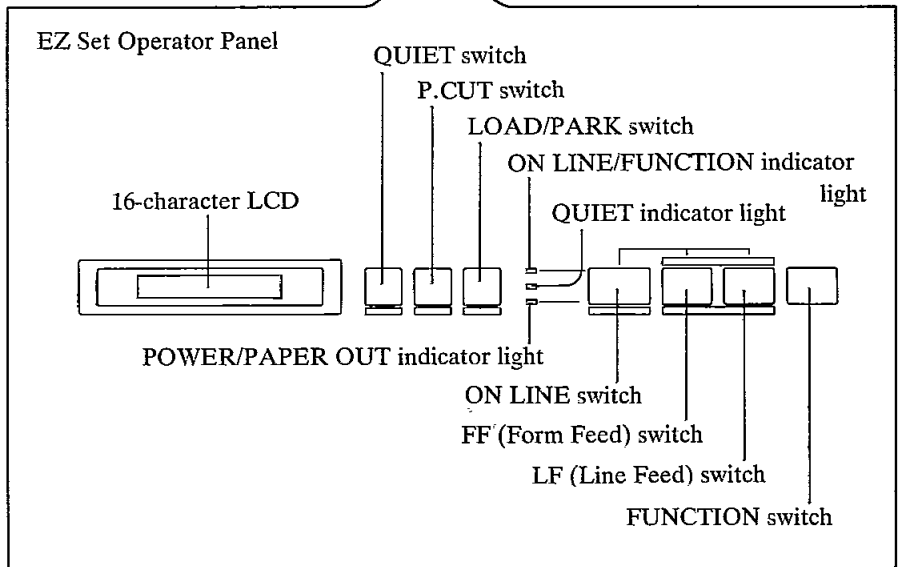
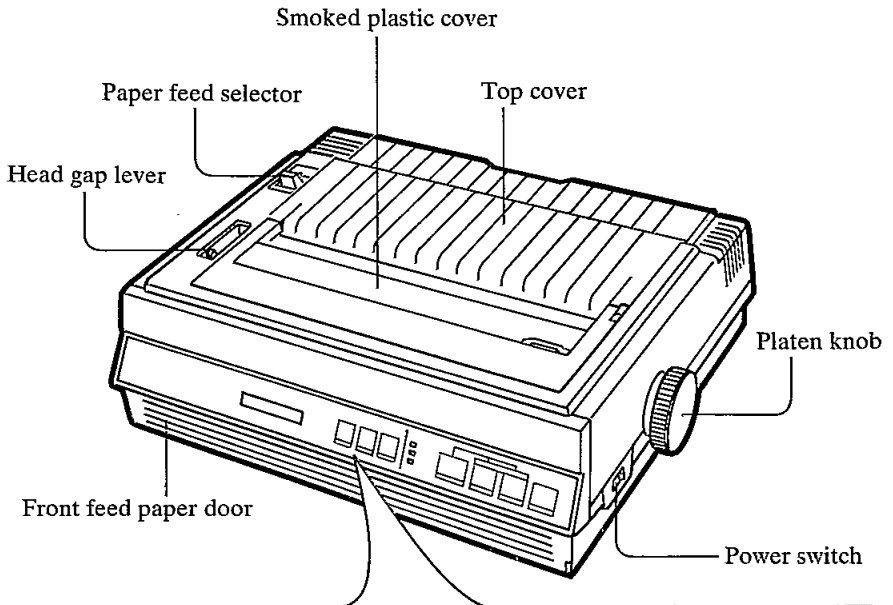
| | | |
|--|--|----------------|
| Maximum number of characters per line (cpl): Print Line (8"/9") | Print Line | 8" / 9" |
| | Pica [10 characters per inch (cpi)] | 80 / 90 cpl |
| | Elite (12 cpi) | 96 / 108 cpl |
| | Micron (15 cpi) | 120 / 136 cpl |
| | Compressed (17 cpi) | 137 / 155 cpl |
| | Elite compressed (20 cpi) | 160 / 181 cpl |
| | Pica elongated (5 cpi) | 40 / 45 cpl |
| | Elite elongated (6 cpi) | 48 / 54 cpl |
| | Micron elongated (7.5 cpi) | 60 / 68 cpl |
| | Compressed elongated (8.5 cpi) | 68 / 77 cpl |
| Elite compressed elongated (10 cpi) | 80 / 90 cpl | |
| Printing speed: | Draft-Pica | 200 cps |
| | Draft-Elite | 240 cps |
| | Draft-Micron | 300 cps |
| | LQ-Pica | 66 cps |
| | LQ-Elite | 80 cps |
| | LQ-Micron | 100 cps |
| | SLQ-Pica | 33 cps |
| | SLQ-Elite | 40 cps |
| Printing direction: | User selectable Bidirectional or Unidirectional | |
| Line feed time: | Approx. 90 msec [with 1/8 inch (4.2 mm) line feeding] 2.5 ips at Form Feed | |
| Paper feed: | Pull/Push (user selectable) Tractor feed (with fanfold paper) Friction feed (with single sheet or envelopes) | |
| Paper used: | Fanfold paper: | |
| | Width: 4~10" (102~254 mm) | |
| | Weight: | |
| | pull mode: 18~24 lbs (68~90 g/m ²) | |
| | push mode: 16~20 lbs (60~75 g/m ²) | |
| | Single sheet: | |
| Width: 4~11.7" (102~297 mm) | | |
| Height: 5~14.3" (127~363 mm) | | |
| Weight: 14~24 lbs (53~90 g/m ²) | | |
| Envelopes: Standard business envelopes | | |
| ie: #6, #10 (Refer to Appendix E) | | |
| Copies: | Original+3 non carbon copies | |

| | |
|------------------------|--|
| Paper thickness: | Total thickness of sheets must be less than 0.013" (0.32 mm) |
| Operating environment: | 50°F (10°C) to 95°F (35°C) temperature, 30~80% humidity (Please allow the printer to stabilize at room temperature within the operating temperature range before operation) |
| Storage environment: | -4°F (-20°C) to 140°F (60°C) temperature, 10~90% humidity |
| Head service life: | Approximately 200 million strokes |
| Ribbon: | Cassette seamless fabric ribbon Ink color: Black Yield: Approx. 3 million characters in draft mode (rolling ASCII) |
| Dimensions: | 16.9 (W)×14.1 (D)× 5.6 (H) inches (430×359×143 mm) |
| Weight: | Approx. 18.7 lbs. (8.5 kg) |

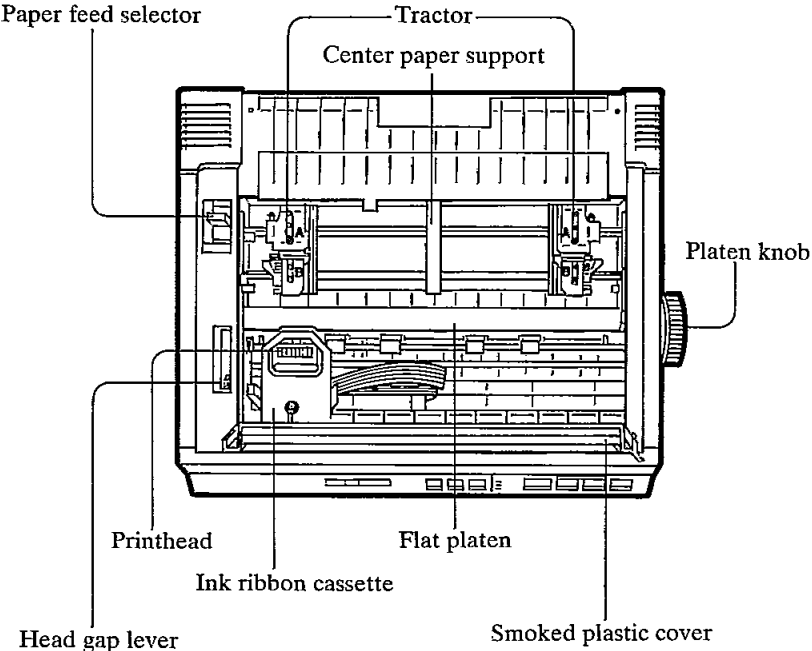
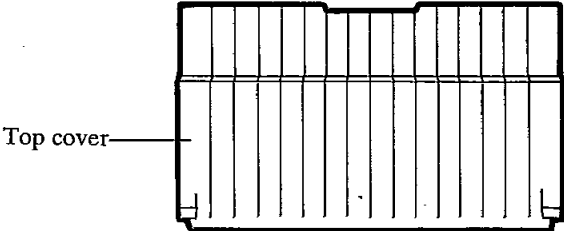
Introduction

1.3 Parts of the Printer

The Front and Right Side View

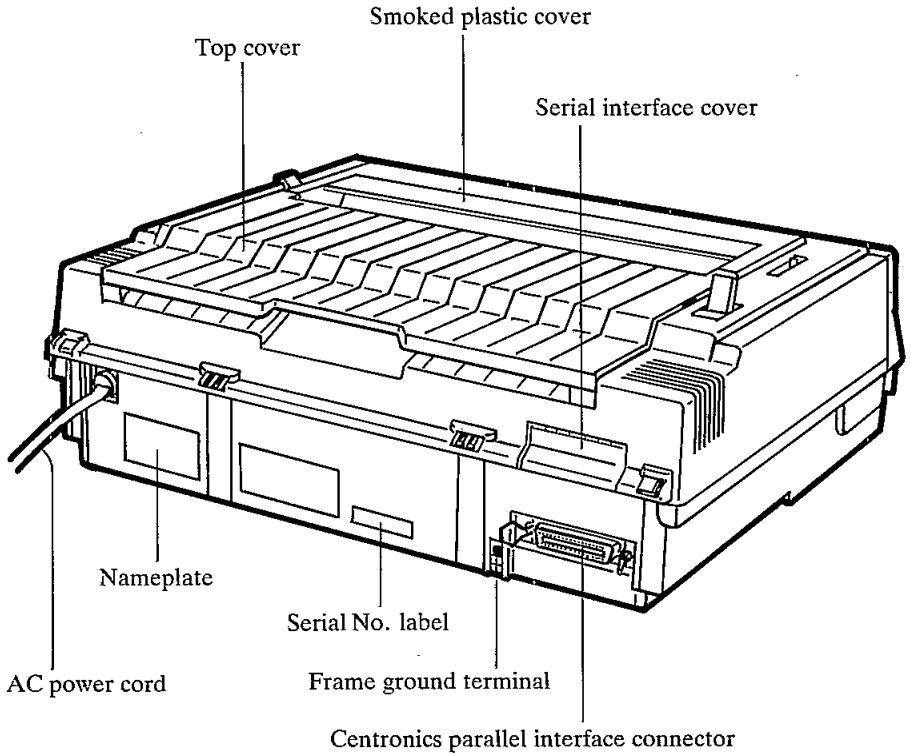


The Top View



Introduction

The Rear View



2. Set Up



2.1 Site Requirements

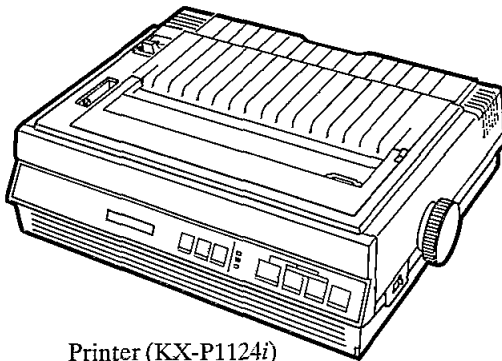
This printer can be installed in any normal office environment. No special wiring or cooling is required.

However, do not use the printer under the following conditions:

- extremely high or low temperature
[temperature range: 50° to 95°F (10° to 35°C)]
- extremely high or low humidity
(humidity range: 30% to 80% RH)
- areas of poor ventilation [a minimum of 4" (10 cm) clearance on all sides necessary to insure proper ventilation]
- areas of high dust concentration
- areas with chemical fume concentration
- areas with extreme vibration or when placed on an unstable or unlevelled surface

2.2 Unpacking and Inspection

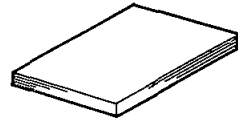
Having opened the shipping carton, carefully remove the contents. Inspect the printer and accessories for damage. Report damage or shortages to the store from which the unit was purchased. Inside the manual's front cover you should record important information regarding the printer.



Printer (KX-P1124i)



Ink ribbon cassette (KX-P145)



Operating manual

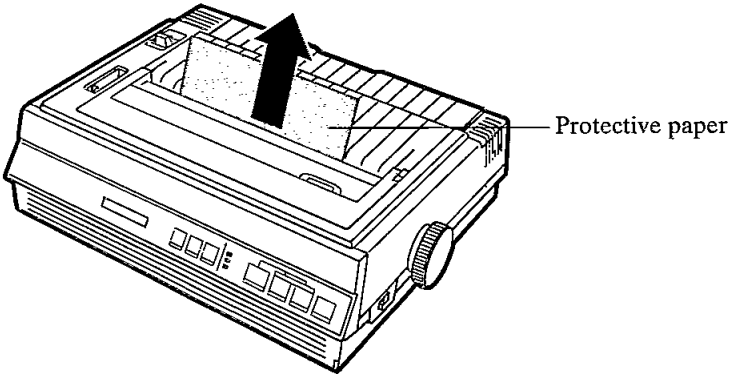
Note:

- Please keep all the packing materials so they may be used should you wish to transport the printer in the future. They are specifically designed to protect your printer during shipment.

Set Up

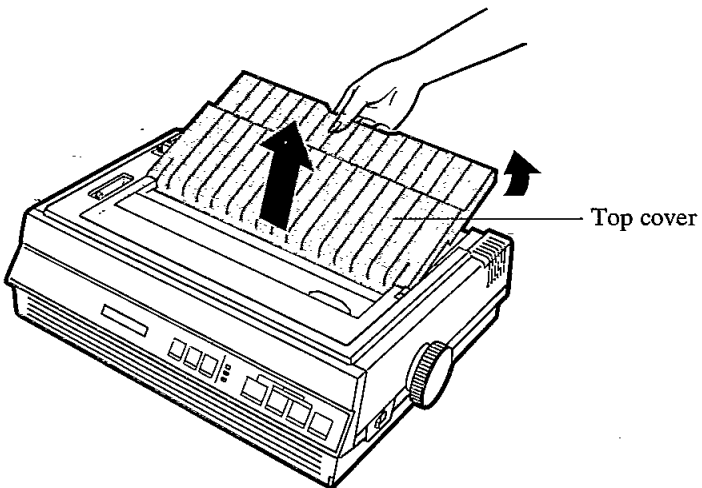
2.3 Initial Set Up

1. Removing the protective paper (if it is installed)



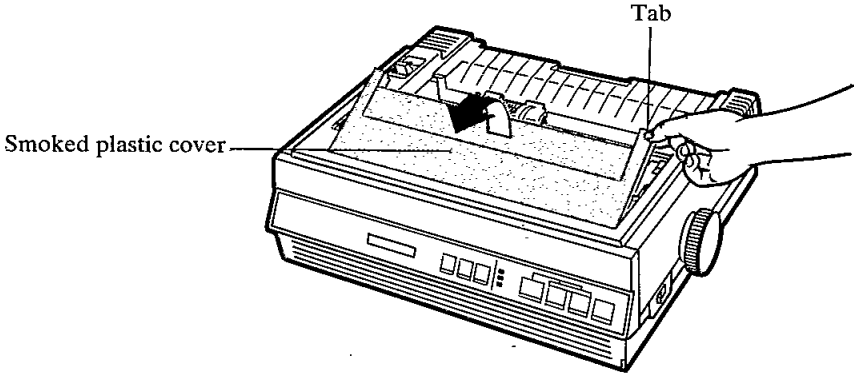
2. Removing the top cover

To remove the top cover, lift it in the direction as shown.



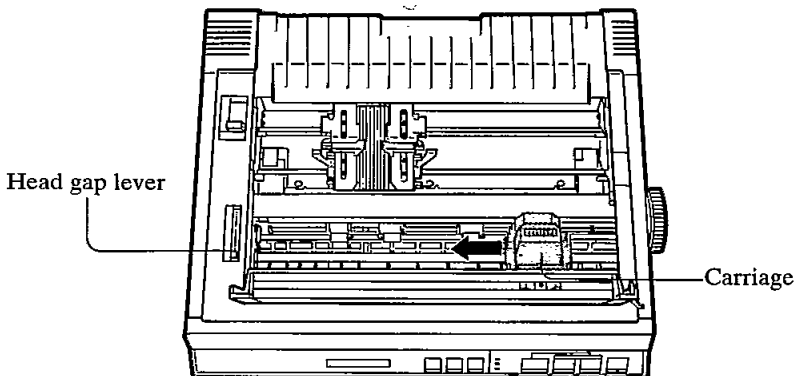
3. Opening the smoked plastic cover

To open the smoked plastic cover, lift by using tab on the right side of cover.



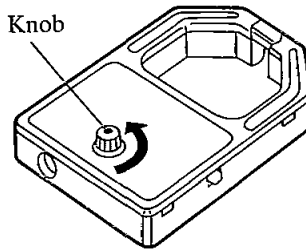
2.4 Mounting the Ribbon Cassette

1. Make sure the printer is off.
2. Gently slide the carriage toward the center of the unit.

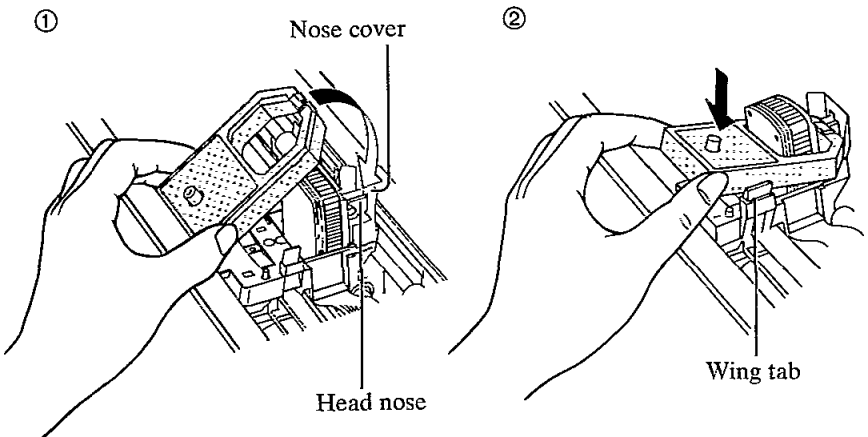


Set Up

3. Verify that the head gap lever is in the (+) position. Refer to diagram on page 2-6.
4. Prior to installing the cassette, remove any slack on the ribbon by rotating the knob on the cassette counterclockwise.



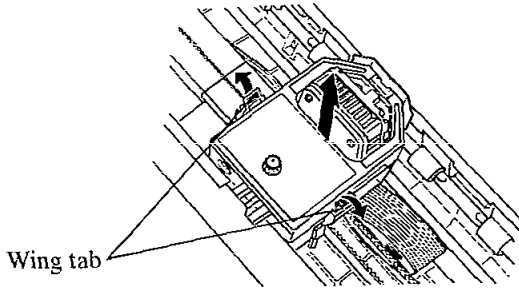
5. Position the cassette over the printhead and lower it in place as shown ①. Visually insure that the ribbon slips between the nose cover and the nose of the printhead. Gently, but firmly, press down on rear of the cassette until the two wing tabs snap into place ②.



6. Set the head gap lever to the proper position. Refer to the Section 2.6 on page 2-6.
7. Close the smoked plastic cover.

To remove the ribbon cassette:

With the printer off, open the smoked plastic cover. Spread the wing tabs and lift up the cassette.



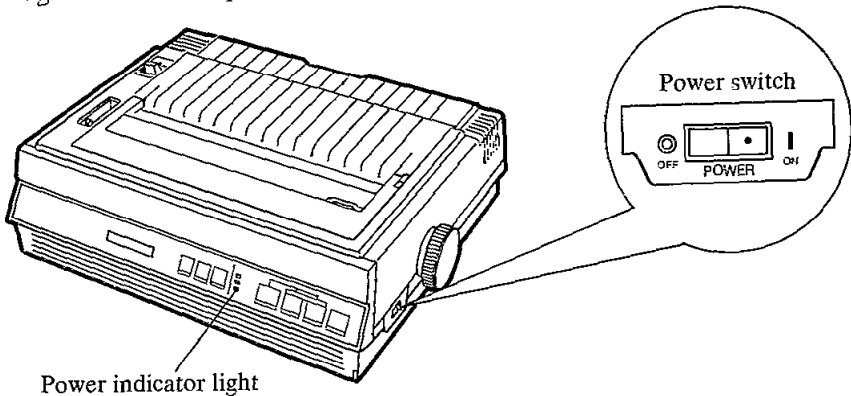
Caution:

- Because the printhead may be extremely hot, use caution when cover is open.

2.5 Power Up

Plug the power cord into an outlet of the proper rating which is listed on the nameplate located in the rear of the printer.

The power switch is located on the right side of the printer toward the front. When the power is supplied to the printer, the power indicator light on the front panel will be lit.



Set Up

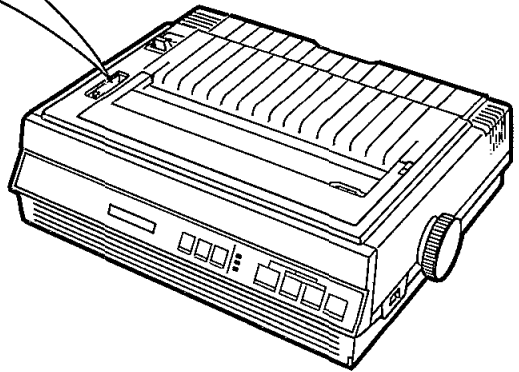
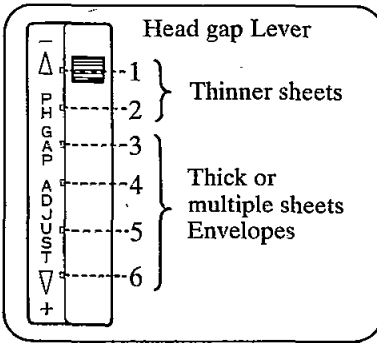
2.6 Adjusting the Printhead Gap

You can adjust the gap between the printhead and the platen to compensate for the thickness of the paper by using the head gap lever.

The lever has 6 steps and moves the printhead closer to or farther away from the platen approximately 0.0028 inch (0.07 mm) per step.

To narrow the gap move the lever forward (-).

To widen the gap move the lever backward (+).



Note:

- If an ink smear occurs when loading paper or during printing, move the lever toward the lower position (+) until the smear no longer appears.

2.7 Paper Installation

This printer has two paper feed mechanisms utilized by 3 paper paths. One mechanism is TRACTOR mode for continuously fed paper. In the tractor mode you can choose between PUSH or PULL.

| MODE | PATH | BEST USED WHEN/FOR |
|------|------------------|--|
| Push | Rear | <ul style="list-style-type: none"> —doing any type of reverse paper feeding —enabling you to do Paper Parking —using single form continuously fed paper |
| Pull | Bottom/ Front | <ul style="list-style-type: none"> —multipart forms —labels |

Note:

- For optimum print quality, do not use reverse line feeding in pull mode. If reverse feeding is necessary in pull mode, set REV-LF/PULL in the INSTALL menu to ON through the Function mode (see page 3-24).
- Paper Parking is not available in pull mode.

The other paper feed mechanism is FRICTION mode. In the friction mode you can feed single sheets or envelopes. These can be fed through the front individually or by using the KX-P36 Cut Sheet Feeder.

A. Fanfold Paper (Tractor PUSH, PULL)


To install fanfold paper follow these procedures.

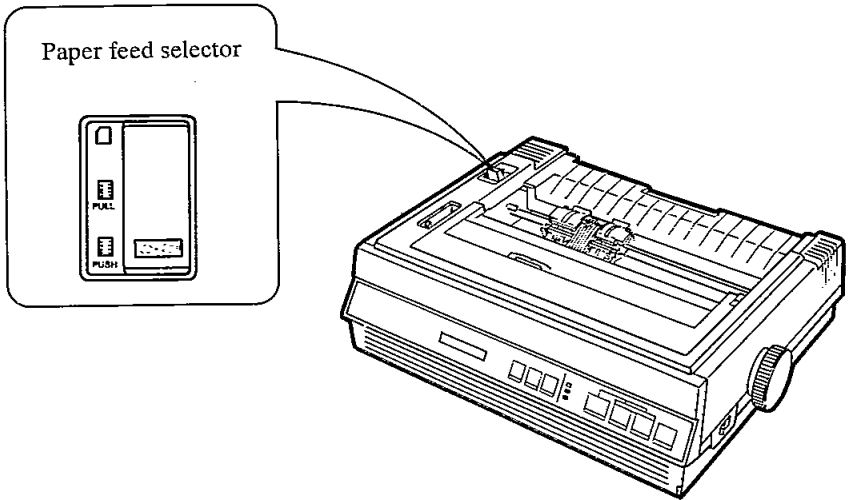
Rear Feeding—with Push Tractor (PUSH)

1. Turn the power switch on. A beep will sound once and the PAPER OUT indicator will flash. This indicates that there is no paper installed in the printer.
2. Make sure that the head gap lever position is appropriate for the thickness of the paper being used. Refer to Section 2.6 on page 2-6.
3. Remove the top cover.

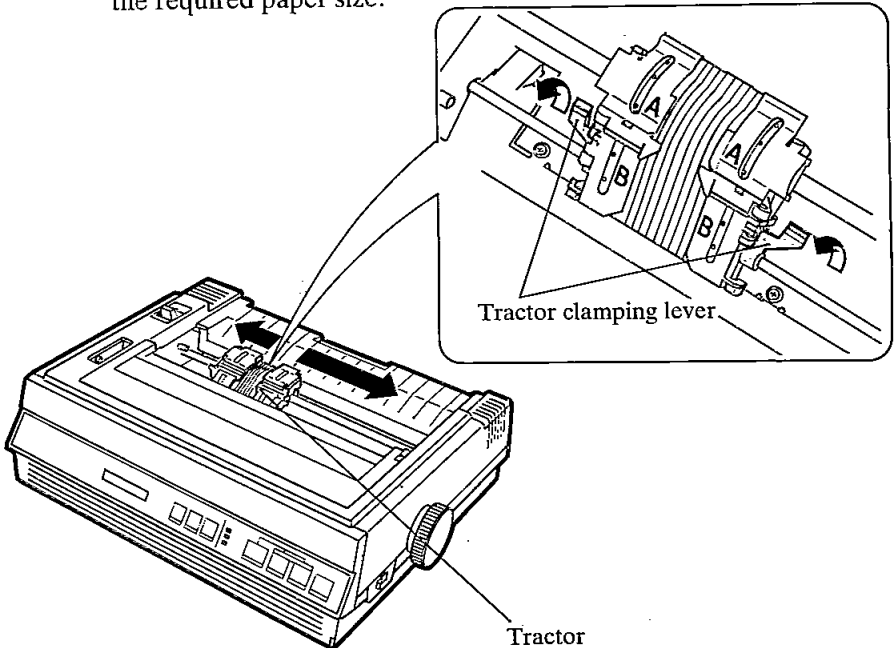
Set Up



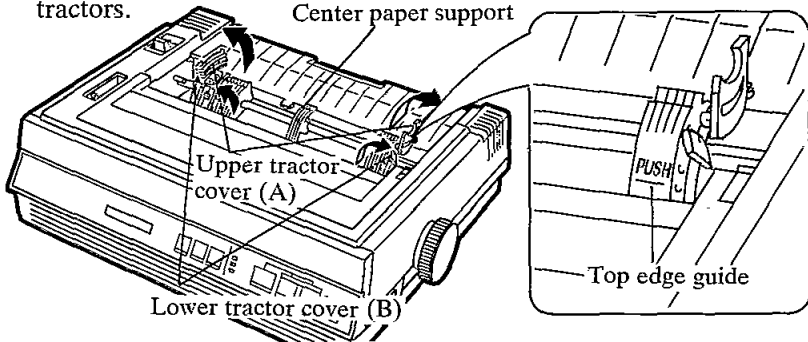
4. Set the paper feed selector to the “ PUSH” position. The display briefly shows “TRACTOR/PUSH”.



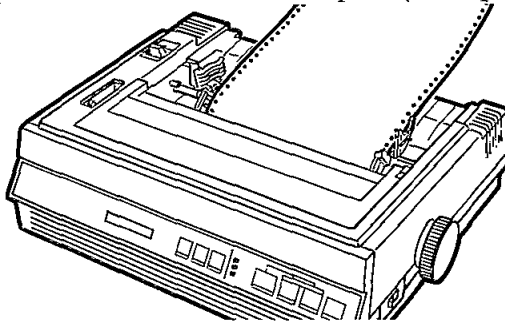
5. Unlock the tractors by pulling the tractor clamping levers forward. Slide the tractors out toward the sides to the approximate width for the required paper size.



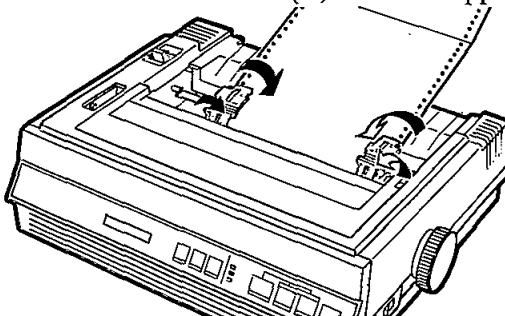
6. Raise the upper tractor covers (A) and the lower tractor covers (B), align the center paper support so that it is centered between the tractors.



7. Load the fanfold paper from the rear of the printer with the side on which you wish to print facing down. The top edge of the paper should be in line with the tractors' top edge guide to ensure easy loading.
8. Align the paper sprocket holes with the tractor pins and verify the paper is straight. To ensure that the paper loads easily, and to avoid any possible jams, it is important to load an adequate number of paper sprocket holes with the tractor pins. (See top edge guide.)

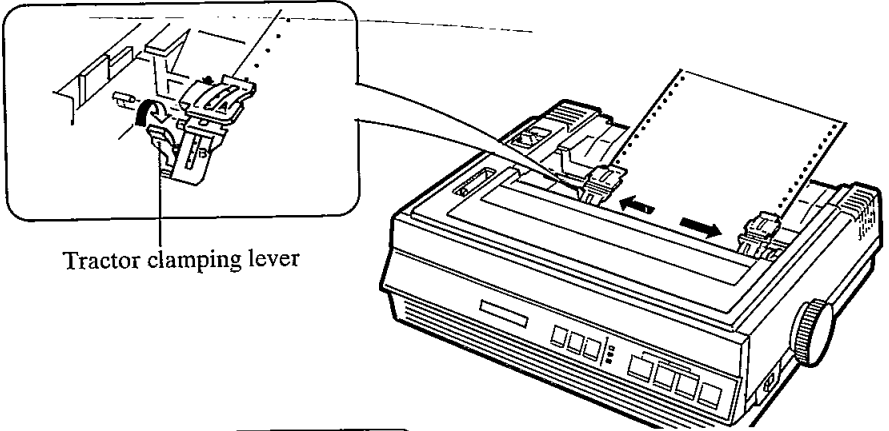


9. Close the lower tractor covers (B) then the upper tractor covers (A).

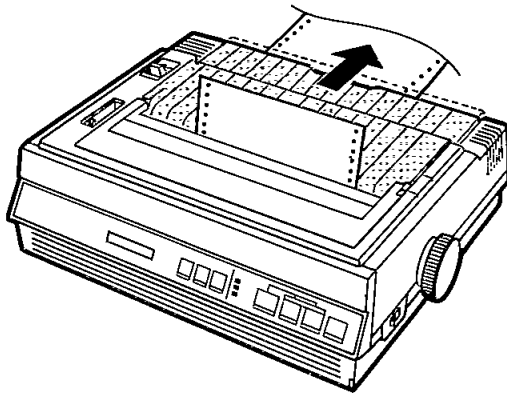


Set Up

10. Adjust the tractors accordingly to remove any slack. Align the paper horizontally by using the marks on the smoked plastic cover as a guide. Press back on the tractor clamping levers locking the tractors in place.




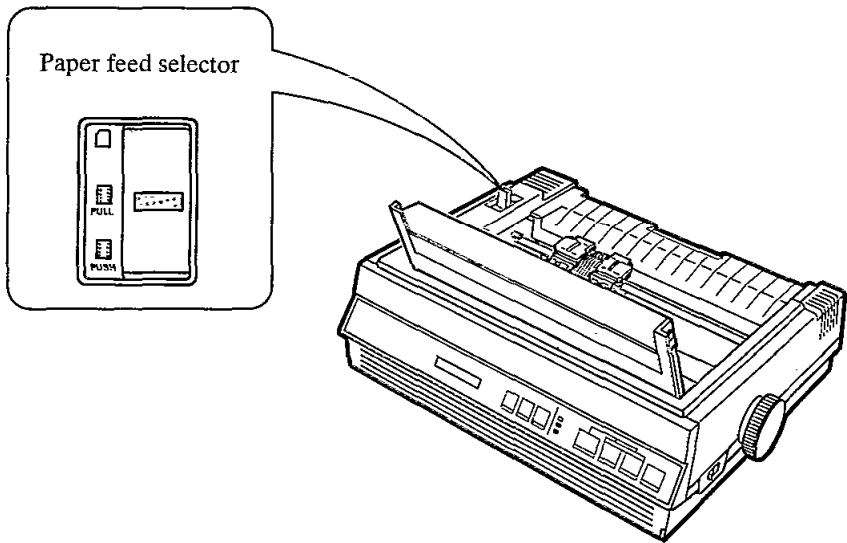
11. Press the **LOAD/PARK** switch to load the paper to the first print line. The display shows "PAPER LOAD" while the printer is loading the paper and then the PAPER OUT indicator will stop blinking.
12. Replace the top cover. Slide the top cover slightly toward the rear of the printer as shown to allow the paper to pass through smoothly.



13. You can now adjust your Top of Form position (see page 3-6) or press the **ON LINE** switch to get ready to print.

Front and Bottom Feeding—with Pull Tractor (PULL)

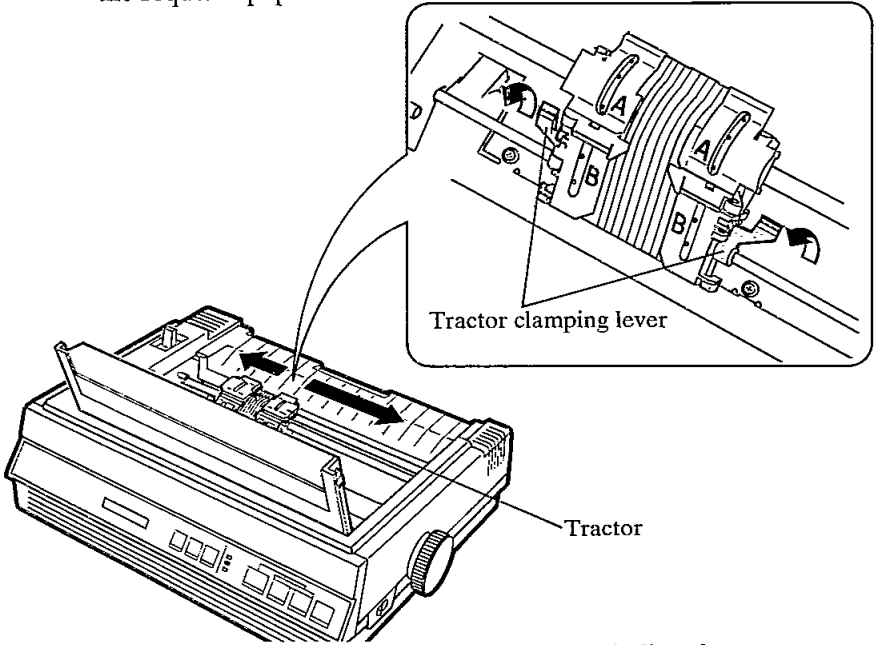
1. Turn the power switch on. A beep will sound and the PAPER OUT indicator will flash. This indicates that there is no paper installed in the printer.
2. Make sure that the head gap lever position is appropriate for the thickness of the paper being used. Refer to Section 2.6 on page 2-6.
3. Remove the top cover and open the smoked plastic cover.
4. Set the paper feed selector to the “  PULL ” position. The display briefly shows “TRACTOR/PULL”.



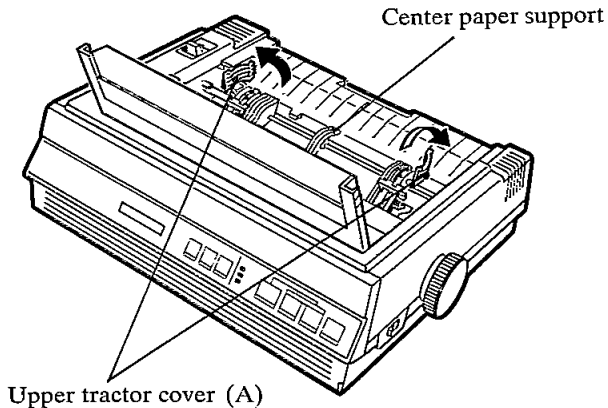
Set Up

2

5. Unlock the tractors by pulling the tractor clamping levers forward. Slide the tractors out toward the sides to the approximate width for the required paper size.

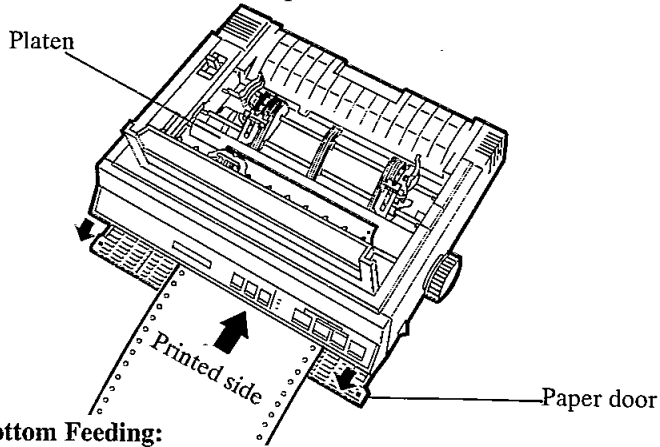


6. Raise the upper tractor covers (A) only and align the center paper support so that it is centered between the tractors.



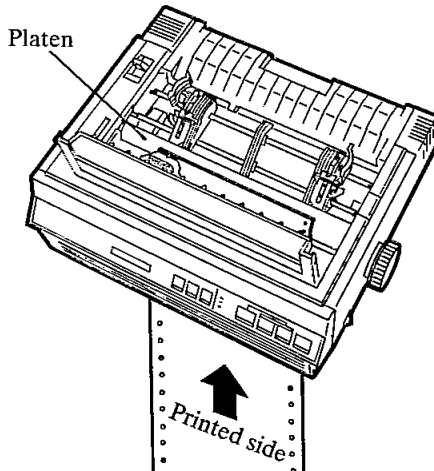
7. When Front Feeding:

Open the paper door on the front of the printer and insert the paper along the paper guides with the side which you wish to print on facing up, until it appears on the platen.



When Bottom Feeding:

Push the paper up, with the side which you wish to print on facing up, until it appears on the platen.

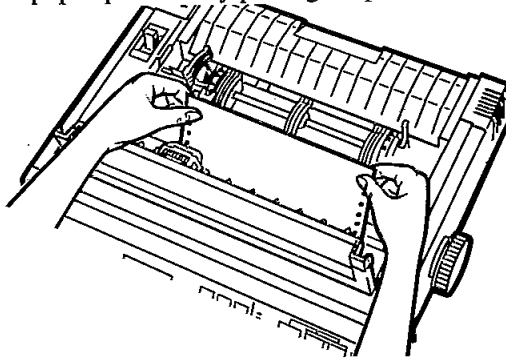


Note:

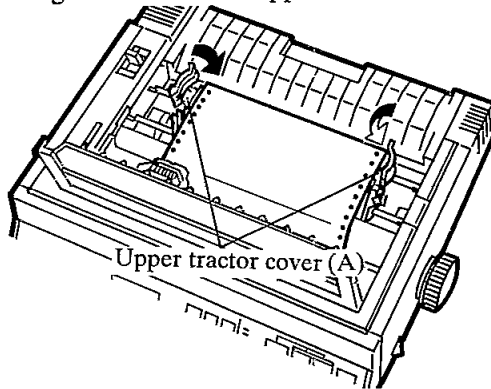
- When feeding fanfold paper through the front paper door, paper types and condition, as well as temperature and humidity conditions may effect accurate line feeding and print quality may not be optimum. For optimum output bottom feed is recommended.

Set Up

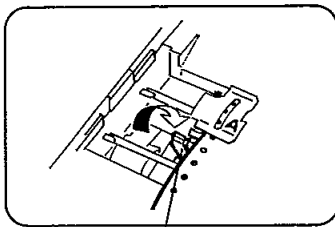
8. Adjust the paper position by pulling it up as shown.



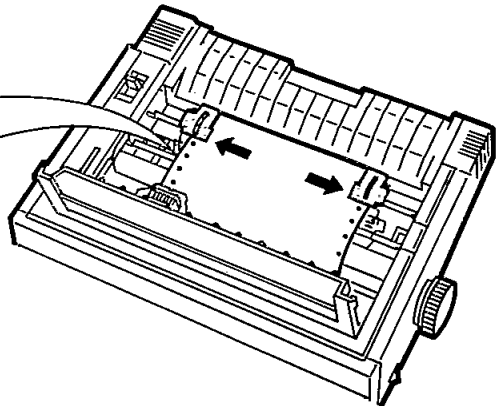
9. Align the paper sprocket holes with the tractor pins. Verify the paper is straight and close the upper tractor covers (A).



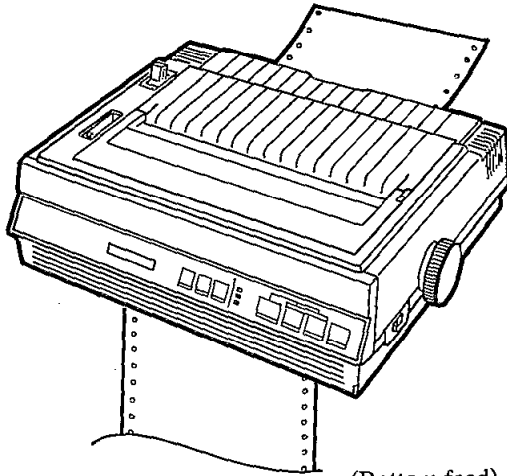
10. Adjust the tractors accordingly to remove any slack. Align the paper horizontally by using the marks on the rear cabinet as a guide. Press back on the tractor clamping levers locking the tractors in place.



Tractor clamping lever



11. Replace the top cover so that it is totally forward, and close the smoked plastic cover.



(Bottom feed)

12. You can now adjust your Top of Form position (see page 3-6) or press the **ON LINE** switch to get ready to print.

Note:

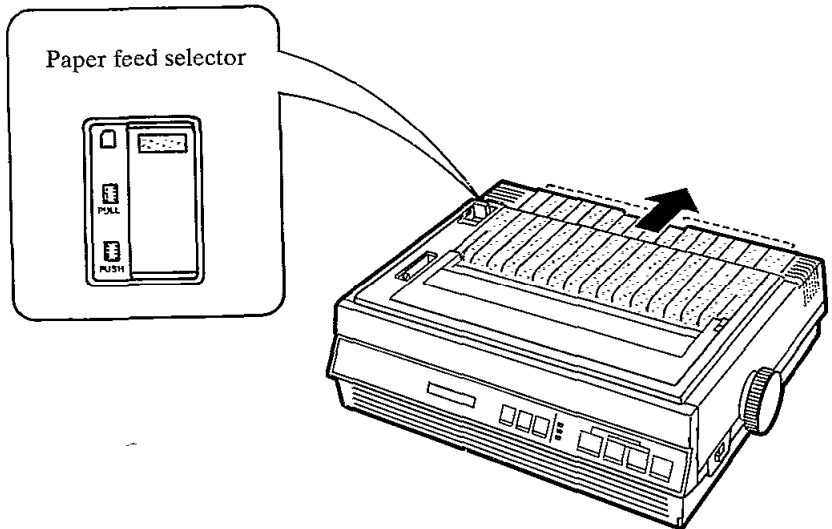
- In the pull tractor mode, reverse feed functions will not feed paper correctly and the resulting printout may not be correct. If reverse feeding is necessary in pull mode, set REV LF/PULL in the INSTALL menu to ON through the Function mode (see page 3-24).

Set Up

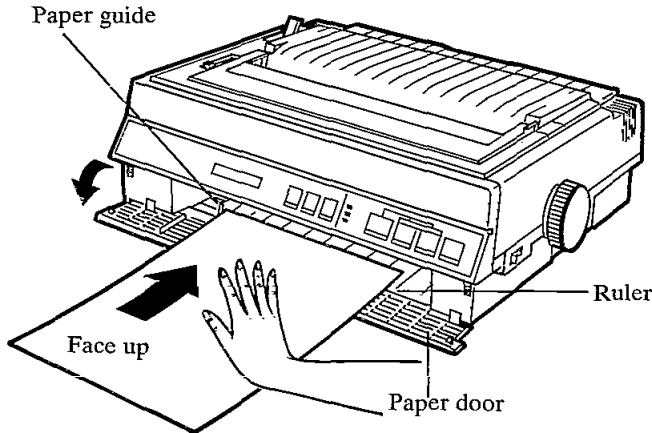
B. Single Sheets and Envelopes (Friction)

To install a single sheet of paper or an envelope, follow these procedures:

1. Turn the power switch on. A beep will sound and the PAPER OUT indicator will flash. This indicates that there is no paper installed in the printer.
2. Make sure that the head gap lever position is appropriate for the thickness of the paper being used. Refer to Section 2.6 on page 2-6.
3. Set the paper feed selector to the "" position. The display briefly shows "FRICTION".
4. Make sure the top cover is in position by sliding the cover toward the rear of the printer until you feel some resistance.



5. Open the paper door and begin inserting the paper. Slide the front paper guide against the paper's edge to insure proper alignment and paper position (the printer will print between 0 and 90 on the ruler when the print width is set to 90 through the Function mode.) The side on which you wish to print should face up.

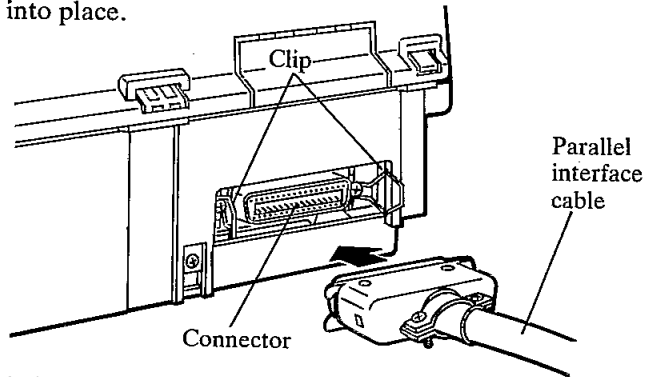


6. Continue to guide the paper with your finger tips into the printer until you feel resistance.
7. Press the **LOAD/PARK** switch to load the paper to the first print line. The display shows "PAPER LOAD" while the printer is loading the paper and then the PAPER OUT indicator will be lit.
8. To align the paper horizontally or vertically, set the paper feed selector to the "PULL" position. This releases the paper and allows the paper to be positioned manually as required. Set the selector back to the "□" position before printing.
9. You can now adjust your Top of Form position (see page 3-6) or press the **ON LINE** switch to get ready to print.

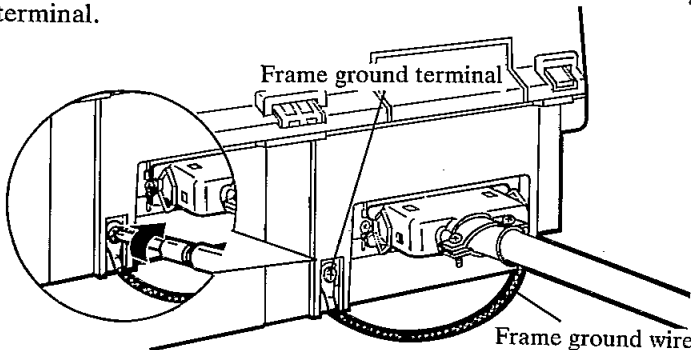
2.9 Connecting Your Printer and Computer

The computer communicates with the printer through an interface cable which you must purchase separately. The printer comes with a Centronics parallel interface.

1. Be sure the power switches of both the printer and the computer are turned off.
2. Plug one end of the cable into the connector of the printer and snap the clips into place.



If the cable has a frame ground wire, connect it to the frame ground terminal.



3. Plug the other end of the cable into the connector of the computer.

Note:

- If the connectors are not alike make sure to plug the appropriate end into each device.
- See Section 8 "Interfacing" for detailed information.
- An RS-232C serial interface is available as an option.

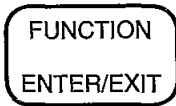
3. Operation

3.1 EZ Set Operator Panel

3

This printer has 7 switches, 3 indicators and a 16-character LCD on the EZ Set Operator Panel. These switches allow you to configure your printer to communicate properly with the computer and to set the desired print conditions.

EZ Set Operator Panel Switches/Indicators/LCD



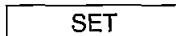
FUNCTION Switch

This switch allows you to enter and exit the Function mode. In the Function mode, the EZ Set Operator Panel switches have new capabilities and you can set the desired print conditions. (See page 3-8 for detailed information.)



ON LINE Switch

The ON LINE switch opens and closes the communication lines with the computer. When the power switch is turned on and paper is installed, the ON LINE indicator is lit, the display shows "ON LINE", and the printer is ready to receive data from the computer. In the OFF LINE mode, the indicator is out, the display shows "OFF LINE" and the printer can no longer receive data.



In the Function mode, this switch sets the selections or conditions of the item shown on the display.

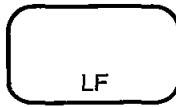


FF (Form Feed) Switch

This switch moves the carriage to the center and advances the paper to the top of the next page in the OFF LINE mode or when the printer is not printing in the ON LINE mode.



In the Function mode, this switch allows you to scroll through the main Menu, the Item-menu (Sub-menu) and the selections or conditions of the item.

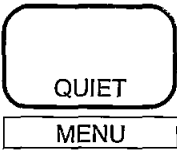


LF (Line Feed) Switch

This switch advances the paper one line. Holding the switch down performs multiple line feeds. These functions are active in the OFF LINE mode or when the printer is not printing in the ON LINE mode.



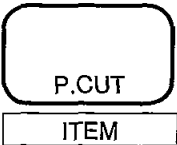
In the Function mode, this switch allows you to scroll back through the main Menu, the Item-menu (Sub-menu) and the selections or conditions of the item



QUIET Switch and QUIET Indicator

Pressing this switch reduces print noise, however it also reduces the printing speed. When it is active, the QUIET indicator is lit and the display briefly shows "QUIET MODE=ON".

In the Function mode, this switch scrolls through the main Menu on the display.



P.CUT Switch

Pressing this switch allows you to perform Perforation Cut in the OFF LINE mode or when not printing in ON LINE mode. (See page 3-4 for detailed information.)

In the Function mode, this switch enters and scrolls through the Item-menu (Sub-menu).



LOAD/PARK Switch

This switch allows you to use single sheets or envelopes without removing or wasting your fanfold paper, available only in the Push tractor mode. (See page 3-4 for detailed information.)

In the Function mode, this switch enters and scrolls through the Selection mode for the Item-menu.

ON LINE/FUNCTION Indicator

This indicator is lit when the printer is in the ON LINE mode, and in the OFF LINE mode, the indicator is out.

In the Function mode, the indicator blinks.

POWER/PAPER OUT Indicator

This indicator is lit when the power switch is turned on and paper is installed. When an out of paper condition occurs, the POWER/PAPER OUT indicator starts blinking.

16-character Liquid Crystal Display (LCD)

This printer has a 16-character LCD to prompt the user with messages and instructions. When you make your settings using the front panel, these messages will guide the operation.

In case of any errors in the printer, the display will immediately indicate the appropriate error messages so you may take remedial action.

Operation

Feeding the paper



You can adjust the paper position by using the front panel switches when the printer is in the OFF LINE mode or when the printer is not printing in the ON LINE mode.

Form Feed

Pressing the **FF** switch advances the paper to the next top of form position.

Line Feed

Pressing the **LF** switch once advances the paper one line. Holding the switch will advance the paper continuously until the switch is released.

Micro Line Feed

Pressing the **FF** switch while pressing the **ON LINE** switch advances the paper one micro line ($\frac{1}{180}$ "). This function is also activated by pressing the **FF** switch when the display shows "TOF SET" in the Function mode. Holding the switch will advance the paper continuously until the switch is released.

Reverse Micro Line Feed

Pressing the **LF** switch while pressing the **ON LINE** switch reverses the paper one micro line ($\frac{1}{180}$ "). This function is also activated by pressing the **LF** switch when the display shows "TOF SET" in the Function mode. The printer cannot reverse the paper past the printable area (see Appendix F). Holding the switch will reverse the paper continuously until the switch is released.

Note:

- In the pull tractor mode, Reverse Micro Line Feed will not feed paper correctly and the resulting print out may not be correct.
- When pressing the **FF** or **LF** switch, the amount of paper which is fed is determined by the current setting for lines per inch specified in the Function mode or software command.

This printer has other special features for paper feeding.

Perforation Cut (P.CUT)

This function allows you to advance your fanfold paper's perforation to the tear position. This is not dependent on your top of form position but is dependent on your form length. After tearing off the page you can return your paper to your top of form. This is only available during rear feeding in the push tractor mode.

1. The ON LINE/FUNCTION indicator may be either OFF or ON (if ON, printer should not be printing) and verify the paper feed selector is in the "PUSH" position. (If the ON LINE indicator is blinking, press the **FUNCTION** switch to exit the Function mode.)
2. Press the **P.CUT** switch to advance the paper's perforation to the tear bar.
3. Tear off the page.
4. Press the **P.CUT** switch again. This will reverse the paper back to the top of form.
 - A Top of Form setting (see page 3-6) past the printable area is ignored by P.CUT. P.CUT will use the Top of Form setting that was last saved.
 - If you do not press the **P.CUT** switch the second time, the printer will automatically reverse the paper to the top of form position that was used for the P.CUT function, once data is received.

Paper Parking (LOAD/PARK)

This function allows you to use single sheets or envelopes without removing or wasting your fanfold paper (in Push tractor mode).

Parking the fanfold paper:

1. Tear off the printed pages. (See P.CUT.)
2. Verify the printer is in the OFF LINE or ON LINE mode.
(If the ON LINE/FUNCTION indicator is blinking, press the **FUNCTION** switch.)

Operation

3. Press the **LOAD/PARK** switch. The printer will reverse the fanfold paper to the parked position.

While the paper is going back, the display shows "PAPER BACK", and when the paper is parked, the display shows "PAPER OUT", with the PAPER OUT indicator blinking. If the printer is in the ON LINE mode, it automatically goes back to the OFF LINE mode.

Loading the cut sheet paper: (also see paper installation section: Single Sheets and Envelopes page 2-16)

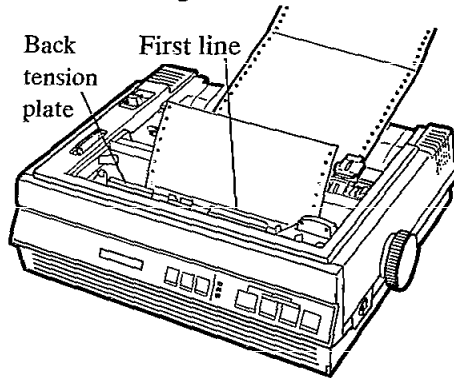
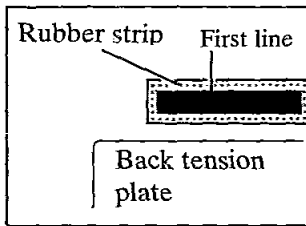
1. Move the paper feed selector to the "□" position. The display briefly shows "FRICTION".
2. Open the paper door and begin inserting the paper. Slide the front paper guide against the paper's edge to insure proper alignment and paper position. The side on which you wish to print should face up.
3. Continue to guide the paper into the printer until you feel some resistance.
4. Press the **LOAD/PARK** switch to load the paper to the first print line. The display shows "PAPER LOAD" while the paper is being loaded and the PAPER OUT indicator will be lit.
5. Press the **ON LINE** switch to enable printing. The ON LINE indicator will be lit and the display will show "ON LINE".
6. When you are finished printing, remove the sheet from the printer by rotating the platen knob.



Reloading the fanfold paper:

1. Move the paper feed selector to the "PUSH" position.
2. Press the **LOAD/PARK** switch to advance the fanfold paper to the top of form previously set for this paper path. (See page 3-6.)

Top of Form function

This printer allows you to set and store the first print line position and load the paper to the designated position automatically. The first print line position will be stored even after the power is turned off. A page is defined by setting the page length through the Function mode or the software command. The first line of text will begin in the middle of the rubber strip on the flat platen.



Additionally, the printer can store the 3 different top of form positions depending on the paper feed method [fanfold paper ( PUSH), single sheet (), and single sheet with the Cut Sheet Feeder option: KX-P36].

To Set the Top of Form:

1. Set the PAGE LENGTH of the paper you are using through the Function mode (see PAGE FORMAT menu in Section 3.2) or software commands (see pages 6-26, 7-20).
2. Load the paper by pressing the **LOAD/PARK** switch.
 - The paper type you insert determines the first print line position for that type. (If using single sheets, you set the top of form for single sheets.)
 - The printer stores the 3 kinds of top margins concurrently.
3. Adjust the paper position by using Line Feed, Micro Line Feed, or Reverse Micro Line Feed (see page 3-3).
 - **Do not rotate the platen knob, the printer will not be able to count the number of lines.**

Operation

3

4. Press the **FUNCTION** switch to enter the Function mode. Verify the ON LINE/FUNCTION light is blinking, and the display shows "TOF SET".
 - You can also adjust the paper position by using the **FF** or **LF** switch. (See "Micro Line Feed" and "Reverse Micro Line Feed" on page 3-3.)
5. Press the **ON LINE** switch to set the Top of Form for the current position.
 - A Top of Form position will be saved when it is between 0 and 5 inches from the top of the page even after the power is turned off. Pressing the **LOAD/PARK** switch will advance the paper to the most recently saved Top of Form setting.
 - A Top of Form position set in the area greater than 5 inches will not be saved after the power is turned off or after parking the paper or after using P.CUT.
6. Press the **FUNCTION** switch to exit the Function mode.

Note:

- Temporary Top of Form setting is indicated by one beep. Saved Top of Form setting is indicated by two beeps.
- When you use fanfold paper, the Top of Form position must be set on the first page because the printer does not accept a top margin which is longer than one page.
- In the double high printing mode, print quality may not be optimum when a Top of Form position is set to 0 inch.

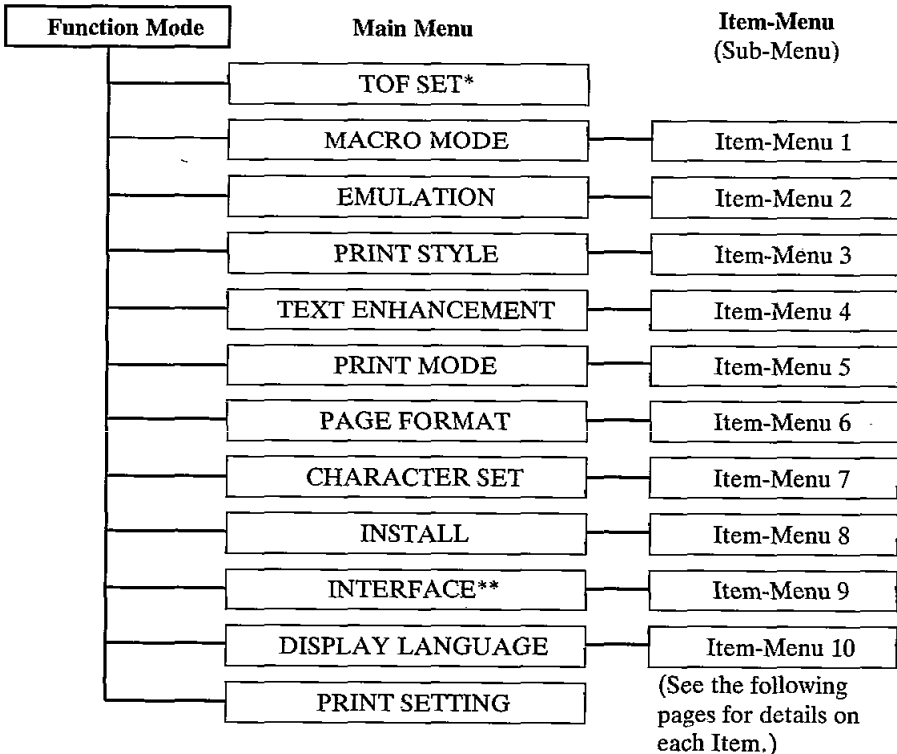
3.2 Function Mode

The features in the Function mode give a new dimension to your printing capabilities.

You enter the Function mode by pressing the **FUNCTION** switch in the OFF LINE mode or when the printer is not printing in the ON LINE mode. The ON LINE indicator blinks, the display briefly shows "FUNCTION MODE", then it changes to "TOF SET". Press the **FUNCTION** switch again to exit the Function mode.

The Function mode is composed of a main Menu and Item-menus (Sub-menu) that allow you to select modes and parameters.

These menus are diagrammed in the following flow chart.



*See "Top of Form function" on page 3-6 about the TOF SET menu. It is only displayed when you first enter the Function mode.

**The INTERFACE menu (Item-menu 9) is only displayed when the optional KX-PS10, RS-232C Serial interface board is installed.

Operation

When you are in the main Menu of the Function mode, the **QUIET** (MENU) switch scrolls through the subjects in the main Menu.

By pressing the **P.CUT** (ITEM) switch, you enter the Item-menu (Sub-menu).

The subjects of the Item-menu (shown on the left side of the display) are scrolled through by holding down the **P.CUT** (ITEM) switch.

These menus (the main Menu and the Item-menu) are also scrolled or scrolled back through by pressing the **FF** (▲) or **LF** (▼) switch.

By pressing the **LOAD/PARK** (SELECTION) switch in the Item-menu, you enter the selection mode and you can scroll through the selections (shown on the right side of the display) of the Item-menu by pressing the **FF** (▲) or **LF** (▼) switch.

When “=” is displayed between the Item-menu and the set selection such as “POWER ON MACRO=1”, that is the current setting.

The Item-menu without “=” indicates a setting which is not currently set but can be selected by pressing the **ON LINE** (SET) switch.

Note:

- All settings made are temporary unless saved in Macro.
- Temporary settings are lost when power is turned off.
- The desired settings when power is turned on should be stored as POWER ON MACRO. (See page 3-10.)

(1) TOF SET Menu

This menu allows you to set your Top of Form. See “Top of Form function” on page 3-6 for detailed information. It is only displayed when you first enter the Function mode.

(2) MACRO MODE Menu

The MACRO MODE Item-menu allows you to load or save a MACRO easily as well as recall the FACTORY setting.

The following table lists all of the items you can select in the MACRO MODE Item-menu.

| Main Menu | Item-Menu 1 | Selection | Function |
|------------|----------------|-----------|---|
| MACRO MODE | LOAD MACRO | #1 | Loads MACRO #1, #2, #3, #4 or FACTORY setting. FCTRY: FACTORY |
| | | #2 | |
| | | #3 | |
| | | #4 | |
| | | FCTRY | |
| | SAVE MACRO | #1 | Saves a combination of all your settings (except for the Top of Form set), set in the Function mode, into the printer's memory as MACRO #1, #2, #3, #4. |
| | | #2 | |
| | | #3 | |
| | | #4 | |
| | POWER ON MACRO | 1 | Recalls (loads) a MACRO or the FACTORY setting automatically when the power switch is turned on. F: FACTORY |
| | | 2 | |
| | | 3 | |
| | | 4 | |
| | | F | |

MACROs

A MACRO allows you to store a combination of your most frequently used print conditions (all settings in the Function mode) into the printer's memory which can be easily recalled and/or changed. This will enable you to recall one of 4 combinations (MACROs #1, #2, #3, #4) at the touch of a button eliminating the need to reset all your features each time you have a print job that uses a previously set combination.

FACTORY setting: Default setting (LOAD MACRO FCTRY and POWER ON MACRO F) is for recalling all the settings in the Function mode as they were originally set when the printer was shipped. However, it does not change any of the settings which are stored in MACRO#1, 2, 3 or 4. To do so, after recalling the Factory setting, you must save each Macro one at a time.

Note:

- The FACTORY settings in the Function mode depend on the countries where the units are shipped. To confirm the FACTORY settings of your country, print them out with the steps at page 3-28 (PRINT SETTING menu).

Operation

Setting the MACRO MODE Menu

3

1. Verify the **ON LINE/FUNCTION** indicator is blinking. (If not, press the **FUNCTION** switch.)
2. Before you can save a MACRO, you must set the print features you wish to store (all settings in the Function mode) as the current settings. (See page 3-12 through 3-27.)
3. Press the **QUIET** (MENU) switch until the display shows "MACRO MODE". You can also scroll the menu by pressing the **FF** (▲) or **LF** (▼) switch.
4. Press the **P.CUT** (ITEM) switch until the Item-menu you wish to enter is shown on the left side of the display. You can also scroll the menu by pressing the **FF** (▲) or **LF** (▼) switch.
5. Press the **LOAD/PARK** (SELECTION) switch and then select the MACRO number or the FACTORY you wish to set (shown on the right side of the display) by pressing the **FF** (▲) or **LF** (▼) switch.
6. Press the **ON LINE** (SET) switch to set the desired selection (mode).
7. Press the **FUNCTION** switch to exit the Function mode.

(3) EMULATION Menu

The EMULATION menu allows you to select EPSON or IBM emulation mode as shown below.



| Main Menu | Item-Menu 2 | Selection | Function |
|----------------|-------------|-----------|---|
| EMULA- TION | EMULATION | EPSON | Sets the emulation mode to Epson LQ-850 or IBM Proprinter X24E. |
| | | IBM | |

Selecting the EMULATION Menu

1. Verify that the ON LINE/FUNCTION indicator is blinking. (If not, press the **FUNCTION** switch.)
2. Press the **QUIET** (MENU) switch until the display shows "EMULATION". You can also scroll the menu by pressing the **FF** (▲) or **LF** (▼) switch.
3. Press the **P.CUT** (ITEM) switch. The display will show "EMULATION EPSON" or "EMULATION IBM". If the mode you want is not displayed, press the **LOAD/PARK** (SELECTION) switch and then press the **FF** (▲) or **LF** (▼) switch to display the one you wish to select.
4. Press the **ON LINE** (SET) switch to set the desired selection (mode).
5. Press the **FUNCTION** switch to exit the Function mode.

Operation

(4) PRINT STYLE Menu

This menu allows you to select the desired font and pitch. Section 5.1 gives you detailed information about font and pitch.

The following table lists all of the items you can select in the PRINT STYLE menu.

| Main Menu | Item-Menu 3 | Selection | Function |
|----------------|-------------|------------|---|
| PRINT STYLE | FONT | DRAFT | Selects Draft, LQ (Letter Quality) or Super LQ font. |
| | | BOLD PS | |
| | | COURIER | |
| | | ORATOR | |
| | | PRESTIGE | |
| | | ROMAN | |
| | | SANS SERIF | |
| | | SCRIPT | |
| | SUPER LQ | | |
| | PITCH | # CPI | #: 5, 6, 7.5, 8.5, 10, 12, 15, 17, 20 Selects the desired characters per inch (cpi) or Proportional Spacing. |
| PROPORTION | | | |

Selecting the PRINT STYLE Menu

1. Verify that the ON LINE/FUNCTION indicator is blinking. (If not, press the **FUNCTION** switch.)
2. Press the **QUIET** (MENU) switch until the display shows "PRINT STYLE". You can also scroll the menu by pressing the **FF** (▲) or **LF** (▼) switch.
3. Press the **P.CUT** (ITEM) switch. The display will show "FONT" on the left side. If you want to set pitch, press the **P.CUT** (ITEM) switch again to show "PITCH".
4. Press the **LOAD/PARK** (SELECTION) switch and then select the font or pitch you wish to set (shown on the right side of the display) by pressing the **FF** (▲) or **LF** (▼) switch.
5. Press the **ON LINE** (SET) switch to set the desired selection.
6. Press the **FUNCTION** switch to exit the Function mode.

Note:

- The Draft font when combined with Proportional spacing is a restricted combination and should not be used.
- The Super LQ font can only be combined with 5, 6, 10 and 12 cpi.

Operation

3

(5) TEXT ENHANCEMENT Menu

This menu allows a document to have a variety of print styles. Section 5.1 gives you a sampling of the features (see page 5-3).

The following table lists all of the items you can select in the TEXT ENHANCEMENT menu.

| Main Menu | Item-Menu 4 | Selection | Function |
|--------------------------|-------------|--|--|
| TEXT ENHANCE- MENT | BOLD | OFF | Performs (ON) or doesn't perform (OFF) bold printing. |
| | | ON | |
| | DBL HIGH | OFF | Performs (ON) or doesn't perform (OFF) double high printing. |
| | | ON | |
| | DBL STRIKE | OFF | Performs (ON) or doesn't perform (OFF) double strike printing. |
| | | ON | |
| | DBL WIDE | OFF | Performs (ON) or doesn't perform (OFF) double wide printing. |
| | | ON | |
| | ITALICS | OFF | Performs (ON) or doesn't perform (OFF) italic printing. |
| | | ON | |
| | OUTLINE | OFF | Performs (ON) or doesn't perform (OFF) outline printing. |
| | | ON | |
| | SHADOW | OFF | Performs (ON) or doesn't perform (OFF) shadow printing. |
| | | ON | |
| ZERO SLASH | OFF | Sets zero slash character \emptyset (ON) or 0 (OFF). (When the International Character Set is set to Norway, zero slash is printed as \emptyset .) | |
| | ON | | |

Setting the TEXT ENHANCEMENT Menu

1. Verify that the ON LINE/FUNCTION indicator is blinking. (If not, press the **FUNCTION** switch.)
2. Press the **QUIET** (MENU) switch until the display shows "TEXT ENHANCEMENT". You can also scroll the menu by pressing the **FF** (▲) or **LF** (▼) switch.
3. Press the **P.CUT** (ITEM) switch until the Item-menu you wish to enter is shown on the left side of the display. You can also scroll the menu by pressing the **FF** (▲) or **LF** (▼) switch.
4. Press the **LOAD/PARK** (SELECTION) switch and then select "ON" or "OFF" by pressing the **FF** (▲) or **LF** (▼) switch.
5. Press the **ON LINE** (SET) switch to set the desired selection (condition).
6. Press the **FUNCTION** switch to exit the Function mode.

Note:

- Enhancements are independent and are set individually, therefore, any enhancement can be set with another.

Operation

(6) PRINT MODE Menu

This menu allows you to select the desired print control.

The following table lists all of the items you can select in the PRINT MODE menu.

| Main Menu | Item-Menu 5 | Selection | Function |
|---------------|---------------------------|-----------|--|
| PRINT MODE | G.DIRECTION (Graphics) | UNI | Graphics print left-to-right only. |
| | | BI | Graphics are printed in both directions. |
| | T.DIRECTION (Text) | UNI | Text prints left-to-right only. |
| | | BI | Text is printed in both directions. |
| | PRINT WIDTH | 8" | Sets the print width to 8 inches or 9 inches (the number of columns will depend on pitch). |
| | | 9" | |
| | PANEL LOCK | OFF | Software commands override all the settings in the Function mode. |
| | | FONT | Font setting in the Function mode overrides software command. |
| | | PITCH | Pitch setting in the Function mode overrides software command. |
| | | F&P | Font and Pitch settings in the Function mode override software commands. |
| | | ALL | All settings in the Function mode override software commands. |

PANEL LOCK

PANEL LOCK in the PRINT MODE menu is the function which decides the priority between the Function mode setting and the software command. The selection column of PANEL LOCK on the previous page shows which is given first priority, the Function mode setting or the software command (when one is set).



Setting the PRINT MODE Menu

1. Verify that the ON LINE/FUNCTION indicator is blinking. (If not, press the **FUNCTION** switch.)
2. Press the **QUIET** (MENU) switch until the display shows "PRINT MODE". You can also scroll the menu by pressing the **FF** (▲) or **LF** (▼) switch.
3. Press the **P.CUT** (ITEM) switch until the Item-menu you wish to enter is shown on the left side of the display. You can also scroll the menu by pressing the **FF** (▲) or **LF** (▼) switch.
4. Press the **LOAD/PARK** (SELECTION) switch and then select the setting you wish (shown on the right side of the display) by pressing the **FF** (▲) or **LF** (▼) switch.
5. Press the **ON LINE** (SET) switch to set the desired selection (condition).
6. Press the **FUNCTION** switch to exit the Function mode.

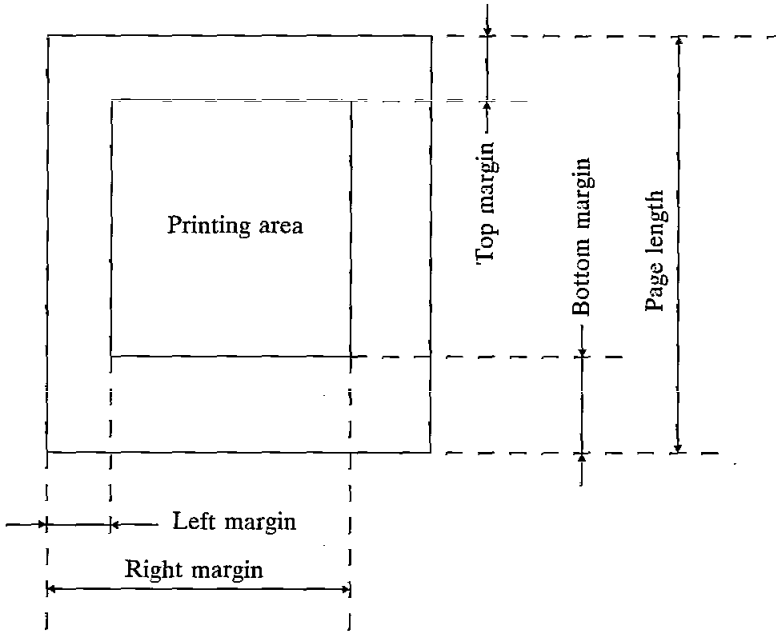
Operation

(7) PAGE FORMAT Menu

This menu allows you to select the desired lines per inch, page length, top margin, bottom margin, left margin, right margin and center position of the printhead as shown below.

| Main Menu | Item-Menu 6 | Selection | Function |
|-----------|------------------------------|-----------|---|
| PAGE | LINES/INCH | # | #: 1 to 12 The number increases or decreases by 0.5 (excluding 3.5, 5.5, 6.5, 7.0, 8.5, 9.5, 10.5, 11, 11.5). |
| | P.LENGTH (Page length) | #" | #: 0.1 to 14.9" The number increases or decreases by 0.1. |
| | T.MRGN (Top margin) | #" | #: 0.00 to 2.50" The number increases or decreases by 0.05. |
| | B.MRGN (Bottom margin) | #" | #: 0.00 to 4.90" The number increases or decreases by 0.05. |
| | L.MRGN (Left margin) | # | #: 0 to 88/10 CPI The number increases or decreases by 1. The value number depends on the CPI which has been selected. |
| | R.MRGN (Right margin) | # | #: 2 to 90/10 CPI The number increases or decreases by 1. The value number depends on the CPI which has been selected. |
| | CTR PRINTHEAD (Center) | # | #: 10 to 80 The number increases or decreases by 1. Selects the center position for the printhead. |

Page formatting is determined by the page length, left/right margin (which sets the margin on the left/right side of the paper) and top/bottom margin (which sets the margin on the upper/lower end of the paper) as shown below.



Setting the PAGE FORMAT Menu

1. Verify that the ON LINE/FUNCTION indicator is blinking. (If not, press the **FUNCTION** switch.)
2. Press the **QUIET** (MENU) switch until the display shows "PAGE FORMAT". You can also scroll the menu by pressing the **FF** (▲) or **LF** (▼) switch.
3. Press the **P.CUT** (ITEM) switch until the Item-menu you wish to enter is shown on the left side of the display. You can also scroll the menu by pressing the **FF** (▲) or **LF** (▼) switch.

Operation

3

4. Press the **LOAD/PARK** (SELECTION) switch and then select the number you wish (shown on the right side of the display). Press the **FF** (**▲**) or **LF** (**▼**) switch to increase or decrease the number.
5. Press the **ON LINE** (SET) switch to set the desired selection (number).
6. Press the **FUNCTION** switch to exit the Function mode.

Note:

- When the Item-menu is L:MRGN or R:MRGN, the **FF** or **LF** switch moves the carriage right or left. Pressing the **FF** or **LF** switch when the carriage reaches the end of the platen moves it to the opposite side. This is helpful in moving the carriage to the second margin position when the first is far from it.
- You can set either the left or the right margin first.
- If the left margin is set to the right of the right margin, the right margin is reset to 80 (10 cpi) automatically.
- When the PRINT WIDTH is changed, the left margin will default to 0" and the right margin will default to 8" or 9" automatically depending on your selection of the print width. Please refer to chart on page 1-3 for the Maximum number of characters per line according to your pitch selection.

(8) CHARACTER SET Menu

This menu allows you to select the desired character set.

The following table lists all of the items you can select in the CHARACTER SET menu.

| Main Menu | Item-Menu 7 | Selection | Function |
|---------------|-------------|-----------|---|
| CHARACTER SET | COUNTRY | USA | Selects one of 14 language or legal character sets. |
| | | DENMARK1 | |
| | | DENMARK2 | |
| | | FRANCE | |
| | | GERMANY | |
| | | ITALY | |
| | | JAPAN | |
| | | KOREA | |
| | | LTN AMER | |
| | | LEGAL | |
| | | NORWAY | |
| | | SPAIN1 | |
| | | SPAIN2 | |
| | | SWEDEN | |
| | UK | | |
| | CHR SET | ITALIC | Selects the italics (Epson mode only) or graphics/character sets 1 or 2 (Epson mode or IBM mode). |
| | | GRAPH1 | |
| | | GRAPH2 | |
| | CODE PAGE | USA | Selects the USA or multilingual code page in IBM mode only. |
| | | MULT | |

Operation

Setting the CHARACTER SET Menu

3

1. Verify that the ON LINE/FUNCTION indicator is blinking. (If not, press the **FUNCTION** switch.)
2. Press the **QUIET** (MENU) switch until the display shows "CHARACTER SET". You can also scroll the menu by pressing the **FF** (▲) or **LF** (▼) switch.
3. Press the **P.CUT** (ITEM) switch until the Item-menu you wish to enter is shown on the left side of the display. You can also scroll the menu by pressing the **FF** (▲) or **LF** (▼) switch.
4. Press the **LOAD/PARK** (SELECTION) switch and then select the setting you wish (shown on the right side of the display) by pressing the **FF** (▲) or **LF** (▼) switch.
5. Press the **ON LINE** (SET) switch to set the desired selection.
6. Press the **FUNCTION** switch to exit the Function mode.

(9) INSTALL Menu

This menu allows you to select the initial setup conditions (this replaces the need for DIP Switches).

The table on this page and the following page shows all of the items you can select in the INSTALL menu.

| Main Menu | Item-Menu 8 | Selection | Function |
|-------------|-------------|--|---|
| INSTALL | AGM/IBM | OFF | Sets Alternate Graphics Mode on or off in the IBM mode. |
| | | ON | |
| | AUTO CR/IBM | OFF | Activates (ON) or prevents (OFF) Automatic CR on LF, VT, ESC+“J”. (This setting is effective only in the IBM mode.) |
| | | ON | |
| | AUTO LF | OFF | Activates (ON) or prevents (OFF) Automatic LF after CR. |
| | | ON | |
| | BUZZER | OFF | Buzzer sounds (ON) or doesn't sound (OFF). |
| | | ON | |
| | D.LENGTH | 8 BIT | Sets data length to 7 bit or 8 bit. |
| | | 7 BIT | |
| | P.O.DETECT | OFF | Paper Out Detector is active (ON) or ignored (OFF). |
| | | ON | |
| | QUIET MODE | OFF | Reduces (ON) or doesn't reduce (OFF) the printing noise. (May also be set out of the Function mode on the front panel and then can be stored in a MACRO.) |
| | | ON | |
| REV LF/PULL | OFF | Sets Reverse Line Feed in Pull mode on or off. | |
| | ON | | |

Operation

| Main Menu | Item-Menu 8 | Selection | Function |
|-----------|-------------|-----------|--|
| INSTALL | TEAR OFF | MANUAL | Doesn't advance the paper's perforation to the tear off position without pressing the P.CUT switch. |
| | | AUTO | Advances the paper's perforation to the tear off position automatically. |
| | CSF MODE | OFF | Cut Sheet Feeder is installed (ON) or not (OFF). This setting is effective only when the paper feed selector is in "□" position and the C.S.F. option (KX-P36) is installed. |
| | | ON | |
| | OPT RAM | BUFFER | Sets the option RAM to buffer or download. (KX-P43 must be installed.) |
| | | DOWNLOAD | |

Setting the INSTALL Menu

1. Verify that the ON LINE/FUNCTION indicator is blinking. (If not, press the **FUNCTION** switch.)
2. Press the **QUIET** (MENU) switch until the display shows "INSTALL". You can also scroll the menu by pressing the **FF** (▲) or **LF** (▼) switch.
3. Press the **P.CUT** (ITEM) switch until the Item-menu you wish to enter is shown on the left side of the display. You can also scroll the menu by pressing the **FF** (▲) or **LF** (▼) switch.
4. Press the **LOAD/PARK** (SELECTION) switch and then select the setting you wish (shown on the right side of the display) by pressing the **FF** (▲) or **LF** (▼) switch.
5. Press the **ON LINE** (SET) switch to set the desired selection (condition).
6. Press the **FUNCTION** switch to exit the Function mode.

Operation

(10) DISPLAY LANGUAGE Menu

This menu allows you to select one of five display languages. All messages shown on the display can be changed into the language you select and set.

| Main Menu | Item-Menu 10 | Selection | Function |
|------------------|--------------|-----------|-------------------------------|
| DISPLAY LANGUAGE | LANGUAGE | ENGLISH | Selects the display language. |
| | | FRENCH | |
| | | GERMAN | |
| | | SPANISH | |
| | | ITALIAN | |

Selecting the DISPLAY LANGUAGE Menu

1. Verify that the ON LINE/FUNCTION indicator is blinking. (If not, press the **FUNCTION** switch.)
2. Press the **QUIET** (MENU) switch until the display shows "DISPLAY LANGUAGE". You can also scroll the menu by pressing the **FF** (▲) or **LF** (▼) switch.
3. Press the **P.CUT** (ITEM) switch. The display shows "LANGUAGE" on the left side. You can also scroll the menu by pressing the **FF** (▲) or **LF** (▼) switch.
4. Press the **LOAD/PARK** (SELECTION) switch and then select the display language you wish to set (shown on the right side of the display) by pressing the **FF** (▲) or **LF** (▼) switch.
5. Press the **ON LINE** (SET) switch to set the desired selection.
6. Press the **FUNCTION** switch to exit the Function mode.

(11) PRINT SETTING Menu

This menu allows you to print the current settings and MACROs status. To print out the current settings, MACROs status and the FACTORY settings, follow these procedures:



| Main Menu | Display | Function |
|---------------|--------------|---|
| PRINT SETTING | NOW PRINTING | Prints the current settings and MACRO status. |

1. Install the paper (refer to Section 2.7 on page 2-7).
2. Verify that the ON LINE/FUNCTION indicator is blinking. (If not, press the **FUNCTION** switch.)
3. Press the **QUIET** (MENU) switch until the display shows "PRINT SETTING". You can also scroll the menu by pressing the **FF** (▲) or **LF** (▼) switch.
4. Press the **ON LINE** (SET) switch. The printer will start printing.
5. After printing is finished, press the **FUNCTION** switch to exit the Function mode.

Operation

3.3 Detectors

3 ■ Paper Out detector

The Paper Out detector is located under the platen and senses the absence of paper. When an out of paper condition occurs, the printing stops, the printer goes to the OFF LINE mode, the alarm sounds and the Paper Out light starts blinking. You will also find that the display shows "PAPER OUT". To continue printing to the end of the current page when an out of paper condition occurs, press the ON LINE switch repeatedly until the page is completed. In this case, the paper will not feed correctly and printout result may not be correct. To start printing the next page, install new paper and press the ON LINE switch. The printer will resume printing.

Note:

- The Paper Out detector can be disabled through the Function mode.

Overheat detector

If the printer is printing continuously for extended periods of time, the printhead may become overheated. When this occurs, an internal protective circuit will cause the printer to pause and the display will show "PRINTHEAD HOT" until the head temperature decreases sufficiently, at which time the printer will automatically resume printing without loss of data. This feature is included to extend the life of the printhead.

Overload detector

An overload condition can occur when the path of the printhead is blocked. At that time the carriage will stop moving and the display will show "OVERLOAD".

To resume printing after an overload condition, eliminate the cause of the overload and recycle the power.

3.4 Initialization

The printer is initialized under the following conditions:

- the AC power is turned on
- the PRIME signal is received
- the RESET PRINTER command is received

When the printer is initialized, the following conditions are set:

- the print buffer is cleared
- the receive buffer is cleared (not cleared by RESET PRINTER command)
- the download character buffer is cleared (not cleared by PRIME signal in IBM Proprinter X24E mode or by RESET PRINTER command)
- horizontal tabs are set every 8 columns
- vertical tab settings are cleared
- all modes set by control and escape commands will be cleared
- present form position is designated as top of form
- the Self Test mode is cleared
- the Function mode settings are read and set
- Control Panel settings are not changed by PRIME signal or RESET PRINTER command*
- the printhead goes to the home position

* Some software packages send PRIME signal at the beginning of their programs. Print modes set by the Function mode will not change.

Receive Buffer Clear Function

This function allows you to clear the receive buffer (information recently sent from the computer and is currently printing) without changing the Function mode settings. This feature is very useful when you find some mistakes while printing.

1. Press the **ON LINE** switch to stop the printing and enter the OFF LINE mode.
2. Press the **LF** switch while pressing the **FUNCTION** switch to clear the data in the receive buffer.
3. Press the **ON LINE** switch to enter the ON LINE mode.

3.5 Hex Dump

In this mode, all data received from the computer is printed in hex code instead of the normal ASCII characters. Function codes for the printer (CR, LF, HT, etc.) are not executed. This mode is very useful to debug programs.

To enter the Hex Dump mode:

Turn the power on while pressing both **FF** and **LF** switches. The display shows "HEX DUMP MODE".

To release the Hex Dump mode:

Turn the power off, then back on.

4. Software Introduction

4.1 Introduction

In order for a computer to communicate with a printer, both pieces of equipment must understand a common language or coding scheme. One such coding scheme is called ASCII (American Standard Code for Information Interchange). For example, the ASCII code can express the character “K” in any of the following forms:

(01001011)₂—Binary
4B_{HEX}, 4B_H—Hexadecimal
75_{DEC}, 75_D—Decimal

Many computers allow you to enter ASCII codes in either hexadecimal or decimal form. The entered ASCII codes are converted to binary form by the computer and then sent to the printer.

In the following sections, you will see how to enter various ASCII codes to enable the printer to perform the functions you would like. Since the decimal equivalent of the ASCII code is most commonly used, all examples which follow will use the decimal form.

Appendix A contains the ASCII characters and control command tables used by this printer.

4.2 Control Codes

The various printer functions are set through the use of control codes, which consist of one or more ASCII characters entered into the computer in a special way. These control codes often differ from printer to printer. Control codes generally fall into two categories: one-byte control codes and multi-byte control codes. The multi-byte control codes are often referred to as Escape Sequences since each code begins with the ASCII code for the ESCAPE character (ESC). Such an ESC character should not be confused with the Escape Key found on some computer keyboards.

Control codes can be sent to this printer from your computer in different ways. The three most common ways are:

Software Introduction

- Through commercial software packages
- Directly from the keyboard
- From within a user written program

4 ■ The latter two methods will specifically refer to the BASIC language, although other languages such as FORTRAN, PASCAL, etc., can also be used. We will use BASIC since it is a relatively easy language to use. In addition, it is one of the most commonly used microcomputer languages.

4.3 Entering Control Codes through Commercial Software Packages

Many computer users do not have the time, the expertise, or the interest to develop software suited for their applications. In such cases software written by professionals can be purchased. Such software should be selected not only to meet the needs of the user, but must also be compatible with both computer and printer.

Commercial software is often written with what is called a driver. A driver is that part of the software which allows the user to configure the package to the type of printer (based on emulation or compatibility setting) and interface being used. Once the software has been booted, the user is generally requested to supply additional information such as:

- Brand/Model/Emulation mode of printer being used.
- I/O port being used. (eg: LPT1:, if a parallel interface is being used.)
- Baud rate, parity, etc. if a serial interface is being used.

But how do you know which mode to choose? The major factor to consider is which printer your software supports. Most commercial software packages include printer drivers that support one or more of the printers that this printer can emulate.

Software Introduction

The installation program usually offers a menu of printers from which to choose. If you find this printer on the menu, select it.

1. Choices in order of priority: [If you set the EMULATION menu to EPSON through the Function mode].

We recommended that you inspect your software first. If it offers a menu of supported printers, select the printer mode in this order of preference:

- a. Panasonic KX-P1124i
- b. Panasonic KX-P1124
- c. Epson LQ-850
- d. Epson LQ Series

2. Choices in order of priority (IBM mode)

- a. IBM Proprinter X24E

Once the necessary information has been supplied, the software will provide the computer with the control codes and other data needed by this printer.

Many word processing packages will request that you enter the ASCII codes used by this printer for special settings such as underlining, compressed print, super- and subscript, italics, etc. In all cases you should refer to your software instruction manual for the proper use of the package with this printer.

Software Introduction

4.4 Entering Control Codes Directly from the Keyboard

With many computers, the BASIC language is ready to use once you power up. With others, BASIC must be loaded into memory. In any case, once BASIC is ready, you may then enter these printer control commands directly from your computer keyboard.

BASIC requires the use of the PRINT command (or LPRINT, PRINT#, etc. depending on the type of BASIC your computer uses) to process and send the control commands to this printer. As part of this print command, you must supply the appropriate ASCII code(s) for the character string (CHR\$) function.

For example, the command: **LPRINT CHR\$(15)** (decimal code 15) followed by a **RETURN** will set this printer to compressed mode. Subsequent output to this printer will appear in compressed mode.

If, after issuing the above command, subsequent PRINT statements output nothing to the printer, check for one or more of the following:

- Have you indicated to the computer that output is to the printer and not the screen? For example, PR#1, causes subsequent PRINT statements on the Apple computer to PRINT to the printer and not to the screen. LPRINT does the same in Microsoft BASIC.
- Is this printer on line? If not, press the green ON LINE switch on the front panel.
- Is the interface cable plugged into the computer and printer?
- When using a serial interface, is the baud rate setting on the printer the same as that on the computer or interface card?

Notice that when you enter a BASIC command directly from the keyboard, you do NOT use a line number as you would in a BASIC program. Moreover, control codes may be entered only one line at a time.

4.5 Entering Control Codes from Within a Basic Program

Control codes may also be entered from within a BASIC program. The advantage to this technique is that you can incorporate a number of different control commands into a single program and therefore produce output with a variety of special features. This is done by RUNNING your program once. In this case BASIC requires that each line in your program be preceded by a line number.

As an example, we mentioned earlier that the command **LPRINT CHR\$(15)** entered directly from the keyboard will set compressed print on this printer. From within a BASIC program, this command might be:

```
50 LPRINT CHR$(15)
```

4.6 Entering Hexadecimal Code

In the event that you will be entering ASCII codes in hexadecimal form, you must supply two extra characters per code. These are the ampersand (&) and the letter H. The example below illustrates the BASIC command to set compressed print on this printer.

Decimal
LPRINT CHR\$(15)

Hexadecimal
LPRINT CHR\$(&H0F)

Refer to Appendix A.

4.7 Control Codes

A number of the printer control commands require only a single ASCII-coded character as part of the LPRINT statement. The command **LPRINT CHR\$(15)** which we discussed earlier is an example of a single-byte control command.

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Multi-byte control codes, often called Escape control codes or Escape sequences, always begin with an ESC designation. ESC is designated by CHR\$(27) in decimal form or CHR\$(&H1B) in hexadecimal form. The ESC designation is always followed by one or more additional codes, hence the name multi-byte control code.

In BASIC, these two or more bytes are joined (or concatenated) into a single command or string using either a plus (+) sign, a semicolon (;), or by neither symbol but rather by listing one byte after another without any spaces. Refer to your BASIC manual for the proper method of string concatenation.

Table 4.1 and 4.2 on the following page, show equivalent methods of entering multi-byte control commands for most computers.

There is one remaining input format commonly used to reduce the keystrokes necessary to enter a multi-byte control command. As you examine the multi-byte control commands in the pages ahead, you will notice that the second byte, with the exception of ESC+SO and ESC+SI, is always a character which appears somewhere on your keyboard. In such cases rather than enter that character's ASCII code as part of the CHR\$ function, you may simply enter that character in quotes (""). For example, to set pica pitch (ESC+"P"), you may enter:

```
LPRINT CHR$(27)+"P"; or LPRINT CHR$(27)+CHR$(80);
```

As another example, to set double width printing, you may enter:

```
LPRINT CHR$(27)+"W"+CHR$(1);
```

or

```
LPRINT CHR$(27)+CHR$(87)+CHR$(1);
```

With this method, any of the three input formats shown in Table 4.1 and 4.2 may also be used (subject to the BASIC you are using).

| | Two-Byte Command |
|---------------------------|--|
| Function Name Code | Set Pica Pitch ESC+“P” 27, 80DEC |
| Input Format 1 | LPRINT CHR\$(27)+“P”; |
| Input Format 2 | LPRINT CHR\$(27);“P”; |
| Input Format 3 | LPRINT CHR\$(27)“P”; |

Table 4.1 Two-Byte Command Input Format

| | Three-Byte Command |
|---------------------------|---|
| Function Name Code | Set Double Wide Printing ESC+“W”+1 27, 87, 1DEC |
| Input Format 1 | LPRINT CHR\$(27)+“W”+CHR\$(1); |
| Input Format 2 | LPRINT CHR\$(27);“W”;CHR\$(1); |
| Input Format 3 | LPRINT CHR\$(27)“W”CHR\$(1); |

Table 4.2 Three-Byte Command Input Format

This printer has two printer (emulation) modes. They are Epson LQ-850 and IBM Proprinter X24E. Software commands for each mode are covered in the corresponding chapters.

4.8 Special Code for IBM PC or Compatible Computers

Since the LPRINT command on IBM PC or compatible computer can generate an unexpected LF and/or CR, use PRINT #1 instead of LPRINT. For details refer to your BASIC manual. The following two lines of BASIC are necessary at the top of the program.

```
10 WIDTH "LPT1:", 255
20 OPEN "LPT1:" AS #1
```

The following line of BASIC is necessary at the end of the program:

```
100 CLOSE
```

(line # will vary accordingly to your program)

PRINT #1 does not generate CR and LF, therefore a CR and LF must be used when they are required.

5. KX-P1124i Features

5.1 Print Feature Controls

This printer has a wide variety of print capabilities as shown below. The user can select any print mode by combining quality, font, font style, pitch and highlight, giving you more than 172,000 different print styles to customize the look of your particular document.

| Quality | Font | Font Style | Pitch | Highlight |
|---------|------------|-------------|-------|------------------|
| Draft | Draft | Subscript | 10 | Double high |
| LQ | Courier | Superscript | 12 | Double wide |
| SLQ | Prestige | Italic | 15* | Bold (Emphasize) |
| | Bold PS | | 17 | Double strike |
| | Script | | 20* | Outline |
| | Sans Serif | | PS | Shadow |
| | Orator | | | Underline |
| | Roman | | | Overline |

*Available in IBM Proprinter X24E mode only through the EZ Set Operator Panel.

Print Quality and Font

This printer has three print quality levels: Draft, LQ (Letter Quality) and SLQ (Super Letter Quality). Which you choose depends on your needs. Draft is printed at the fastest speed and is normally used for printing draft documents. LQ produces the high print quality and SLQ produces much better print quality than LQ; they are used to print the final version of formal documents.

The printer has seven LQ fonts: Courier, Prestige, Bold PS, Script, Sans Serif, Orator and Roman; three Draft fonts: Pica, Elite and Micron; and one SLQ font. These can be selected either by setting it on the EZ Set Operator Panel or through software.

Sub/superscript font characters are two-thirds the height of normal characters and are typically used in mathematical expressions, chemical formulae and footnotes.

Character Pitch

This printer has ten character pitches: 10 cpi (Pica), 12 cpi (Elite), 15 cpi (Micron), 17 cpi (Compressed), 20 cpi (Elite compressed), 5 cpi (Pica elongated), 6 cpi (Elite elongated), 7.5 cpi (Micron elongated), 8.5 cpi (Compressed elongated) and Proportional Spacing.

The height of the characters in the different pitches is the same; only the width varies. The pitches except PS are fixed pitch (within a pitch, all characters have the same width).

In proportional spacing, character widths vary with the character. An “I”, for example, takes up less space than an “M” or a “W”.

Proportional printing gives the document a typeset appearance. **Proportional spacing cannot be printed in draft mode.**

(Print Example)

```
5 cpi printing  
  (Pica elongated)  
6 cpi printing  
  (Elite elongated)  
7.5 cpi printing  
  (Micron elongated)  
8.5 cpi printing  
  (Compressed elongated)  
10 cpi printing (Pica)  
12 cpi printing (Elite)  
15 cpi printing (Micron)  
17 cpi printing (Compressed)  
20 cpi printing (Elite Compressed)  
Proportional Spacing
```

KX-P1124i Features

Character Highlighting

This printer allows a document to have a variety of print styles through the Function mode or the software commands.

Double high printing makes the height of a character twice that of a normal one.

Double wide printing makes the width of a character twice that of a normal one.

Double strike printing uses a double strike with two passes of the printhead.

Bold (Emphasized) printing is done with one pass of the printhead at half speed, which allows horizontally adjacent dots to be printed.

Outline printing makes the outline character of a normal one.

Shadow printing makes the shadow character of a normal one.

Underline printing produces a continuous line under characters, using the 24th pin of the printhead.

Overline printing produces a continuous line over characters using the first pin of the printhead.

(Print Example)

Double High
Double Wide
Double Strike Printing
Emphasized Printing
Outline printing
Shadow printing
Underline Overline Printing

5.2 Download Characters

Should you need to custom design special characters in addition to those provided, the 32K byte buffer option (KX-P43), is required. Draft and Letter Quality (LQ) fonts can be downloaded simultaneously. Draft download characters are printed when the printer is in draft mode. LQ characters are printed when the printer is in LQ mode.

To Download a character, you must first make preparations for:

- Installing the 32K buffer option (KX-P43).
- OPT RAM in the INSTALL menu is selected to DOWNLOAD through the Function mode (see page 3-25).

Making Maximum Use of the Buffer

Epson LQ-850 mode

18K (18,432) bytes are available which can be divided between draft and LQ characters in any combination, subject to hexadecimal address and buffer limits. Draft letters require 39 bytes maximum each while LQ letters require 114 maximum. To determine if the desired combination will fit, use the formula:

$$(\# \text{ of draft characters} \times 39) + (\# \text{ of LQ characters} \times 114) \leq 18,432$$

For example: 120 draft and 120 LQ are desired.

$$(120 \times 39) + (120 \times 114) = 4,680 + 13,680 = 18,360$$

therefore this combination will fit.

Because no more than 256 addresses can be identified in 1 byte (00_{HEX}–FF_{HEX}). 256 is the maximum number of draft characters that can be defined. The maximum number of LQ characters that can be loaded is 161.

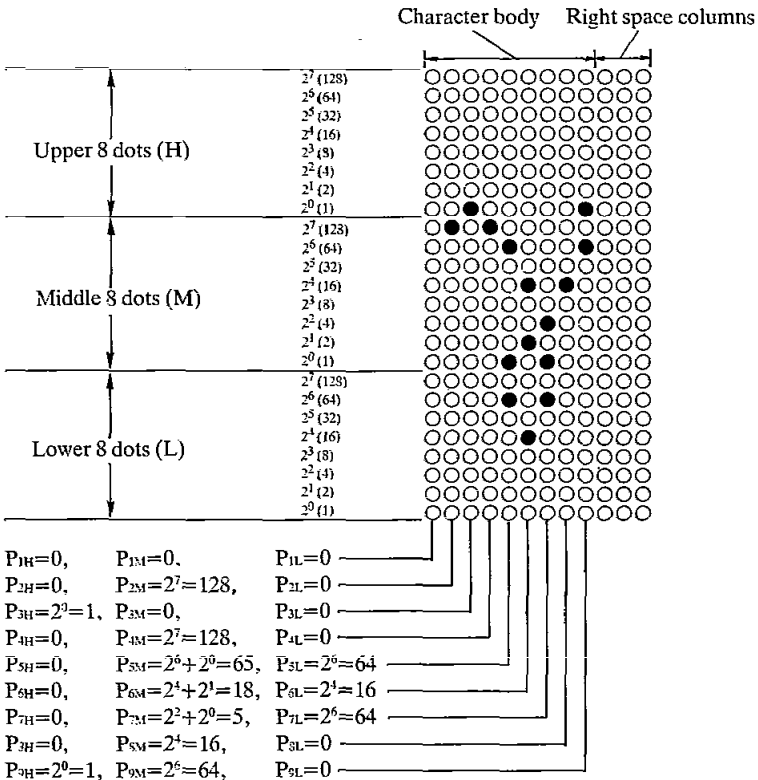
IBM Proprinter X24E mode

The 32K bytes available can be divided between draft and LQ characters in any combination. The download data also can be entered to RAM by compression. The maximum number of characters depends on the manner in which the characters are entered.

Designing Download Characters

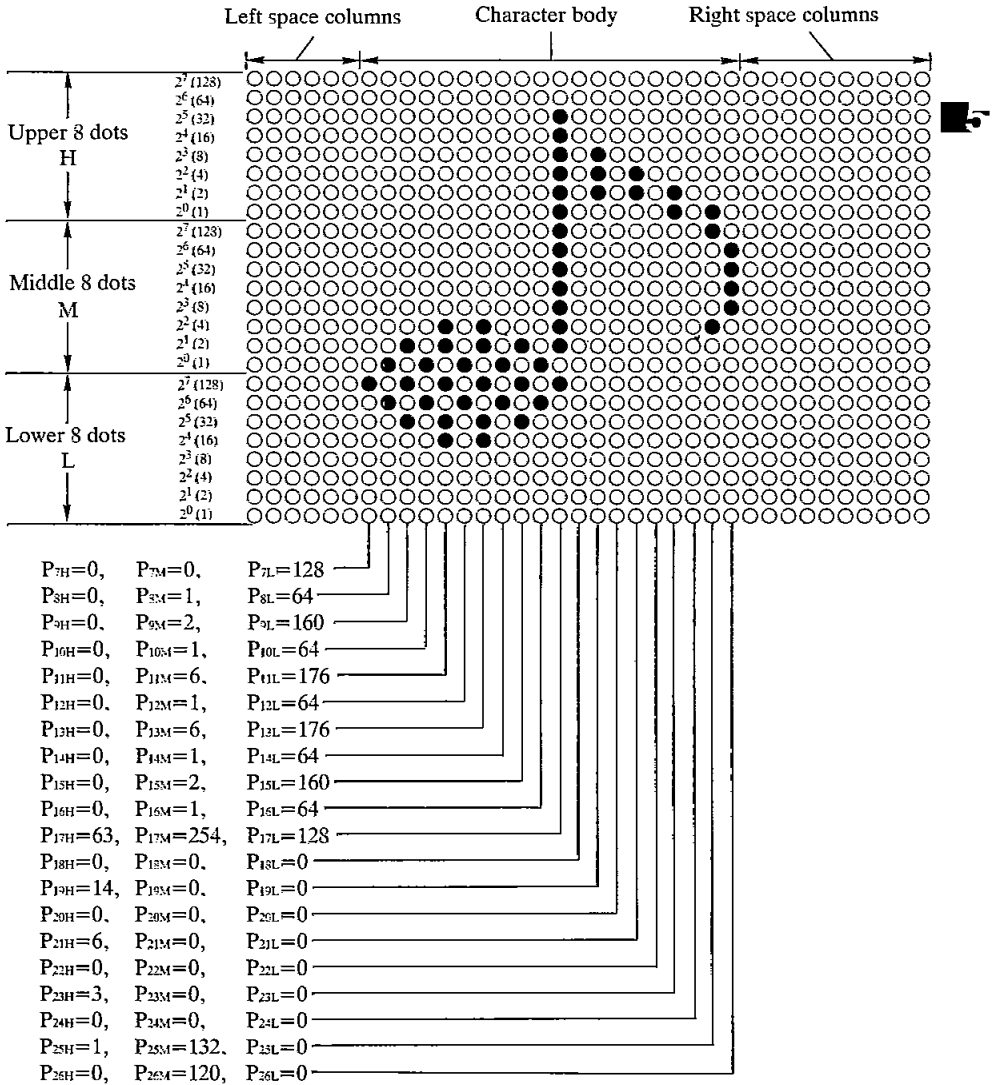
1. Draft Font

To download a character you must first design the character. A draft font download character uses 9 columns and 24 rows of dots. Since a given column contains 24 dots, each column is divided into 3 portions, upper 8, middle 8 and lower 8 dots. Column 1 is labeled P_{1H} for the upper 8 dots, P_{1M} for the middle 8 and P_{1L} for the lower 8 dots. Similarly column 9 is labeled P_{9H} for the upper 8 dots, P_{9M} for the middle 8 and P_{9L} for the lower 8 dots. Columns 10, 11 and 12 are always set to zero, thus we are working with P_{1H} through P_{9L} . In the matrix below, the circles represent pins which may be fired. You may darken any circle provided no two adjacent horizontal circles are filled in. Once you have designed the character, you must quantify each dot column, P_{1H} – P_{9H} , by summing the powers of two represented by each dot. Consider the design of the Greek character gamma.



2. LQ Font

A LQ font download character uses 36 columns and 24 rows of dots. Designing and storing fonts can be performed in the same way as with draft fonts. Here, consider the design of the one-eighth-note character:



KX-P1124i Features

Entering Download Data

Epson LQ-850 mode

1. Draft Font

Download command in the Epson LQ-850 mode is:

ESC+"&" + 0 + n + m + d₀ + d₁ + d₂ + DATA

Input format for download command is:

LPRINT CHR\$(27)+"&" + CHR\$(0) + CHR\$(n) + CHR\$(m)
+ CHR\$(d₀) + CHR\$(d₁) + CHR\$(d₂) + DATA

Programming example for the Greek character gamma is as follows:

```
10 REM Draft Download Character
20 WIDTH "LPT1:",255
30 OPEN "LPT1:" AS #1
40 PRINT #1,CHR$(27)+"x0";
50 PRINT #1,CHR$(27)+";"+CHR$(0)+CHR$(0)+CHR$(0);
60 PRINT #1,CHR$(27)+"&" + CHR$(0) + CHR$(65) + CHR$(65);
70 PRINT #1,CHR$(1)+CHR$(8)+CHR$(3);
80 PRINT #1,CHR$(0)+CHR$(128)+CHR$(0);
90 PRINT #1,CHR$(1)+CHR$(0)+CHR$(0);
100 PRINT #1,CHR$(0)+CHR$(128)+CHR$(0);
110 PRINT #1,CHR$(0)+CHR$(65)+CHR$(64);
120 PRINT #1,CHR$(0)+CHR$(18)+CHR$(16);
130 PRINT #1,CHR$(0)+CHR$(5)+CHR$(64);
140 PRINT #1,CHR$(0)+CHR$(16)+CHR$(0);
150 PRINT #1,CHR$(1)+CHR$(64)+CHR$(0);
160 REM Download character print
170 PRINT #1,CHR$(27)+"%" + CHR$(1);
180 PRINT #1,"A A A A A A A A A A ";CHR$(10);
190 PRINT #1,CHR$(27)+"%" + CHR$(0);
200 END
```

First determine where in RAM the character(s) should be stored. The variables "n" and "m" are used for this purpose. The value specified for n indicates the location into which the first download character will be stored. The value specified for "m" indicates the location into which the last download character will be stored. If you are storing a single character, then n=m.

Next define the value of "d₀", "d₁" and "d₂" which specify attribute information. The attribute information includes the following:

d₀=number of space dot columns to the left of the character body

d₁=number of character body dot columns

d₂=number of space dot columns to the right of the character body

In our sample program, we created a gamma character. This character consists of 1 left space dot column, 8 body dot columns and 3 right space dot columns. Therefore, $d_0=1$, $d_1=8$ and $d_2=3$.

In general, d_1 cannot exceed 9 and $d_0+d_1+d_2$ cannot exceed 12.

Note:

- Program line 40 is necessary for downloading draft font and designates draft printing.
- Program lines 80~150 use the eight values $P_H \sim P_M$ to define the shape and size of the gamma.
- Program line 170 selects download character generator. After this selection, by printing the download code [in this example, $\text{CHR}\$(65)='A'$] the downloaded character is printed.
- Two horizontal adjacent columns cannot be printed in either draft or LQ mode.

2. LQ Font

Input format is the same as with draft fonts.

Programming example for the one-eighth-note character is as follows:

```
10 REM Define Download Letter Quality Character
20 WIDTH "LPT1:",255
30 OPEN "LPT1:" AS #1
40 PRINT #1,CHR$(27)+"x1";
50 PRINT #1,CHR$(27)+" ":"+CHR$(0)+CHR$(0)+CHR$(0);
60 PRINT #1,CHR$(27)+"&"+CHR$(0)+CHR$(65)+CHR$(65);
70 PRINT #1,CHR$(6)+CHR$(20)+CHR$(10);
80 PRINT #1,CHR$(0)+CHR$(0)+CHR$(128);
90 PRINT #1,CHR$(0)+CHR$(1)+CHR$(64);
100 PRINT #1,CHR$(0)+CHR$(2)+CHR$(160);
110 PRINT #1,CHR$(0)+CHR$(1)+CHR$(64);
120 PRINT #1,CHR$(0)+CHR$(6)+CHR$(176);
130 PRINT #1,CHR$(0)+CHR$(1)+CHR$(64);
140 PRINT #1,CHR$(0)+CHR$(6)+CHR$(176);
150 PRINT #1,CHR$(0)+CHR$(1)+CHR$(64);
160 PRINT #1,CHR$(0)+CHR$(2)+CHR$(160);
170 PRINT #1,CHR$(0)+CHR$(1)+CHR$(64);
180 PRINT #1,CHR$(63)+CHR$(254)+CHR$(128);
190 PRINT #1,CHR$(0)+CHR$(0)+CHR$(0);
200 PRINT #1,CHR$(14)+CHR$(0)+CHR$(0);
210 PRINT #1,CHR$(0)+CHR$(0)+CHR$(0);
220 PRINT #1,CHR$(6)+CHR$(0)+CHR$(0);
230 PRINT #1,CHR$(0)+CHR$(0)+CHR$(0);
240 PRINT #1,CHR$(3)+CHR$(0)+CHR$(0);
250 PRINT #1,CHR$(0)+CHR$(0)+CHR$(0);
260 PRINT #1,CHR$(1)+CHR$(132)+CHR$(0);
270 PRINT #1,CHR$(0)+CHR$(120)+CHR$(0);
280 REM Download character print
290 PRINT #1,CHR$(27)+"%" +CHR$(1);
300 PRINT #1,"A A A A A A A A A ";CHR$(10);
310 PRINT #1,CHR$(27)+"%" +CHR$(0);
320 END
```

KX-P1124i Features

The number of printable columns for characters downloaded in the letter quality font is as follows:

| | $d_0 + d_1 + d_2$ |
|----------------------|-------------------|
| LQ 10 cpi | 36 |
| LQ 12 cpi | 30 |
| Proportional Spacing | 42 |

Print Mode Combination:

- Draft Download characters can be printed only when the FONT is set to Draft through the Function mode or through software commands.
- Letter quality download characters can be printed only when the FONT is set to Bold PS, Courier, Orator, Prestige, Roman, Sans Serif, Script through the Function mode or through software commands.

IBM Proprinter X24E mode

Downloading fonts in IBM Proprinter X24E mode requires downloading character Dot Pattern data and character Index Table data. Dot pattern data controls which pins fire when printing a character, Index Table data is placed in a “lookup table” that provides information on where Dot Pattern data is stored in memory and defines certain attributes of the character.

The format for the command to input download data is:

ESC+“=”+ $n_1 + n_2 + 35 + A_1 + A_2 + d_1 + d_2 + \dots + d_x$

where

$n_1 + (256 \times n_2)$ = the number of data bytes to be downloaded, 35 is a fixed number that must always be sent, A_1 and A_2 indicate the low order and high order addresses in which data is to be stored, and d_1, d_2, \dots is the data being downloaded. This data will be in one of two formats, depending on whether it is Dot Pattern or Index Table:

Index Table Addresses

Starting memory addresses for Index Tables are:

| | |
|-----------------------|---------------------|
| Draft (10 and 12 cpi) | 8011 _{HEX} |
| LQ 10 cpi | 8912 _{HEX} |
| LQ Proportional | 9213 _{HEX} |
| LQ 12 cpi | 9B14 _{HEX} |

To calculate the address for an individual character Index Table Entry, use the equation:

$$\text{Address} = 9 \times \text{ASCII character number} + \text{starting address.}$$

To find the address of the Index Table location for the draft letter "A":

Multiply 9×65 (ASCII character number for "A") = 585_{DEC}

Convert to hexadecimal = 249_{HEX}

Add starting address for draft = 8011_{HEX}

yielding $825A_{\text{HEX}}$ making $A_1 = 5A_{\text{HEX}}$, and $A_2 = 82_{\text{HEX}}$.

Dot Pattern Data

Dot Pattern data is sent for all columns that must be uniquely defined. If adjacent horizontal columns are identical (or can be made identical knowing that the printer will not print adjacent horizontal dots) data compression may be used and the duplicate data need not be sent. Dot Pattern data may be stored at any address from $A414_{\text{HEX}}$ to $FFFF_{\text{HEX}}$ inclusive.

Dot columns for characters are as follows:

Draft (10 and 12 cpi) 10 columns

LQ 10 cpi 36 columns

LQ 12 cpi 30 columns

LQ Proportional 18~42 columns

It is important to note that the last column is always blank. (e.g. A download draft character is defined by 9 columns. The printer automatically adds the tenth column.)

$$\text{Data} = P_{1H} + P_{1M} + P_{1L} + P_{2H} + P_{2M} + P_{2L} + \dots + P_{nH} + P_{nM} + P_{nL}$$

Index Table Data

$$AA_1 + AA_2 + IT_1 + IT_2 + CM_1 + \dots + CM_5$$

where

AA_1 and AA_2 indicate the address where Dot Pattern data is stored.

AA_1 and AA_2 are the high order and the low order bytes respectively.

KX-P1124i Features

IT₁ is Index Table byte #1. Bit designation is:

| Bit | 0 | 1 |
|-----|---|--------------------|
| 7 | Normal Character | Graphic Character |
| 6 | Download Character | Resident Character |
| 5~0 | Number of columns in the character memory | |

IT₂ is Index Table byte #2. Bit designation is:

Bits 7, 6 Type of block graphic character
 00 shading character
 01 line drawing character
 10 underscore character
 11 not supported

Bits 5~0 number of columns in the character less 1
 [e.g. for draft characters, 10-1=9_{DEC}=(001001)₂
 bits 5~0=001001]

CM₁~CM₅ are compression mask bits. (0=no compression, 1=compression)

CM₁ bit 7=1st dot column
 bit 6=2nd dot column
 .
 .
 .

CM₅ bit 3=37th dot column
 bit 2=38th dot column
 bit 1=39th dot column
 bit 0=40th dot column

Note:

- All block graphic characters are 30 dots high, even though only 24 dots are defined for each column. An underline is defined as a blank block graphic character (all zeros). The underline is generated by the printer during the second pass. A shadow character repeats dots 1~6 of each column as dots 25 through 30 respectively. A line draw character repeats dots 23 and 24 as the pairs 25 and 26, 27 and 28, and 29 and 30.
- Entry data can designate any character data image whether resident or downloaded. Multiple table entries can designate the same character. The address of an undefined entry should be 000. An undefined entry is printed as a space.
- Location 0 (00hex) normally stores the slashed zero. If a character is downloaded into this location, when the slashed zero is selected through the Function mode, the downloaded character will print in place of any zero.

Data Compression

Data Compression allows the efficient use of memory in storing downloaded characters providing space for more characters than would be available without compression. The printer repeats the previous dot column in the current column when the current column compression mask bit is set to 1.

Resetting Download Area

Issuing the command ESC+“=”+0+0 initializes the download area. All previously downloaded characters are cleared and the Index Tables are loaded with information for resident fonts.

KX-P1124i Features

Programming Examples:

To load the draft character used in the example for the Epson LQ-850 mode (Greek gamma), the following program may be used.

```
10 REM Greek Gamma Character Download and print
20 WIDTH "LPT1:",255
30 OPEN "LPT1:" AS #1
40 REM---(Initialize the Download Buffer)
50 PRINT #1,CHR$(27)+"=" +CHR$(0)+CHR$(0);
60 REM---(Dot Pattern Data Entry to ASCII "A")
70 PRINT #1,CHR$(27)+"=" +CHR$(30)+CHR$(0)+CHR$(35);
80 PRINT #1,CHR$(&H0)+CHR$(&HB0);
90 PRINT #1, CHR$(0)+CHR$(128)+CHR$(0);
100 PRINT #1,CHR$(1)+CHR$(0)+CHR$(0);
110 PRINT #1,CHR$(0)+CHR$(128)+CHR$(0);
120 PRINT #1,CHR$(0)+CHR$(65)+CHR$(64);
130 PRINT #1,CHR$(0)+CHR$(18)+CHR$(16);
140 PRINT #1,CHR$(0)+CHR$(5)+CHR$(64);
150 PRINT #1,CHR$(0)+CHR$(16)+CHR$(0);
160 PRINT #1,CHR$(1)+CHR$(64)+CHR$(0);
170 PRINT #1,CHR$(0)+CHR$(0)+CHR$(0);
180 REM---(Index Table Entry to ASCII "A" )
190 PRINT #1,CHR$(27)+"=" +CHR$(12)+CHR$(0)+CHR$(35);
200 PRINT #1,CHR$(&H5A)+CHR$(&H82);
210 PRINT #1,CHR$(&HB0)+CHR$(&H0)+CHR$(8);
220 PRINT #1,CHR$(10)+CHR$(0)+CHR$(0);
230 PRINT #1,CHR$(0)+CHR$(0)+CHR$(0);
240 REM---(Download Character print )
250 PRINT #1,CHR$(27)+"I"+CHR$(4);
260 FOR I=1 TO 10
270 PRINT #1, "A";
280 NEXT
290 PRINT #1,CHR$(13);CHR$(10);
300 CLOSE #1
310 END
```

In this example of Greek gamma, a character is not compressed and data of CM₁ through CM₅ are all zeros.

To load the LQ character used in the example for the one-eighth-note character, the following program may be used.

Input format is the same as with draft fonts.

KX-P1124i Features

Programming example for the one-eighth-note character is as follows:

```
10 REM One-eighth-note Character Download and print
20 WIDTH "LPT1:",255
30 OPEN "LPT1:" AS #1
40 REM---(Initialize the Download Buffer)
50 PRINT #1,CHR$(27)+"=" +CHR$(0)+CHR$(0);
60 REM---(Dot Pattern Data Entry to ASCII "B")
70 PRINT #1,CHR$(27)+"=" +CHR$(45)+CHR$(0)+CHR$(35);
80 PRINT #1,CHR$(&H0)+CHR$(&HB0);
90 PRINT #1, CHR$(0)+CHR$(0)+CHR$(0);
100 PRINT #1,CHR$(0)+CHR$(0)+CHR$(128);
110 PRINT #1,CHR$(0)+CHR$(1)+CHR$(64);
120 PRINT #1,CHR$(0)+CHR$(3)+CHR$(224);
130 PRINT #1,CHR$(0)+CHR$(7)+CHR$(240);
140 PRINT #1,CHR$(0)+CHR$(3)+CHR$(224);
150 PRINT #1,CHR$(0)+CHR$(1)+CHR$(64);
160 PRINT #1,CHR$(63)+CHR$(254)+CHR$(128);
170 PRINT #1,CHR$(14)+CHR$(0)+CHR$(0);
180 PRINT #1,CHR$(6)+CHR$(0)+CHR$(0);
190 PRINT #1,CHR$(3)+CHR$(0)+CHR$(0);
200 PRINT #1,CHR$(1)+CHR$(132)+CHR$(0);
210 PRINT #1,CHR$(0)+CHR$(120)+CHR$(0);
220 PRINT #1,CHR$(0)+CHR$(0)+CHR$(0);
230 REM---(Index Table Entry to ASCII "B" )
240 PRINT #1,CHR$(27)+"=" +CHR$(12)+CHR$(0)+CHR$(35);
250 PRINT #1,CHR$(&H64)+CHR$(&H8B);
260 PRINT #1,CHR$(&HB0)+CHR$(&H0)+CHR$(14);
270 PRINT #1,CHR$(35)+CHR$(124)+CHR$(90);
280 PRINT #1,CHR$(85)+CHR$(47)+CHR$(240);
290 REM---(Download Character print )
300 PRINT #1,CHR$(27);"I";CHR$(6);
310 FOR I=1 TO 10
320 PRINT #1,"B";
330 NEXT
340 PRINT #1,CHR$(13);CHR$(10);
350 CLOSE #1
360 END
```

Note:

- The left most column of adjacent identical columns has its compression mask bit set to 0 and that bit in the other such columns is set to 1.
- Entry data can designate any character data image, whether resident or downloaded. Multiple table entries can designate the same character. The address of an undefined entry should be 000. An undefined entry is printed as a space.
- Location 0 (00_{HEX}) normally stores the slashed zero. If a character is downloaded into this location, when the slashed zero is selected through the Function mode, the downloaded character will print in place of any zero.
- ASCII character in location 255 (FF_{HEX}) cannot be defined.

5.3 Bit Image (Graphics)

Bit image (Graphics) is used to produce pictures, graphs, charts or creative patterns. Many commercial software packages use bit images. This printer has six 8-pin bit image modes and five 24-pin bit image modes within LQ-850 mode, and has four 8-pin/24-pin bit image modes within IBM Proprinter X24E mode, so that you have a wide variety of image printing. When you use a commercial software package you should refer to your software instruction manual for the proper use of it with this printer. Each printer mode has its own bit image commands. Because differences between the two modes are small, only LQ-850 mode is used here as an example of how to print bit images through software commands.

Dot Density

Dot density (dot resolution) refers to the maximum number of dots which can be printed in an inch or on a line. This printer enables you to access a variety of dot densities through specific control commands. The various dot densities and corresponding control commands appear in Table 5.1.

| Command | Function | Dots/Inch | Dots/line |
|--|---|-----------|-----------|
| ESC+“K”+n ₁ +n ₂ | Standard density | 60 | 480 |
| ESC+“L”+n ₁ +n ₂ | Double density | 120 | 960 |
| ESC+“Y”+n ₁ +n ₂ | Double speed, Double density | 120 | 960 |
| ESC+“Z”+n ₁ +n ₂ | Quadruple density | 240 | 1920 |
| ESC+“*”+m+n ₁ +n ₂ | 8-Pin Mode Selection: m=0 (Standard) | 60 | 480 |
| | m=1 (Double) | 120 | 960 |
| | m=2 (Double speed, Double density) | 120 | 960 |
| | m=3 (Quadruple density) | 240 | 1920 |
| | m=4 (CRT I) | 80 | 640 |
| | m=6 (CRT II) | 90 | 720 |
| | 24-Pin Mode Selection: m=32 (Standard) | 60 | 480 |
| | m=33 (Double) | 120 | 960 |
| | m=38 (CRT III) | 90 | 720 |
| | m=39 (Triple) | 180 | 1440 |
| | m=40 (Hex) | 360 | 2880 |
| ESC+“[”+“g”+n ₁ +n ₂ +m | 8-Pin Mode Selection: m=0 (Standard) | 60 | 480 |
| | m=1 (Double) | 120 | 960 |
| | m=2 (Double speed, Double density) | 120 | 960 |
| | m=3 (Quadruple density) | 240 | 1920 |
| | 24-pin Mode Selection: m=8 (Standard) | 60 | 480 |
| | m=9 (Double) | 120 | 960 |
| | m=11 (Triple) | 180 | 1440 |
| | m=12 (Hex) | 360 | 2880 |

Table 5.1 Dot Density

KX-P1124i Features

8-Pin Bit Image Mode

This printer has 24 pins in the printhead. The distance between the centers of adjacent pins is $\frac{1}{180}$ " (0.14 mm) and the diameter of each pin is $\frac{1}{127}$ " (0.2 mm). In 8-pin bit image mode the 24 pins of the printhead are grouped as follows. One byte is sent to the printer for each column to be printed. Each bit of that byte represents an individual pin-block. By summing the powers of two corresponding to each pin-block you wish to fire, you will obtain a numerical value for the column in question. By sending a string of bytes, numerical values for each column on a line are input and processed. The result is one line of graphics.

| Pin-block | Pin-block Code | Pins | Pin No. | Pin-block Code | Pin-block | |
|-----------|----------------|------|---------|----------------|-----------|---|
| 1 | $2^7=128$ | | 1 | $2^7=128$ | 1 | |
| | | | 2 | | | |
| | | | 3 | | 1 and 2 | |
| | | | 4 | | | |
| 2 | $2^6=64$ | | 5 | | $2^6=64$ | 2 |
| | | | 6 | | | |
| | | | 7 | | $2^5=32$ | 3 |
| | | | 8 | | | |
| 3 | $2^5=32$ | | 9 | | | |
| | | | 10 | | 3 and 4 | |
| | | | 11 | | $2^4=16$ | 4 |
| 4 | $2^4=16$ | | 12 | | | |
| | | | 13 | | $2^3=8$ | 5 |
| | | | 14 | | | |
| 5 | $2^3=8$ | | 15 | | | |
| | | | 16 | | 5 and 6 | |
| | | | 17 | | $2^2=4$ | 6 |
| 6 | $2^2=4$ | | 18 | | | |
| | | | 19 | | $2^1=2$ | 7 |
| | | | 20 | | | |
| 7 | $2^1=2$ | | 21 | | | |
| | | | 22 | | 7 and 8 | |
| | | | 23 | | $2^0=1$ | 8 |
| 8 | $2^0=1$ | | 24 | | | |
| | | | | } Not used | | |

LQ-850 mode and
 IBM Proprinter X24E mode
 (Alternate Graphic Mode: ON)

IBM Proprinter X24E mode
 (Alternate Graphic Mode: OFF)

Note:

- In the LO-850 mode or IBM Proprinter X24E mode with Alternate Graphic Mode (AGM) set to ON through the Function mode, 8-pin bit image graphics is printed by using all 24 pins in the printhead.

As an example, suppose you want to fire pin-blocks 1, 2, 5 and 8 simultaneously. Then you compute the following sum:

$$\begin{aligned} \text{Input code} &= \text{Pin-block 1 code} + \text{Pin-block 2 code} + \\ &\quad \text{Pin-block 5 code} + \text{Pin-block 8 code} \\ &= 2^7 + 2^6 + 2^3 + 2^0 = 128 + 64 + 8 + 1 = 201 \end{aligned}$$

Thus, the value 201 is entered in the CHR\$ function in order to print a single column of dots resulting from firing pin-blocks 1, 2, 5 and 8.

For our final example, refer to the standard density designation in Table 5.1. This setting is given by ESC+“K”+n₁+n₂. Suppose you wish to print 100 columns of dots, where every column fires pins 1 and 8 only. You first compute the values of n₁ and n₂ which define the number of columns to be printed.

$$\begin{array}{r} \overline{0 \text{ (n}_2\text{)}} \\ 256 \overline{) 100} \\ \underline{0} \\ 100 \text{ (n}_1\text{)} \end{array} \quad , \text{so } n_2=0 \text{ and } n_1=100$$

Our control code ESC+“K”+n₁+n₂ now translates into:

```
LPRINT CHR$(27)+"K"+CHR$(100)+CHR$(0);
```

If you use ESC+“[”+“g”+n₁+n₂+m in IBM Proprinter X24E mode, compute the values of n₁ and n₂ as follows:

$$\begin{aligned} n_2 \times 256 + n_1 &= \text{Column} \times \text{Bytes} + 1 \\ m=0, 1, 2, 3: &\quad \text{Bytes}=1 \\ m=8, 9, 11, 12: &\quad \text{Bytes}=3 \end{aligned}$$

For example, 24-pin bit image of 100 column is:

$$100 \times 3 + 1, \text{ so } n_2=1 \text{ and } n_1=45.$$

KX-P1124i Features

A programming example is as follows:

```
10 REM STANDARD DENSITY
20 WIDTH "LPT1:",255
30 OPEN "LPT1:" AS #1
40 PRINT #1,CHR$(27)+"3"+CHR$(24);
50 PRINT #1,CHR$(27)+"K"+CHR$(100)+CHR$(0);
60 FOR I=1 TO 5
70 PRINT #1,CHR$(1)+CHR$(2)+CHR$(4)+CHR$(8)+CHR$(16);
80 PRINT #1,CHR$(32)+CHR$(64)+CHR$(128)+CHR$(64)+CHR$(128);
90 PRINT #1,CHR$(64)+CHR$(128)+CHR$(64)+CHR$(128)+CHR$(64);
100 PRINT #1,CHR$(32)+CHR$(16)+CHR$(8)+CHR$(4)+CHR$(2);
110 NEXT I
120 PRINT #1,CHR$(13)+CHR$(10);
130 PRINT #1,CHR$(27)+"K"+CHR$(100)+CHR$(0);
140 FOR I=1 TO 5
150 PRINT #1,CHR$(128)+CHR$(64)+CHR$(32)+CHR$(16)+CHR$(8);
160 PRINT #1,CHR$(4)+CHR$(2)+CHR$(1)+CHR$(2)+CHR$(1);
170 PRINT #1,CHR$(2)+CHR$(1)+CHR$(2)+CHR$(1)+CHR$(2);
180 PRINT #1,CHR$(4)+CHR$(8)+CHR$(16)+CHR$(32)+CHR$(64);
190 NEXT I
200 PRINT #1,CHR$(13);CHR$(10);
210 CLOSE
220 END
```

$2\frac{1}{180}$ " Line space set



2nd line data

1st line data

Note:

- Line 20 and 30 are necessary for the proper execution of this program on many IBM-compatible computers.
- Line 40 is necessary to set the line feed for printing in the bit image mode. In the IBM Proprinter X24E mode, when AGM is set to OFF through the Function mode, it will amount to $2\frac{1}{216}$ inch.

24-Pin Bit Image Mode

In the 24-pin bit image mode, all 24-pins of the printhead may be fired. In this mode, 3 data bytes must be sent to the printer for each column. The 24 pins in the printhead are divided into three portions, the upper 8 pins, middle 8 pins and lower 8 pins.

As an example, suppose you want to fire pins 1, 2, 5, 8, 9, 11, 12, 21 and 24 simultaneously. Then you compute the following three values:

Byte 1: Input code=Pin 1 code+Pin 2 code+Pin 5 code+Pin 8 code
 $=2^7+2^6+2^3+2^0=128+64+8+1=201$

Byte 2: Input code=Pin 9 code+Pin 11 code+Pin 12 code
 $=2^7+2^5+2^4=128+32+16=176$

Byte 3: Input code=Pin 21 code+Pin 24 code= $2^3+2^0=8+1=9$

Thus, the three bytes for a single column of dots are entered as CHR\$(201);CHR\$(176);CHR\$(9); Refer to the 24-pin standard density command in Table 5-1. This setting is given by ESC+“*”+m+n₁+n₂, where m=32. Suppose you wish to print 100 columns of dots, where every column fires pins 1, 2, 5, 8, 9, 11, 12, 21 and 24 as above.

As in the 8-pin example on page 5-19, n₁=100 and n₂=0. Our command ESC+“*”+m+n₁+n₂ now translates into

LPRINT CHR\$(27)+“*”+CHR\$(32)+CHR\$(100)+CHR\$(0);

If we incorporate this information into a program, we might have the following:

```
10 REM 24 PIN STANDARD DENSITY
20 WIDTH "LPT1:" ,255
30 OPEN "LPT1:" AS #1
40 PRINT #1,CHR$(27)+"*" +CHR$(32)+CHR$(100)+CHR$(0);
50 FOR I=1 TO 100
60 PRINT #1,CHR$(201);
70 PRINT #1,CHR$(176);
80 PRINT #1,CHR$(9);
90 NEXT I
100 PRINT #1,CHR$(10);
110 CLOSE
120 END
```

If in IBM mode AGM must be set to ON.

If you use ESC+“[”+“g”+n₁+n₂+m in IBM Proprinter X24E mode, you must change line 40 as follows:

40 PRINT #1, CHR\$(27)+“[”+CHR\$(45)+CHR\$(1)+CHR\$(8);

KX-P1124i Features

Note:

- Bit Image Graphics prints unidirectionally for high precision printing. For high speed printing set the printer to bidirectional printing through the Function mode (see page 3-17).
- Graphics mode is released immediately following the printing of all bit image data. Printing will return to text mode.
- Bit image data is not affected by MSB control commands.

Alternate Graphic Mode (AGM)

There are two kinds of graphic printing in IBM Proprinter X24E mode. You can set them through Alternate Graphic Mode setting through the Function mode or software.

When AGM is set to OFF, 8-pin bit image graphic is printed by using pins 1 through 20.

When AGM is set to ON, the printing of 8-pin graphic mode is the same as in Epson LQ-850 mode. Also, graphic printing command, ESC+“*” in Epson LQ-850 mode is effective in this mode. Therefore, you can use the same command as in Epson LQ-850 mode.

The following table shows commands affected by AGM mode.

| | | AGM ON | AGM OFF |
|--|-------------|--|--|
| ESC+“K”+n ₁ +n ₂ ESC+“L”+n ₁ +n ₂ ESC+“Y”+n ₁ +n ₂ ESC+“Z”+n ₁ +n ₂ | | use 24 pin | use 20 pin |
| ESC+“[”+ “g”+n ₁ +n ₂ +m | 8-pin mode | use 24 pin | use 20 pin |
| | 24-pin mode | | use 24 pin |
| ESC+“3”+n ESC+“A”+n ESC+“J”+n | | based on 1/180 inch based on 1/60 inch based on 1/180 inch | based on 1/216 inch based on 1/72 inch based on 1/216 inch |

6. Epson LQ-850 Mode Commands

This chapter covers the software commands for Epson LQ-850 mode. The software commands are grouped into the following classifications:

FONT SELECTION

| Name | Function | Page |
|-----------|-----------------------------------|------|
| ESC+“x”+n | Selects print quality | 6-6 |
| ESC+“k”+n | Selects print font style | 6-6 |
| ESC+“S”+1 | Selects subscript printing | 6-7 |
| ESC+“S”+0 | Selects superscript printing | 6-7 |
| ESC+“T” | Releases sub/superscript printing | 6-7 |

CHARACTER PITCH SELECTION

| Name | Function | Page |
|-----------|--|------|
| ESC+“P” | Sets pica pitch (10 cpi) printing* | 6-7 |
| ESC+“M” | *Sets elite pitch (12 cpi) printing | 6-8 |
| ESC+“g” | Sets micron (15 cpi) printing | 6-8 |
| SI | *Sets compressed (17 cpi) printing | 6-9 |
| ESC+SI | *Sets compressed (17 cpi) printing | 6-9 |
| DC2 | Releases compressed printing | 6-9 |
| ESC+“p”+1 | Sets proportional spacing | 6-9 |
| ESC+“p”+0 | Releases proportional spacing | 6-9 |
| ESC+“!”+n | Sets certain pitches based upon value of n | 6-10 |

* When elite and compressed pitch are set simultaneously, subsequent output is printed in 20 cpi (up to 160 cpl).

CHARACTER HIGHLIGHT SELECTION

| Name | Function | Page |
|-----------|---|------|
| ESC+“!”+n | Sets highlighting based upon value of n | 6-10 |
| ESC+“E” | Sets emphasized printing | 6-10 |
| ESC+“F” | Releases emphasized printing | 6-10 |
| ESC+“w”+1 | Sets double high printing | 6-11 |
| ESC+“w”+0 | Releases double high printing | 6-11 |
| DC4 | Releases single-line double wide printing | 6-11 |
| SO | Sets single-line double wide printing | 6-11 |
| ESC+SO | Sets single-line double wide printing | 6-11 |
| ESC+“W”+1 | Sets double wide printing | 6-12 |
| ESC+“W”+0 | Releases double wide printing | 6-12 |
| ESC+“q”+n | Sets outline and shadow printing | 6-12 |

Epson LQ-850 Mode Commands

CHARACTER HIGHLIGHT SELECTION (continued)

| Name | Function | Page |
|--|---------------------------------|------|
| ESC+“G” | Sets double strike printing | 6-13 |
| ESC+“H” | Releases double strike printing | 6-13 |
| ESC+“-”+1 | Sets underlining | 6-13 |
| ESC+“-”+0 | Releases underlining | 6-13 |
| ESC+“(”+“-” +n ₁ +n ₂ +m +d ₁ +d ₂ | Sets/releases score | 6-14 |

6

WORD PROCESSING MODE SELECTION

| Name | Function | Page |
|-----------|-------------------------------|------|
| ESC+“a”+0 | Releases Word Processing mode | 6-15 |
| ESC+“a”+1 | Selects centering mode | 6-15 |
| ESC+“a”+2 | Selects right alignment mode | 6-15 |
| ESC+“a”+3 | Selects justification mode | 6-15 |
| ESC+SP+n | Sets character dots spacing | 6-15 |

CHARACTER SET SELECTION

| Name | Function | Page |
|-----------|----------------------------------|------|
| ESC+“4” | Sets Italic printing | 6-16 |
| ESC+“5” | Releases Italic printing | 6-16 |
| ESC+“R”+n | Sets international character set | 6-16 |
| ESC+“7” | Selects graphic Character Set 1 | 6-17 |
| ESC+“6” | Selects graphic Character Set 2 | 6-17 |
| ESC+“t”+n | Selects alternate character set | 6-18 |

BIT IMAGE (GRAPHICS) MODE SELECTION

| Name | Function | Page |
|---|--|------|
| ESC+“K”+n ₁ +n ₂ | Sets 8-pin image standard density (60 dpi) | 6-18 |
| ESC+“L”+n ₁ +n ₂ | Sets 8-pin image double density (120 dpi) | 6-18 |
| ESC+“Y”+n ₁ +n ₂ | Sets 8-pin image double density/ double speed (120 dpi) | 6-19 |
| ESC+“Z”+n ₁ +n ₂ | Sets 8-pin bit image quadruple density (240 dpi) | 6-19 |

Epson LQ-850 Mode Commands

BIT IMAGE (GRAPHICS) MODE SELECTION (continued)

| Name | Function | Page |
|--|--|------|
| ESC+“*”+m +n ₁ +n ₂ | Sets bit image mode selection (8-pin 60, 120, 120D, 240, 80, 90, 24-pin 60, 120, 90, 180, 360) | 6-20 |
| ESC+“?”+n+m | Reassigns graphics mode density | 6-21 |

PAPER FEED SELECTION—Amount

| Name | Function | Page |
|-----------|--------------------------------------|------|
| ESC+“0” | Sets paper feed to 1/8 inch (3.2 mm) | 6-21 |
| ESC+“2” | Sets paper feed to 1/6 inch (4.2 mm) | 6-22 |
| ESC+“A”+n | Sets paper feed to 1/60 inch | 6-22 |
| ESC+“3”+n | Sets paper feed to 1/180 inch | 6-22 |
| ESC+“+”+n | Sets paper feed to 1/360 inch | 6-23 |

PAPER FEED SELECTION—Execution

| Name | Function | Page |
|-----------|---|------|
| LF | Feeds paper one line | 6-23 |
| FF | Feeds paper to next top of form | 6-24 |
| ESC+“J”+n | Executes paper feed of 1/180 inch for one line | 6-24 |
| ESC+“j”+n | Executes reverse paper feed of 1/180 inch for one line | 6-25 |

PAGE FORMAT CONTROL

| Name | Function | Page |
|-------------|----------------------------|------|
| ESC+“C”+0+n | Sets page length in inches | 6-26 |
| ESC+“C”+n | Sets page length in lines | 6-26 |
| ESC+“l”+n | Sets left margin | 6-27 |
| ESC+“Q”+n | Sets right margin | 6-28 |
| ESC+“N”+n | Sets skip perforation | 6-28 |
| ESC+“O” | Releases skip perforation | 6-28 |

Epson LQ-850 Mode Commands

TABULATION—Horizontal

| Name | Function | Page |
|--|-------------------------|------|
| ESC+“D”+n ₁ +...+n _x +0 | Sets horizontal tab | 6-29 |
| ESC+“D”+0 | Releases horizontal tab | 6-29 |
| HT | Executes horizontal tab | 6-29 |

TABULATION—Vertical

| Name | Function | Page |
|---|-------------------------|------|
| ESC+“B”+n ₁ +...+n _x +0 | Sets vertical tab | 6-30 |
| ESC+“B”+0 | Releases vertical tab | 6-30 |
| VT | Executes vertical tab | 6-30 |
| ESC+“/”+n | Sets VFU channel | 6-31 |
| ESC+“b”+m +n ₁ +...+n _x +0 | Sets VFU tabulation | 6-31 |
| ESC+“b”+m+0 | Releases VFU tabulation | 6-31 |

CARRIAGE CONTROL

| Name | Function | Page |
|--|--|------|
| BS | Prints, then backspaces one character | 6-32 |
| CR | Prints a line, then returns carriage | 6-32 |
| ESC+“<” | Homes the printhead | 6-32 |
| ESC+“U”+1 | Sets single direction printing | 6-33 |
| ESC+“U”+0 | Releases single direction printing | 6-33 |
| ESC+“s”+1 | Sets half speed printing | 6-33 |
| ESC+“s”+0 | Releases half speed printing | 6-33 |
| ESC+“\”+n ₁ +n ₂ | Moves the printhead to a relative horizontal position | 6-33 |
| ESC+“\$”+n ₁ +n ₂ | Moves the printhead to an absolute horizontal position | 6-34 |

Epson LQ-850 Mode Commands

DATA CONTROL

| Name | Function | Page |
|---------|----------------------------------|------|
| CAN | Clears data in line buffer | 6-34 |
| DC1 | Selects printer remotely | 6-34 |
| DC3 | Deselects printer remotely | 6-35 |
| DEL | Deletes last printable character | 6-35 |
| ESC+“>” | Sets MSB on | 6-35 |
| ESC+“=” | Sets MSB off | 6-36 |
| ESC+“#” | Cancels MSB setting | 6-36 |

DOWNLOAD CHARACTER SELECTION

| Name | Function | Page |
|-------------------|---|------|
| ESC+“&”+0 +n+m | Defines download font | 6-37 |
| ESC+“%”+0 | Selects ROM CG | 6-37 |
| ESC+“%”+1 | Selects download CG | 6-37 |
| ESC+“:”+0+n +0 | Copies internal ROM CG font into download CG | 6-38 |

MISCELLANEOUS

| Name | Function | Page |
|----------|--|------|
| BEL | Sounds the buzzer | 6-38 |
| ESC | First byte of multi-byte control codes | 6-38 |
| NUL | Last byte of certain multi-byte control codes | 6-39 |
| ESC+“@” | Initializes the printer | 6-39 |
| ESC+EM+n | Cut Sheet Feeder control | 6-39 |

Epson LQ-850 Mode Commands

LETTER QUALITY (LQ) FONT:

Selects letter quality font printing.

| | | | | |
|--------------|-----|-----|---|-------------|
| Name: | ESC | “x” | n | (n=0, 1, 2) |
| Dec.: | 27 | 120 | n | |
| Hex.: | 1B | 78 | n | |

Comments:

- This command sets letter quality printing in whichever pitch is set at the time.
 - Sub/superscript characters can be printed in the letter quality font.
 - The following values of n can be used:
 - n=0: Draft font
 - n=1: LQ font
 - n=2: SLQ font (Roman)
 - PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

FONT STYLE:

Selects font style.

| | | | | |
|--------------|-----|-----|---|-------------------------|
| Name: | ESC | “k” | n | (n=0, 1, 2, 3, 4, 5, 6) |
| Dec.: | 27 | 107 | n | |
| Hex.: | 1B | 6B | n | |

Comments:

- The following values of n can be used:
 - n=0: Roman font
 - n=1: Sans Serif font
 - n=2: Courier font
 - n=3: Prestige font
 - n=4: Script font
 - n=5: Orator font
 - n=6: Bold PS font
- This command is effective only in letter quality mode (ESC+“x”+1).
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

Epson LQ-850 Mode Commands

SUB/SUPERSCRIFT FONT:

Selects sub/superscript font with characters printed in the bottom/top area of the line.

Name: Set: ESC "S" n Release: ESC "T"
(subscript: n=1/superscript: n=0)

| | | | | | |
|--------------|----|----|---|----|----|
| Dec.: | 27 | 83 | n | 27 | 84 |
| Hex.: | 1B | 53 | n | 1B | 54 |

Comments:

- Sub/superscript characters are $\frac{2}{3}$ normal height.
- In PS mode, font and pitch are reduced to $\frac{2}{3}$ their original width. In the other modes, font is reduced to $\frac{2}{3}$ their original width and pitch is normal width. Refer to Appendix B.
- In draft mode, characters are normal width.

PICA PITCH:

Sets printing to 10 characters per inch (up to 80 characters per line).

Name: ESC "P"

| | | |
|--------------|----|----|
| Dec.: | 27 | 80 |
| Hex.: | 1B | 50 |

Comments:

- When pica and compressed are set simultaneously output is 17 cpi (up to 137 cpl).
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

Epson LQ-850 Mode Commands

ELITE PITCH:

Sets printing to 12 characters per inch (up to 96 characters per line).

Name: ESC "M"
Dec.: 27 77
Hex.: 1B 4D

Comments:

- When elite and compressed are set simultaneously output is 20 cpi (up to 160 cpl).
 - **PANEL LOCK** in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

MICRON PITCH:

Sets printing to 15 characters per inch (up to 120 characters per line).

Name: ESC "g"
Dec.: 27 103
Hex.: 1B 67

Comments:

- When micron and compressed are set simultaneously output is 15 cpi (up to 120 cpl).
- **PANEL LOCK** in the Function mode affects this command.
(See pages 3-17, 3-18.)

Epson LQ-850 Mode Commands

COMPRESSED PITCH:

Sets printing to 17 characters per inch (up to 137 characters per line).

| | | | | | | |
|--------------|------|----|----|--------|----------|-----|
| Name: | Set: | SI | or | ESC SI | Release: | DC2 |
| Dec.: | | 15 | or | 27 15 | | 18 |
| Hex.: | | 0F | or | 1B 0F | | 12 |

Comments:

- When pica and compressed are set simultaneously output is 17 cpi (up to 137 characters per line).
 - When elite and compressed are set simultaneously output is 20 cpi (up to 160 cpl).
 - When micron and compressed are set simultaneously output is 15 cpi (up to 120 cpl).
 - When PS (Proportional Spacing) and compressed are set simultaneously output is compressed PS pitch.
 - PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

PROPORTIONAL SPACING:

Sets proportional spacing between characters.

| | | | | | | |
|--------------|------|---------|-------|----------|---------|-------|
| Name: | Set: | ESC "p" | 1 | Release: | ESC "p" | 0 |
| Dec.: | | 27 | 112 1 | | 27 | 112 0 |
| Hex.: | | 1B | 70 01 | | 1B | 70 00 |

Comments:

- If proportional spacing is set together with pica, elite or micron pitch, subsequent output is printed in Proportional Spacing (setting with compressed pitch is printed in compressed PS).
- This command is ineffective when the font is set to Draft through the Function mode.
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

Epson LQ-850 Mode Commands

PROGRAMMABLE PITCH/HIGHLIGHTING:

Sets a combination of character pitch and/or highlighting.

Name: ESC "!" n (0 ≤ n ≤ 255)
Dec.: 27 33 n
Hex.: 1B 21 n

Comments:

- Print modes correspond to the setting of each bit as illustrated below.

| Bit | 7 (MSB) | 6 | 5 | 4 | 3 | 2 | 1 | 0 (LSB) |
|-----|-------------|--------|--------------|-----------------|------------|------------|--------|---------|
| "1" | Underlining | Italic | Double width | Double printing | Emphasized | Compressed | PS | Elite |
| "0" | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Pica |

- Bits 0, 1 and 2 only pertain to pitch.
- If n=49 (31_{HEX}), bits 0, 4 and 5 are set to "1" producing double width, elite double printing.
- Pitch and highlight combinations are determined by the value of n.
- Invalid values of n follow rules noted in individual commands.
- When elite and compressed are set simultaneously output is 20 cpi (up to 160 cpl).
- PANEL LOCK in the Function mode affects this command. (See pages 3-17, 3-18.)

EMPHASIZED PRINTING:

Sets printing to twice the original horizontal dot density.

Name: Set: ESC "E" Release: ESC "F"
Dec.: 27 69 27 70
Hex.: 1B 45 1B 46

Comments:

- Emphasized characters are printed at half speed.
- PANEL LOCK in the Function mode affects this command. (See pages 3-17, 3-18.)

Epson LQ-850 Mode Commands

DOUBLE HIGH PRINTING:

Sets double high printing.

| | | | | | | | |
|--------------|------|---------|-----|----------|---------|-----|----|
| Name: | Set: | ESC "w" | 1 | Release: | ESC "w" | 0 | |
| Dec.: | | 27 | 119 | 1 | 27 | 119 | 0 |
| Hex.: | | 1B | 77 | 01 | 1B | 77 | 00 |

Comment:

- **PANEL LOCK** in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

DOUBLE WIDE PRINTING—SINGLE LINE:

Sets double wide (elongated) character printing for one line only.

| | | | | | |
|--------------|------|--------------|----------|----------------|----|
| Name: | Set: | SO or ESC SO | Release: | DC4 or ESC "W" | 0 |
| Dec.: | | 14 or 27 14 | | 20 or 27 87 | 0 |
| Hex.: | | 0E or 1B 0E | | 14 or 1B 57 | 00 |

Comments:

- Single line double wide printing is released when:
 - a LF, FF or VT is executed.
 - the printer is initialized.
 - DC4 or ESC+"W"+0 is executed.
 - ESC+"!" +0 is executed.
- **PANEL LOCK** in the Function mode affects this command.
(See pages 3-17, 3-18.)

Epson LQ-850 Mode Commands

DOUBLE WIDE PRINTING:

Sets double wide (elongated) character printing.

| | | | | | | | |
|--------------|------|---------|----|----------|---------|----|----|
| Name: | Set: | ESC “W” | 1 | Release: | ESC “W” | 0 | |
| Dec.: | | 27 | 87 | 1 | 27 | 87 | 0 |
| Hex.: | | 1B | 57 | 01 | 1B | 57 | 00 |

Comments:

- DC4 will not release the double wide printing set by ESC+“W”+1.
 - PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

OUTLINE AND SHADOW PRINTING:

Sets outline and shadow printing.

| | | | |
|--------------|---------|-----|---|
| Name: | ESC “q” | n | |
| Dec.: | 27 | 113 | n |
| Hex.: | 1B | 71 | n |

Comments:

- The following values of n can be used.
 - n=0: Reset
 - n=1: Outline
 - n=2: Shadow
 - n=3: Outline with Shadow
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

Epson LQ-850 Mode Commands

DOUBLE STRIKE PRINTING:

Sets double printing.

| | | | | |
|--------------|------|---------|----------|---------|
| Name: | Set: | ESC "G" | Release: | ESC "H" |
| Dec.: | | 27 71 | | 27 72 |
| Hex.: | | 1B 47 | | 1B 48 |

Comments:

- Double strike printing prints each line of data with two passes of the printhead.
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)



UNDERLINING:

Sets continuous underlining of characters.

| | | | | |
|--------------|------|-----------|----------|-----------|
| Name: | Set: | ESC "~" 1 | Release: | ESC "~" 0 |
| Dec.: | | 27 45 1 | | 27 45 0 |
| Hex.: | | 1B 2D 01 | | 1B 2D 00 |

Comment:

- Bit image data, spaces set by the HT code and IBM graphic characters are not underlined.

Epson LQ-850 Mode Commands

SCORE:

Sets/releases score.

| | | | | | | | | |
|--------------|-----|-----|-----|----------------|----------------|---|----------------|----------------|
| Name: | ESC | "(" | "_" | n ₁ | n ₂ | m | d ₁ | d ₂ |
| Dec.: | 27 | 40 | 45 | n ₁ | n ₂ | m | d ₁ | d ₂ |
| Hex.: | 1B | 28 | 2D | n ₁ | n ₂ | m | d ₁ | d ₂ |

Comments:

- Use decimal or hexadecimal values for all variables, not ASCII characters.
- The following values of n₁, n₂ and m can be used.
 - n₁=3
 - n₂=0
 - m=1
- The value of d₁ determines the location of the score:
 - d₁=1: Underline
 - d₁=2: Strikethrough
 - d₁=3: Overscore
- The value of d₂ determines whether the score line is single, double, broken or continuous:
 - d₂=0: Cancel the score line selected by d₁
 - d₂=1: Single continuous line
 - d₂=2: Double continuous line
 - d₂=5: Single broken line
 - d₂=6: Double broken line
- Bits 0, 1 and 2 of d₂ determine the characteristics of the score line as shown below:

| | Bit 2 | Bit 1 | Bit 0 |
|---------|-----------------|-----------------|-----------------|
| On (1) | Broken line | Double line on | Single line on |
| Off (0) | Continuous line | Double line off | Single line off |

Note:

- If Bit 1 and Bit 0 are both off, the selected score is cancelled. Double line and single line scores cannot be combined at the same score position.

Epson LQ-850 Mode Commands

WORD PROCESSING MODE SELECTION:

Selects word processing mode.

| | | | | |
|--------------|-----|-----|---|----------------|
| Name: | ESC | "a" | n | (n=0, 1, 2, 3) |
| Dec.: | 27 | 97 | n | |
| Hex.: | 1B | 61 | n | |

Comment:

- The following values of n can be used.
 - n=0: Releases word processing mode.
 - n=1: Selects centering mode.
 - n=2: Selects right alignment mode.
 - n=3: Selects justification mode.



CHARACTER DOT SPACING:

Sets character dot spacing until changed.

| | | | | |
|--------------|-----|----|---|-------------------------|
| Name: | ESC | SP | n | ($0 \leq n \leq 127$) |
| Dec.: | 27 | 32 | n | |
| Hex.: | 1B | 20 | n | |

Comments:

- Sets the amount of dot space (Draft: $\frac{1}{120}$ inch, LQ: $\frac{1}{180}$ inch) added to the right of each character.
- This command allows microjustification.

Epson LQ-850 Mode Commands

ITALIC FONT:

Selects italic character printing.

| | | | | |
|--------------|------|---------|----------|---------|
| Name: | Set: | ESC "4" | Release: | ESC "5" |
| Dec.: | | 27 52 | | 27 53 |
| Hex.: | | 1B 34 | | 1B 35 |

Comments:

- Italic characters are printed in place of characters in locations 32_{DEC}~126_{DEC} (20_{HEX}~7E_{HEX}).
 - **PANEL LOCK** in the *Function mode* affects this command.
(See pages 3-17, 3-18.)
-

INTERNATIONAL CHARACTER SET:

Selects any one of 14 language or Legal character sets.

| | | | |
|--------------|---------|----|--------------------|
| Name: | ESC "R" | n | (0 ≤ n ≤ 13, n=64) |
| Dec.: | 27 | 82 | n |
| Hex.: | 1B | 52 | n |

Comments:

- Page A-10 identifies the characters generated by the appropriate codes.
- International character sets can be set in the *Function mode* (see page 3-22).
- **PANEL LOCK** in the *Function mode* affects this command.
(See pages 3-17, 3-18.)

Epson LQ-850 Mode Commands

GRAPHIC CHARACTER SET I:

Selects graphic character set 1.

Name: ESC "7"
Dec.: 27 55
Hex.: 1B 37

Comments:

- Refer to Appendix A.
- This command is operational only when the graphic character set is selected by ESC+"t"+1.
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

GRAPHIC CHARACTER SET II:

Selects graphic character set 2.

Name: ESC "6"
Dec.: 27 54
Hex.: 1B 36

Comments:

- Refer to Appendix A.
- This command is operational only when the graphic character set is selected by ESC+"t"+1.
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

Epson LQ-850 Mode Commands

ALTERNATE CHARACTER SET:

Selects alternate character set.

| | | | |
|--------------|---------|-----|-------------|
| Name: | ESC "t" | n | (n=0, 1, 2) |
| Dec.: | 27 | 116 | n |
| Hex.: | 1B | 74 | n |

Comments:

- The following values of n can be used.
 - n=0: Italic
 - n=1: Graphic character set
 - n=2: Re-maps any downloaded characters from 0-127 to 128-255.
 - PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

8-PIN STANDARD DENSITY GRAPHICS:

Sets standard density graphics mode [60 dots per inch (25.4 mm)/480 dots per line]. (For detailed information, refer to Section 5.3.)

| | | | | | |
|--------------|---------|----|----|------|------|
| Name: | ESC "K" | n1 | n2 | Data | |
| Dec.: | 27 | 75 | n1 | n2 | Data |
| Hex.: | 1B | 4B | n1 | n2 | Data |

8-PIN DOUBLE DENSITY GRAPHICS:

Sets double density graphics mode [120 dots per inch (25.4 mm)/960 dots per line]. (For detailed information, refer to Section 5.3.)

| | | | | | |
|--------------|---------|----|----|------|------|
| Name: | ESC "L" | n1 | n2 | Data | |
| Dec.: | 27 | 76 | n1 | n2 | Data |
| Hex.: | 1B | 4C | n1 | n2 | Data |

Epson LQ-850 Mode Commands

8-PIN DOUBLE SPEED/DOUBLE DENSITY GRAPHICS:

Sets double speed, double density graphics mode [120 dots per inch (25.4 mm)/960 dots per line]. (For detailed information, refer to Section 5.3.)

| | | | | | |
|--------------|-----|-----|----------------|----------------|------|
| Name: | ESC | "Y" | n ₁ | n ₂ | Data |
| Dec.: | 27 | 89 | n ₁ | n ₂ | Data |
| Hex.: | 1B | 59 | n ₁ | n ₂ | Data |

Comment:

- Horizontal adjacent dots cannot be printed.
-

8-PIN QUADRUPLE DENSITY GRAPHICS:

Sets quadruple density graphics mode [240 dots per inch (25.4 mm)/1920 dots per line]. (For detailed information, refer to Section 5.3.)

| | | | | | |
|--------------|-----|-----|----------------|----------------|------|
| Name: | ESC | "Z" | n ₁ | n ₂ | Data |
| Dec.: | 27 | 90 | n ₁ | n ₂ | Data |
| Hex.: | 1B | 5A | n ₁ | n ₂ | Data |

Comment:

- Horizontal adjacent dots cannot be printed.

Epson LQ-850 Mode Commands

BIT IMAGE MODE SELECTION:

Selects one of the 8-pin on 24-pin bit image graphic modes. (For detailed information, refer to Section 5.3.)

Name: ESC "*" m n₁ n₂ Data
(m=0, 1, 2, 3, 4, 6, 32, 33, 38, 39, 40)

Dec.: 27 42 m n₁ n₂ Data

Hex.: 1B 2A m n₁ n₂ Data

Comments:

- The following table illustrates the various modes based upon the values of m.

| m | pin | Dots/Inch | Dots/Line | |
|----|-----|-----------|-----------|------------------------------|
| 0 | 8 | 60 | 480 | Standard Density |
| 1 | 8 | 120 | 960 | Double Density |
| 2 | 8 | 120 | 960 | Double Speed, Double Density |
| 3 | 8 | 240 | 1920 | Quadruple Density |
| 4 | 8 | 80 | 640 | CRT I |
| 6 | 8 | 90 | 720 | CRT II |
| 32 | 24 | 60 | 480 | Standard Density |
| 33 | 24 | 120 | 960 | Double Density |
| 38 | 24 | 90 | 720 | CRT III |
| 39 | 24 | 180 | 1440 | Triple Density |
| 40 | 24 | 360 | 2880 | Hex Density |

- When m=2, 3, 40, horizontal adjacent dots cannot be printed.

Epson LQ-850 Mode Commands

BIT IMAGE MODE REASSIGNMENT:

Reassigns bit image graphics mode density.

Name: ESC “?” n m
(n=75, 76, 89, 90 m=0, 1, 2, 3, 4, 6, 32, 33, 38, 39, 40)
Dec.: 27 63 n m
Hex.: 1B 3F n m

Comments:

- The value of n specifies the graphics mode which is to be reassigned:
n=75: Reassign Standard Density (ESC+“K”+n₁+n₂)
n=76: Reassign Double Density (ESC+“L”+n₁+n₂)
n=89: Reassign Double speed, Double Density
(ESC+“Y”+n₁+n₂)
n=90: Reassign Quadruple Density (ESC+“Z”+n₁+n₂)
 - The value of m specifies the graphics mode to which the original is to be reassigned. Refer to Table 5.1 on page 5-16.
-

1/8 INCH PAPER FEED:

Sets paper feed amount to 1/8 inch (3.2 mm).

Name: ESC “0”
Dec.: 27 48
Hex.: 1B 30

Comment:

- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

Epson LQ-850 Mode Commands

1/6 INCH PAPER FEED:

Sets paper feed amount to 1/6 inch (4.23 mm).

Name: ESC "2"
Dec.: 27 50
Hex.: 1B 32

Comment:

- **PANEL LOCK** in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

n/60 INCH PAPER FEED:

Sets programmable paper feed amount to n/60 inch.

Name: ESC "A" n
Dec.: 27 65 n
Hex.: 1B 41 n

Comments:

- n/60 inch paper feed is valid for $0 \leq n \leq 127$.
 - **PANEL LOCK** in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

n/180 INCH PAPER FEED:

Sets programmable paper feed amount to n/180 inch.

Name: ESC "3" n
Dec.: 27 51 n
Hex.: 1B 33 n

Comments:

- n/180 inch paper feed is valid for $0 \leq n \leq 255$.
- **PANEL LOCK** in the Function mode affects this command.
(See pages 3-17, 3-18.)

Epson LQ-850 Mode Commands

$\frac{n}{360}$ INCH PAPER FEED:

Sets programmable paper feed amount to $\frac{n}{360}$ inch.

| | | |
|--------------|---------|---|
| Name: | ESC “+” | n |
| Dec.: | 27 43 | n |
| Hex.: | 1B 2B | n |

Comments:

- $\frac{n}{360}$ inch paper feed is valid for $0 \leq n \leq 255$.
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

LINE FEED (LF):

Causes data in line buffer to be printed and then executes a single line feed.

| | |
|--------------|----|
| Name: | LF |
| Dec.: | 10 |
| Hex.: | 0A |

Comments:

- When the new line position falls within the perforation skip area, the paper advances to the next top of form position if skip over perforation is turned on through software.
- If there is no data, “space” data (ASCII 32), or blanks between HT print positions in the line buffer, LF feeds the paper by 1 line.
- LF code releases single line double width printing set by SO or ESC+SO.
- The amount of line feed depends upon the lines per inch set by the line feed amount command or the EZ Set Operator Panel.

Epson LQ-850 Mode Commands

FORM FEED (FF):

Feeds paper to next top of form position after printing data in the line buffer.

Name: FF
Dec.: 12
Hex.: 0C

Comments:

- FF releases single-line double width printing set by SO or ESC+SO.
 - Amount of form feed depends upon page length set by the page length control command or the EZ Set Operator Panel.
-

1/180 INCH SINGLE LINE PAPER FEED:

Prints out the data in the line buffer and feeds the paper 1/180 inch.

Name: ESC "J" n
Dec.: 27 74 n
Hex.: 1B 4A n

Comments:

- Single-line, 1/180 inch paper feed is valid for $0 \leq n \leq 255$.
- This command sets the paper feed for ONE line only. The carriage does not return to the left margin position. Instead, printing of the next line begins where previous printing left off.
- This command does not release single-line double width printing set by SO or ESC+SO.

Epson LQ-850 Mode Commands

$\frac{1}{180}$ INCH REVERSE DIRECTION SINGLE LINE PAPER FEED:

Prints out the data in the line buffer and feeds the paper $\frac{1}{180}$ inch in reverse direction.

| | | |
|--------------|---------|---|
| Name: | ESC “j” | n |
| Dec.: | 27 106 | n |
| Hex.: | 1B 6A | n |

Comments:

- Reverse, single line $\frac{1}{180}$ inch paper feed is valid for $0 \leq n \leq 255$.
- This command sets reverse direction paper feed for one line only. The carriage will not return to the left margin position. Instead, the printing of the next line begins where the previous printing left off.
- This command does not release single-line double width printing set by SO or ESC+SO.

Note:

- Reverse paper feed cannot be executed in the area within 3.6 inches (91.4 mm) of the bottom perforation. Additionally, the perforation should not be included in the area of reverse paper feed.
- Multi-part forms or pull tractor feed paper should not be used with reverse paper feed. If reverse feeding is necessary in pull mode, set REV LF/PULL in the INSTALL menu to ON through the Function mode (see page 3-24).

Epson LQ-850 Mode Commands

PAGE LENGTH (INCHES):

Sets page length in inches.

| | | | | |
|--------------|-----|-----|----|---|
| Name: | ESC | "C" | 0 | n |
| Dec.: | 27 | 67 | 0 | n |
| Hex.: | 1B | 43 | 00 | n |

Comments:

- Upon receipt of ESC+"C"+0+n, the present line position becomes the top of page position.
 - The value of n must be in the range $0 \leq n \leq 22$.
 - ESC+"C"+0+n releases the skip perforation settings.
 - The page length does not change even if the paper feed amount is changed.
 - The terms "form" and "page" are interchangeable.
 - PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

PAGE LENGTH (LINES):

Sets page length in number of lines.

| | | | |
|--------------|-----|-----|---|
| Name: | ESC | "C" | n |
| Dec.: | 27 | 67 | n |
| Hex.: | 1B | 43 | n |

Comments:

- Upon receipt of ESC+"C"+n, the present line position becomes the top of page position.
- The value of n must be in the range $1 \leq n \leq 127$. If n=0, page length returns to the inch designation.
- ESC+"C"+n releases the skip perforation settings.
- The page length does not change even if the paper feed amount is changed.
- The terms "form" and "page" are interchangeable.
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

Epson LQ-850 Mode Commands

LEFT MARGIN:

Sets position of left margin.

Name: ESC "l" n
Dec.: 27 108 n
Hex.: 1B 6C n

Comments:

- If the value of n exceeds the right margin value, ESC+"l"+n is ineffective and the left margin does not change.
- Setting the left margin position clears all data in the line buffer.
- In proportional spacing, the value of n is based on 10 cpi.
- Once the left margin position is set, a change in the character mode will not alter this left margin setting.
- Permissible values of n are given below.

| | 8" print line | 9" print line |
|------------------|---------------------|---------------------|
| Pica print | $0 \leq n \leq 78$ | $0 \leq n \leq 88$ |
| Elite print | $0 \leq n \leq 93$ | $0 \leq n \leq 105$ |
| Micron print | $0 \leq n \leq 117$ | $0 \leq n \leq 133$ |
| Compressed print | $0 \leq n \leq 133$ | $0 \leq n \leq 151$ |

- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

Epson LQ-850 Mode Commands

RIGHT MARGIN:

Sets position of right margin.

Name: ESC "Q" n
Dec.: 27 81 n
Hex.: 1B 51 n

Comments:

- Permissible values of n are given below.

| | 8" print line | 9" print line |
|------------------|---------------------|---------------------|
| Pica print | $2 \leq n \leq 80$ | $2 \leq n \leq 90$ |
| Elite print | $3 \leq n \leq 96$ | $3 \leq n \leq 108$ |
| Micron print | $3 \leq n \leq 120$ | $3 \leq n \leq 136$ |
| Compressed print | $4 \leq n \leq 137$ | $4 \leq n \leq 155$ |

- If the value of n exceeds the left margin value, ESC+"Q"+n is ignored.
- Setting the right margin clears all data in the line buffer.
- In proportional spacing, the value of n is based on 10 cpi.
- Once the right margin position is set, a change in the character mode will not alter this right margin setting.
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

SKIP PERFORATION:

Sets skip perforation.

Name: Set: ESC "N" n Release: ESC "O"
Dec.: 27 78 n 27 79
Hex.: 1B 4E n 1B 4F

Comments:

- The value of n specifies the number of lines (or n times the current line spacing amount) to be skipped at the bottom of the page.
- This command is effective only for $1 \leq n \leq 127$. If $n > 128$, the value is processed as $n - 128$, if $n = 128$ the command is ignored.
- The skip perforation amount does not change even if the paper feed amount is changed following a skip perforation designation.
- The skip perforation setting is released upon receipt of the page length designation command.
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

Epson LQ-850 Mode Commands

HORIZONTAL TAB STOP SETTING:

Sets horizontal tabulations to specified values.

| | | | | | | | | |
|--------------|--------------|-------|-----------------|-----------------|------------------|----|----|----|
| Name: | Set: ESC "D" | n_1 | $n_2 \dots n_x$ | 0 | Release: ESC "D" | 0 | | |
| Dec.: | 27 | 68 | n_1 | $n_2 \dots n_x$ | 27 | 68 | 0 | |
| Hex.: | 1B | 44 | n_1 | $n_2 \dots n_x$ | 00 | 1B | 44 | 00 |

Comments:

- Horizontal tabs are set from the left margin position.
- Horizontal tabs must be designated such that $n_1 < n_2 < \dots < n_x$.
- A maximum of 32 tabs may be set on a single line.
- ESC+"D"+ $n_1+n_2+\dots+n_x+0$ sets horizontal tab stops. The HT command executes the tab designation.
- In proportional spacing, horizontal tabs are set based on 10 cpi.
- When the left margin is changed, horizontal tabs will be moved based on new margin setting.
- When the printer is powered up, TAB is automatically set every 8 characters.
- If the pitch is altered after designation of horizontal tabs, the tab positions do not move.

HORIZONTAL TAB EXECUTION:

Executes the horizontal TAB as designated by ESC+"D"+ $n_1+n_2+\dots+n_x+0$.

| | |
|--------------|----|
| Name: | HT |
| Dec.: | 9 |
| Hex.: | 09 |

Comments:

- If the value of the horizontal TAB is less than present column position, then HT is ignored.
- When in underline mode, the blank spaces between consecutive HT print positions are not underlined.

Epson LQ-850 Mode Commands

VERTICAL TAB STOP SETTING:

Sets vertical tabulation to specified values.

| | | |
|--------------|--|--------------------|
| Name: | Set: ESC "B" n ₁ n ₂ ...n _x 0 | Release: ESC "B" 0 |
| Dec.: | 27 66 n ₁ n ₂ ...n _x 0 | 27 66 0 |
| Hex.: | 1B 42 n ₁ n ₂ ...n _x 00 | 1B 42 00 |

Comments:

- VT is set from the top of page position.
- Vertical tabs must be designed such that $n_1 < n_2 \dots < n_x$.
- ESC+"B"+n₁+n₂+...+n_x+0 sets vertical tab stops. The VT command executes the tab designation.
- If the paper feed amount is changed after a designation of vertical tabs, the positions do not change.
- VT setting is also released by page length designation commands.
- A maximum of 16 tabs may be set.

VERTICAL TAB EXECUTION:

Executes the vertical TAB as designated by ESC+"B"+n₁+n₂+...+n_x+0, ESC+"b"+m+n₁+n₂+...n_x+0.

| | |
|--------------|----|
| Name: | VT |
| Dec.: | 11 |
| Hex.: | 0B |

Comments:

- When TABs are set with VT or VFU setting command and when there is no tab setting on a position exceeding the present line, data is printed out and paper is fed to the next top of page position (same as FF).
- On power up no vertical tabs have been set, therefore when a VT is sent the paper advances one line.
- When vertical TAB is cleared by ESC+"B"+0, execution of VT causes data in the line buffer to be printed and does not advance the paper.

Epson LQ-850 Mode Commands

VFU CHANNEL SELECTION:

Selects one of eight channels in the Vertical Format Unit (VFU).

| | | | |
|--------------|---------|----|-----------------------|
| Name: | ESC “/” | n | ($0 \leq n \leq 7$) |
| Dec.: | 27 | 47 | n |
| Hex.: | 1B | 2F | n |

Comments:

- The value of n must be in the range $0 \leq n \leq 7$ and selects one of eight channels (0~7).
- Channel 0 is the default setting.

VFU SETTING:

Sets the tab position of any channel in the VFU (Vertical Format Unit).

| | | | | | | | | | | |
|--------------|--------------|----|----------------|----------------------------------|----------------------------------|------------------|----|------------------------|---|----|
| Name: | Set: ESC “b” | m | n ₁ | n ₂ ...n _x | 0 | Release: ESC “b” | m | 0 | | |
| | | | | | ($0 \leq m \leq 7$) | | | ($1 \leq x \leq 16$) | | |
| Dec.: | 27 | 98 | m | n ₁ | n ₂ ...n _x | 0 | 27 | 98 | m | 0 |
| Hex.: | 1B | 62 | m | n ₁ | n ₂ ...n _x | 00 | 1B | 62 | m | 00 |

Comments:

- The VFU has 8 channels. A maximum of 16 vertical tabs can be set by each channel.
- The VFU is valid for $0 \leq m \leq 7$ and selects one channel based on the value of m.
- Any VFU setting exceeding the page length is ineffective.
- To operate the VFU, input the VT code (11_{DEC}) after selecting the channel via channel selection command (ESC+“/”+n).
- The VFU position does not change even if paper feed amount is altered after VFU setting.
- The VFU setting is also released by the page length designation commands.
- The vertical tab specified with ESC+“B”+n₁+n₂+...n_x+0 is set to VFU channel 0.

Epson LQ-850 Mode Commands

BACKSPACE:

Prints data in line buffer and backspaces one space.

Name: BS
Dec.: 8
Hex.: 08

Comment:

- Since BS backspaces the width of a character, the backspacing amount will depend upon the pitch set when the BS code is executed.
-

CARRIAGE RETURN:

Prints all data in line buffer and designates that the next line starts at the left margin.

Name: CR
Dec.: 13
Hex.: 0D

Comments:

- Certain computers issue an automatic line feed with a carriage return. Check your computer manual for details.
 - When automatic LF is set to ON through the Function mode (see page 3-24), the paper is fed (a LF is executed automatically) whenever a CR code is executed.
-

HOME PRINTHEAD:

Causes printhead to return to its home position.

Name: ESC "<"
Dec.: 27 60
Hex.: 1B 3C

Epson LQ-850 Mode Commands

SINGLE DIRECTION:

Sets single direction (left to right) printing mode.

| | | | | | | | |
|--------------|------|---------|----|----------|---------|----|----|
| Name: | Set: | ESC "U" | 1 | Release: | ESC "U" | 0 | |
| Dec.: | | 27 | 85 | | 27 | 85 | 0 |
| Hex.: | | 1B | 55 | | 1B | 55 | 00 |

Comment:

- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

HALF SPEED PRINTING:

Sets printing to half speed.

| | | | | | | | |
|--------------|------|---------|-----|----------|---------|-----|----|
| Name: | Set: | ESC "s" | 1 | Release: | ESC "s" | 0 | |
| Dec.: | | 27 | 115 | | 27 | 115 | 0 |
| Hex.: | | 1B | 73 | | 1B | 73 | 00 |

Comment:

- Half speed printing can be set only in the draft pica, draft elite, standard density image, double speed double density image, CRT I image and CRT II image modes.
-

RELATIVE HORIZONTAL POSITION:

Moves the printhead to a relative horizontal position.

| | | | | |
|--------------|-----|----|----------------|----------------|
| Name: | ESC | "\ | n ₁ | n ₂ |
| Dec.: | 27 | 92 | n ₁ | n ₂ |
| Hex.: | 1B | 5C | n ₁ | n ₂ |

Comments:

- This command moves the printhead $(n_1+256 \times n_2)/120$ inch in draft, or $(n_1+256 \times n_2)/180$ inch in LQ from current position at which point printing of subsequent data will start.
- The printhead can be moved to the right or left.
To move m dots to right: $n_1 = m \bmod 256$, $n_2 = \text{INT}(m/256)$
To move m dots to left: $n_1 = (65536 - m) - n_2 \times 256$,
 $n_2 = \text{INT}[(65536 - m)/256]$

Epson LQ-850 Mode Commands

ABSOLUTE HORIZONTAL POSITION:

Moves the printhead to an absolute horizontal position.

Name: ESC "\$" n₁ n₂
Dec.: 27 36 n₁ n₂
Hex.: 1B 24 n₁ n₂

Comment:

- This command moves the printhead to a position $n_1 + 256 \times n_2$ dots (units) from the left margin. Each unit equals $\frac{1}{60}$ th of an inch.
-

CANCEL:

Clears all data in the line buffer.

Name: CAN
Dec.: 24
Hex.: 18

REMOTE PRINTER SELECT:

Selects the printer remotely, enabling it to receive data.

Name: DC1 (Device Control 1)
Dec.: 17
Hex.: 11

Comments:

- Receipt of DC1 while the printer is deselected by DC3 enables the printer to receive data.
- The printer buffer data previously received between DC3 and DC1 is lost.

Epson LQ-850 Mode Commands

REMOTE PRINTER DESELECT:

Deselects the printer remotely, disabling it from receiving data.

Name: DC3 (Device Control 3)
Dec.: 19
Hex.: 13

Comment:

- All data sent in deselect status becomes invalid. In order to return to select status, send DC1 code.
-

DELETE:

Deletes the last character stored in the line buffer.

Name: DEL
Dec.: 127
Hex.: 7F

Comment:

- Only ordinary text may be DELETED. Bit image data, spacing between output generated by consecutive TABs, and commands cannot be DELETED.
-

MSB ON:

Sets the Most Significant Bit to 1.

Name: ESC ">"
Dec.: 27 62
Hex.: 1B 3E

Comments:

- ESC+">" has no effect on bit image data.
- This setting can be released by ESC+"#".
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

Epson LQ-850 Mode Commands

MSB OFF:

Sets the Most Significant Bit to 0.

Name: ESC “=”
Dec.: 27 61
Hex.: 1B 3D

Comments:

- ESC+“=” has no effect on bit image data.
 - This setting can be released by ESC+“#”.
 - PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

CANCELS MSB SETTING:

Sets printer to receive 8th bit “as is”.

Name: ESC “#”
Dec.: 27 35
Hex.: 1B 23

Comments:

- This setting has no effect on bit image data.
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

Epson LQ-850 Mode Commands

FONT DOWNLOADING:

Defines downloadable characters into specified address locations in RAM (see Section 5.2).

| | | | | | | | | | |
|--------------|---------|----|----|---|----------------|----------------|----------------|----------------------------------|----------------------------------|
| Name: | ESC "&" | 0 | n | m | d ₀ | d ₁ | d ₂ | P ₁ ...P _x | |
| Dec.: | 27 | 38 | 0 | n | m | d ₀ | d ₁ | d ₂ | P ₁ ...P _x |
| Hex.: | 1B | 26 | 00 | n | m | d ₀ | d ₁ | d ₂ | P ₁ ...P _x |

Comments:

- The values n and m are the ASCII address locations of the first and last characters being defined.
- The values of d₀, d₁ and d₂ define the character cell.
d₀=Left Space d₁=Body d₂=Right Space
- The values of d₀, d₁ and d₂ vary with pitch as follows:

| | d ₁ | d ₀ +d ₁ +d ₂ (total) |
|-----------|----------------|--|
| Draft | 9 | 12 |
| LQ 10 cpi | 29 | 36 |
| LQ 12 cpi | 23 | 30 |
| LQ 15 cpi | 15 | 24 |
| PS | 37 | 42 |

- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

Note:

- In PS, values of d₁ and d₀+d₁+d₂ are at the maximum allowable width.

SELECTS ROM CG OR DOWNLOADED CG:

(See Section 5.2.)

| | | | |
|--------------|---------|----|----------|
| Name: | ESC "%" | n | (n=0, 1) |
| Dec.: | 27 | 37 | n |
| Hex.: | 1B | 25 | n |

Comments:

- The following values of n can be used.
n=0: Select ROM CG
n=1: Select download CG
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

Epson LQ-850 Mode Commands

ROM CHARACTER GENERATION SET COPY:

Copies internal ROM CG font into downloadable font area.

| | | | | | |
|--------------|---------|----|----|---|----------------------|
| Name: | ESC “:” | 0 | n | 0 | (n=1, 2, 3, 4, 5, 6) |
| Dec.: | 27 | 58 | 0 | n | 0 |
| Hex.: | 1B | 3A | 00 | n | 00 |

Comments:

- The values of n can be used in the same way as ESC+“k”+n.
 - All ROM CG font in draft and LQ modes are copied to the downloadable font area.
 - Upon receipt of the command, all previous downloaded fonts will be changed to ROM CG font.
 - When altering only part of the ROM CG, use this command before font downloading.
 - PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

BELL:

Sounds buzzer for approximately 0.5 second.

| | |
|--------------|-----|
| Name: | BEL |
| Dec.: | 7 |
| Hex.: | 07 |

ESCAPE:

First byte of each multi byte printer control code.

| | |
|--------------|-----|
| Name: | ESC |
| Dec.: | 27 |
| Hex.: | 1B |

Comment:

- Cannot be generated by the ESC key on certain computers.

Epson LQ-850 Mode Commands

NULL:

Last byte of certain multi byte printer control codes.

Name: NUL
Dec.: 0
Hex.: 00

RESET PRINTER:

Initializes printer, causing data in the line buffer, but not in the receive buffer, to be cleared.

Name: ESC “@”
Dec.: 27 64
Hex.: 1B 40

Comment:

- Refer to Section 3.4 on page 3-30 for an explanation of printer initialization.
-

SELECTS CSF:

Selects Cut Sheet Feeder (CSF) mode ON/OFF.

Name: ESC EM n
Dec.: 27 25 n
Hex.: 1B 19 n

Comments:

- The following values of n can be used.
 - n=“R”: Eject and Load a sheet
 - n=“0”: Cut Sheet Feeder mode is OFF
 - n=“4”: Cut Sheet Feeder mode is ON
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

Note:

- If the Cut Sheet Feeder mode is set to ON without installing the CSF, the paper will not feed correctly.

7. IBM Proprinter X24E Mode Commands

This chapter covers the software commands for IBM Proprinter X24E mode. The software commands are grouped into the following classifications:

FONT SELECTION

| Name | Function | Page |
|-----------|-----------------------------------|------|
| ESC+"I"+n | Selects print style | 7-5 |
| ESC+"k"+n | Selects print font style | 7-6 |
| ESC+"S"+1 | Selects subscript printing | 7-6 |
| ESC+"S"+0 | Selects superscript printing | 7-6 |
| ESC+"T" | Releases sub/superscript printing | 7-6 |

CHARACTER PITCH SELECTION

| Name | Function | Page |
|-----------|--|------|
| ESC+"."' | Sets elite pitch (12 cpi) printing | 7-7 |
| SI | Sets compressed (17 cpi) printing | 7-7 |
| ESC+SI | Sets compressed (17 cpi) printing | 7-7 |
| DC2 | Releases elite and compressed printing | 7-7 |
| ESC+"P"+1 | Sets proportional spacing | 7-7 |
| ESC+"P"+0 | Releases proportional spacing | 7-7 |

CHARACTER HIGHLIGHT SELECTION

| Name | Function | Page |
|---|---|------|
| ESC+"E" | Sets emphasized printing | 7-8 |
| ESC+"F" | Releases emphasized printing | 7-8 |
| ESC+"G" | Sets double strike printing | 7-8 |
| ESC+"H" | Releases double strike printing | 7-8 |
| SO | Sets single-line double wide printing | 7-9 |
| DC4 | Releases single-line double wide printing | 7-9 |
| ESC+SO | Sets single-line double wide printing | 7-9 |
| ESC+"W"+1 | Sets double wide printing | 7-9 |
| ESC+"W"+0 | Releases double wide printing | 7-9 |
| ESC+"["+"@" +n ₁ +n ₂ +m ₁ +m ₂ +m ₃ +m ₄ | Sets double high & double wide printing | 7-10 |
| ESC+"_" +1 | Sets underlining | 7-11 |
| ESC+"_" +0 | Releases underlining | 7-11 |
| ESC+"_" +1 | Sets overlining | 7-11 |
| ESC+"_" +0 | Releases overlining | 7-11 |

IBM Proprinter X24E Mode Commands

CHARACTER SET SELECTION

| Name | Function | Page |
|---|-----------------------------------|------|
| ESC+“7” | Selects alternate Character Set 1 | 7-11 |
| ESC+“6” | Selects alternate Character Set 2 | 7-12 |
| ESC+“[”+“T” +n ₁ +n ₂ +n ₃ +n ₄ +n ₅ +n ₆ | Changes the current code page | 7-12 |

BIT IMAGE (GRAPHICS) MODE SELECTION

| Name | Function | Page |
|--|--|------|
| ESC+“K”+n ₁ +n ₂ | Sets 8-pin image standard density (60 dpi) | 7-13 |
| ESC+“L”+n ₁ +n ₂ | Sets 8-pin image double density (120 dpi) | 7-13 |
| ESC+“Y”+n ₁ +n ₂ | Sets 8-pin image double density/double speed (120 dpi) | 7-13 |
| ESC+“Z”+n ₁ +n ₂ | Sets 8-pin image quadruple density (240 dpi) | 7-14 |
| ESC+“*”+m +n ₁ +n ₂ (AGM only) | Sets bit image mode selection (8-pin 60, 80, 90, 120, 120D, 240) (24-pin 60, 90, 120, 180, 240, 360) | 7-14 |
| ESC+“[”+“g” +n ₁ +n ₂ +m | Sets bit image mode selection (8-pin 60, 120, 120D, 240) (24-pin 60, 120, 180, 360) | 7-15 |

PAPER FEED SELECTION—Amount

| Name | Function | Page |
|---|--|------|
| ESC+“0” | Sets paper feed to 1/8 inch (3.2 mm) | 7-15 |
| ESC+“1” | Sets paper feed to 7/32 inch (2.5 mm) | 7-16 |
| ESC+“2” | Executes line spacing set by ESC+“A”+n | 7-16 |
| ESC+“A”+n | Sets paper feed to 1/72 inch or 1/60 inch | 7-16 |
| ESC+“3”+n | Sets paper feed to 1/216 inch or 1/180 inch | 7-17 |
| ESC+“[”+“\” n ₁ +n ₂ +n ₃ n ₄ +n ₅ +n ₆ | Selects the base line feed unit for ESC+“3” and ESC+“J” | 7-17 |
| ESC+“5”+1 | Sets automatic line feed | 7-18 |
| ESC+“5”+0 | Releases automatic line feed | 7-18 |

IBM Proprinter X24E Mode Commands

PAPER FEED SELECTION—Execution

| Name | Function | Page |
|-----------|---|------|
| LF | Feeds paper one line | 7-18 |
| FF | Feeds paper to next top of form | 7-19 |
| ESC+“J”+n | Executes one-line paper feed of $\frac{1}{2}$ 16 inch or $\frac{1}{4}$ 180 inch | 7-19 |

PAGE FORMAT CONTROL

| Name | Function | Page |
|---|----------------------------|------|
| ESC+“C”+0+n | Sets page length in inches | 7-20 |
| ESC+“C”+n | Sets page length in lines | 7-20 |
| ESC+“X”+n ₁ +n ₂ | Sets left and right margin | 7-21 |
| ESC+“N”+n | Sets skip perforation | 7-22 |
| ESC+“O” | Releases skip perforation | 7-22 |
| ESC+“4” | Sets top of form | 7-22 |

TABULATION—Horizontal

| Name | Function | Page |
|--|-------------------------|------|
| ESC+“D”+n ₁ +...+n _x +0 | Sets horizontal tab | 7-23 |
| ESC+“D”+0 | Releases horizontal tab | 7-23 |
| HT | Executes horizontal tab | 7-23 |

TABULATION—Vertical

| Name | Function | Page |
|--|-------------------------|------|
| ESC+“B”+n ₁ +...+n _x +0 | Sets vertical tab | 7-24 |
| ESC+“B”+0 | Releases vertical tab | 7-24 |
| VT | Executes vertical tab | 7-24 |
| ESC+“R” | Returns to default tabs | 7-25 |

IBM Proprinter X24E Mode Commands

CARRIAGE CONTROL

| Name | Function | Page |
|---|---|------|
| BS | Prints, then backspaces one character | 7-25 |
| CR | Prints a line, then returns carriage | 7-26 |
| ESC+"U"+1 | Sets single direction printing | 7-26 |
| ESC+"U"+0 | Releases single direction printing | 7-26 |
| ESC+"d"+n ₁ +n ₂ | Moves the printhead to a relative horizontal position | 7-27 |

DATA CONTROL

| Name | Function | Page |
|------------|----------------------------|------|
| CAN | Clears data in line buffer | 7-27 |
| DC1 | Selects printer remotely | 7-27 |
| ESC+"Q"+36 | Deselects printer remotely | 7-28 |

DOWNLOAD CHARACTER SELECTION

| Name | Function | Page |
|---|-----------------------|------|
| ESC+"="+n ₁ +n ₂ +35+A ₁ +A ₂ | Defines download font | 7-28 |

MISCELLANEOUS

| Name | Function | Page |
|---|---|------|
| BEL | Sounds the buzzer | 7-28 |
| ESC | First byte of multi-byte control codes | 7-29 |
| NUL | Last byte of certain multi-byte control codes | 7-29 |
| ESC+"\""+n ₁ +n ₂ | Prints continuously from All Character Chart | 7-29 |
| ESC+"^" | Prints one character from All Character Chart | 7-30 |
| ESC+"j" | Sets OFF LINE mode | 7-30 |
| ESC+"["+"K" +n ₁ +n ₂ +m +36+p ₁ +p ₂ | Resets to initial state | 7-30 |

IBM Proprinter X24E Mode Commands

PRINT STYLE SELECT:

Selects the printing fonts and quality.

| | | | |
|--------------|-----|-----|---|
| Name: | ESC | "T" | n |
| Dec.: | 27 | 73 | n |
| Hex.: | 1B | 49 | n |

Comments:

- The following values of n can be used.
 - n=0: Internal characters Draft 10 cpi font
 - n=2: Internal characters LQ 10 cpi font
 - n=3: Internal characters Proportional LQ font
 - n=4: Download characters Draft 10 cpi font
 - n=6: Download characters LQ 10 cpi font
 - n=7: Download characters Proportional LQ font
 - n=8: Internal characters Draft 12 cpi font
 - n=10: Internal characters LQ 12 cpi font
 - n=12: Download characters Draft 12 cpi font
 - n=14: Download characters LQ 12 cpi font
 - n=16: Internal characters Draft 17 cpi font
 - n=18: Internal characters LQ 17 cpi font
 - n=20: Download characters Draft 17 cpi font
 - n=22: Download characters LQ 17 cpi font
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

IBM Proprinter X24E Mode Commands

FONT STYLE:

Selects font style.

| | | | |
|--------------|---------|---|-------------------------|
| Name: | ESC "k" | n | (n=0, 1, 2, 3, 4, 5, 6) |
| Dec.: | 27 107 | n | |
| Hex.: | 1B 6B | n | |

Comments:

- The following values can be used.
 - n=0: Roman font
 - n=1: Sans Serif font
 - n=2: Courier font
 - n=3: Prestige font
 - n=4: Script font
 - n=5: Orator font
 - n=6: Bold PS font
 - IBM characters in locations 0~31_{DEC} (except 19, 20, 21_{DEC}) [00~1F_{HEX} (except 13, 14, 15_{HEX})] and 250~255_{DEC} (F0~FF_{HEX}) are printed in Courier font, regardless of font selection.
 - PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

SUB/SUPERSCRIP FONT:

Selects sub/superscript font with characters printed in the bottom/top $\frac{2}{3}$ area of the line.

| | | | |
|--------------|-----------------------------------|---|------------------|
| Name: | Set: ESC "S" | n | Release: ESC "T" |
| | (subscript: n=1/superscript: n=0) | | |
| Dec.: | 27 83 | n | 27 84 |
| Hex.: | 1B 53 | n | 1B 54 |

Comments:

- Sub/superscript characters are $\frac{2}{3}$ normal height.
- Sub/superscript characters can be printed in the letter quality or draft mode.
- Sub/superscript characters are normal width.

IBM Proprinter X24E Mode Commands

ELITE PITCH:

Sets printing to 12 characters per inch (up to 96 characters per line).

| | | | | |
|--------------|------|---------|----------|-----|
| Name: | Set: | ESC “:” | Release: | DC2 |
| Dec.: | | 27 58 | | 18 |
| Hex.: | | 1B 3A | | 12 |

Comment:

- **PANEL LOCK** in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

COMPRESSED PITCH:

Sets printing to 17 characters per inch (up to 137 characters per line).

| | | | | |
|--------------|------|--------------|----------|-----|
| Name: | Set: | SI or ESC SI | Release: | DC2 |
| Dec.: | | 15 or 27 15 | | 18 |
| Hex.: | | 0F or 1B 0F | | 12 |

Comment:

- **PANEL LOCK** in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

PROPORTIONAL SPACING:

Sets proportional spacing between characters.

| | | | | |
|--------------|------|-----------|----------|-----------|
| Name: | Set: | ESC “P” 1 | Release: | ESC “P” 0 |
| Dec.: | | 27 80 1 | | 27 80 0 |
| Hex.: | | 1B 50 01 | | 1B 50 00 |

Comments:

- This command is ineffective when the **FONT** is set to Draft through the Function mode.
- **PANEL LOCK** in the Function mode affects this command.
(See pages 3-17, 3-18.)

IBM Proprinter X24E Mode Commands

EMPHASIZED PRINTING:

Sets printing to twice the original horizontal dot density.

| | | | | |
|--------------|------|---------|----------|---------|
| Name: | Set: | ESC "E" | Release: | ESC "F" |
| Dec.: | | 27 69 | | 27 70 |
| Hex.: | | 1B 45 | | 1B 46 |

Comments:

- Emphasized characters are printed at half speed (100 cps in draft pica pitch).
 - PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

DOUBLE STRIKE PRINTING:

Sets double strike character printing.

| | | | | |
|--------------|------|---------|----------|---------|
| Name: | Set: | ESC "G" | Release: | ESC "H" |
| Dec.: | | 27 71 | | 27 72 |
| Hex.: | | 1B 47 | | 1B 48 |

Comment:

- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

IBM Proprinter X24E Mode Commands

DOUBLE WIDE PRINTING—SINGLE LINE:

Sets double wide (elongated) character printing for one line only.

| | | | | | | | | | |
|-------|------|----|----|--------|----------|-----|----|---------|----|
| Name: | Set: | SO | or | ESC SO | Release: | DC4 | or | ESC "W" | 0 |
| Dec.: | | 14 | | 27 14 | | 20 | | 27 87 | 0 |
| Hex.: | | 0E | | 1B 0E | | 14 | | 1B 57 | 00 |

Comments:

- Single line double wide printing is released when:
 - a LF, FF or VT is executed.
 - a CR is executed.
 - DC4 or ESC+"W"+0 is executed.
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

DOUBLE WIDE PRINTING:

Sets double wide (elongated) character printing.

| | | | | | | |
|-------|------|---------|----|----------|---------|----|
| Name: | Set: | ESC "W" | 1 | Release: | ESC "W" | 0 |
| Dec.: | | 27 87 | 1 | | 27 87 | 0 |
| Hex.: | | 1B 57 | 01 | | 1B 57 | 00 |

Comments:

- Double wide printing set by ESC+"W"+1 is only released by ESC+"W"+0.
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

IBM Proprinter X24E Mode Commands

DOUBLE HIGH AND DOUBLE WIDE PRINTING:

Sets printing to double high, double wide or both at the same time.

| | | | | | | | | | |
|--------------|-----|-----|-----|----------------|----------------|----------------|----------------|----------------|----------------|
| Name: | ESC | “[” | “@” | n ₁ | n ₂ | m ₁ | m ₂ | m ₃ | m ₄ |
| Dec.: | 27 | 91 | 64 | n ₁ | n ₂ | m ₁ | m ₂ | m ₃ | m ₄ |
| Hex.: | 1B | 5B | 40 | n ₁ | n ₂ | m ₁ | m ₂ | m ₃ | m ₄ |

Comments:

- The values of n₁, n₂, m₁ and m₂ must be used as follows:
 n₁=4, n₂=0, m₁=0, m₂=0
- The value of m₃ selects both the line feed and character height as follows:

| m ₃ | Function | |
|----------------|-----------|------------------|
| | Line feed | Character height |
| 0 | Unchanged | Unchanged |
| 1 | Unchanged | Single-line |
| 2 | Unchanged | Double-high |
| 16 | Single | Unchanged |
| 17 | Single | Single-high |
| 18 | Single | Double-high |
| 32 | Double | Unchanged |
| 33 | Double | Single-high |
| 34 | Double | Double-high |

- The value of m₄ selects the character width as follows:
 m₄=0: No change
 m₄=1: Single-width
 m₄=2: Double-width
- PANEL LOCK in the Function mode affects this command.
 (See pages 3-17, 3-18.)

IBM Proprinter X24E Mode Commands

UNDERLINING:

Sets continuous underlining of characters.

| | | | | | | | | |
|--------------|------|-----|-----|----|----------|-----|-----|----|
| Name: | Set: | ESC | "_" | 1 | Release: | ESC | "_" | 0 |
| Dec.: | | 27 | 45 | 1 | | 27 | 45 | 0 |
| Hex.: | | 1B | 2D | 01 | | 1B | 2D | 00 |

Comments:

- Bit image data, spaces set by the HT code and IBM Graphic characters are not underlined.
 - Pin No. 24 of the printhead is used for underlining.
-

OVERLINING:

Sets continuous overlining of characters.

| | | | | | | | | |
|--------------|------|-----|-----|----|----------|-----|-----|----|
| Name: | Set: | ESC | "_" | 1 | Release: | ESC | "_" | 0 |
| Dec.: | | 27 | 95 | 1 | | 27 | 95 | 0 |
| Hex.: | | 1B | 5F | 01 | | 1B | 5F | 00 |

Comments:

- Bit image data, spaces set by the HT code, IBM graphic characters are not overlined.
 - Pin No. 1 of the printhead is used for overlining.
-

IBM CHARACTER SET I:

Selects IBM Proprinter X24E character set 1.

| | | |
|--------------|-----|-----|
| Name: | ESC | "7" |
| Dec.: | 27 | 55 |
| Hex.: | 1B | 37 |

Comments:

- Refer to Appendix A.
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

IBM Proprinter X24E Mode Commands

IBM CHARACTER SET II:

Selects IBM Proprinter X24E character set 2.

Name: ESC "6"
Dec.: 27 54
Hex.: 1B 36

Comments:

- Refer to Appendix A.
 - PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

SETS CODE PAGE

Changes the current code page.

Name: ESC "[" "T" n₁ n₂ n₃ n₄ n₅ n₆
Dec.: 27 91 84 n₁ n₂ n₃ n₄ n₅ n₆
Hex.: 1B 5B 54 n₁ n₂ n₃ n₄ n₅ n₆

Comments:

- This command is ignored if an unavailable code page is specified.
- The values of n₁ n₂ n₃ and n₄ can be used.
n₁=4
n₂=n₃=n₄=0
- The values of n₅ and n₆ select the code pages as follows:
n₅=00H, n₆=00H: Current
n₅=01H, n₆=B5H: U.S. character set
n₅=03H, n₆=52H: Multilingual character set
Except the above: Downloaded font
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)
- Refer to Appendix A.

IBM Proprinter X24E Mode Commands

8-PIN STANDARD DENSITY GRAPHICS:

Sets standard density graphic mode [60 dots per inch (25.4 mm)/480 dots per line]. (For detailed information, refer to Section 5.3.)

| | | | | |
|--------------|---------|----|----|------|
| Name: | ESC "K" | n1 | n2 | Data |
| Dec.: | 27 75 | n1 | n2 | Data |
| Hex.: | 1B 4B | n1 | n2 | Data |

8-PIN DOUBLE DENSITY GRAPHICS:

Sets double density graphic mode [120 dots per inch (25.4 mm)/960 dots per line]. (For detailed information, refer to Section 5.3.)

| | | | | |
|--------------|---------|----|----|------|
| Name: | ESC "L" | n1 | n2 | Data |
| Dec.: | 27 76 | n1 | n2 | Data |
| Hex.: | 1B 4C | n1 | n2 | Data |

DOUBLE SPEED, DOUBLE DENSITY GRAPHICS:

Sets double speed, double density graphics mode [120 dots per inch (25.4 mm)/960 dots per line]. (For detailed information, refer to Section 5.3.)

| | | | | |
|--------------|---------|----|----|------|
| Name: | ESC "Y" | n1 | n2 | Data |
| Dec.: | 27 89 | n1 | n2 | Data |
| Hex.: | 1B 59 | n1 | n2 | Data |

Comment:

- Horizontal adjacent dots cannot be printed.

IBM Proprinter X24E Mode Commands

8-PIN QUADRUPLE DENSITY GRAPHICS:

Sets quadruple density graphics mode [240 dots per inch (25.4 mm)/1920 dots per line]. (For detailed information, refer to Section 5.3.)

Name: ESC "Z" n₁ n₂ Data
Dec.: 27 90 n₁ n₂ Data
Hex.: 1B 5A n₁ n₂ Data

Comment:

- Horizontal adjacent dots cannot be printed.

BIT IMAGE MODE SELECTION (AGM):

Selects one of the 8-pin and 24-pin bit image graphic modes (AGM only).

Name: ESC "*" m n₁ n₂ Data
(m=0, 1, 2, 3, 4, 6, 32, 33, 38, 39, 40)
Dec.: 27 42 m n₁ n₂ Data
Hex.: 1B 2A m n₁ n₂ Data

Comments:

- The following table illustrates the various modes based upon the values of m.

| m | Pin | Dots/Inch | Dots/Line | |
|----|-----|-----------|-----------|---------------------------------|
| 0 | 8 | 60 | 480 | Standard Density |
| 1 | 8 | 120 | 960 | Double Density |
| 2 | 8 | 120 | 960 | Double Speed, Double Density |
| 3 | 8 | 240 | 1920 | Quadruple Density |
| 4 | 8 | 80 | 640 | CRT I |
| 6 | 8 | 90 | 720 | CRT II |
| 32 | 24 | 60 | 480 | Standard Density |
| 33 | 24 | 120 | 960 | Double Density |
| 38 | 24 | 90 | 720 | CRT III |
| 39 | 24 | 180 | 1440 | Triple Density |
| 40 | 24 | 360 | 2880 | Hex Density |

- When m=2, 3, 40, horizontal adjacent dots cannot be printed.
- This command is effective only when AGM mode is set to ON through the Function mode (see pages 3-24, 5-21).

IBM Proprinter X24E Mode Commands

BIT IMAGE MODE SELECTION:

Selects one of the 8-pin or 24-pin bit image graphic modes.

Name: ESC “[” “g” n₁ n₂ m Data
(m=0, 1, 2, 3, 8, 9, 11, 12)

Dec.: 27 91 103 n₁ n₂ m Data

Hex.: 1B 5B 67 n₁ n₂ m Data

Comments:

- The following table illustrates the various modes based upon the values of m.

| m | Pin | Dots/Inch | Dots/Line | |
|----|-----|-----------|-----------|---------------------------------|
| 0 | 8 | 60 | 480 | Standard Density |
| 1 | 8 | 120 | 960 | Double Density |
| 2 | 8 | 120 | 960 | Double Speed, Double Density |
| 3 | 8 | 240 | 1920 | Quadruple Density |
| 8 | 24 | 60 | 480 | Standard Density |
| 9 | 24 | 120 | 960 | Double Density |
| 11 | 24 | 180 | 1440 | Triple Density |
| 12 | 24 | 360 | 2880 | Hex Density |

- When m=2, 3, 12, horizontal adjacent dots cannot be printed (see Section 5.3).

1/8 INCH PAPER FEED:

Sets paper feed amount to 1/8 inch (3.2 mm).

Name: ESC “0”

Dec.: 27 48

Hex.: 1B 30

Comment:

- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

IBM Proprinter X24E Mode Commands

7/2 INCH PAPER FEED:

Sets paper feed amount to 7/2 inch (2.5 mm).

Name: ESC "1"
Dec.: 27 49
Hex.: 1B 31

Comment:

- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

LINE SPACING:

Executes line spacing set by ESC+"A"+n.

Name: ESC "2"
Dec.: 27 50
Hex.: 1B 32

Comment:

- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)
-

1/2 INCH PAPER FEED SELECTION:

Sets programmable paper feed amount to 1/2 inch.

Name: ESC "A" n
Dec.: 27 65 n
Hex.: 1B 41 n

Comments:

- ESC+"2" must be input after ESC+"A"+n for 1/2 inch paper feed to become effective (when AGM is set to OFF only).
- 1/2 inch paper feed is valid for $0 \leq n \leq 255$.
- The IBM Proprinter X24E mode defaults to 1/6 inch.
- In the AGM mode, this command sets one line paper feed of 1/60 inch (see pages 3-24, 5-21).
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

IBM Proprinter X24E Mode Commands

1/216 INCH PAPER FEED:

Sets programmable paper feed amount to 1/216 inch.

Name: ESC "3" n
Dec.: 27 51 n
Hex.: 1B 33 n

Comments:

- 1/216 inch paper feed is valid for $0 \leq n \leq 255$.
- The paper feed amount is not exactly 1/216 inch, for the minimum unit is 1/360 inch.
- This command sets one line paper feed of 1/180 inch in the AGM mode (see pages 3-24, 5-21).
- PANEL LOCK in the Function mode affects this command. (See pages 3-17, 3-18.)

LINE FEED PITCH SELECTION:

Selects line base unit for ESC+"3" and ESC+"J".

Name: ESC "[" \ " n1 n2 n3 n4 n5 n6
Dec.: 27 91 92 n1 n2 n3 n4 n5 n6
Hex.: 1B 5B 5C n1 n2 n3 n4 n5 n6

Comments:

- The values of n1, n2, n3, n4 and n5 must be used as follows:
n1=4
n2=n3=n4=n5=0
- The value of n6 selects the base line feed unit for ESC+"3" and ESC+"J".
Base unit
n6=180 1/180 inch
n6=216 1/216 inch
- Other values of n6 are unsupported.

IBM Proprinter X24E Mode Commands

AUTOMATIC LINE FEED MODE (FORM FEED)

Automatically executes a Line Feed following a Carriage Return.

| | | | | |
|-------|------|-----------|----------|-----------|
| Name: | Set: | ESC "5" 1 | Release: | ESC "5" 0 |
| Dec.: | | 27 53 1 | Hex: | 1B 35 01 |
| Hex.: | | 1B 35 01 | | |

Comment:

- PANEL LOCK in the Function mode affects this command.
- The amount of form feed depends upon the page length set by the page length control command in the ESC function panel.

LINE FEED (LF):

Causes data in line buffer to be printed and then executes a single line feed.

| | |
|-------|----|
| Name: | LF |
| Dec.: | 10 |
| Hex.: | 0A |

Comments:

- When the new line position falls within the skip perforation area, the paper advances to the next top of form position.
- If there is no data or space (data (ASCII 32)) or blanks between HT command print positions in the line buffer, LF feeds the paper by 1 line.
- The amount of spacing generated by LF is a function of the paper feed amount setting.
- LF code releases single-line double width printing set by SO and ESC+SO.
- Function mode controls the Automatic CR function. When this mode is set to OFF, LF executes a single line feed with no carriage movement. When this mode is set to ON as a Carriage Return command (CR) is added to each Line Feed (LF).

IBM Proprinter X24E Mode Commands

FORM FEED (FF):

Feeds paper to next top of form position after first printing any data in the line buffer.

Name: FF
Dec.: 12
Hex.: 0C

Comments:

- FF releases single-line double width printing set by SO or ESC+SO.
 - Amount of form feed depends upon the page length set by the page length control command or the EZ Set Operator panel.
-

$\frac{1}{216}$ INCH PAPER FEED SELECTION:

Prints out the data in the line buffer and feeds the paper $\frac{1}{216}$ inch or $\frac{1}{180}$ inch.

Name: ESC "J" n
Dec.: 27 74 n
Hex.: 1B 4A n

Comments:

- When Automatic CR is set to ON through the Function mode, Carriage Return command (CR) is added automatically to this command.
- The value of n is valid for $0 \leq n \leq 255$.
- This command sets the paper feed for one line only. Subsequent paper feed returns to previous setting. However, the carriage does not return to the left margin position. Instead, printing of next line begins where previous printing left off.
- This command does not release single-line double width printing.
- The paper feed amount is not exactly $\frac{1}{216}$ inch, for the minimum unit is $\frac{1}{360}$ inch.
- In the AGM mode, this command sets one line paper feed of $\frac{1}{180}$ inch (see pages 3-24, 5-21).

IBM Proprinter X24E Mode Commands

PAGE LENGTH (INCHES):

Sets page length in inches.

| | | | | |
|--------------|-----|-----|----|---|
| Name: | ESC | "C" | 0 | n |
| Dec.: | 27 | 67 | 0 | n |
| Hex.: | 1B | 43 | 00 | n |

Comments:

- Upon receipt of ESC+"C"+0+n, the present line position becomes the top of page position.
- The value of n must be in the range $1 \leq n \leq 255$.
- ESC+"C"+0+n releases the skip perforation settings.
- The page length does not change even if the paper feed amount is changed.
- The terms "form" and "page" are interchangeable.
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

PAGE LENGTH (LINES):

Sets page length in number of lines.

| | | | |
|--------------|-----|-----|---|
| Name: | ESC | "C" | n |
| Dec.: | 27 | 67 | n |
| Hex.: | 1B | 43 | n |

Comments:

- Upon receipt of ESC+"C"+n, the present line position becomes the top of page position.
- The value of n must be in the range $1 \leq n \leq 255$. If n=0, page length returns to the inch designation.
- ESC+"C"+n releases the skip perforation settings.
- The page length does not change even if the paper feed amount is changed.
- The terms "form" and "page" are interchangeable.
- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

IBM Proprinter X24E Mode Commands

MARGIN SET:

Sets positions of left and right margins.

| | | | |
|-------|---------|----------------|----------------|
| Name: | ESC "X" | n ₁ | n ₂ |
| Dec.: | 27 88 | n ₁ | n ₂ |
| Hex.: | 1B 58 | n ₁ | n ₂ |

Comments:

- The left margin column is set to n₁ in the current width, and the right margin column is set to n₂.
- Any right margin designation to the left of the left margin position is ignored.
- Setting the margin clears all data in the line buffer.
- Once the margin position is set, a change in the pitch will not alter this margin setting.
- When n₁=0, the left margin does not change. When n₂=0, the right margin does not change.
- Permissible values of n₁, n₂ are given below.

| | 8" print line | 9" print line |
|------------------|--|--|
| Pica print | 0 ≤ n ₁ ≤ 78 2 ≤ n ₂ ≤ 80 | 0 ≤ n ₁ ≤ 88 2 ≤ n ₂ ≤ 90 |
| Elite print | 0 ≤ n ₁ ≤ 93 3 ≤ n ₂ ≤ 96 | 0 ≤ n ₁ ≤ 105 3 ≤ n ₂ ≤ 108 |
| Compressed print | 0 ≤ n ₁ ≤ 133 4 ≤ n ₂ ≤ 137 | 0 ≤ n ₁ ≤ 151 4 ≤ n ₂ ≤ 155 |

- **PANEL LOCK** in the Function mode affects this command.
(See pages 3-17, 3-18.)

Upon receipt of ESC "X" at the present line position becomes the top of page position.

The value of n must be in the range 0 ≤ n ≤ 255. If n = 0 page length returns to the left designation.

ESC "X" releases the slip perforation status.

The page length does not change even if the paper feed amount is changed.

The terms "form" and "page" are interchangeable.

PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

IBM Proprinter X24E Mode Commands

HORIZONTAL TAB STOP SETTING:

Sets horizontal tabulations to specified values.

| | | |
|--------------|--|--------------------|
| Name: | Set: ESC "D" n ₁ n ₂ ...n _x 0 | Release: ESC "D" 0 |
| Dec.: | 27 68 n ₁ n ₂ ...n _x 0 | 27 68 0 |
| Hex.: | 1B 44 n ₁ n ₂ ...n _x 00 | 1B 44 00 |

Comments:

- Horizontal tabs are set from the left margin position.
- Horizontal tabs must be designated such that $n_1 < n_2 < \dots < n_x$.
- A maximum of 32 tabs may be set on a single line.
- ESC+"D"+n₁+n₂+...+n_x+0 sets horizontal tab stops. The HT command executes the tab designation.
- In proportional spacing, horizontal tabs are set based on 10 cpi.
- If the character pitch is altered after designation of horizontal tabs, the tab positions change.
- When the left margin is changed, horizontal tabs will be moved based on the new margin setting.
- When the printer is powered up, tabs are automatically set every 8 characters.

HORIZONTAL TAB EXECUTION:

Executes the horizontal TAB as designated by ESC+"D"+n₁+n₂+...+n_x+0.

| | |
|--------------|----|
| Name: | HT |
| Dec.: | 9 |
| Hex.: | 09 |

Comments:

- If the value of the horizontal TAB is less than the present column position, that HT is ignored.
- When in underline mode, the blank spaces between consecutive HT print positions are not underlined.

IBM Proprinter X24E Mode Commands

VERTICAL TAB STOP SETTING:

Sets vertical tabulation to specified values.

| | | | | | | | |
|--------------|--------------|----------------|----------------------------------|----------------------------------|------------------|----|----|
| Name: | Set: ESC "B" | n ₁ | n ₂ ...n _x | 0 | Release: ESC "B" | 0 | |
| Dec.: | 27 | 66 | n ₁ | n ₂ ...n _x | 27 | 66 | 0 |
| Hex.: | 1B | 42 | n ₁ | n ₂ ...n _x | 1B | 42 | 00 |

Comments:

- VT is set from the top of page position.
- Vertical tabs must be designed such that $n_1 < n_2 < \dots < n_x$.
- ESC+"B"+n₁+n₂+...+n_x+0 sets vertical tab stops. The VT command executes the tab designation.
- If the paper feed amount is changed after a designation of vertical tabs, the tab positions do not change.
- A maximum of 64 tabs may be set.

VERTICAL TAB EXECUTION:

Executes the vertical TAB as designated by ESC+"B"+n₁+n₂+...+n_x+0.

| | |
|--------------|----|
| Name: | VT |
| Dec.: | 11 |
| Hex.: | 0B |

Comments:

- When TABs are set with VT setting command and there is no tab setting on a position exceeding the present line, data is printed out and advances the paper one line (same as LF).
- When vertical TAB has not been set by ESC+"B"+n₁+n₂+...+n_x+0, execution of VT causes data in the line buffer to be printed and advances the paper one line (same functions as LF).

IBM Proprinter X24E Mode Commands

ALL TAB INITIAL CLEAR

Sets all tabs to power ON settings.

| | |
|-------|-------|
| Name: | ESC R |
| Dec.: | 27 82 |
| Hex.: | 1B 52 |

Comment:

- This command sets horizontal tabs at every 8th position and clears all vertical tabs.

BACKSPACE:

Prints data in line buffer and backspaces one space before printing next character.

| | |
|-------|----|
| Name: | BS |
| Dec.: | 8 |
| Hex.: | 08 |

Comment:

- Since BS backspaces the width of a character, the backspacing amount will depend upon the character mode set when the BS code is executed.

IBM Proprinter X24E Mode Commands

CARRIAGE RETURN

Prints all data in line buffer and designates that the next line starts at the left margin.

| | | | |
|--------------|----|------|----|
| Name: | CR | Hex: | 0D |
| Dec.: | 13 | Hex: | 0D |
| Hex.: | 0D | Hex: | 0D |

- Comments:**
- Certain computers issue an automatic line feed with a carriage return. (Check your computer manual for details.)
 - When auto LF is set to ON through the Function mode, the paper is fed automatically (a LF is executed automatically) whenever a CR code is executed.
 - CR code releases single line double width printing set by SO or ESC+SO.

SINGLE DIRECTION:

Sets single direction (left to right) printing mode

| | | | | |
|--------------|------|-----------|----------|-----------|
| Name: | Set: | ESC "U" 1 | Release: | ESC "U" 0 |
| Dec.: | | 27 85 1 | | 27 85 0 |
| Hex.: | | 1B 55 01 | | 1B 55 00 |

Comment:

- PANEL LOCK in the Function mode affects this command.
(See pages 3-17, 3-18.)

IBM Proprinter X24E Mode Commands

RELATIVE HORIZONTAL POSITION:

Moves the printhead toward the right $\frac{1}{120}$ inch.

Name: ESC "d" n₁ n₂
Dec.: 27 100 n₁ n₂
Hex.: 1B 64 n₁ n₂

Comments:

- When underlining or overlining, spaces created by the move are underlined or overlined.
 - This command moves the printhead to a position $n_1 + (256 \times n_2)$ units from the current position. Each unit equals $\frac{1}{120}$ of an inch.
-

CANCEL:

Clears all data in the line buffer.

Name: CAN
Dec.: 24
Hex.: 18

REMOTE PRINTER SELECT:

Selects the printer remotely, enabling it to receive data.

Name: DC1 (Device Control 1)
Dec.: 17
Hex.: 11

Comments:

- Receipt of DC1 while the printer is deselected by ESC+"Q"+36 enables the printer to receive data.
- The data received between ESC+"Q"+36 and DC1 is lost.

IBM Proprinter X24E Mode Commands

REMOTE DESELECT PRINTER:

Deselects the printer remotely, disabling it from receiving data.

Name: ESC "Q" 36
Dec.: 27 81 36
Hex.: 1B 51 24

Comment:

- All data sent in deselect status becomes invalid. In order to return to select status, send DC1 code.
-

FONT DOWNLOADING:

Defines download characters into specified address locations in RAM.

Name: ESC "=" n₁ n₂ 35 A₁ A₂ Data
Dec.: 27 61 n₁ n₂ 35 A₁ A₂ Data
Hex.: 1B 3D n₁ n₂ 23 A₁ A₂ Data

Comments:

- This command is operational only when the 32K buffer option (KX-P43) is installed.
 - When n₁=n₂=0, download characters are all cleared.
 - Refer to Section 5.2 on page 5-4 for detailed information.
 - PANEL LOCK in the Function mode affects this command. (See pages 3-17, 3-18.)
-

BELL:

Sounds buzzer for approximately 0.5 second.

Name: BEL
Dec.: 7
Hex.: 07

IBM Proprinter X24E Mode Commands

ESCAPE:

First byte of each multi byte printer control code.

| | | | |
|-------|-----|-------|----|
| Name: | ESC | Hex: | 1B |
| Dec.: | 27 | Hex: | 1B |
| Hex.: | 1B | Dec.: | 27 |

Comment:

Cannot be generated by the ESC key on certain computers.

NULL:

Last byte of certain multi-byte printer control codes.

| | | | |
|-------|-----|-------|----|
| Name: | NUL | Hex: | 00 |
| Dec.: | 0 | Hex: | 00 |
| Hex.: | 00 | Dec.: | 0 |

ALL CHARACTER CHART PRINTING (Continuous):

Prints continuously from All Character Chart.

| | |
|-------|-------------|
| Name: | ESC n1 n2 |
| Dec.: | 27 n1 n2 |
| Hex.: | 1B 5C n1 n2 |

Comments:

- This command allows the printing of all characters including characters with an ASCII value below decimal 32.
- Refer to IBM All Character Chart (Appendix A).
- The values specified for n1 and n2 indicate how many characters to print from All Character Chart, calculating the total count with this formula; Total count = n2 × 256 + n1.
- The data following this command and designated by n1 and n2 will be printed as characters from the All Character Chart.

IBM Proprinter X24E Mode Commands

All CHARACTER CHART PRINTING (Single)

Prints single character from All Character Chart.

| | | | |
|--|-----|----|----|
| Name: ESC | 27 | 1B | 5E |
| Dec.: 27 | 106 | 9A | 78 |
| Hex.: 1B | 6A | 4E | 4E |
| Comments: | | | |
| <ul style="list-style-type: none"> • Only the character following this command will be printed. • Refer to IBM All Character Chart (Appendix A). | | | |

SETS OFF LINE MODE:

Stops printing and goes to OFF LINE mode.

| | | | |
|---|-----|----|----|
| Name: ESC | 27 | 1B | 6A |
| Dec.: 27 | 106 | 9A | 78 |
| Hex.: 1B | 6A | 4E | 4E |
| Comment: | | | |
| <ul style="list-style-type: none"> • When you desire to print again, press the ON LINE switch. | | | |

INITIAL STATE:

Resets to initial state.

| | | | | | | | |
|---|----|----|----|----|----|----|----|
| Name: ESC | 27 | 91 | 75 | n1 | n2 | n3 | n4 |
| Dec.: | 27 | 91 | 75 | n1 | n2 | n3 | n4 |
| Hex.: | 1B | 5B | 4B | n1 | n2 | n3 | n4 |
| Comments: | | | | | | | |
| <ul style="list-style-type: none"> • The following values of n1 can be used. | | | | | | | |
| <ul style="list-style-type: none"> n1=1: Initialize only. n1=3: Initialize and set by p1 n1=4: Initialize and set by p1 and p2 | | | | | | | |

IBM Proprinter X24E Mode Commands

- The following table illustrates the various modes based upon the value of m.

| m | Initialization | Download | |
|-----|-----------------|-------------|-----------|
| 0 | Current MACRO | Not cleared | Not saved |
| 1 | Current MACRO | Cleared | Not saved |
| 4 | FACTORY setting | Cleared | Not saved |
| 5 | FACTORY setting | Cleared | Not saved |
| 254 | Current MACRO | Not cleared | Saved |
| 255 | FACTORY setting | Cleared | Saved |

- The following tables illustrate the parameter specifications.

p₁ (Parameter 1):

| Bit | | OFF | ON |
|-----|-----------------|-------------------|------------------|
| 7 | Discard byte | Process this byte | Ignore this byte |
| 6 | Not used | | |
| 5 | Paper out alarm | Enable | Disable |
| 4 | Auto LF | OFF | ON |
| 3 | Auto CR | OFF | ON |
| 2 | Form length | 11" | 12" |
| 1 | Zero slash | Normal | Slashed Zero |
| 0 | Character set | Set 1 | Set 2 |

p₂ (Parameter 2):

| Bit | | OFF | ON |
|-----|------------------|-------------------|------------------|
| 7 | Discard byte | Process this byte | Ignore this byte |
| 6 | Select code page | USA | Multilingual |
| 5 | Not used | | |
| 4 | Not used | | |
| 3 | Not used | | |
| 2 | Not used | | |
| 1 | Ignore | | |
| 0 | Cut sheet feeder | Disable | Enable |

8. Interfacing

Parallel Interfacing

Communication with a computer is accomplished through a parallel interface based on the Centronics standard.

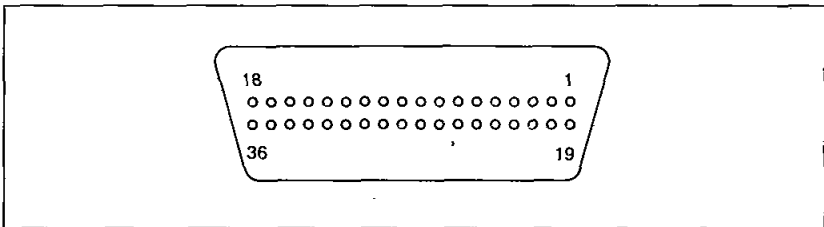
Specifications:

- data transfer speed: 1000 cps minimum
- synchronization: external STROBE pulse
- logic levels: TTL
- handshaking: BUSY and $\overline{\text{ACK}}$ signals
- connector type: 57-30360 (AMPHENOL) or equivalent
- cable: use a shielded cable (6'5"/1.95 meters) or less in length.

When the printer is processing data, the BUSY signal is high. The printer will not accept new data from the computer. After the processing is completed, the BUSY signal goes low. (The BUSY signal is also high when the printer is OFF LINE). When the busy signal occurs, the $\overline{\text{ACK}}$ signal goes low indicating to the computer that the data has been processed and the printer is ready to accept more data. This handshaking routine occurs each time a character is sent to the printer.

| | BUSY | SLCT | PO | $\overline{\text{ERROR}}$ |
|-----------|------|------|------|---------------------------|
| ON LINE | LOW | HIGH | LOW | HIGH |
| OFF LINE | HIGH | LOW | LOW | LOW |
| PAPER OUT | HIGH | LOW | HIGH | LOW |

Printer Status signals



Parallel Interface Connector (Printer side)

| Signal pin | Return side pin | Signal | Direction |
|------------|-----------------|-----------------|-----------|
| 1 | 19 | STB | Input |
| 2 | 20 | DATA 1 | |
| 3 | 21 | DATA 2 | |
| 4 | 22 | DATA 3 | |
| 5 | 23 | DATA 4 | |
| 6 | 24 | DATA 5 | |
| 7 | 25 | DATA 6 | |
| 8 | 26 | DATA 7 | |
| 9 | 27 | DATA 8 | |
| 10 | 28 | ACK | Output |
| 11 | 29 | BUSY | Output |
| 12 | | PQ I/O | Output |
| 13 | | SLCT | Output |
| 14 | | AUTO FEED XTILL | Input |
| 15 | | | |
| 16 | | SG | |
| 17 | | FG | |
| 28 | | +5V | Output |
| 31 | 30 | PRIME | Input |
| 32 | | ERROR | Output |
| 33 | | SG | |
| 34 | | | |
| 35 | | | |
| 36 | | | |

Pin Configuration (Parallel)

Note:

- "INPUT" refers to a signal coming into the printer. "OUTPUT" denotes a signal exiting the printer.
- "RETURN" denotes the return side wire of a twisted pair cable and is connected to signal ground.
- All interface signals are at TTL (Transistor-Transistor-Logic) levels.

Connector pin signals

STB...STROBE

- This is a synchronizing input signal to read data into the printer.
- This signal is normally high. Data is read in when it goes low.
- The pulse must be low for at least 1 microsecond.

DATA 1–DATA8

- These are the input signals which carry the 8 data bits of information.
- The signal is read in synchronization with the STROBE pulse. A high level indicates a logical “1”.
- The signal must be present 0.5 microsecond before and after the STROBE pulse.

ACK...ACKNOWLEDGE

- This is an output signal to the computer indicating that the printer is ready to receive the next block of data. It is sent out when the BUSY signal drops from high to low. Therefore, it can be thought of as a data request pulse.
- The signal is normally high. When the condition becomes true, the signal goes low.
- The ACK signal is automatically sent whenever the printer is switched ON LINE.

BUSY

- This output signal indicates the status of the printer. The signal is high when the printer is busy and cannot receive data.
- The signal is high under the following conditions:
 1. receive buffer full
 2. printer is processing data
 3. printer is OFF LINE
 4. printer is in an error condition

PO...PAPER OUT

- This output signal indicates that paper out detector detects the absence of paper.
- The signal is normally low and goes high during a “Paper Out” condition.

Interfacing

SLCT...SELECT

- SELECT is an output signal which indicates the ON LINE or OFF LINE state of the printer. The signal is high in the ON LINE state and low when OFF LINE.
- The printer enters the ON LINE state:
 1. when the printer is turned on
 2. when $\overline{\text{PRIME}}$ is received
 3. when the RESET command is received
 4. when the ON LINE switch is pressed
- The printer enters the OFF LINE state:
 1. when the printer is out of paper
 2. when the printer is switched OFF LINE

$\overline{\text{AUTO FEED XT}}$ ($\overline{\text{AFXT}}$)

- This input signal determines if a line feed (LF) command will be added to each carriage return (CR).
- When $\overline{\text{AFXT}}$ is low, CR+LF action occurs. When $\overline{\text{AFXT}}$ is high, only a carriage return is performed.
- **Auto LF setting in the Function mode can alter the response by the printer to an $\overline{\text{AFXT}}$ signal. If auto LF is ON, the printer will perform a CR+LF regardless of the level of the incoming signal. When auto LF is OFF, this automatic action is disabled.**

SG...SIGNAL GROUND

- The twisted pair return wires (pins 19–30) are connected to signal ground.

FG...FRAME GROUND

- Frame ground is the same as chassis ground.

+5 V

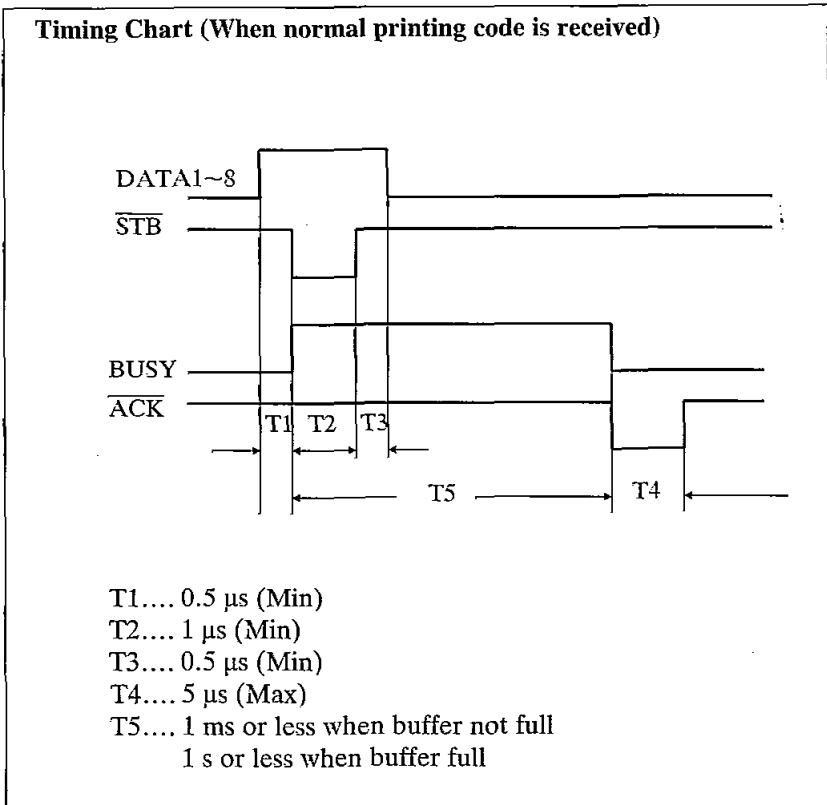
- This is for evaluation only. It should not be used to supply power for external equipment.

PRIME

- This input signal is used to initialize the printer. The signal is normally high and goes low to reset the printer. It can be received anytime during printer operation.

ERROR

- This output signal is an “error” or “fault” condition. Normally high, this signal goes low when an error occurs. An error condition can be caused by:
 1. a “Paper Out” condition
 2. the printer is OFF LINE
 3. an overload condition exists



Timing Diagram

9. Maintenance

The printer does not require any routine maintenance. However, reasonable care of the printer will extend its life. The following precautions and periodic measures are recommended:

Precautions

- Keep all liquids away from the printer. Accidental spillage of a liquid into the printer can cause severe damage.
- Do not block the air flow around the printer. Do not place books, paper, or other items on top of the printer.
- Special care should be taken to protect the printer if it is used in an unfriendly environment such as a machine shop, a dusty or sandy area, etc.
- The life of the printhead can be extended by observing a few simple precautions.
 - Do not operate the printer without paper and a ribbon cassette installed.
 - Avoid prolonged use without allowing the printhead time to cool.
 - Do not obstruct the movement of the printhead while in operation.
- If the printer is not going to be used for an extended period, unplug the power cord.

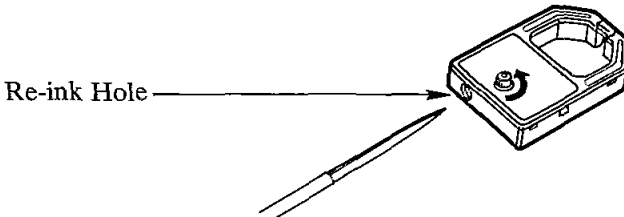
Periodic Maintenance

- Cleaning the unit is the most important action the user can perform. The frequency of cleaning is dependent upon the environment.
 - Turn the power OFF.
 - Clean the case and covers with a soft cloth. Use any mild commercial cleaner on the cloth, do not spray directly on the printer.

- Open the top and the smoked plastic covers. Vacuum or dust the inside area of the unit. Be very careful not to damage the flex ribbon cable and the carriage drive belt.
- The platen should be cleaned with denatured alcohol only.
- The carriage guide bar can be lubricated with a very light oil. Contact your Authorized Panasonic Service Center for advice on lubrication.

Ribbon Cassette

A single ribbon permits the printing of about 3 million characters. When the printing starts to fade, gently push the counter spring in the ribbon cassette hole with the tip of a ballpoint pen or other object. **Once the ribbon cassette is mounted onto the carriage and printing is performed for a short time, the characters will become darker.**



Note:

- Do not re-ink the ribbon before printing starts to fade. If the ribbon has too much ink, the characters may smear when printed.
- Wear and tear of the printhead pins may cause serious damage to the ribbon and cause the printing to fade. In such cases the printer needs servicing.

Troubleshooting

Most problems associated with the printer can be traced to improper setup, installation, or cabling. The error messages shown on the display (see Table 9.2) and the following table will assist the user in identifying and correcting some of the more common problems. If you need additional help, contact the store from which the unit was purchased.

Maintenance

| Symptom | Possible Cause | Probable Solution |
|---|--|--|
| Printer does not power up | No AC power | Check power cord |
| Power on but printer not printing | Printer not ON LINE Interface cable not connected | Press ON LINE switch Secure connection |
| Printer won't go ON LINE | Out of Paper | Replace paper |
| Paper out sensor inoperative | *P.O.DETECT is OFF | *Set P.O.DETECT to ON |
| Paper slips around platen | Paper feed selector in "PULL" position | Set selector to "PUSH" or "PULL" position |
| Head moves but does not print | Ribbon not installed correctly | Re-insert ribbon |
| Paper wrinkles when using tractor feed | No reverse tension on paper Selector switch is in "PUSH" position | Set paper supply lower than printer Set selector to "PUSH" or "PULL" position |
| Cannot change form length | *CSF is ON | *Set CSF to OFF |
| Print out is double-spaced | *Auto LF is ON | *Set Auto LF to OFF |
| Cannot print ASCII characters with code above 127 | *D.LENGTH is set incorrectly | *Set D.LENGTH as required |
| Wrong character set printed | *Wrong character set selected | *Set the character set as required |
| Cannot change print style from computer | *FONT and PITCH modes are set incorrectly | *Set PANEL LOCK to OFF |

Table 9.1 Troubleshooting (* in the Function mode. See page 3-8.)

Maintenance

| Error Messages | Possible Cause | Probable Solution |
|---------------------|---|---|
| CAN'T LOAD MACRO | Printer can't load a MACRO in Hex. Dump mode | Power off then on |
| | Some data remains in printer | Press ON LINE switch to print out remaining data |
| CAN'T PRINT OUT | Some data remains and printer can't output | With paper installed press ON LINE switch to print out remaining data |
| CAN'T SET MARGIN | Margins are set incorrectly | Set margins correctly |
| PAPER OUT | Paper is not installed or loaded under platen | Install paper or load paper by pressing LOAD/PARK switch |
| OVERLOAD | Path of printhead is blocked | Eliminate the blockage Power off then on to resume printing |
| PRINTHEAD HOT | Printhead is overheated and printer pauses until head temperature decreases | Automatic recovery |
| NO REV LF/PULL | *REV LF/PULL is OFF | *Set REV LF/PULL ON |
| CAN'T BACK PAPER | Printer can't back paper past printable area | Do not back paper past printable area |
| TOP MARGIN | Printer can't back paper past top margin (only when a top margin is set) | Do not back paper past top margin or reset top margin to 0 |
| CAN'T SET TOF | Printer can't set top of form | Check your paper installation |
| EEPROM ERROR | EEP ROM chip is out of order | Contact a local Authorized Service |
| RAM ERROR | RAM chip is out of order | |

Table 9.2 Error messages (*in the Function mode. See page 3-8.)

Appendix A

Epson LQ-850 Italic Character Set

| Dec. | 0 | 16 | 32 | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 | 176 | 192 | 208 | 224 | 240 | | |
|------|---|-----|-----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|---|
| Hex | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F | | |
| 0 | 0 | NUL | | SP | 0 | @ | P | ' | p | | | SP | 0 | @ | P | ' | p | |
| 1 | 1 | | DC1 | ! | 1 | A | Q | a | q | | | DC1 | ! | 1 | A | Q | a | q |
| 2 | 2 | | DC2 | " | 2 | B | R | b | r | | | DC2 | " | 2 | B | R | b | r |
| 3 | 3 | | DC3 | # | 3 | C | S | c | s | | | DC3 | # | 3 | C | S | c | s |
| 4 | 4 | | DC4 | \$ | 4 | D | T | d | t | | | DC4 | \$ | 4 | D | T | d | t |
| 5 | 5 | | | % | 5 | E | U | e | u | | | % | 5 | E | U | e | u | |
| 6 | 6 | | | & | 6 | F | V | f | v | | | & | 6 | F | V | f | v | |
| 7 | 7 | BEL | | ' | 7 | G | W | g | w | BEL | | ' | 7 | G | W | g | w | |
| 8 | 8 | BS | CAN | (| 8 | H | X | h | x | BS | CAN | (| 8 | H | X | h | x | |
| 9 | 9 | HT | EM |) | 9 | I | Y | i | y | HT | EM |) | 9 | I | Y | i | y | |
| 10 | A | LF | | * | : | J | Z | j | z | LF | | * | : | J | Z | j | z | |
| 11 | B | VT | ESC | + | ; | K | [| k | { | VT | ESC | + | ; | K | [| k | { | |
| 12 | C | FF | | , | < | L | \ | l | | FF | | , | < | L | \ | l | | / |
| 13 | D | CR | | - | = | M |] | m | } | CR | | - | = | M |] | m | } | |
| 14 | E | SO | | . | > | N | ^ | n | ~ | SO | | . | > | N | ^ | n | ~ | |
| 15 | F | SI | | / | ? | O | _ | o | | DEL | SI | | / | ? | O | _ | o | |

Appendix A

Epson LQ-850 Graphic Character Set 1

| Dec | 0 | 16 | 32 | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 | 176 | 192 | 208 | 224 | 240 |
|-----|---|--------|----|----|----|----|----|-----|--------|-----|-----|-----|-----|-----|-----|-----|
| Hex | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
| 0 | 0 | NUL | SP | 0 | @ | P | ' | p | | | á | | L | ll | α | ≡ |
| 1 | 1 | DC1 | ! | 1 | A | Q | a | q | DC1 | í | | l | ll | β | ± | |
| 2 | 2 | DC2 | " | 2 | B | R | b | r | DC2 | ó | | l | ll | Γ | ≥ | |
| 3 | 3 | DC3 | # | 3 | C | S | c | s | DC3 | ú | | l | ll | π | ≤ | |
| 4 | 4 | DC4 | \$ | 4 | D | T | d | t | DC4 | ñ | l | l | E | Σ | ∫ | |
| 5 | 5 | | § | % | 5 | E | U | e | u | | Ñ | l | l | F | σ | ∫ |
| 6 | 6 | | | & | 6 | F | V | f | v | | a | l | l | ll | μ | + |
| 7 | 7 | BEL | ' | 7 | G | W | g | w | BEL | | o | l | l | ll | τ | ≈ |
| 8 | 8 | BS CAN | (| 8 | H | X | h | x | BS CAN | ¿ | l | l | ll | ll | Φ | ° |
| 9 | 9 | HT EM |) | 9 | I | Y | i | y | HT EM | □ | l | l | ll | ll | θ | • |
| 10 | A | LF | * | : | J | Z | j | z | LF | | l | l | ll | ll | Ω | • |
| 11 | B | VT ESC | + | ; | K | [| k | { | VT ESC | ½ | l | l | ll | ll | δ | √ |
| 12 | C | FF | , | < | L | \ | l | | FF | ¼ | l | l | ll | ll | ∞ | ∞ |
| 13 | D | CR | - | = | M |] | m | } | CR | j | l | l | ll | ll | ø | ² |
| 14 | E | SO | . | > | N | ^ | n | ~ | SO | ≪ | l | l | ll | ll | € | ■ |
| 15 | F | SI | / | ? | O | _ | o | DEL | SI | ≫ | l | l | ll | ll | ∩ | SP |

Appendix A

Epson LQ-850 Graphic Character Set 2

| Dec. | 0 | 16 | 32 | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 | 176 | 192 | 208 | 224 | 240 | | |
|------|---|-----|-----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|---|
| Hex. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F | | |
| 0 | 0 | NUL | | SP | 0 | @ | P | ' | p | Ç | É | á | | L | ll | α | ≡ | |
| 1 | 1 | | DC1 | ! | 1 | A | Q | a | q | ü | æ | í | | l | ll | β | ± | |
| 2 | 2 | | DC2 | " | 2 | B | R | b | r | é | Æ | ó | | l | ll | Γ | ≥ | |
| 3 | 3 | | DC3 | # | 3 | C | S | c | s | â | ô | ú | l | ll | π | ≤ | | |
| 4 | 4 | | DC4 | \$ | 4 | D | T | d | t | ä | ö | ñ | l | ll | Σ | | | |
| 5 | 5 | | § | % | 5 | E | U | e | u | à | ò | Ñ | l | ll | σ | | | |
| 6 | 6 | | | & | 6 | F | V | f | v | â | û | a | l | ll | μ | + | | |
| 7 | 7 | BEL | | ' | 7 | G | W | g | w | ç | ù | o | l | ll | τ | ≈ | | |
| 8 | 8 | BS | CAN | (| 8 | H | X | h | x | ê | ÿ | ı | l | ll | Φ | ° | | |
| 9 | 9 | HT | EM |) | 9 | I | Y | i | y | ë | Ö | l | ll | l | ll | θ | • | |
| 10 | A | LF | | * | : | J | Z | j | z | è | Ü | l | ll | l | ll | Ω | • | |
| 11 | B | VT | ESC | + | ; | K | [| k | { | ï | φ | ½ | l | ll | | δ | √ | |
| 12 | C | FF | | , | < | L | \ | l | | í | £ | ¼ | l | ll | | ∞ | " | |
| 13 | D | CR | | - | = | M |] | m | } | ì | ¥ | l | ll | l | ll | | ø | ² |
| 14 | E | SO | | . | > | N | ^ | n | ~ | Ä | Pt | << | l | ll | + | | € | ■ |
| 15 | F | SI | | / | ? | O | _ | o | DEL | Å | f | >> | l | ll | | ∅ | SP | |

Appendix A

IBM Proprinter X24E Character Set 1

| Dec | 0 | 16 | 32 | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 | 176 | 192 | 208 | 224 | 240 | | |
|-----|---|-----|-----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|----|
| Hex | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F | | |
| 0 | 0 | NUL | | SP | 0 | @ | P | ` | p | | | á | | L | ll | α | ≡ | |
| 1 | 1 | | DC1 | ! | 1 | A | Q | a | q | | DC1 | í | | l | ll | β | ± | |
| 2 | 2 | | DC2 | " | 2 | B | R | b | r | | DC2 | ó | | l | ll | Γ | ≥ | |
| 3 | 3 | | | # | 3 | C | S | c | s | | | ú | l | ll | ll | π | ≤ | |
| 4 | 4 | | DC4 | \$ | 4 | D | T | d | t | | DC4 | ñ | l | ll | ll | Σ | | |
| 5 | 5 | | | % | 5 | E | U | e | u | | | Ñ | l | ll | ll | σ | | |
| 6 | 6 | | | & | 6 | F | V | f | v | | | á | l | ll | ll | μ | + | |
| 7 | 7 | BEL | | ' | 7 | G | W | g | w | BEL | | ó | l | ll | ll | τ | ≈ | |
| 8 | 8 | BS | CAN | (| 8 | H | X | h | x | BS | CAN | ¿ | l | ll | ll | Φ | ° | |
| 9 | 9 | HT | |) | 9 | I | Y | i | y | HT | | l | ll | ll | ll | θ | • | |
| 10 | A | LF | | * | : | J | Z | j | z | LF | | l | ll | ll | ll | Ω | • | |
| 11 | B | VT | ESC | + | ; | K | [| k | { | VT | ESC | ½ | l | ll | ll | | δ | √ |
| 12 | C | FF | | , | < | L | \ | l |] | FF | | ¼ | l | ll | ll | | ∞ | ˆ |
| 13 | D | CR | | - | = | M |] | m | } | CR | | i | l | ll | ll | | ø | ² |
| 14 | E | SO | | . | > | N | ^ | n | ~ | SO | | << | l | ll | ll | | ε | ■ |
| 15 | F | SI | | / | ? | O | _ | o | | SI | | >> | l | ll | ll | | ∩ | SP |



Appendix A

IBM Proprinter X24E Character Set 2

| Dec | Hex | 0: | 16: | 32: | 48: | 64: | 80: | 96: | 112: | 128: | 144: | 160: | 176: | 192: | 208: | 224: | 240: |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|
| 0 | 0 | NUL | | SP | 0 | @ | P | ` | p | Ç | É | á | ▀ | ⌌ | ⌌ | α | ≡ |
| 1 | 1 | | DC1 | ! | 1 | A | Q | a | q | ü | æ | í | ▀ | ⌌ | ⌌ | β | ± |
| 2 | 2 | | DC2 | " | 2 | B | R | b | r | é | Æ | ó | ▀ | ⌌ | ⌌ | Γ | ≥ |
| 3 | 3 | ♥ | | # | 3 | C | S | c | s | â | ô | ú | | ⌌ | ⌌ | π | ≤ |
| 4 | 4 | ♦ | DC4 | \$ | 4 | D | T | d | t | ä | ö | ñ | ⌌ | ⌌ | Ε | Σ | ∫ |
| 5 | 5 | ♣ | | § | % | 5 | E | U | e | u | à | ò | Ñ | ⌌ | ⌌ | Φ | σ |
| 6 | 6 | ♠ | | & | 6 | F | V | f | v | â | û | ä | ⌌ | ⌌ | ⌌ | μ | † |
| 7 | 7 | BEL | | ' | 7 | G | W | g | w | ç | ù | ø | ⌌ | ⌌ | ⌌ | τ | ≈ |
| 8 | 8 | BS | CAN | (| 8 | H | X | h | x | ê | ÿ | ¿ | ⌌ | ⌌ | ⌌ | Φ | ° |
| 9 | 9 | HT | |) | 9 | I | Y | i | y | ë | Ö | | ⌌ | ⌌ | ⌌ | θ | • |
| 10 | A | LF | | * | : | J | Z | j | z | è | Ü | | ⌌ | ⌌ | ⌌ | Ω | • |
| 11 | B | VT | ESC | + | ; | K | [| k | { | ÿ | ϕ | ½ | ⌌ | ⌌ | ▀ | δ | √ |
| 12 | C | FF | | , | < | L | \ | l | | î | £ | ¼ | ⌌ | ⌌ | ▀ | ∞ | " |
| 13 | D | CR | | - | = | M |] | m | } | ï | ¥ | ì | ⌌ | ⌌ | ▀ | ø | ² |
| 14 | E | SO | | . | > | N | ^ | n | ~ | Ä | Pts | ≪ | ⌌ | ⌌ | ▀ | ε | ■ |
| 15 | F | SI | | / | ? | O | _ | o | | Å | f | ≫ | ⌌ | ⌌ | ▀ | ∩ | SP |

IBM Proprinter X24E All Character Chart

| Dec. | 0 | 16 | 32 | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 | 176 | 192 | 208 | 224 | 240 | |
|------|---|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| Hex | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F | |
| 0 | 0 | ∅ | ▶ | SP | 0 | @ | P | ` | p | Ç | É | á | █ | Ⓕ | Ⓖ | α | ≡ |
| 1 | 1 | ⊙ | ◀ | ! | 1 | A | Q | a | q | ü | æ | í | █ | Ⓕ | Ⓖ | β | ± |
| 2 | 2 | ● | ↑ | " | 2 | B | R | b | r | é | Æ | ó | █ | Ⓕ | Ⓖ | Γ | ≥ |
| 3 | 3 | ♥ | !! | # | 3 | C | S | c | s | â | ô | ú | █ | Ⓕ | Ⓖ | π | ≤ |
| 4 | 4 | ◆ | ¶ | \$ | 4 | D | T | d | t | ä | ö | ñ | █ | Ⓕ | Ⓖ | Σ | ∫ |
| 5 | 5 | ♣ | § | % | 5 | E | U | e | u | à | ò | Ñ | █ | Ⓕ | Ⓖ | σ | ∫ |
| 6 | 6 | ♠ | - | & | 6 | F | V | f | v | á | û | ä | █ | Ⓕ | Ⓖ | μ | † |
| 7 | 7 | • | ‡ | ' | 7 | G | W | g | w | ç | ù | o | █ | Ⓕ | Ⓖ | τ | ≈ |
| 8 | 8 | ▣ | ↑ | (| 8 | H | X | h | x | é | ÿ | ¿ | █ | Ⓕ | Ⓖ | Φ | ° |
| 9 | 9 | ◊ | ↓ |) | 9 | I | Y | i | y | ë | Ö | █ | Ⓕ | Ⓖ | θ | • | |
| 10 | A | ◻ | → | * | : | J | Z | j | z | è | Ü | █ | Ⓕ | Ⓖ | Ω | • | |
| 11 | B | ♂ | ← | + | ; | K | [| k | { | ï | ç | ½ | █ | Ⓕ | Ⓖ | δ | √ |
| 12 | C | ♀ | L | , | < | L | \ | l | | î | £ | ¼ | █ | Ⓕ | Ⓖ | ∞ | " |
| 13 | D | ♫ | ↔ | - | = | M |] | m | } | ì | ¥ | ì | █ | Ⓕ | Ⓖ | ∅ | ² |
| 14 | E | ♯ | ▲ | . | > | N | ^ | n | ˘ | Ä | Pts | << | █ | Ⓕ | Ⓖ | ε | ■ |
| 15 | F | * | ▼ | / | ? | O | _ | o | ◊ | Å | f | >> | █ | Ⓕ | Ⓖ | ∩ | SP |

Appendix A

IBM Character Set 1 Multilingual

| Dec | 0 | 16 | 32 | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 | 176 | 192 | 208 | 224 | 240 | |
|-----|---|-----|-----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| Hex | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F | |
| 0 | 0 | NUL | SP | 0 | @ | P | ` | p | | | á | █ | Ł | Š | Ó | — | |
| 1 | 1 | | DC1 | ! | 1 | A | Q | a | q | | DC1 | í | █ | ł | Đ | β | ± |
| 2 | 2 | | DC2 | " | 2 | B | R | b | r | | DC2 | ó | █ | ł | Ê | Ô | — |
| 3 | 3 | | | # | 3 | C | S | c | s | | | ú | ł | ł | Ë | Ò | ¾ |
| 4 | 4 | | DC4 | \$ | 4 | D | T | d | t | | DC4 | ñ | ł | — | È | ö | ¶ |
| 5 | 5 | | | % | 5 | E | U | e | u | | | Ñ | Á | ł | ı | Õ | § |
| 6 | 6 | | | & | 6 | F | V | f | v | | | ä | Â | ã | í | μ | ÷ |
| 7 | 7 | BEL | | ' | 7 | G | W | g | w | BEL | | ö | Â | Ã | î | þ | , |
| 8 | 8 | BS | CAN | (| 8 | H | X | h | x | BS | CAN | ç | ⊙ | ł | ï | þ | ° |
| 9 | 9 | HT | |) | 9 | I | Y | i | y | HT | | ⊙ | ł | ł | ł | Ú | “ |
| 10 | A | LF | | * | : | J | Z | j | z | LF | | ł | ł | ł | ł | Û | • |
| 11 | B | VT | ESC | + | ; | K | [| k | { | VT | ESC | ½ | ł | ł | █ | Ü | ' |
| 12 | C | FF | | , | < | L | \ | l | | FF | | ¼ | ł | ł | █ | Ý | ³ |
| 13 | D | CR | | - | = | M |] | m | } | CR | | ı | ç | = | ı | Ÿ | ² |
| 14 | E | SO | | . | > | N | ^ | n | ~ | SO | | << | ¥ | ł | ı | — | █ |
| 15 | F | SI | | / | ? | O | _ | o | | SI | | >> | ł | α | █ | ' | SP |

IBM Character Set 2 Multilingual

| Dec | 0 | 16 | 32 | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 | 176 | 192 | 208 | 224 | 240 | |
|-----|---|-----|-----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| Hex | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F | |
| 0 | 0 | NUL | | SP | 0 | @ | P | ` | p | Ç | É | á | ⋮ | Ł | ø | Ó | — |
| 1 | 1 | | DC1 | ! | 1 | A | Q | a | q | ū | æ | í | ⋮ | Ł | Ð | β | ± |
| 2 | 2 | | DC2 | " | 2 | B | R | b | r | é | Æ | ó | ⋮ | Ł | Ê | Ô | — |
| 3 | 3 | ♥ | | # | 3 | C | S | c | s | â | ô | ú | Ł | Ł | Ë | Ò | ¾ |
| 4 | 4 | ♦ | DC4 | \$ | 4 | D | T | d | t | ä | ö | ñ | Ł | — | È | õ | ¶ |
| 5 | 5 | ♣ | | § | % | 5 | E | U | e | u | à | ò | Ñ | Á | † | ı | Œ |
| 6 | 6 | ♠ | | & | 6 | F | V | f | v | â | û | ä | Â | ã | í | μ | ÷ |
| 7 | 7 | BEL | | ' | 7 | G | W | g | w | ç | ù | ø | À | Ã | î | þ | , |
| 8 | 8 | BS | CAN | (| 8 | H | X | h | x | ê | ÿ | ı | ⊙ | Ł | ï | þ | ° |
| 9 | 9 | HT | |) | 9 | I | Y | i | y | ë | Ö | ® | Ł | Ł | Ł | Ú | " |
| 10 | A | LF | | * | : | J | Z | j | z | è | Ü | Ł | Ł | Ł | Ł | Û | • |
| 11 | B | VT | ESC | + | ; | K | [| k | { | ï | ø | ½ | Ł | Ł | ■ | Ü | ¹ |
| 12 | C | FF | | , | < | L | \ | l | | î | ε | ¼ | Ł | Ł | ■ | Ý | ³ |
| 13 | D | CR | | - | = | M |] | m | } | ı | ∅ | ı | ç | = | ı | Ÿ | ² |
| 14 | E | SO | | . | > | N | ^ | n | ~ | Ä | x | << | ¥ | Ł | ı | ˘ | ■ |
| 15 | F | SI | | / | ? | O | _ | o | | Å | f | >> | Ł | α | ■ | ' | SP |

Appendix A

IBM All Character Chart Multilingual

| Dec | 0 | 16 | 32 | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 | 176 | 192 | 208 | 224 | 240 | |
|-----|---|----|----|----|----|----|----|-----|-----|-----|-----|---------------|-----|-----|-----|-----|---------------|
| Hex | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F | |
| 0 | 0 | ∅ | ▶ | SP | 0 | @ | P | ` | p | Ç | É | á | ⋮ | Ł | ø | Ó | - |
| 1 | 1 | ⊙ | ◀ | ! | 1 | A | Q | a | q | ū | æ | í | ⋮ | ⊥ | Ð | β | ± |
| 2 | 2 | ● | ↑ | " | 2 | B | R | b | r | é | Æ | ó | ⋮ | ⊥ | Ê | Ô | — |
| 3 | 3 | ♥ | !! | # | 3 | C | S | c | s | â | ô | ú | ⋮ | ⊥ | Ë | Ò | $\frac{3}{4}$ |
| 4 | 4 | ♦ | ¶ | \$ | 4 | D | T | d | t | ä | ö | ñ | ⋮ | — | È | ō | ¶ |
| 5 | 5 | ♣ | § | % | 5 | E | U | e | u | à | ò | Ñ | Á | ⊥ | ı | Ö | § |
| 6 | 6 | ♠ | - | & | 6 | F | V | f | v | á | û | ä | Ā | ā | í | μ | ÷ |
| 7 | 7 | • | ‡ | ' | 7 | G | W | g | w | ç | ù | ø | À | Ā | î | þ | , |
| 8 | 8 | ◼ | ↑ | (| 8 | H | X | h | x | ê | ÿ | ı | ⊙ | ⊥ | İ | þ | ° |
| 9 | 9 | ◊ | ↓ |) | 9 | I | Y | i | y | ë | Ö | ® | ⋮ | ⊥ | ı | Ú | - |
| 10 | A | ◻ | → | * | : | J | Z | j | z | è | Ü | ⊥ | ⋮ | ⊥ | ı | Û | • |
| 11 | B | ♂ | ← | + | ; | K | I | k | { | ï | ø | $\frac{1}{2}$ | ⋮ | ⊥ | ⋮ | Û | ' |
| 12 | C | ♀ | L | , | < | L | \ | l | | î | ε | $\frac{1}{4}$ | ⋮ | ⋮ | ⋮ | ý | ³ |
| 13 | D | ♪ | ↔ | - | = | M | J | m | } | ì | ∅ | ı | ϕ | = | ı | Ý | ² |
| 14 | E | ♯ | ▲ | . | > | N | ˆ | n | ˘ | Å | x | ≪ | ¥ | ⋮ | ı | - | ■ |
| 15 | F | * | ▼ | / | ? | O | — | o | ∆ | Å | f | ≫ | ⊥ | ⋮ | ' | SP | |

A

International Character Set

| | n | 35 _D 23 _H | 36 _D 24 _H | 64 _D 40 _H | 91 _D 5B _H | 92 _D 5C _H | 93 _D 5D _H | 94 _D 5E _H | 96 _D 60 _H | 123 _D 7B _H | 124 _D 7C _H | 125 _D 7D _H | 126 _D 7E _H | 155 _D 9B _H | 157 _D 9D _H |
|---------------|----|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| USA | 0 | # | \$ | @ | [| \ |] | ^ | ' | { | | } | - | ¢ | ¥ |
| FRANCE | 1 | # | \$ | à | ° | ç | § | ^ | ' | é | ù | è | ¨ | ¢ | ¥ |
| GERMANY | 2 | # | \$ | § | Ä | Ö | Ü | ^ | ' | ä | ö | ü | ß | ¢ | ¥ |
| ENGLAND | 3 | £ | \$ | @ | [| \ |] | ^ | ' | { | | } | - | ¢ | ¥ |
| DENMARK I | 4 | # | \$ | @ | Æ | Ø | Å | ^ | ' | æ | ø | å | ˆ | ø | Ø |
| SWEDEN | 5 | # | α | É | Ä | Ö | Å | Ü | é | ä | ö | å | ü | ¢ | ¥ |
| ITALY | 6 | # | \$ | @ | ° | \ | é | ^ | ù | à | ò | è | ì | ¢ | ¥ |
| SPAIN I | 7 | Pt | \$ | @ | ı | Ñ | ı | ^ | ' | ı | ñ | } | - | ¢ | ¥ |
| JAPAN | 8 | # | \$ | @ | [| ¥ |] | ^ | ' | { | | } | - | ¢ | ¥ |
| NORWAY | 9 | # | α | É | Æ | Ø | Å | Ü | é | æ | ø | å | ü | ø | Ø |
| DENMARK II | 10 | # | \$ | É | Æ | Ø | Å | Ü | é | æ | ø | å | ü | ø | Ø |
| SPAIN II | 11 | # | \$ | á | ı | Ñ | ı | é | ' | ı | ñ | ó | ú | ¢ | ¥ |
| LATIN AMERICA | 12 | # | \$ | á | ı | Ñ | ı | é | ü | ı | ñ | ó | ú | ¢ | ¥ |
| KOREA | 13 | # | \$ | @ | [| ₩ |] | ^ | ' | { | | } | - | ¢ | ¥ |
| LEGAL | 64 | # | \$ | § | ° | ' | " | ¶ | ' | ® | ® | † | ™ | ¢ | ¥ |

*1

*2

Note:

- *1 These characters can be changed only in the Epson LQ-850 mode. In the IBM Proprinter X24E mode, International Character Set is set to USA and it can not be changed.
- *2 These characters are effective in both Graphic Character Set 2 of the Epson LQ-850 and IBM Proprinter X24E modes.

Appendix B

Proportional Spacing Tables

ASCII Characters

Epson LQ-850 Mode Characters

| ASCII code | Char | Width | |
|------------|-------|--------|--------|
| | | Normal | Script |
| 0 | à | 30 | 20 |
| 1 | è | 30 | 20 |
| 2 | ù | 36 | 24 |
| 3 | ò | 30 | 20 |
| 4 | ì | 18 | 12 |
| 5 | ° | 24 | 16 |
| 6 | £ | 30 | 20 |
| 7 | ı | 30 | 20 |
| 8 | ž | 30 | 20 |
| 9 | Ñ | 36 | 24 |
| 10 | ñ | 36 | 24 |
| 11 | ıı | 30 | 20 |
| 12 | Ɔ | 42 | 28 |
| 13 | À | 36 | 24 |
| 14 | à | 30 | 20 |
| 15 | ç | 30 | 20 |
| 16 | š | 30 | 20 |
| 17 | ß | 36 | 24 |
| 18 | Æ | 42 | 28 |
| 19 | æ | 42 | 28 |
| 20 | Ø | 36 | 24 |
| 21 | ø | 30 | 20 |
| 22 | ˆ | 30 | 20 |
| 23 | Ä | 36 | 24 |
| 24 | Ö | 36 | 24 |
| 25 | Ü | 42 | 28 |
| 26 | ä | 30 | 20 |
| 27 | ö | 30 | 20 |
| 28 | ü | 36 | 24 |
| 29 | Ë | 36 | 24 |
| 30 | é | 30 | 20 |
| 31 | ¥ | 36 | 24 |
| 32 | SPACE | 30 | 20 |
| 33 | ! | 18 | 12 |
| 34 | ˆ | 30 | 20 |
| 35 | # | 30 | 20 |
| 36 | \$ | 30 | 20 |
| 37 | % | 36 | 24 |
| 38 | & | 36 | 24 |
| 39 | ' | 18 | 12 |
| 40 | (| 24 | 16 |
| 41 |) | 24 | 16 |
| 42 | * | 30 | 20 |
| 43 | + | 30 | 20 |

| ASCII code | Char | Width | |
|------------|------|--------|--------|
| | | Normal | Script |
| 44 | , | 18 | 12 |
| 45 | ~ | 30 | 20 |
| 46 | . | 18 | 12 |
| 47 | / | 30 | 20 |
| 48 | 0 | 30 | 20 |
| 49 | 1 | 30 | 20 |
| 50 | 2 | 30 | 20 |
| 51 | 3 | 30 | 20 |
| 52 | 4 | 30 | 20 |
| 53 | 5 | 30 | 20 |
| 54 | 6 | 30 | 20 |
| 55 | 7 | 30 | 20 |
| 56 | 8 | 30 | 20 |
| 57 | 9 | 30 | 20 |
| 58 | : | 18 | 12 |
| 59 | : | 18 | 12 |
| 60 | < | 30 | 20 |
| 61 | = | 30 | 20 |
| 62 | > | 30 | 20 |
| 63 | ? | 30 | 20 |
| 64 | @ | 36 | 24 |
| 65 | A | 36 | 24 |
| 66 | B | 36 | 24 |
| 67 | C | 36 | 24 |
| 68 | D | 36 | 24 |
| 69 | E | 36 | 24 |
| 70 | F | 36 | 24 |
| 71 | G | 36 | 24 |
| 72 | H | 36 | 24 |
| 73 | I | 24 | 16 |
| 74 | J | 30 | 20 |
| 75 | K | 36 | 24 |
| 76 | L | 36 | 24 |
| 77 | M | 42 | 28 |
| 78 | N | 36 | 24 |
| 79 | O | 36 | 24 |
| 80 | P | 36 | 24 |
| 81 | Q | 36 | 24 |
| 82 | R | 36 | 24 |
| 83 | S | 36 | 24 |
| 84 | T | 36 | 24 |
| 85 | U | 42 | 28 |
| 86 | V | 36 | 24 |
| 87 | W | 42 | 28 |

| ASCII code | Char | Width | |
|------------|------|--------|--------|
| | | Normal | Script |
| 88 | X | 36 | 24 |
| 89 | Y | 36 | 24 |
| 90 | Z | 30 | 20 |
| 91 | [| 24 | 16 |
| 92 | \ | 30 | 20 |
| 93 |] | 24 | 16 |
| 94 | ˆ | 30 | 20 |
| 95 | _ | 30 | 24 |
| 96 | ˆ | 18 | 12 |
| 97 | a | 30 | 20 |
| 98 | b | 36 | 24 |
| 99 | c | 30 | 20 |
| 100 | d | 36 | 24 |
| 101 | e | 30 | 20 |
| 102 | f | 24 | 16 |
| 103 | g | 36 | 24 |
| 104 | h | 36 | 24 |
| 105 | i | 18 | 12 |
| 106 | j | 24 | 16 |
| 107 | k | 36 | 24 |
| 108 | l | 18 | 12 |
| 109 | m | 42 | 28 |
| 110 | n | 36 | 24 |
| 111 | o | 30 | 20 |
| 112 | p | 36 | 24 |
| 113 | q | 36 | 24 |
| 114 | r | 30 | 20 |
| 115 | s | 30 | 20 |
| 116 | t | 24 | 16 |
| 117 | u | 36 | 24 |
| 118 | v | 36 | 24 |
| 119 | w | 42 | 28 |
| 120 | x | 30 | 20 |
| 121 | y | 36 | 24 |
| 122 | z | 30 | 20 |
| 123 | { | 24 | 16 |
| 124 | } | 18 | 12 |
| 125 | ˆ | 24 | 16 |
| 126 | ˆ | 30 | 20 |
| 127 | 0 | 30 | 20 |

Unit: 1/360 inch (0.07 mm)

IBM Proprinter X24E Mode Characters

| ASCII code | Char | Width | |
|---------------|-------|--------|--------|
| | | Normal | Script |
| 32 | SPACE | 30 | |
| 33 | ! | 30 | |
| 34 | " | 30 | |
| 35 | # | 30 | |
| 36 | \$ | 30 | |
| 37 | % | 30 | |
| 38 | & | 36 | |
| 39 | ' | 18 | |
| 40 | (| 30 | |
| 41 |) | 30 | |
| 42 | * | 30 | |
| 43 | + | 30 | |
| 44 | , | 30 | |
| 45 | - | 30 | |
| 46 | . | 30 | |
| 47 | / | 30 | |
| 48 | 0 | 30 | |
| 49 | 1 | 30 | |
| 50 | 2 | 30 | |
| 51 | 3 | 30 | |
| 52 | 4 | 30 | |
| 53 | 5 | 30 | |
| 54 | 6 | 30 | |
| 55 | 7 | 30 | |
| 56 | 8 | 30 | |
| 57 | 9 | 30 | |
| 58 | : | 30 | |
| 59 | : | 30 | |
| 60 | < | 30 | |
| 61 | = | 30 | |
| 62 | > | 30 | |
| 63 | ? | 30 | |
| 64 | @ | 30 | |
| 65 | A | 42 | |
| 66 | B | 42 | |
| 67 | C | 42 | |
| 68 | D | 42 | |
| 69 | E | 36 | |
| 70 | F | 36 | |
| 71 | G | 42 | |
| 72 | H | 42 | |
| 73 | J | 24 | |
| 74 | K | 30 | |
| 75 | K | 42 | |

| ASCII code | Char | Width | |
|---------------|------|--------|--------|
| | | Normal | Script |
| 76 | L | 36 | |
| 77 | M | 42 | |
| 78 | N | 42 | |
| 79 | O | 42 | |
| 80 | P | 36 | |
| 81 | Q | 42 | |
| 82 | R | 42 | |
| 83 | S | 36 | |
| 84 | T | 42 | |
| 85 | U | 42 | |
| 86 | V | 42 | |
| 87 | W | 42 | |
| 88 | X | 42 | |
| 89 | Y | 42 | |
| 90 | Z | 36 | |
| 91 | [| 30 | |
| 92 | \ | 30 | |
| 93 |] | 30 | |
| 94 | ` | 30 | |
| 95 | ~ | 30 | |
| 96 | · | 30 | |
| 97 | a | 30 | |
| 98 | b | 36 | |
| 99 | c | 30 | |
| 100 | d | 36 | |
| 101 | e | 30 | |
| 102 | f | 24 | |
| 103 | g | 36 | |
| 104 | h | 36 | |
| 105 | i | 18 | |
| 106 | j | 18 | |
| 107 | k | 36 | |
| 108 | l | 18 | |
| 109 | m | 42 | |
| 110 | n | 36 | |
| 111 | o | 30 | |
| 112 | p | 36 | |
| 113 | q | 36 | |
| 114 | r | 30 | |
| 115 | s | 30 | |
| 116 | t | 24 | |
| 117 | u | 36 | |
| 118 | v | 36 | |
| 119 | w | 42 | |

| ASCII code | Char | Width | |
|---------------|------|--------|--------|
| | | Normal | Script |
| 120 | x | 36 | |
| 121 | y | 36 | |
| 122 | z | 30 | |
| 123 | { | 30 | |
| 124 | | 30 | |
| 125 | } | 30 | |
| 126 | ~ | 30 | |

Unit: 1/360 inch (0.07 mm)

Appendix B

Special Characters

Epson LQ-850 Mode Characters

| ASCII code | Char | Width | |
|------------|------|--------|--------|
| | | Normal | Script |
| 21 | § | 30 | 20 |
| 36 | ix | 30 | 20 |
| 48 | θ | 30 | 20 |
| 91 | ° | 24 | 16 |
| 92 | ø | 36 | 24 |
| 92 | ’ | 36 | 24 |
| 92 | ¥ | 42 | 28 |
| 93 | ” | 36 | 24 |
| 123 | ◊ | 36 | 24 |
| 124 | σ | 30 | 20 |
| 125 | + | 36 | 24 |
| 126 | ” | 30 | 20 |
| 126 | ™ | 36 | 24 |
| 128 | Ç | 36 | 24 |
| 129 | ù | 36 | 24 |
| 130 | é | 30 | 20 |
| 131 | à | 30 | 20 |
| 132 | ä | 30 | 20 |
| 133 | à | 30 | 20 |
| 134 | á | 30 | 20 |
| 135 | ç | 30 | 20 |
| 136 | è | 30 | 20 |
| 137 | ë | 30 | 20 |
| 138 | è | 30 | 20 |
| 139 | ï | 18 | 12 |
| 140 | ï | 18 | 12 |
| 141 | ï | 18 | 12 |
| 142 | Ä | 36 | 24 |
| 143 | Ä | 36 | 24 |
| 144 | É | 36 | 24 |
| 145 | æ | 42 | 28 |
| 146 | Æ | 42 | 28 |
| 147 | ð | 30 | 20 |
| 148 | ö | 30 | 20 |
| 149 | ö | 30 | 20 |
| 150 | ù | 36 | 24 |
| 151 | ù | 36 | 24 |
| 152 | ÿ | 36 | 24 |
| 153 | Ö | 36 | 24 |
| 154 | Ü | 42 | 28 |
| 155 | ç | 30 | 20 |
| 156 | £ | 30 | 20 |

| ASCII code | Char | Width | |
|------------|------|--------|--------|
| | | Normal | Script |
| 157 | ¥ | 36 | 24 |
| 158 | ƒ | 42 | 28 |
| 159 | f | 30 | 20 |
| 160 | à | 30 | 20 |
| 161 | í | 18 | 12 |
| 162 | ó | 30 | 20 |
| 163 | ú | 36 | 24 |
| 164 | ñ | 36 | 24 |
| 165 | Ñ | 36 | 24 |
| 166 | ß | 30 | 20 |
| 167 | Ω | 30 | 20 |
| 168 | ¿ | 30 | 20 |
| 169 | ┘ | 30 | 20 |
| 170 | ┘ | 30 | 20 |
| 171 | ┘ | 30 | 20 |
| 172 | ┘ | 30 | 20 |
| 173 | ı | 18 | 12 |
| 174 | << | 30 | 20 |
| 175 | >> | 30 | 20 |
| 224 | α | 30 | 20 |
| 225 | β | 30 | 20 |
| 226 | Γ | 30 | 20 |
| 227 | π | 30 | 20 |
| 228 | Σ | 30 | 20 |
| 229 | σ | 30 | 20 |
| 230 | μ | 30 | 20 |
| 231 | τ | 30 | 20 |
| 232 | Φ | 30 | 20 |
| 233 | θ | 30 | 20 |
| 234 | Ω | 30 | 20 |
| 235 | Ö | 30 | 20 |
| 236 | ø | 36 | 24 |
| 237 | φ | 30 | 20 |
| 238 | © | 30 | 20 |
| 239 | © | 30 | 20 |
| 240 | © | 30 | 20 |
| 241 | © | 30 | 20 |
| 242 | © | 30 | 20 |
| 243 | © | 30 | 20 |
| 246 | © | 30 | 20 |
| 247 | © | 30 | 20 |
| 248 | © | 30 | 20 |

| ASCII code | Char | Width | |
|------------|------|--------|--------|
| | | Normal | Script |
| 249 | • | 30 | 20 |
| 250 | • | 30 | 20 |
| 251 | √ | 30 | 20 |
| 252 | ² | 30 | 20 |
| 253 | ² | 30 | 20 |
| 254 | ■ | 30 | 20 |
| 255 | SP | 30 | 20 |

Unit: 1/360 inch (0.07 mm)

Appendix B

IBM Proprinter X24E Mode Characters

| ASCII code | Char | Width | |
|------------|------|--------|--------|
| | | Normal | Script |
| 0 | ø | 30 | |
| 1 | ð | 30 | |
| 2 | • | 30 | |
| 3 | ♥ | 30 | |
| 4 | ♦ | 30 | |
| 5 | ♣ | 30 | |
| 6 | ♠ | 30 | |
| 7 | • | 30 | |
| 8 | • | 30 | |
| 9 | • | 30 | |
| 10 | • | 30 | |
| 11 | • | 30 | |
| 12 | • | 30 | |
| 13 | • | 30 | |
| 14 | • | 30 | |
| 15 | • | 30 | |
| 16 | • | 30 | |
| 17 | • | 30 | |
| 18 | • | 30 | |
| 19 | • | 30 | |
| 20 | • | 30 | |
| 21 | • | 30 | |
| 22 | • | 30 | |
| 23 | • | 30 | |
| 24 | • | 30 | |
| 25 | • | 30 | |
| 26 | • | 30 | |
| 27 | • | 30 | |
| 28 | • | 30 | |
| 29 | • | 30 | |
| 30 | • | 30 | |
| 31 | • | 30 | |
| 127 | • | 30 | |
| 128 | Ç | 42 | |
| 129 | ü | 36 | |
| 130 | é | 30 | |
| 131 | á | 30 | |
| 132 | ä | 30 | |
| 133 | à | 30 | |
| 134 | â | 30 | |
| 135 | ç | 30 | |
| 136 | ê | 30 | |
| 137 | ë | 30 | |
| 138 | è | 30 | |
| 139 | ï | 18 | |

| ASCII code | Char | Width | |
|------------|------|--------|--------|
| | | Normal | Script |
| 140 | ï | 18 | |
| 141 | ı | 18 | |
| 142 | Ä | 36 | |
| 143 | Å | 36 | |
| 144 | É | 36 | |
| 145 | æ | 42 | |
| 146 | Æ | 42 | |
| 147 | ð | 30 | |
| 148 | ö | 30 | |
| 149 | ó | 30 | |
| 150 | ù | 36 | |
| 151 | û | 36 | |
| 152 | ÿ | 36 | |
| 153 | Ö | 36 | |
| 154 | Ü | 42 | |
| 155 | ç | 30 | |
| 156 | £ | 30 | |
| 157 | ¥ | 36 | |
| 158 | Pts | 42 | |
| 159 | f | 30 | |
| 160 | á | 30 | |
| 161 | ı | 18 | |
| 162 | ó | 30 | |
| 163 | ù | 36 | |
| 164 | ñ | 36 | |
| 165 | N | 36 | |
| 166 | a | 30 | |
| 167 | o | 30 | |
| 168 | z | 30 | |
| 169 | ı | 30 | |
| 170 | ı | 30 | |
| 171 | ı | 30 | |
| 172 | ı | 30 | |
| 173 | ı | 30 | |
| 174 | <> | 42 | |
| 175 | >< | 42 | |
| 224 | α | 30 | |
| 225 | β | 36 | |
| 226 | Γ | 36 | |
| 227 | π | 36 | |
| 228 | Σ | 42 | |
| 229 | σ | 36 | |
| 230 | μ | 36 | |

| ASCII code | Char | Width | |
|------------|------|--------|--------|
| | | Normal | Script |
| 231 | τ | 30 | |
| 232 | φ | 42 | |
| 233 | θ | 42 | |
| 234 | Ω | 42 | |
| 235 | δ | 30 | |
| 236 | ς | 30 | |
| 237 | φ | 42 | |
| 238 | e | 30 | |
| 239 | ç | 30 | |
| 240 | ı | 30 | |
| 241 | ı | 30 | |
| 242 | ı | 30 | |
| 243 | ı | 30 | |
| 246 | ı | 30 | |
| 247 | ı | 30 | |
| 248 | ı | 30 | |
| 249 | ı | 30 | |
| 250 | ı | 30 | |
| 251 | ı | 30 | |
| 252 | ı | 30 | |
| 253 | ı | 30 | |
| 254 | ı | 30 | |
| 255 | SP | 30 | |

Unit: 1/360 inch (0.07 mm)

Appendix B

IBM Proprinter X24E Mode Characters (Multilingual)

| ASCII code | Char | Width | |
|------------|------|--------|--------|
| | | Normal | Script |
| 0 | Ø | 20 | |
| 1 | ☉ | 30 | |
| 2 | ● | 30 | |
| 3 | ♥ | 30 | |
| 4 | ♦ | 30 | |
| 5 | ♣ | 30 | |
| 6 | ♠ | 30 | |
| 7 | • | 30 | |
| 8 | ◻ | 30 | |
| 9 | ◊ | 30 | |
| 10 | ◼ | 30 | |
| 11 | ◌◊◌ | 30 | |
| 12 | ◌◊◌ | 30 | |
| 13 | ◌◊◌ | 30 | |
| 14 | ◌◊◌ | 30 | |
| 15 | ◌◊◌ | 30 | |
| 16 | ◌◊◌ | 30 | |
| 17 | ◌◊◌ | 30 | |
| 18 | ◌◊◌ | 30 | |
| 19 | | 30 | |
| 20 | | 30 | |
| 21 | | 30 | |
| 22 | | 30 | |
| 23 | | 30 | |
| 24 | | 30 | |
| 25 | | 30 | |
| 26 | | 30 | |
| 27 | | 30 | |
| 28 | | 30 | |
| 29 | | 30 | |
| 30 | | 30 | |
| 31 | | 30 | |
| 127 | ◌◊◌ | 30 | |
| 128 | ◌◊◌ | 42 | |
| 129 | ◌◊◌ | 36 | |
| 130 | ◌◊◌ | 30 | |
| 131 | ◌◊◌ | 30 | |
| 132 | ◌◊◌ | 30 | |
| 133 | ◌◊◌ | 30 | |
| 134 | ◌◊◌ | 30 | |
| 135 | ◌◊◌ | 30 | |
| 136 | ◌◊◌ | 30 | |
| 137 | ◌◊◌ | 30 | |
| 138 | ◌◊◌ | 30 | |
| 139 | ◌◊◌ | 18 | |

| ASCII code | Char | Width | |
|------------|------|--------|--------|
| | | Normal | Script |
| 140 | ı | 18 | |
| 141 | ı | 18 | |
| 142 | Ä | 36 | |
| 143 | Å | 36 | |
| 144 | É | 36 | |
| 145 | æ | 42 | |
| 146 | Æ | 42 | |
| 147 | ø | 30 | |
| 148 | ö | 30 | |
| 149 | ò | 30 | |
| 150 | ù | 36 | |
| 151 | ü | 36 | |
| 152 | ÿ | 36 | |
| 153 | Ŏ | 36 | |
| 154 | Ů | 42 | |
| 155 | ø | 30 | |
| 156 | £ | 30 | |
| 157 | Ø | 42 | |
| 158 | x | 30 | |
| 159 | f | 30 | |
| 160 | á | 30 | |
| 161 | ı | 18 | |
| 162 | o | 30 | |
| 163 | ü | 36 | |
| 164 | ñ | 36 | |
| 165 | Ñ | 42 | |
| 166 | ä | 30 | |
| 167 | å | 30 | |
| 168 | ø | 30 | |
| 169 | ö | 30 | |
| 170 | ÿ | 30 | |
| 171 | ı | 30 | |
| 172 | ı | 30 | |
| 173 | ı | 30 | |
| 174 | << | 42 | |
| 175 | >> | 42 | |
| 181 | Ä | 42 | |
| 182 | Å | 42 | |
| 183 | Ä | 42 | |
| 184 | ö | 30 | |
| 207 | ¤ | 30 | |
| 208 | € | 36 | |
| 209 | Ð | 42 | |
| 210 | É | 36 | |
| 211 | È | 36 | |

| ASCII code | Char | Width | |
|------------|------|--------|--------|
| | | Normal | Script |
| 212 | È | 36 | |
| 213 | ı | 18 | |
| 214 | ı | 24 | |
| 215 | ı | 24 | |
| 216 | ı | 24 | |
| 221 | ı | 30 | |
| 222 | ı | 24 | |
| 224 | Ó | 42 | |
| 225 | ß | 30 | |
| 226 | Ö | 42 | |
| 227 | Ò | 42 | |
| 228 | ó | 30 | |
| 229 | ö | 36 | |
| 230 | µ | 36 | |
| 231 | þ | 36 | |
| 232 | þ | 36 | |
| 233 | Û | 42 | |
| 234 | Ü | 42 | |
| 235 | Ü | 42 | |
| 236 | ÿ | 36 | |
| 237 | ÿ | 36 | |
| 238 | ÿ | 30 | |
| 239 | - | 30 | |
| 240 | - | 30 | |
| 241 | ± | 30 | |
| 242 | - | 30 | |
| 243 | ¼ | 30 | |
| 244 | ½ | 30 | |
| 245 | ¾ | 30 | |
| 246 | + | 30 | |
| 247 | . | 30 | |
| 248 | . | 30 | |
| 249 | . | 30 | |
| 250 | . | 30 | |
| 251 | ı | 30 | |
| 252 | ı | 30 | |
| 253 | ı | 30 | |
| 254 | ■ | 30 | |
| 255 | SP | 30 | |

Unit: 1/360 inch (0.07 mm)

Appendix C

Structure of an Index Table Entry

10 cpi draft font

| Address | Data | | |
|---------|---------------------|------|--------------------|
| 8010 | 40 | 8155 | D7024A090000000000 |
| 8011 | D3454A090000000000 | 815E | D7204A090000000000 |
| 801A | D3634A090000000000 | 8167 | D73E4A090000000000 |
| 8023 | D3814A090000000000 | 8170 | D75C44090000000000 |
| 802C | D39F4A090000000000 | 8179 | D76847090000000000 |
| 8035 | D3BD4A090000000000 | 8182 | D77D47090000000000 |
| 803E | D3DB4A090000000000 | 818B | D7924A090000000000 |
| 8047 | D3F94A090000000000 | 8194 | D7B048090000000000 |
| 8050 | D41748090000000000 | 819D | D7C846090000000000 |
| 8059 | D42F48090000000000 | 81A6 | D7DA46090000000000 |
| 8062 | D44748090000000000 | 81AF | D7EC46090000000000 |
| 806B | D45F4A090000000000 | 81B8 | D7FE4A090000000000 |
| 8074 | D47D48090000000000 | 81C1 | D81C48090000000000 |
| 807D | D4954A090000000000 | 81CA | D83446090000000000 |
| 8086 | D4B34A090000000000 | 81D3 | D8464A090000000000 |
| 808F | D4D14A090000000000 | 81DC | D86448090000000000 |
| 8098 | D4EF4A090000000000 | 81E5 | D87C49090000000000 |
| 80A1 | D50D4A090000000000 | 81EE | D89749090000000000 |
| 80AA | D52B4A090000000000 | 81F7 | D8B249090000000000 |
| 80B3 | D5494A090000000000 | 8200 | D8CD49090000000000 |
| 80BC | D56749090000000000 | 8209 | D8E848090000000000 |
| 80C5 | D58249090000000000 | 8212 | D90049090000000000 |
| 80CE | D59D48090000000000 | 821B | D91B46090000000000 |
| 80D7 | D5B546090000000000 | 8224 | D92D46090000000000 |
| 80E0 | D5C74A090000000000 | 822D | D93F4A090000000000 |
| 80E9 | D5E54A090000000000 | 8236 | D95D46090000000000 |
| 80F2 | D6034A090000000000 | 823F | D96F4A090000000000 |
| 80FB | D621490900000000000 | 8248 | D98D4A090000000000 |
| 8104 | D63C49090000000000 | 8251 | D9AB4A090000000000 |
| 810D | D65746090000000000 | 825A | D9C94A090000000000 |
| 8116 | D66948090000000000 | 8263 | D9E747090000000000 |
| 811F | D6814A090000000000 | 826C | D9FC48090000000000 |
| 8128 | D69F4A090000000000 | 8275 | DA1447090000000000 |
| 8131 | D6BD42090000000000 | 827E | DA2947090000000000 |
| 813A | D6C346090000000000 | 8287 | DA3E47090000000000 |
| 8143 | D6D546090000000000 | 8290 | DA534A090000000000 |
| 814C | D6E749090000000000 | 8299 | DA7145090000000000 |

Appendix C

| | | | |
|------|---------------------|------|--------------------|
| 82A2 | DA8048090000000000 | 8413 | DE7049090000000000 |
| 82AB | DA9847090000000000 | 841C | DE8B48090000000000 |
| 82B4 | DAAD49090000000000 | 8425 | DEA348090000000000 |
| 82BD | DAC8460900000000000 | 842E | DEBB49090000000000 |
| 82C6 | DADA4A0900000000000 | 8437 | DED64A090000000000 |
| 82CF | DAF84A0900000000000 | 8440 | DEF44A090000000000 |
| 82D8 | DB16480900000000000 | 8449 | DF124A090000000000 |
| 82E1 | DB2E470900000000000 | 8452 | DF304A090000000000 |
| 82EA | DB434A0900000000000 | 845B | DF4E4A090000000000 |
| 82F3 | DB61480900000000000 | 8464 | DF6C48090000000000 |
| 82FC | DB79480900000000000 | 846D | DF8444090000000000 |
| 8305 | DB91460900000000000 | 8476 | DF9048090000000000 |
| 830E | DBA3480900000000000 | 847F | DFA84A090000000000 |
| 8317 | DBBB4A0900000000000 | 8488 | DFC64A090000000000 |
| 8320 | DBD94A0900000000000 | 8491 | DFE44A090000000000 |
| 8329 | DBF74A0900000000000 | 849A | E00249090000000000 |
| 8332 | DC154A0900000000000 | 84A3 | E01D4A090000000000 |
| 833B | DC334A0900000000000 | 84AC | E03B4A090000000000 |
| 8344 | DC51460900000000000 | 84B5 | E05949090000000000 |
| 834D | DC634A0900000000000 | 84BE | E0744A090000000000 |
| 8356 | DC81460900000000000 | 84C7 | E0924A090000000000 |
| 835F | DC934A0900000000000 | 84D0 | E0B04A090000000000 |
| 8368 | D6BDC38900000000000 | 84D9 | E0CE4A090000000000 |
| 8371 | DCB1470900000000000 | 84E2 | E0EC48090000000000 |
| 837A | DC64809000000000000 | 84EB | E1044A090000000000 |
| 8383 | DCDE490900000000000 | 84F4 | E12249090000000000 |
| 838C | DCF9480900000000000 | 84FD | E13D4A090000000000 |
| 8395 | DD11490900000000000 | 8506 | E15B47090000000000 |
| 839E | DD2C480900000000000 | 850F | E1704A090000000000 |
| 83A7 | DD44480900000000000 | 8518 | E18E4A090000000000 |
| 83B0 | DD5C480900000000000 | 8521 | E1AC48090000000000 |
| 83B9 | DD74490900000000000 | 852A | E1C44A090000000000 |
| 83C2 | DD8F480900000000000 | 8533 | E1E248090000000000 |
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| 83D4 | DDC24A0900000000000 | 8545 | E21848090000000000 |
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| 840A | DE58480900000000000 | 857B | E2C048090000000000 |

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| 86AD | E605C7490000000000 | 881E | E8B148090000000000 |
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| 86BF | E62FC5490000000000 | 8830 | E8E748090000000000 |
| 86C8 | E63EC5490000000000 | 8839 | E8FF4A090000000000 |
| 86D1 | E64DC4490000000000 | 8842 | E91D48090000000000 |
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10 cpi LQ font

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| 8A44 | AB4F4E230000000000 |
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| 8A5F | ABE259230000000000 |

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|------|---------------------|------|--------------------|
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| 8A71 | AC7B48230000000000 | 8BD9 | B3FE54230000000000 |
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| 8A83 | ACB74C230000000000 | 8BEB | B45E5B230000000000 |
| 8A8C | ACDB58230000000000 | 8BF4 | B4AF53230000000000 |
| 8A95 | AD2346230000000000 | 8BFD | B4E857230000000000 |
| 8A9E | AD354D230000000000 | 8C06 | B52D4A230000000000 |
| 8AA7 | AD5C44230000000000 | 8C0F | B54B50230000000000 |
| 8AB0 | AD6846230000000000 | 8C18 | B57B5C230000000000 |
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| 8ADD | AE6A55230000000000 | 8C45 | B6FB45230000000000 |
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| 8B13 | AFD257230000000000 | 8C7B | B7AC53230000000000 |
| 8B1C | B017462300000000000 | 8C84 | B7E553230000000000 |
| 8B25 | B0294E230000000000 | 8C8D | B81E56230000000000 |
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| 8B76 | B2034F230000000000 | 8CDE | BA074A230000000000 |
| 8B7F | B230492300000000000 | 8CE7 | BA2554230000000000 |
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| 8B91 | B26656230000000000 | 8CF9 | BAA056230000000000 |
| 8B9A | B2A84A230000000000 | 8D02 | BAE253230000000000 |
| 8BA3 | B2C646230000000000 | 8D0B | B1B532300000000000 |
| 8BAC | B2D84E230000000000 | 8D14 | BB544D230000000000 |
| 8BB5 | B302572300000000000 | 8D1D | BB7B56230000000000 |
| 8BBE | B34748230000000000 | 8D26 | BBBD4F230000000000 |
| 8BC7 | B35F5A230000000000 | 8D2F | BBEA54230000000000 |



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| 8D38 | BC265A230000000000 | 8EA9 | C6C454230000000000 |
| 8D41 | BC7460230000000000 | 8EB2 | C70057230000000000 |
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| 8DE3 | C10055230000000000 | 8F54 | CAB1C9230000000000 |
| 8DEC | C13F59230000000000 | 8F5D | CACCC4630000000000 |
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| 8E2B | C2F258230000000000 | 8F9C | CB32C6630000000000 |
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| 8EA0 | C6735B230000000000 | 9011 | CBE0C6630000000000 |

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| 9047 | CC4CC2630000000000 | 91B8 | D1D748230000000000 |
| 9050 | CC52C6630000000000 | 91C1 | D1EF50230000000000 |
| 9059 | CC64C4630000000000 | 91CA | D21F52230000000000 |
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| 90B3 | CCFAC4630000000000 | | |
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| 90E0 | CD27C3630000000000 | | |
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Proportional Spacing LQ font

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| 9264 | A67B501D0000000000 |
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| 927F | A717501D0000000000 |
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| 92C7 | EBBA4E1D0000000000 |
| 92D0 | EBE4581D0000000000 |
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| 92EE | A966561D0000000000 |
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| 92FD | A9EA4D1D0000000000 |
| 9306 | AA144E1D0000000000 |
| 930F | AA3E451D0000000000 |
| 9318 | AA4D581D0000000000 |
| 9321 | AA955A1D0000000000 |
| 932A | AAE35A1D0000000000 |
| 9333 | EC2C421D0000000000 |
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| 9357 | EC9E551D0000000000 |
| 9360 | ECDD521D0000000000 |

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| 9396 | AD23461D0000000000 |
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| 93A8 | EE30441D0000000000 |
| 93B1 | EE3C461D0000000000 |
| 93BA | EE4E5B1D0000000000 |
| 93C3 | EE9F541D0000000000 |
| 93CC | EEDB4A1D0000000000 |
| 93D5 | EEF9561D0000000000 |
| 93DE | EF3B531D0000000000 |
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| 93F9 | EFE9571D0000000000 |
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| 940B | F064541D0000000000 |
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| 9426 | F0F74D1D0000000000 |
| 942F | B053501D0000000000 |
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| 9441 | B08F501D0000000000 |
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| 9453 | F157551D0000000000 |
| 945C | F19660290000000000 |
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| 9492 | F2E659290000000000 |
| 949B | F3314E290000000000 |
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| 94FE | F5C554230000000000 | 966F | FEE0441D0000000000 |
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| 957C | F8FB531D0000000000 | 96ED | 5257581D0000000000 |
| 9585 | F93452230000000000 | 96F6 | 529F4B110000000000 |
| 958E | F96A531D0000000000 | 96FF | 52C04E110000000000 |
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| 95B2 | FA3C53230000000000 | 9723 | 53CE4F230000000000 |
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| 9603 | FBEF53230000000000 | 9774 | 56475B290000000000 |
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| 9828 | 5AE8481D0000000000 | 9999 | CCCAC65D0000000000 |
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| 9879 | CAF0C65D0000000000 | 99EA | CD30C25D0000000000 |
| 9882 | CB02C65D0000000000 | 99F3 | 5B9C5E1D0000000000 |
| 988B | CB14C45D0000000000 | 99FC | 5BF65A230000000000 |
| 9894 | CB20C65D0000000000 | 9A05 | 5C4448230000000000 |
| 989D | CB32C65D0000000000 | 9A0E | 5C5C50230000000000 |
| 98A6 | CB44C65D0000000000 | 9A17 | 5C8C5A290000000000 |
| 98AF | CB56C65D0000000000 | 9A20 | 5CDA54230000000000 |
| 98B8 | CB68C65D0000000000 | 9A29 | 5D1652230000000000 |
| 98C1 | CB7AC45D0000000000 | 9A32 | 5D4C4D1D0000000000 |
| 98CA | CB86C45D0000000000 | 9A3B | 5D7356290000000000 |
| 98D3 | CB92C45D0000000000 | 9A44 | 5DB55A290000000000 |
| 98DC | CB9EC45D0000000000 | 9A4D | 5E035A290000000000 |
| 98E5 | CBAAC45D0000000000 | 9A56 | 5E51561D0000000000 |
| 98EE | CBB6C45D0000000000 | 9A5F | D012541D0000000000 |
| 98F7 | CBC2C25D0000000000 | 9A68 | 5E9358290000000000 |
| 9900 | CBC8C45D0000000000 | 9A71 | 5EDB511D0000000000 |
| 9909 | CBD4C45D0000000000 | 9A7A | D0CC521D0000000000 |
| 9912 | CBE0C65D0000000000 | 9A83 | D102441D0000000000 |

Appendix C

| | |
|------|--------------------|
| 9A8C | D10E461D0000000000 |
| 9A95 | D120501D0000000000 |
| 9A9E | D150501D0000000000 |
| 9AA7 | D180CF5D0000000000 |
| 9AB0 | D1AD4E1D0000000000 |
| 9AB9 | D1D7481D0000000000 |
| 9AC2 | D1EF501D0000000000 |
| 9ACB | D21F521D0000000000 |
| 9AD4 | D255481D0000000000 |
| 9ADD | D26D461D0000000000 |
| 9AE6 | D27F5E1D0000000000 |
| 9AEF | 5F0E511D0000000000 |
| 9AF8 | 5F414D1D0000000000 |
| 9B01 | D333441D0000000000 |
| 9B0A | 5F68421D0000000000 |

12 cpi LQ font

| Address | Data |
|---------|--------------------|
| 9B13 | 02 |
| 9B14 | 5F6E581D0000000000 |
| 9B1D | A468581D0000000000 |
| 9B26 | A4B35A1D0000000000 |
| 9B2F | A504581D0000000000 |
| 9B38 | A54F5B1D0000000000 |
| 9B41 | A5A0591D0000000000 |
| 9B4A | A5EB5B1D0000000000 |
| 9B53 | A63C481D0000000000 |
| 9B5C | A6544C1D0000000000 |
| 9B65 | A67B501D0000000000 |
| 9B6E | A6AB4E1D0000000000 |
| 9B77 | A6D8551D0000000000 |
| 9B80 | A717501D0000000000 |
| 9B89 | A747561D0000000000 |
| 9B92 | A78C531D0000000000 |
| 9B9B | A7C8551D0000000000 |
| 9BA4 | A80A4A1D0000000000 |
| 9BAD | A8284A1D0000000000 |
| 9BB6 | A846561D0000000000 |
| 9BBF | 5FB64E1D0000000000 |
| 9BC8 | 5FE04D1D0000000000 |
| 9BD1 | 6007531D0000000000 |
| 9BDA | A918441D0000000000 |
| 9BE3 | A924561D0000000000 |
| 9BEC | A966561D0000000000 |
| 9BF5 | A9A8561D0000000000 |
| 9BFE | A9EA4D1D0000000000 |
| 9C07 | AA144E1D0000000000 |
| 9C10 | AA3E451D0000000000 |
| 9C19 | AA4D581D0000000000 |
| 9C22 | AA955A1D0000000000 |
| 9C2B | AAE35A1D0000000000 |
| 9C34 | AB31421D0000000000 |
| 9C3D | 6040481D0000000000 |
| 9C46 | 60584E1D0000000000 |
| 9C4F | 6082551D0000000000 |
| 9C58 | 60C1541D0000000000 |
| 9C61 | 60FD5C1D0000000000 |



Appendix C

| | | | |
|------|--------------------|------|--------------------|
| 9C6A | 6151591D0000000000 | 9DD2 | 67AB561D0000000000 |
| 9C73 | 619C481D0000000000 | 9DDB | 67ED501D0000000000 |
| 9C7C | 61B44E1D0000000000 | 9DE4 | 681D4D1D0000000000 |
| 9C85 | 61DE4E1D0000000000 | 9DED | 6844551D0000000000 |
| 9C8E | 6208571D0000000000 | 9DF6 | 6883501D0000000000 |
| 9C97 | AD23461D0000000000 | 9DFF | 68B3511D0000000000 |
| 9CA0 | 624D481D0000000000 | 9E08 | 68E64C1D0000000000 |
| 9CA9 | 6265441D0000000000 | 9E11 | 690A501D0000000000 |
| 9CB2 | 6271461D0000000000 | 9E1A | 693A591D0000000000 |
| 9CBB | 6283501D0000000000 | 9E23 | 69855C1D0000000000 |
| 9CC4 | 62B3501D0000000000 | 9E2C | 69D95A1D0000000000 |
| 9CCD | 62E3461D0000000000 | 9E35 | 6A27571D0000000000 |
| 9CD6 | 62F5571D0000000000 | 9E3E | 6A6C581D0000000000 |
| 9CDF | 633A4F1D0000000000 | 9E47 | 6AB4451D0000000000 |
| 9CE8 | 6367531D0000000000 | 9E50 | 6AC3501D0000000000 |
| 9CF1 | 63A04F1D0000000000 | 9E59 | 6AF3451D0000000000 |
| 9CFA | 63CD551D0000000000 | 9E62 | 6B024A1D0000000000 |
| 9D03 | 640C531D0000000000 | 9E6B | AB31C29D0000000000 |
| 9D0C | 6445551D0000000000 | 9E74 | 6B204A1D0000000000 |
| 9D15 | 6484551D0000000000 | 9E7D | 6B3E531D0000000000 |
| 9D1E | 64C3461D0000000000 | 9E86 | 6B77531D0000000000 |
| 9D27 | 64D5481D0000000000 | 9E8F | 6BB0521D0000000000 |
| 9D30 | B053501D0000000000 | 9E98 | 6BE6501D0000000000 |
| 9D39 | B083441D0000000000 | 9EA1 | 6C16511D0000000000 |
| 9D42 | B08F501D0000000000 | 9EAA | 6C494A1D0000000000 |
| 9D4B | 64ED511D0000000000 | 9EB3 | 6C67561D0000000000 |
| 9D54 | 6520571D0000000000 | 9EBC | 6CA9521D0000000000 |
| 9D5D | 65655C1D0000000000 | 9EC5 | 6CDF4B1D0000000000 |
| 9D66 | 65B94D1D0000000000 | 9ECE | 6D004D1D0000000000 |
| 9D6F | 65E0501D0000000000 | 9ED7 | 6D27561D0000000000 |
| 9D78 | 66104E1D0000000000 | 9EE0 | 6D69481D0000000000 |
| 9D81 | 663A4B1D0000000000 | 9EE9 | 6D81521D0000000000 |
| 9D8A | 665B4A1D0000000000 | 9EF2 | 6DB7521D0000000000 |
| 9D93 | 6679511D0000000000 | 9EFB | 6DED521D0000000000 |
| 9D9C | 66AC4A1D0000000000 | 9F04 | 6E234F1D0000000000 |
| 9DA5 | 66CA481D0000000000 | 9F0D | 6E50501D0000000000 |
| 9DAE | 66E24E1D0000000000 | 9F16 | 6E80531D0000000000 |
| 9DB7 | 670C531D0000000000 | 9F1F | 6EB9501D0000000000 |
| 9DC0 | 67454A1D0000000000 | 9F28 | 6EE94A1D0000000000 |
| 9DC9 | 6763581D0000000000 | 9F31 | 6F07501D0000000000 |

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| | | | |
|------|--------------------|------|--------------------|
| 9F3A | 6F37591D0000000000 | A0AB | 78AC541D0000000000 |
| 9F43 | 6F825E1D0000000000 | A0B4 | 78E8571D0000000000 |
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| 9F70 | 70D8441D0000000000 | A0E1 | 7A1D581D0000000000 |
| 9F79 | 70E44A1D0000000000 | A0EA | 7A65541D0000000000 |
| 9F82 | 71024D1D0000000000 | A0F3 | 7AA1501D0000000000 |
| 9F8B | BE4B5C1D0000000000 | A0FC | 7AD1501D0000000000 |
| 9F94 | 7129561D0000000000 | A105 | C952451D0000000000 |
| 9F9D | 716B531D0000000000 | A10E | C961451D0000000000 |
| 9FA6 | 71A4561D0000000000 | A117 | 7B01521D0000000000 |
| 9FAF | 71E6561D0000000000 | A120 | 7B37511D0000000000 |
| 9FB8 | 7228571D0000000000 | A129 | 7B6A481D0000000000 |
| 9FC1 | 726D571D0000000000 | A132 | 7B82561D0000000000 |
| 9FCA | 72B2561D0000000000 | A13B | 7BC4571D0000000000 |
| 9FD3 | 72F4561D0000000000 | A144 | 7C09C51D0000000000 |
| 9FDC | 7336531D0000000000 | A14D | 7C18C51D0000000000 |
| 9FE5 | 736F531D0000000000 | A156 | 7C27C31D0000000000 |
| 9FEE | 73A8531D0000000000 | A15F | CACCC45D0000000000 |
| 9FF7 | 73E14E1D0000000000 | A168 | CAD8C45D0000000000 |
| A000 | 740B4D1D0000000000 | A171 | CAE4C45D0000000000 |
| A009 | 74324D1D0000000000 | A17A | CAF0C65D0000000000 |
| A012 | 74595B1D0000000000 | A183 | CB02C65D0000000000 |
| A01B | 74AA571D0000000000 | A18C | CB14C45D0000000000 |
| A024 | 74EF531D0000000000 | A195 | CB20C65D0000000000 |
| A02D | 7528591D0000000000 | A19E | CB32C65D0000000000 |
| A036 | 7573541D0000000000 | A1A7 | CB44C65D0000000000 |
| A03F | 75AF541D0000000000 | A1B0 | CB56C65D0000000000 |
| A048 | 75EB521D0000000000 | A1B9 | CB68C65D0000000000 |
| A051 | 7621571D0000000000 | A1C2 | CB7AC45D0000000000 |
| A05A | 7666531D0000000000 | A1CB | CB86C45D0000000000 |
| A063 | 769F561D0000000000 | A1D4 | CB92C45D0000000000 |
| A06C | 76E1581D0000000000 | A1DD | CB9EC45D0000000000 |
| A075 | 7729521D0000000000 | A1E6 | CBAAC45D0000000000 |
| A07E | 775F541D0000000000 | A1EF | CBB6C45D0000000000 |
| A087 | 779B511D0000000000 | A1F8 | CBC2C25D0000000000 |
| A090 | 77CE581D0000000000 | A201 | CBC8C45D0000000000 |
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| A0A2 | 786A561D0000000000 | A213 | CBE0C65D0000000000 |



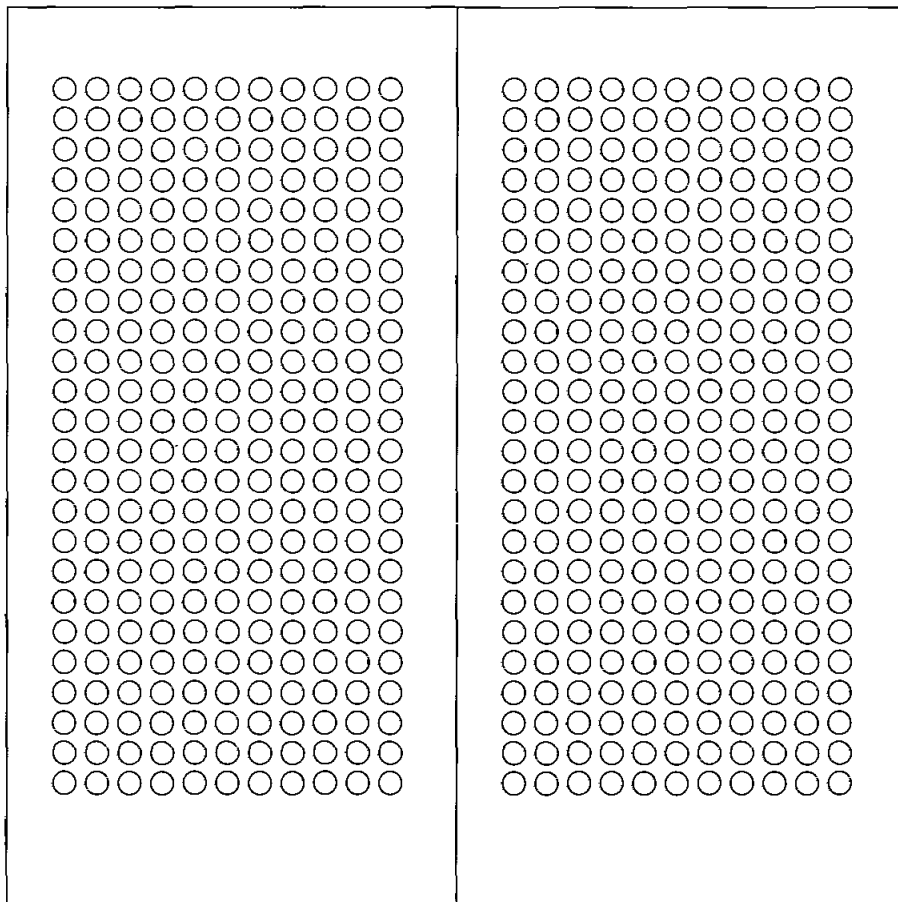
Appendix C

| | | | |
|------|--------------------|------|--------------------|
| A21C | CBF2C65D0000000000 | A38D | D10E461D0000000000 |
| A225 | CC04C65D0000000000 | A396 | D120501D0000000000 |
| A22E | CC16C65D0000000000 | A39F | D150501D0000000000 |
| A237 | CC28C65D0000000000 | A3A8 | D180CF5D0000000000 |
| A240 | CC3AC65D0000000000 | A3B1 | D1AD4E1D0000000000 |
| A249 | CC4CC25D0000000000 | A3BA | D1D7481D0000000000 |
| A252 | CC52C65D0000000000 | A3C3 | D1EF501D0000000000 |
| A25B | CC64C45D0000000000 | A3CC | D21F521D0000000000 |
| A264 | CC70C65D0000000000 | A3D5 | D255481D0000000000 |
| A26D | CC82C45D0000000000 | A3DE | D26D461D0000000000 |
| A276 | CC8EC65D0000000000 | A3E7 | D27F5E1D0000000000 |
| A27F | CCA0C65D0000000000 | A3F0 | 7F3C501D0000000000 |
| A288 | CCB2C45D0000000000 | A3F9 | 7F6C4E1D0000000000 |
| A291 | CCBEC45D0000000000 | A402 | D333441D0000000000 |
| A29A | CCCAC65D0000000000 | A40B | 7F96421D0000000000 |
| A2A3 | CCDCC65D0000000000 | | |
| A2AC | CCEEC45D0000000000 | | |
| A2B5 | CCFAC45D0000000000 | | |
| A2BE | CD06C45D0000000000 | | |
| A2C7 | CD12C25D0000000000 | | |
| A2D0 | CD18C25D0000000000 | | |
| A2D9 | CD1EC35D0000000000 | | |
| A2E2 | CD27C35D0000000000 | | |
| A2EB | CD30C25D0000000000 | | |
| A2F4 | 7C30581D0000000000 | | |
| A2FD | 7C78551D0000000000 | | |
| A306 | 7CB7481D0000000000 | | |
| A30F | 7CCF501D0000000000 | | |
| A318 | 7CFF521D0000000000 | | |
| A321 | 7D35531D0000000000 | | |
| A32A | 7D6E571D0000000000 | | |
| A333 | 7DB3511D0000000000 | | |
| A33C | 7DE6501D0000000000 | | |
| A345 | 7E16541D0000000000 | | |
| A34E | 7E52541D0000000000 | | |
| A357 | 7E8E541D0000000000 | | |
| A360 | D012541D0000000000 | | |
| A369 | 7ECA561D0000000000 | | |
| A372 | 7F0C501D0000000000 | | |
| A37B | D0CC521D0000000000 | | |
| A384 | D102441D0000000000 | | |

Appendix D

Download Character Matrix Blanks: Draft

24×11

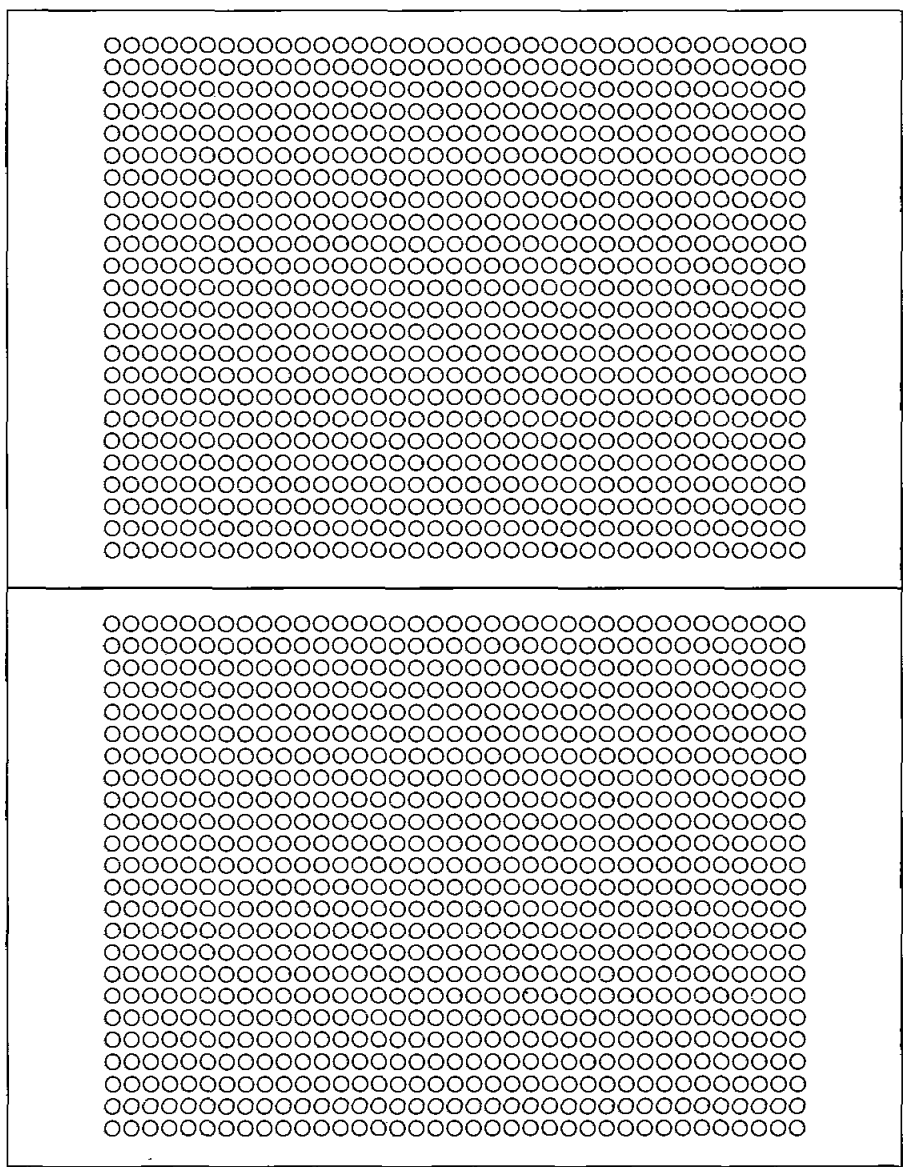


Make copies of this page first.
Then use blank matrices to design your download characters.

Appendix D

Download Character Matrix Blanks: LQ

24x37



Make copies of this page first.
Then use blank matrices to design your download characters.

Paper Specifications

Paper which may be used with this unit must be within the specifications provided below.

1. Fanfold paper

Width: 4~10 inches (102~254 mm)

Quality and number of sheets:

* only for the last sheet

| Type of paper | Sheets | Weight | | | |
|---------------------------|--------|-------------|-------|---------------------|-------|
| | | in lbs | | in g/m ² | |
| | | push | pull | push | pull |
| Fine-quality paper | 1 | 16~20 | 18~24 | 60~75 | 68~90 |
| Non-carbon | 2~4 | 11~14 (17*) | | 41~53 (64*) | |
| Multi-layered with carbon | 2 | 11~14 (17*) | | 41~53 (64*) | |

Note:

- When using multi-part fanfold paper, especially in environments which have very high or low temperature and/or humidity, we recommend the use of the bottom feed pull mode to optimize paper handling and print quality.
- To insure optimum print quality, 16~22 lbs (60~83 g/m²) is recommended for graphic printing.
- In multi-layered paper with carbon, the carbon is equivalent to a sheet of paper.
- "Weight in pounds" represents the weight of 500 [17×22 inches (432×559 mm)] sheets.
- The printer will handle multipart papers up to 0.013 inch (0.32 mm). Up to 4 copies of 14 lb chemical release paper can be used.
- When using multipart forms, rear feeding can be used up to 2-part forms. For 3 or 4 part forms, we recommend bottom feeding for optimum print quality.

Appendix E

2. Single Sheet

Width: 4~11.7 inches (102~297 mm)

Height: 5~14.3 inches (127~363 mm)

Weight in pounds (g/m²): 14~24 (53~90 g/m²)

Note:

- Paper should be within operating temperature and humidity ranges at least 24 hours prior to use.

3. Envelope

#6 and #10 size envelopes are recommended. Since envelopes vary in size, paper weight and construction, we cannot guarantee print quality and paper handling for all types of envelopes.

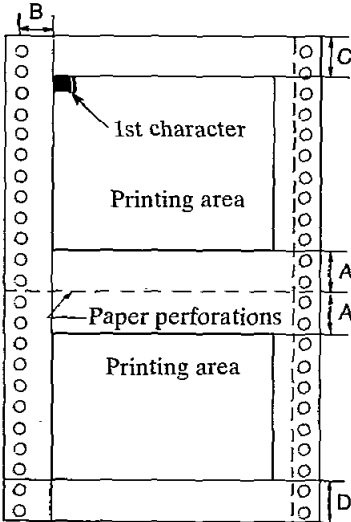
Note:

- To optimize print quality printing should not occur in areas where the edges overlap.

Appendix F

Printing Area

1. Fanfold paper



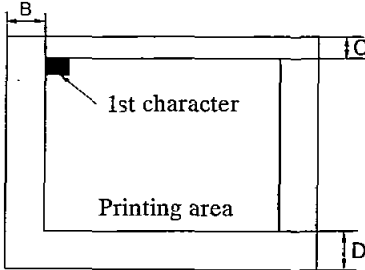
| | Push | Pull |
|---|--------------|-----------------|
| A | 1" (25.4 mm) | |
| B | 1" (25.4 mm) | |
| C | 0" | 4.5" (114.3 mm) |
| D | 1" (25.4 mm) | |

- A:** Value A indicates the area near the paper perforations where the quality may not be optimum.
- B:** Value B indicates the minimum distance between the sprockets and first printable character. (When the left tractor is set on the left end and the margin is set to 0.)
- C:** Value C indicates the area that printing can be done but print quality may not be optimum.
- D:** Value D indicates the position where paper out is detected and printing may not be optimum.

Note:
• The first print line position for double high characters should be greater than $\frac{29}{180}$ " in order to allow the entire characters to be printed correctly.

Appendix F

2. Single sheet and Envelope



| | Single Sheet and Envelopes |
|----------|----------------------------|
| B | 0.25" (6.3 mm) |
| C | 0" |
| D | 1" (25.4 mm) |

- B:** Value B indicates the minimum distance between the edge of the paper and the first printable character. (When the left paper guide is set to the left end and the margin is set to 0.)
- C:** Value C indicates the area that printing can be done but print quality may not be optimum.
- D:** Value D indicates the position where paper out is detected and printing may not be optimum. (When printing on envelopes do not print on area where edges overlap. Print quality may not be optimum.)

Note:

- The first print line position for double high characters should be greater than $\frac{28}{180}$ " in order to allow the entire characters to be printed correctly.

Glossary

ASCII:

“ASCII” is an acronym for “American Standard Code for Information Interchange”. In ASCII, each character has a unique code.

BASIC:

BASIC is a commonly used microcomputer programming language.

Baud (baud rate):

Baud is a unit of data transmission speed between computer devices. Can be but not necessarily equal to bits per second.

Bidirectional printing:

Processing speed is increased by bidirectional printing. That is, the printer prints right-to-left as well as in the normal left-to-right manner.

Binary:

Binary is a numbering system using the two digits of zero (0) and one (1).

Bit:

Bit is an abbreviation for “binary digit (0~1)”, and is the smallest unit of information used by a printer or computer.

Buffer:

Buffer is an area of memory which stores data temporarily.

Byte:

Byte is the unit of information used by a printer or computer. One byte is equivalent to eight (8) bits.



Appendix G

Character set:

Character set is the set of characters, numbers, and symbols available for printing.

Control codes:

Control codes are *commands from the computer to the printer that are non-printable characters*. They are used to control printer functions. (See Control Codes on page 4-1.)

cpi:

“cpi” is an abbreviation for “characters per inch”, and means the number of characters printed in one horizontal inch.

cpl:

“cpl” is an abbreviation for “characters per line”, and means the maximum number of characters printed on one line.

cps:

“cps” is an abbreviation for “characters per second”, and means the number of characters printed in one second.

CR (Carriage Return):

“CR” is a control code that returns the printhead to the left margin.

Decimal (Dec.):

Decimal is a numbering system composed of 10 digits 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9.

Default:

Default has two meanings: one indicates the previously set conditions or settings executed when the power is turned on, reset or initialized; and the other indicates the original settings when shipped from the factory (FACTORY settings).

Double strike printing:

Double printing is a print quality enhancing mode which uses a double strike with two passes of the printhead, feeding the paper $\frac{1}{180}$ " (0.14 mm) between the first and second pass (in Epson mode only).

Double high printing:

Double high printing makes the height of a character twice that of a normal one.

Double wide printing:

Double wide printing makes the width of character twice that of a normal one.

Download character:

Download character is a character which the user can design. (See Section 5.2.)

Draft:

Draft is one of three print qualities available on the KX-P1124*i*. Draft mode uses a minimum number of dots per character to maximize printing speed.

Emphasized printing:

Emphasized printing is a print quality enhancing mode done in one pass of the printhead at half speed, allowing horizontally adjacent dots to be printed producing a darker character.

Escape (ESC) sequence:

“ESC” is a control code that begins most printer commands. The characters which follow the “ESC” are interpreted as command, rather than characters to print.

Emulation:

Emulation means to operate like another printer.

The KX-P1124*i* can emulate the Epson LQ-850 or the IBM Proprinter X24E.

Fanfold paper:

Fanfold paper has regularly spaced sprocket holes on the left and right sides and pages are separated by a perforation between each sheet. May also be known as computer paper or tractor paper.

FF (Form feed):

“FF” is a control code that advances the paper one page.

Font:

Font is a style and size of type designated by a family name.



Appendix G

FORTRAN:

FORTRAN is one of many programming languages. It is used primarily in scientific applications.

Function:

Function allows you to determine how the printer will operate.

Hexadecimal:

Hexadecimal is a numbering system using the 16 digits, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E and F.

Initialization:

Initialization means to reset the printer to the initial startup condition.

Interface:

Interface is the connection between the two separate systems, such as the computer and the printer. A parallel interface transfers data one character or code at a time, and a serial interface transfers data one bit at a time.

I/O:

“I/O” is the symbolic notation for “Input/Output”.

Item:

Item is a sub menu of the main menu (see menu on page G-5).

Letter Quality (LQ):

LQ is one of three print qualities available on the KX-P1124i. LQ mode increases the number of dots per character to improve the print quality but decrease the printing speed.

LF (Line Feed):

“LF” is a control code that advances the paper one line.



Liquid Crystal Display (LCD):

LCD is a display to show the messages which guide the operation or it may show the error messages (see page 9-4). The message is composed of 16 characters at most.

LSB:

“LSB” is an acronym for “Least Significant Bit”, and means the rightmost position in a binary number.

MACRO memory function:

This feature allows the KX-P1124i to easily save and recall a particular combination of functions, even if the power is turned off.

Menu:

Menu is a list of topics from which you can enter to select the desired conditions or settings. The Function mode in the KX-P1124i is composed of a main Menu and Item-menus (Sub-menus). (See page 3-8.)

MICRO LINE FEED:

MICRO LINE FEED function allows you to feed the paper by one micro line ($1/180''$). (See page 3-3.)

MSB:

“MSB” is an acronym for “Most Significant Bit”, and means the leftmost position in a binary number.

OFF LINE:

OFF LINE is the condition in which the printer can not communicate with the computer.

ON LINE:

ON LINE is the condition in which the printer can communicate with the computer.

Overline printing:

Overline printing produces a continuous line above the characters, using the first pin of the printhead.



Appendix G

Parallel interface:

See interface on page G-4.

Parity:

Parity is a method for a computer and printer to check the accuracy of data transfer.

PASCAL:

PASCAL is a commonly used microcomputer programming language.

Perforation:

Perforation indicates the tear position on the fanfold paper. (See page F-1.)

Pitch:

Pitch is the number of characters which will print in one inch. Pitch is equivalent to characters per inch (cpi).

Platen:

Platen is the metal plank provided as a backing for the paper when printing.

Printer drivers:

Most of today's off the shelf software programs use printer drivers to control printer functions. These drivers contain the software codes your software program uses to access printer features. With the printer driver installed, you will seldom need to know any of the KX-P1124i commands.

Proportional spacing (PS):

Proportional spacing is a printing method of adjusting the character space in which a character is printed. A "w" will take up more space than an "i".

Protocol:

Protocol is the set of rules permitting communication between a computer and printer when a serial interface (RS-232C) is used. It covers polarity, baud rate, parity, data length, start bit and stop bit.

**QUIET mode:**

QUIET mode is a helpful feature of the KX-P1124i which reduces printing noise.

RAM:

RAM is an acronym for “Random Access Memory”. It is the part of the printer’s memory in which data is stored, control codes or download characters are to be printed. RAM is cleared when the printer is turned off.

ROM:

ROM is an acronym for “Read Only Memory”. It is the part of the printer’s memory in which predefined characters and operating information for the printer are stored. ROM is not cleared when the printer is turned off.

Self test:

Self test is a method for testing the operation of the printer. (See Self test on page 2-18.)

Serial interface:

See interface on page G-4.

Shielded Cable:

Shielded cable is a cable wrapped with a special metal around its wires. This guards against radio interference.

Skip perforation:

Skip perforation means nothing is printed in a specified area before and after the page perforation.

String concatenation:

This is the joining of two or more bytes of data into a single command.

Super Letter Quality (SLQ):

SLQ is one of three print qualities available on the KX-P1124i. SLQ mode uses a maximum number of dots per character to improve the print quality more than LQ mode but decreases the printing speed less than LQ mode.



Appendix G

Top of Form:

Top of Form is the first line position on the paper. The KX-P1124i has the “Top of Form function” a helpful feature which loads the paper automatically to the designated position.

Unidirectional printing:

The printer prints left-to-right only. Printing speed is slow compared with bidirectional printing. This print method permits better vertical alignment.

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Most of the software commands of Epson LQ-850 mode and IBM Proprinter X24E mode descriptions are not indexed here. For page references for Epson LQ-850 mode commands, see pages 6-1 through 6-5 in Section 6. For IBM Proprinter X24E mode commands, see pages 7-1 through 7-4 in Section 7.

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MEMO

MEMO

OPTIONS and SUPPLIES

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| KX-PS10 | RS-232C/Serial Interface Board |
| KX-P19 | RS-232C/Current Loop Serial Interface Board |
| KX-P36 | Auto Cut Sheet Feeder (Single bin) |
| KX-P43 | 32K Buffer Chip |
| KX-P145 | Ribbon Cassette (Black) |

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