NX-2420

MULTI-FONT

NX-2420

RAINBOW/COLOUR

USERS MANUAL

Trademark Acknowledgements

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IBM PC, PC-AT, PC-XT, Proprinter X24E, Proprinter X24, PC-DOS: International Business Machines Corp.
Microsoft BASIC, MS-DOS: Microsoft Corporation
LQ-860, LQ-850: Seiko Epson Corp.

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HOW TO USE THIS MANUAL

This manual is organized into nine chapters. To learn how to make the best use of your printer you are urged to read through chapters 1 through 3. The remaining chapters may be treated as a reference guide for programming operations, etc. It assumes a degree of knowledge of the operation of computers (for instance, it assumes you know about hexadecimal numbers). The chapters are as follows:

Chapter 1 — Setting up the printer

This chapter explains how to get the printer unpacked and set up. Read this chapter before you do anything else.

Chapter 2 — Control panel operations

There are a number of controls on the front panel which perform various functions related to paper handling, print modes and font selection.

After getting set up, read this chapter and try out the various procedures in it to find out how the printer works.

Chapter 3 — Default settings

This chapter explains how to use the Electronic DIP Switch (EDS) mode to make system settings on the printer.

Chapter 4 — Printer control commands

This chapter explains the different emulations provided by your printer, and the software commands used to drive it. This section is of use if you are writing or modifying programs to take advantage of the printer's features.

Chapter 5 — Download characters

This chapter explains the procedures to create your own characters.

Chapter 6 — MS-DOS and your printer

Since the PC or PC-AT family of computers running under MS-DOS is currently the most popular configuration of microcomputer, we have included a few hints and tips to help you use your printer with such systems. Since virtually all PCs are sold with a Microsoft BASIC interpreter, we have also included some hints, and a sample program in this language to demonstrate the capabilities of the printer.

Chapter 7 — Troubleshooting and maintenance

This section gives a checklist of points to check if your printer is not working in the expected way. It also includes details of some routine maintenance operations you can carry out yourself. It is not, however, a complete service manual. Call a qualified service engineer if you are unsure of your ability to carry out any maintenance or servicing operations.

Chapter 8 — Specifications

This section gives the specifications of your printer.

Chapter 9 — Character sets

These charts show the different character sets available.

FEATURES OF THE PRINTER

This printer has a full complement of features, making it an excellent partner for a personal computer. It supports the IBM/Epson printer commands and character sets, enabling it to print just about anything your computer can generate, both text and graphics. Some of its main features are the following:

• Versatile paper handling

Single sheets, fanfold forms, and multi-part forms (up to 5-ply) are all accepted, and you can use either push/pull tractor or friction feed. (You can load fanfold forms from the rear with push tractor, or fanfold forms and multi-part forms from the bottom with pull tractor.) A special feature enables you to keep fanfold forms parked in readiness while printing on other paper.

• Six bright colors

Magenta, cyan, violet, yellow, orange, and green add a color dimension to your printed output by the color version printer.

• Large variety of fonts and sizes

The printer has one draft font, one High-Speed Draft font and five LQ fonts (Roman, Sanserif, Courier, Prestige and Script), italics for all styles, plus condensed print, bold print, double-sized print, and quadruple-sized print.

• Extensive software support

Since it is compatible with the Epson and IBM printers, it works with any software that supports those printers. That includes most word-processing and graphics programs, spread-sheets, and integrated software packages.

• Easy operation

Indicator displays and beep tones provide immediate, easy to understand feedback when you press the buttons on the control panel. The five buttons can operate in combinations to perform a surprising variety of functions, including micro-alignment.

• Easy care and maintenance

The ribbon cartridge can be replaced in seconds the print head in a few minutes.

TABLE OF CONTENTS

Chapter 1

SETTING UP THE PRINTER

Subjects covered in Chapter 1 include —

- Locating the printer
- Unpacking and inspection (part names)
- Setting up and connecting
- Loading single sheets
- Loading and parking fanfold forms
- Adjusting the printing gap

LOCATING THE PRINTER

Before you start unpacking and setting up your printer, make sure that you have a suitable place on which to locate it. By "a suitable place", we mean:

- A firm, level surface which is fairly vibration-free
- Away from excessive heat (such as direct sunlight, heaters, etc)
- Away from excessive humidity
- Away from excessive dust
- Supply it with "clean" electricity. Do not connect it to the same circuit as a large, noise-producing appliance such as a refrigerator.
- Make sure the line voltage is the voltage specified on the printer's identification plate.
- To disconnect the printer the plug has to be disconnected from the wall socket, which has to be located close to the printer, and easy to access.
- Install the printer where there is sufficient room for the paper and any paper being fed in or printed out.
- If you are connecting your printer with a parallel cable, make sure that the cable is within 2m (6ft) of the printer. An RS-232 connection using the optional SPC-8K interface can be made over longer distances.

UNPACKING AND INSPECTION

Checking the carton contents

Now unpack the contents of the shipping carton, and check each item in the box against Figure 1-1 to make sure that you have everything (there should be six items).
If any of these items are missing, contact your supplier.
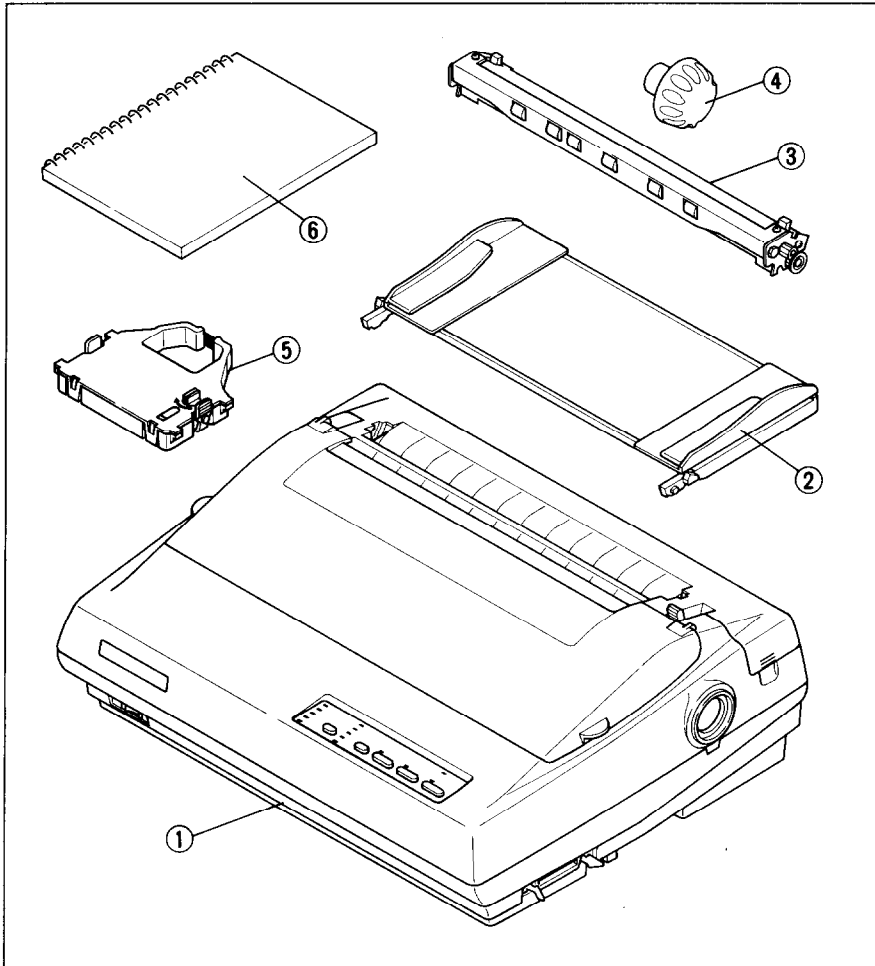
Figure 1-1. Check to make sure you have all six items: 1) Printer, 2) Paper guide, 3) Roller unit, 4) Platen knob, 5) Ribbon cartridge, and 6) Manual set (User's manual, User's guide and Sticker).

The optional accessories which you may have ordered with your printer are:

- Font cartridges (FC-1Z, FC-2Z, FC-3Z, FC-4Z)
- RAM cartridge (RC-32Z)
- Serial-Parallel converter (SPC-8K)
- Automatic sheet feeder (SF-10DQ)
- Roll paper holder (RH-10Z)

Identifying printer parts

Make an external inspection of the printer. Note the locations of the following parts in Figure 1-2.
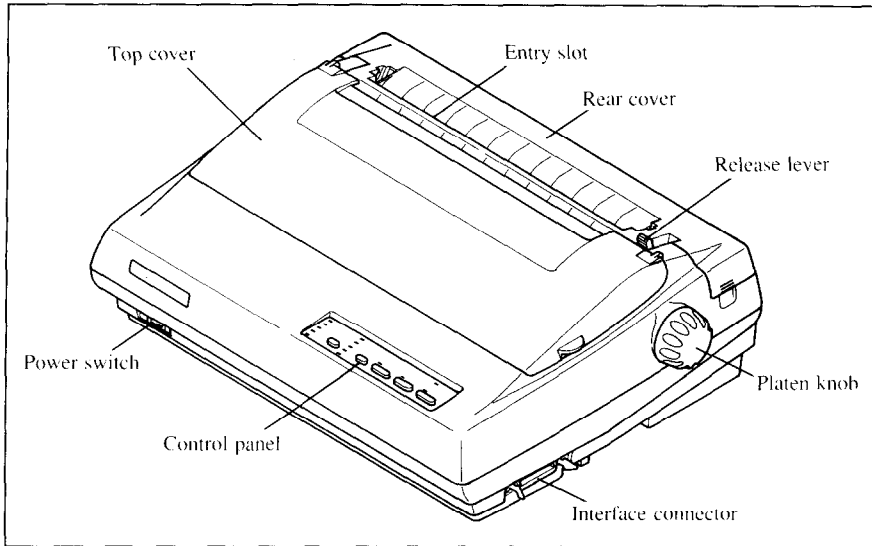
Figure 1-2. The printer's external parts

Roller unit: holds the paper against the platen.

Release lever: releases the platen. This lever must be back for single sheets, and forward for fanfold forms.

Top cover: protects the print head and other internal parts.

Rear cover: protects the tractor feed mechanism.

Entry slot: for inserting single sheets of paper.

Control panel: controls various printer functions.

Power switch: turns power on and off.

Interface connector: for connecting the computer to the printer.

SETTING UP

Place the printer in the desired location, and remove all packing material from inside the top cover. This packing material is intended to prevent damage to the printer while in transit. You will want to keep all the packing material, along with the printer carton, in case you have to move the printer to a new location.

Mounting the platen knob

The platen knob is packed into a recess of the packing material which held your printer inside the carton. Be sure to remove the knob from the packaging.

Mount the knob on the platen shaft, which is on the right-hand side of the printer. Rotate the knob on the shaft before pushing the knob fully into position.
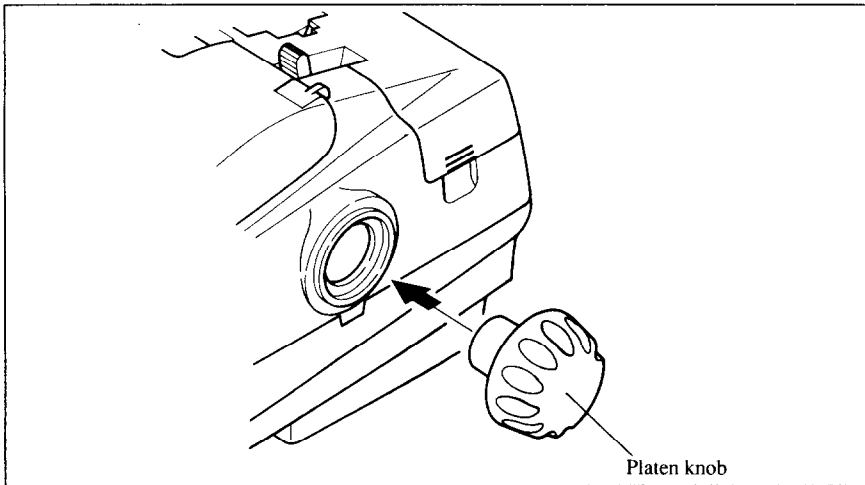
Platen knob

Figure 1-3. Mounting the platen knob

Installing the ribbon cartridge and the roller unit

Remove the top cover by lifting up the front (using the two grips on either side), and pulling the cover towards you (see Figure 1-4). Now install the ribbon. (If you want the color printer to print in black only, install the optional monochrome ribbon cartridge, Z24HD or LZ24.)

NOTE: Turn off the power switch when you replace the ribbon cartridge.

4
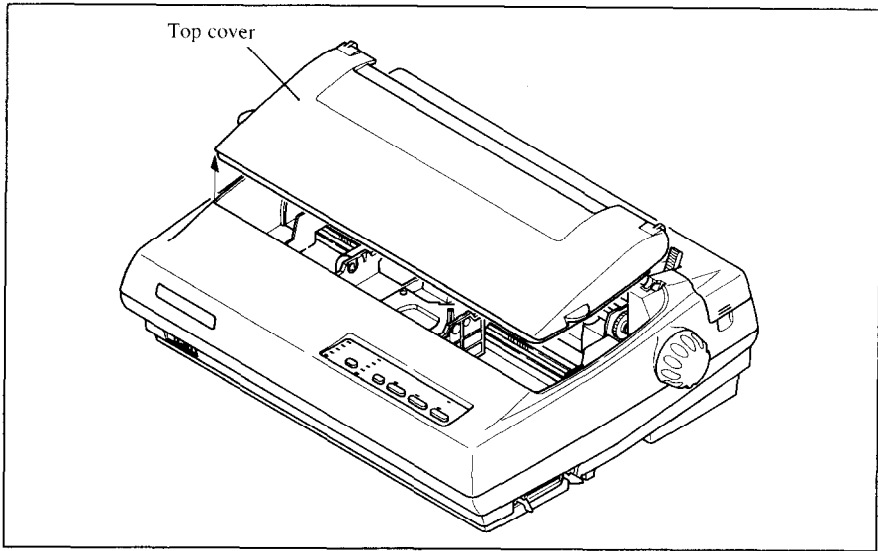
Figure 1-4. Removing the top cover

1. Turn the tension knob clockwise on the ribbon cartridge to tighten the ribbon if it is slack.
2. Guide the ribbon between the print head and the silver print head shield, making certain that the spindles on the cartridge holder fit into the sockets on the cartridge itself.
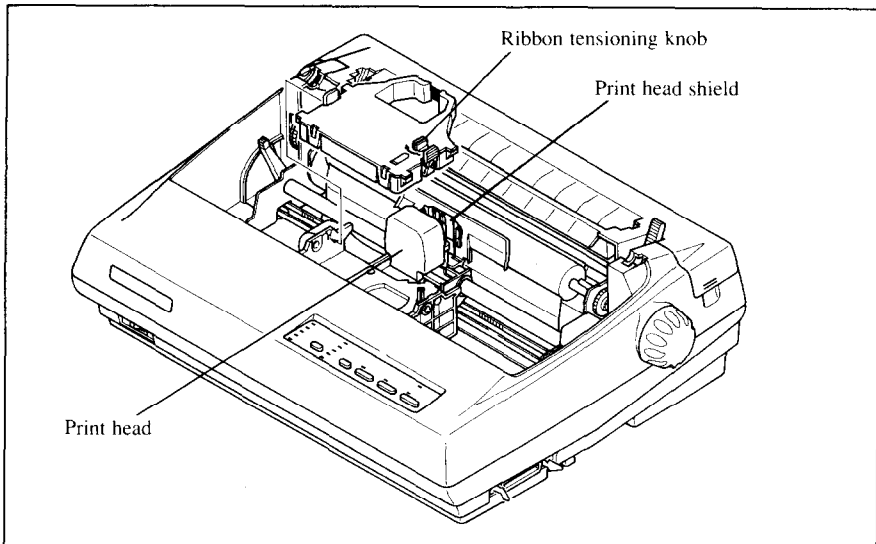
Figure 1-5. Installing the ribbon cartridge

3. The ribbon should pass between the print head and the print head shield (see Figure 1-6).

Print head   Print head shield
              Ink ribbon
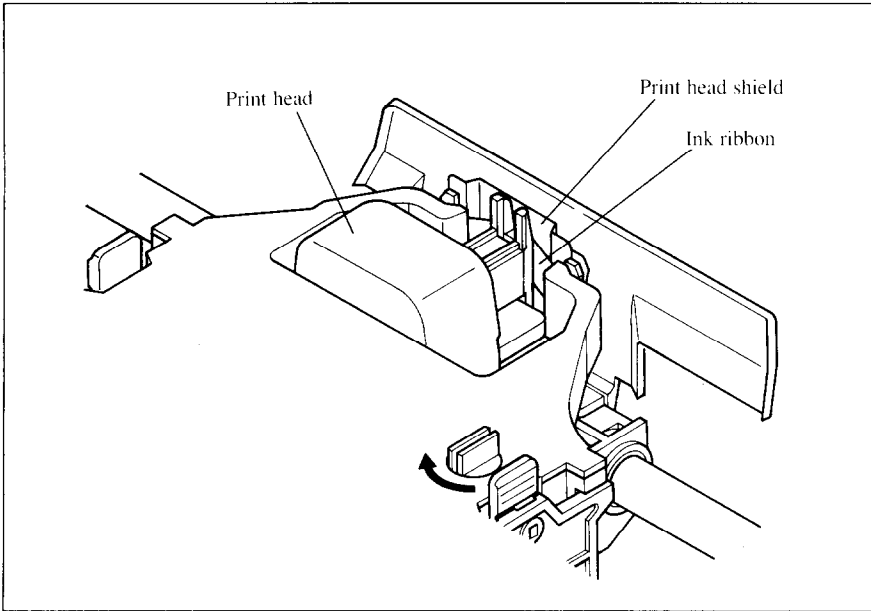
Figure 1-6. Pass the ribbon between the print head and print head shield

4. After you have installed the ribbon cartridge, install the roller unit.
5. Open the rear cover using the two pits on either side.
6. Gripping the lock levers on both sides of the roller unit, fit the mounting brackets onto the shaft inside of the printer mechanism. You will need to tilt the roller unit slightly backward.
7. Secure the roller unit firmly by lowering into position, as shown in Figure 1-7.
8. Close the rear cover.
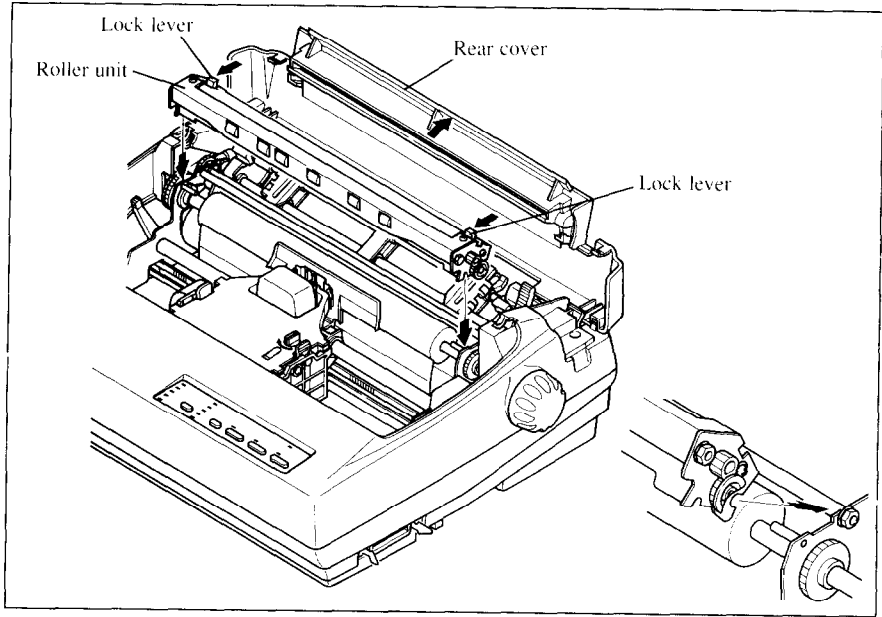
Figure 1-7. Install the roller unit onto the printer

To replace the top cover, insert the tabs into the slots on the printer case. Swing the front edge down to close the cover.

Leave the top cover closed during normal operation. The cover keeps out dust and dirt and reduces the printer's operating sounds. Open the cover only to change the ribbon or make an adjustment.

Installing the optional cartridge

This printer has five built-in LQ fonts, and a 7 K-byte (30 K-byte for color printer) printing buffer.

You can add more fonts or expand the printing buffer by installing optional cartridges (Font catridge or RAM cartridge).

To install or change a cartidge, follow the procedure below.

1. Turn off the power switch at the front of the printer, and remove the top cover.
2. Remove the connector cover at the right side of the printer.
3. Push out the cap from the connector cover.
    NOTE : Keep this cap in a safety place.
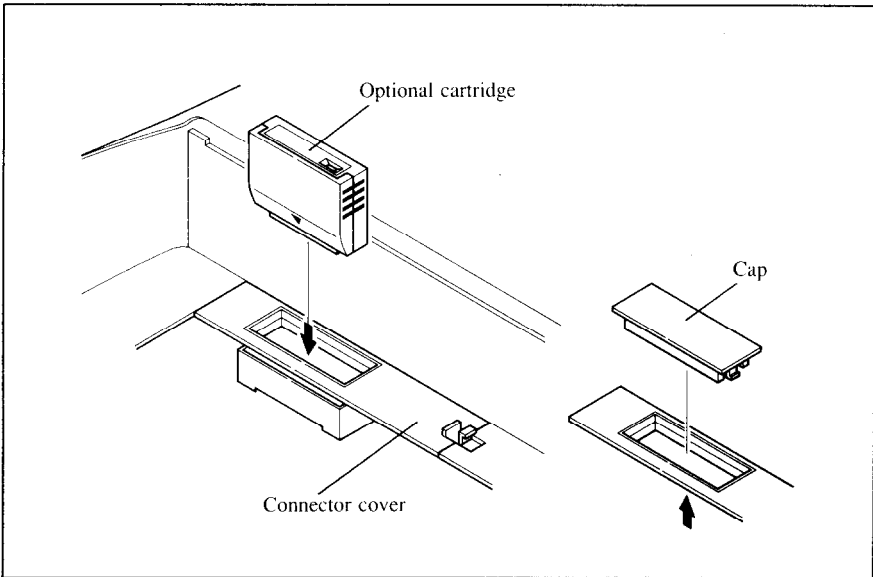
Figure 1-8. Slide the cartridge into the slot with the power switch off.

4. Install the connector cover into the printer.
5. Insert the cartridge into the slot of the connector cover, and slide it all the way in.

NOTE: Remount the cap on the connector cover if you do not use the optional cartridge.

Connecting the printer to your computer

Connect the printer to your computer using a standard parallel interface cable. On a PC or PC/AT-type computer, this means that you use the 25-pin D-type connector at the computer end, and the Amphenol-type 36-pin connector at the printer end. The configuration of the printer's connector is given in Chapter 8 should you need a cable for connection to another computer.

If you need to connect to a serial port, use the optional Serial-Parallel converter, SPC-8K.
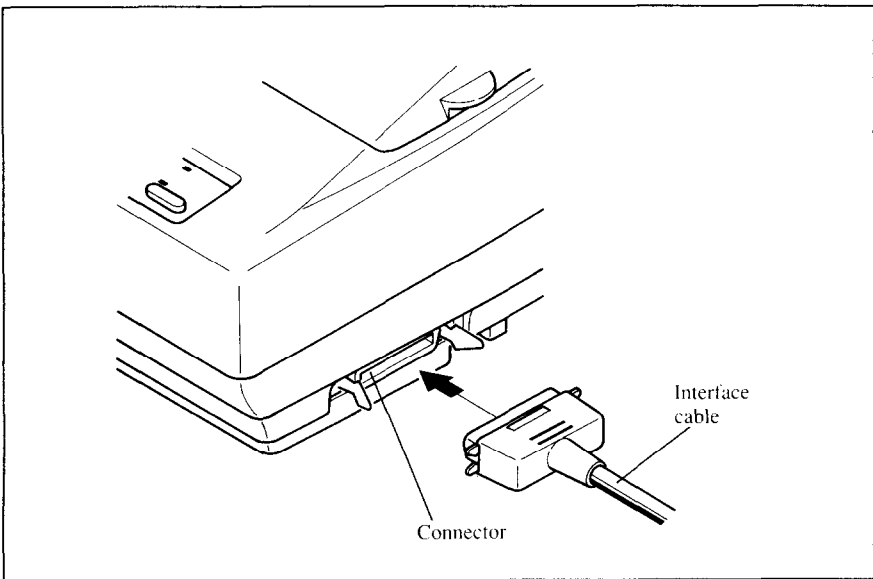
Figure 1-9. Connecting the interface cable

Plug the printer into a suitable outlet. However, DO NOT turn on the power switch at the front of the printer yet.

NOTE: To disconnect the printer the plug has to be disconnected from the wall socket, which has to be located close to the printer, and easy to access.

LOADING SINGLE SHEETS

This section will take you through the procedures for loading single sheets of paper.

If you are using the optional automatic sheet feeder (SF-10DQ), refer to the ASF instruction booklet.

Automatic loading

Single sheets can be loaded manually with the power off, or automatically with the power on. We will start the easy way with automatic loading.

1. Place the paper guide in position by inserting the tabs, located on the bottom of the assembly, into the slots on the rear cover of the printer.
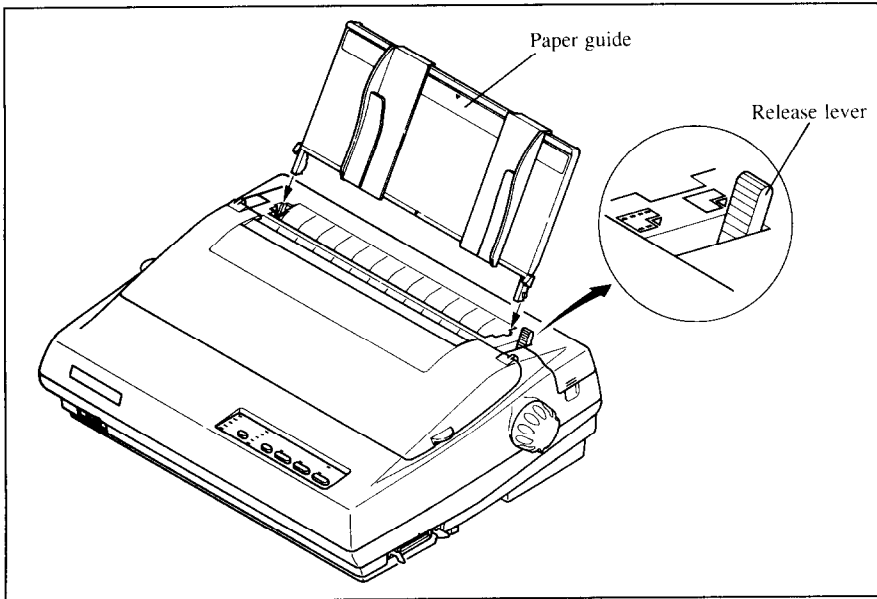
Figure 1-10. Mounting the paper guide for single sheets

2. Adjust the paper guides to match the size of the paper you will be using. Remember that printing will start some distance from the left-hand edge of the carriage.
3. Turn on the power using the switch located at the front of the printer. The printer will beep, indicating that there is no paper in position for printing. The orange POWER indicator will also flash to confirm this.

4. Make sure that the release lever is back.
   If fanfold paper is already mounted in the printer, press the (SELECT/EJECT PARK) button to park the paper in the off-line state, then move the release lever backwards.
5. Place a single sheet between the guides, placing the side on which you want to print towards the back of the printer. Gently push the paper down in the guides until you feel it stop.
6. Now press the (SELECT/EJECT PARK) button. The paper will be fed into the printer and adjusted past the print head to a position ready for printing.
7. If you want to set the paper to a different position, set the printer off-line by pressing the (ON LINE) button, then set the paper by using the micro-feed function. (For details, refer to Chapter 2.)
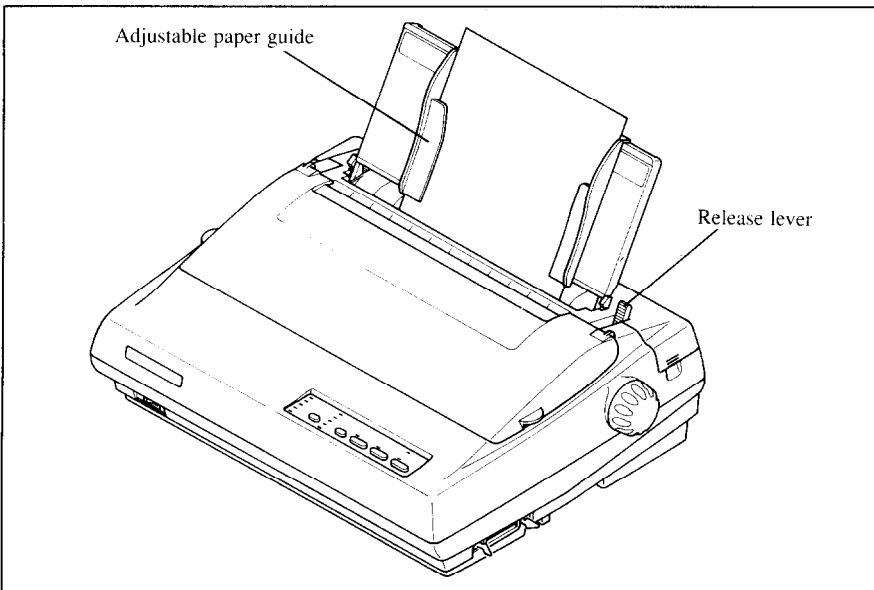
Figure 1-11. Loading a single sheet

Manual loading

It is also possible to load paper manually while the printer's power is off. The procedure is:

1. Place the paper guide in position by inserting the tabs, located on the bottom of the assembly, into the slots on the rear cover of the printer.
2. Check that printer power is off and the release lever is back.
3. Adjust the paper guides to match the size of paper you will be using. Remember that printing will start some distance from the left-hand edge of the carriage.
4. Place a single sheet between the guides, placing the side on which you want to print towards the back of the printer. Gently push the paper down in the guides until you feel it stop.
5. Turn the platen knob clockwise until the front edge of the paper comes out from under the top cover.
6. If the paper is not straight, move the release lever forward, then straighten the paper by hand and move the release lever back.

LOADING AND PARKING FANFOLD FORMS

Fanfold forms have holes along the sides and perforations between the sheets. They are also called sprocket forms, punched forms, or just plain "computer paper". This printer accepts forms up to 10" wide. This section will take you through the procedures for loading, parking and unparking fanfold forms.

NOTE: To get good line-feeding, put 1-inch space (non-printing area) around a perforation.

Loading the paper from the rear of the printer

You can load the fanfold paper either from the rear or from the bottom of the printer. If you are going to load the paper from the bottom, refer to the next section.

1. Place a stack of fanfold paper behind and at least one page-length below the printer.
2. Turn the printer's power OFF.
3. Push the release lever forward. This has the effect of releasing the paper from the platen roller, and engaging the tractor feed.
4. Remove the paper guide and put it aside for the moment.
5. Remove the rear cover using the two pits on either side, and push backwards as in Figure 1-12.
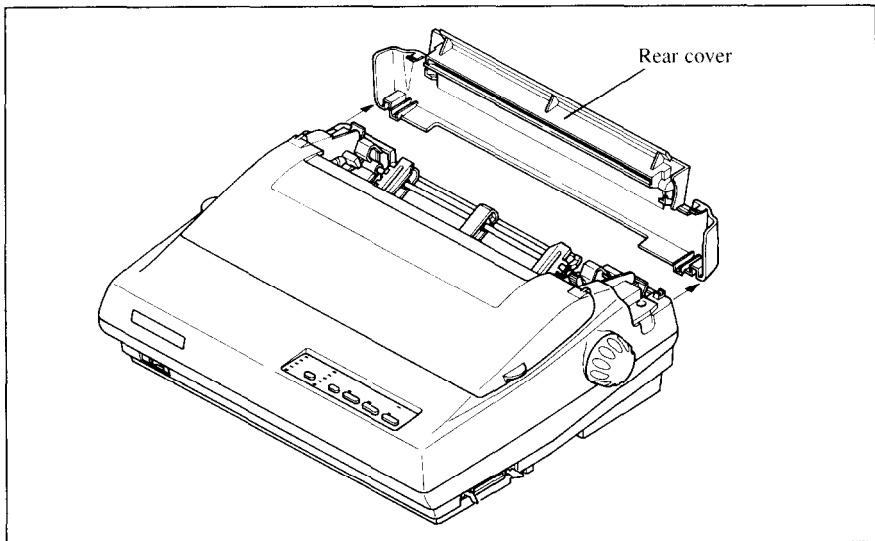
Rear cover

Figure 1-12. Removing the rear cover

6. Move the tractor units downwards by gripping the positioning levers on both side of the tractor unit as shown in Figure 1-13.
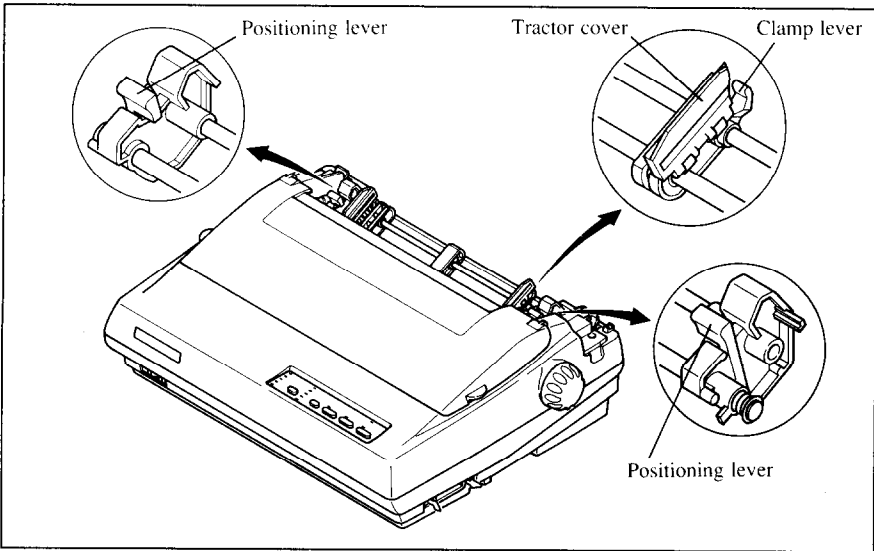
Figure 1-13. Move the tractor units downwards for loading the paper from the rear

7. With the tractor covers open, mount the paper by aligning holes with the pins on the tractor unit.
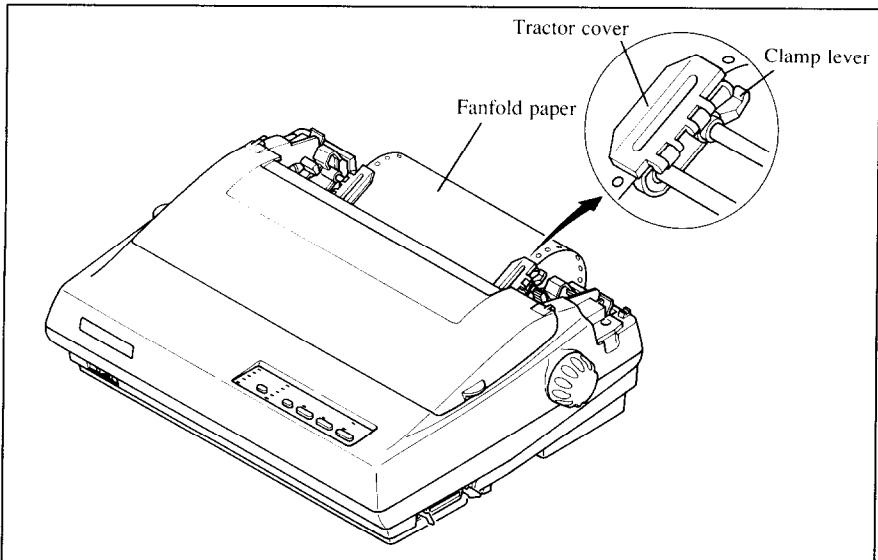
Figure 1-14. Mount the fanfold paper over the tractor units.

8. Adjust the spacing of the tractor units by sliding them along the bar, using the clamp lever at the back of each unit to release and lock them in position. When the clamp lever is up, the unit is released, and when it is down, the unit is locked.

9. Now close the tractor covers, again making sure that the paper holes are aligned with the pins on the tractor units. If they are not aligned properly, you will have problems with paper feeding, possibly resulting in tearing and jamming of the paper.

10. Turn on the power using the switch located at the front of the printer. The printer will beep, indicating that the paper is not yet fully loaded. The orange POWER indicator will also flash to confirm this.

11. Now press the (SET/EJECT PARK) button. The paper will be fed and adjusted past the print head to a position ready for printing.

12. If you want to set the paper to a different position, set the printer off-line by pressing the (ON LINE) button, then set the paper by using the micro-feed function. (For details, refer to Chapter 2.)

13. Replace the rear cover, and mount the paper guide in the horizontal position shown in Figure 1-15, so that it will separate the printed from the unprinted paper.
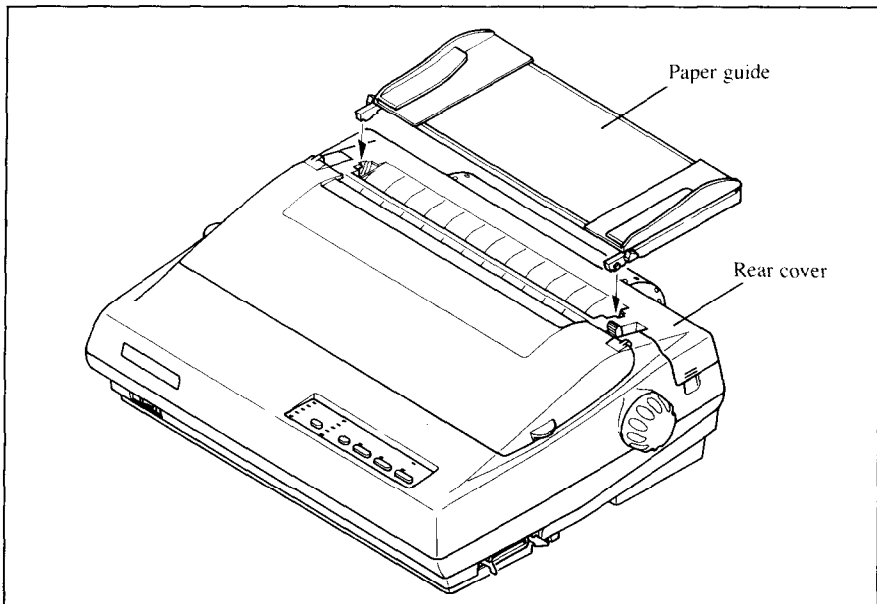
Figure 1-15. Mounting the paper guide for fanfold forms

Loading the paper from the bottom of the printer

You can load the fanfold paper from the bottom of the printer with the following procedure.

1. Remove the top cover and the roller unit.
2. Open the rear cover using the two pits at the side, and push backwards.
3. Grip the positioning levers on both side of the tractor unit, and pull the unit upwards as shown in Figure 1-16.
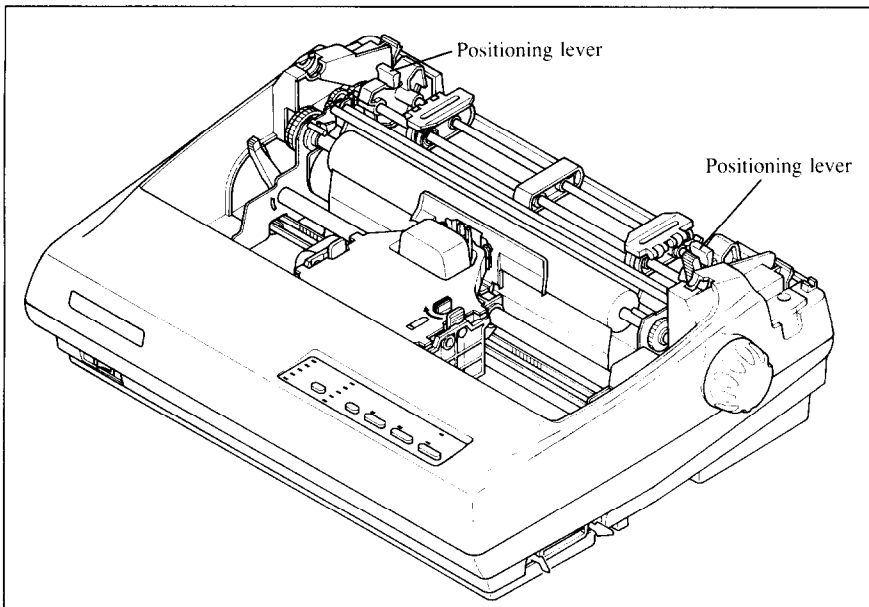
Figure 1-16. Pull up the tractor unit for bottom feeding

4. Place a stack of fanfold paper below the printer.
5. With the tractor covers open, mount the paper from the bottom of the printer, by aligning holes with the pins on the tractor unit.
6. Adjust the spacing of the tractor units by sliding them along the bar, using the clamp lever at the back of each unit to release and lock them in position. When the lever is up, the unit is released, and when it is down, the unit is locked.
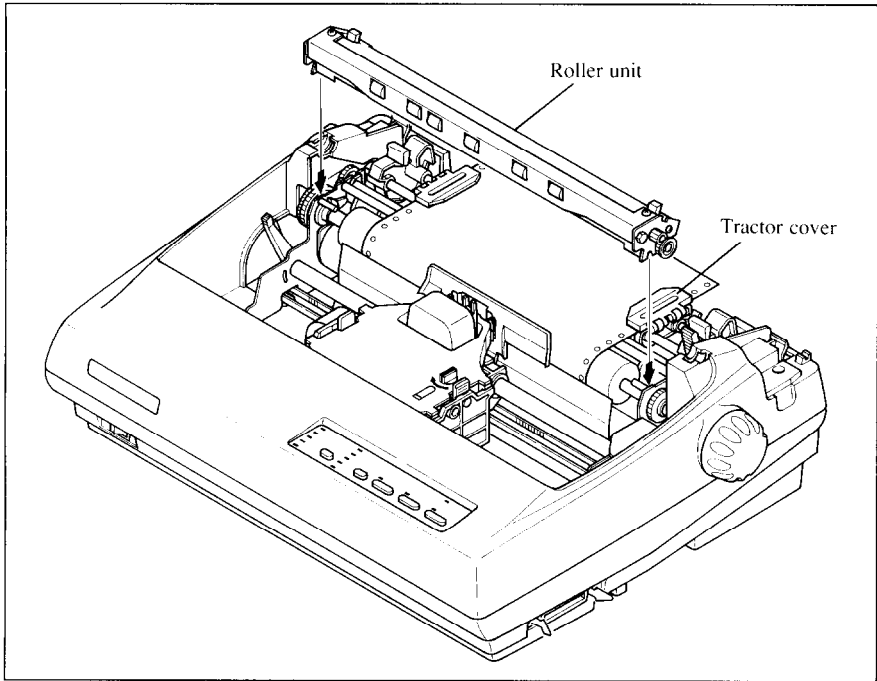
Figure 1-17. Install the roller unit after mounted the fanfold paper from the bottom of the printer.

7. Now close the tractor covers, again making sure that the paper holes are aligned with the pins on the tractor units. If they are not aligned properly, you will have problems with paper feeding, possibly resulting in tearing and jamming of the paper.

8. Remount the roller unit and replace the rear cover and the top cover.

Paper parking

After loading fanfold paper from the rear of the printer, you do not have to unload it when you want to print on a single sheet. The printer will "park" it for you if you follow the procedure below.

1. To begin paper parking, start with power ON, fanfold paper loaded in printing position, and the release lever forward.

2. Press the (ON LINE)button on the control panel to set the printer off-line. ON LINE indicator will turn off.

3. Tear off the printed form at the last perforation, leaving not more than about half a page showing above the top cover. If necessary, press the (PAPER FEED) button to feed paper forward until a perforation is located just above the top cover, and tear there.

17

4. Press the ⌈ˢᵉᵀ/ᴱᴶᴱᶜᵀ_ₚₐᵣₖ⌉ button on the control panel.
   The printer will automatically feed the fanfold form backward until the
   paper is completely free of the platen.
5. Move the release lever to the back.
6. Mount the paper guide in the upright position.

Now you can load single sheets either automatically or manually, as
explained previously. The fanfold paper remains parked at the back of the
printer.

NOTE: You cannot park the fanfold paper if you have loaded it from the
      bottom of the printer.

Paper unparking

When you want to resume using fanfold paper, the procedure is as follows.

1. Remove all single sheets from the printer.
2. Mount the paper guide in the horizontal position.
3. Move the release lever to the front.
4. Press the ⌈ˢᵉᵀ/ᴱᴶᴱᶜᵀ_ₚₐᵣₖ⌉ button. The printer will automatically feed the
   parked fanfold paper back into position for printing.

NOTE: The printer beeps intermittently if you move the release lever while
      the paper is loaded.

LOADING MULTI-PART FORMS

You can print on continuous multi-part forms with the built-in tractor unit. You can use multi-part forms that have up to five parts including the original when the Multi-part mode is selected with the EDS setting. (For details, please refer to Chapter 3.)

It is recommended to use forms jointed by dotted or pasting under the normal office condition.

Multi-part forms should be pressure sensitive, and should not be used in the friction feed. (Bottom feed with the pull-tractor is recommended.)

NOTE: When printing continuous multi-part forms, care should be taken, as the edges of the paper might be damaged.
The tolerance between the dotted or pasted position and other positions must be less than 0.05 mm.

ADJUSTING THE PRINTING GAP

The distance between the print head and the platen can be adjusted to accommodate different paper thicknesses. To make this adjustment, remove the top cover. The adjustment lever is located at the left side of the printer mechanism. Pushing the adjustment lever backwards narrows the gap; pulling it forwards widens the gap.

There are six positions, and you can feel the lever clicking into each position. The second position from the rear is the one most commonly used for single sheets of paper. Try different positions until you get the best printing results. (Do not set the lever out of the marked positions.)
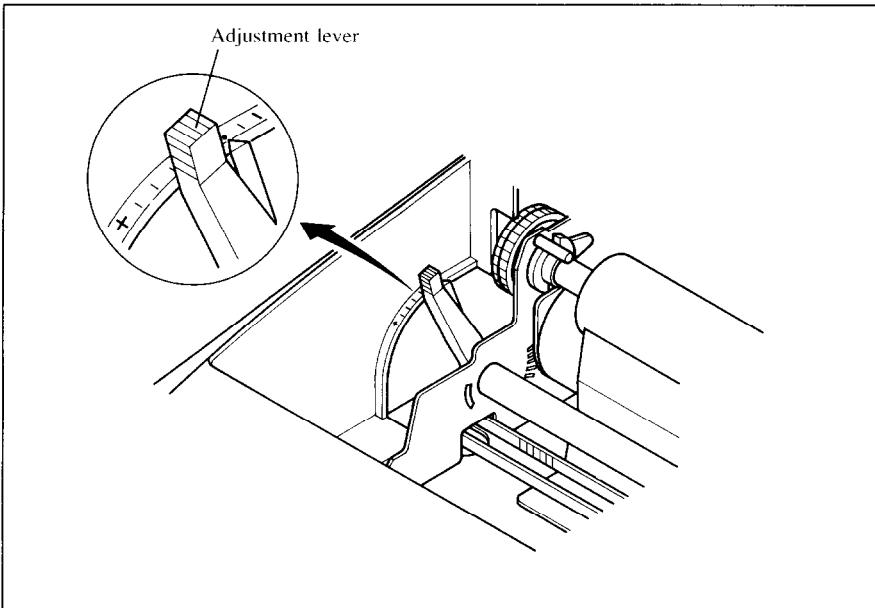
Figure 1-18. Location of the adjustment lever

The following table provides the recommended lever positions for each paper types as a reference.

Paper Type	Weight (g/m²) (Each paper)	Thickness (mm) (Total)	Recommended Lever position
Single	52 ~ 82	0.07 ~ 0.10	2nd
	83 ~ 90	0.11 ~ 0.12	3rd
2-ply	40 ~ 58	0.12 ~ 0.16	3rd
3-ply	40 ~ 58	0.18 ~ 0.20	3rd
		0.21 ~ 0.25	4th
4-ply	40 ~ 58	0.24 ~ 0.26	4th
		0.27 ~ 0.30	5th
5-ply	40 ~ 58	0.30 ~ 0.33	5th
		0.34 ~ 0.35	6th

NOTE: Pressure sensitive paper is recommended for the multi-part paper. Multi-part mode is recommended when using the 4-ply and 5-ply paper. (Refer to Chapter 3.)

MEMO

chapter 2
CONTROL PANEL OPERATIONS

The control panel buttons can be pressed individually to perform the operations indicated by their names. Other functions can be achieved by holding these buttons down when you turn the printer's power on, or by pressing the control panel buttons in combination.

This chapter explains all the button and indicator functions.
- Pause printing
- Feed paper (fast and slow, forward and reverse)
- Park fanfold forms
- Set the top-of-form position
- Select the print pitch
- Select a font
- Print test patterns
- Prevent software from changing the panel pitch and font selections
- Print a hexadecimal dump
- Clear the printer's buffer
- Change the print color (color printer only)
- Store macro definition

BUTTONS AND INDICATORS

The printer is equipped with five buttons on the control panel. From left to right they are, (FONT) and (PITCH) (smaller buttons), and (SET/EJECT PARK), (PAPER FEED), and (ON LINE) (larger buttons).

The following is a brief guide to the buttons and indicators on the control panel.
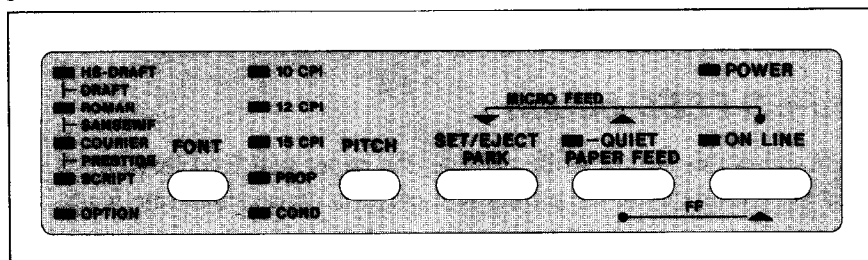
Figure 2-1. Control panel

ON LINE button

The ⟨ ON LINE ⟩ button sets the printer on-line and off-line. The status changes each time you press the button.

When the printer is on-line, it can receive and print data from the computer. When the printer is off-line, it stops printing and sends the computer a signal indicating that it cannot accept data.

The printer powers up in the on-line status if paper is loaded. If paper is not loaded, the printer powers up off-line with the POWER indicator flashing. When you load paper, the POWER indicator stops flashing, and the printer goes on-line.

You will want to press the ⟨ ON LINE ⟩ button:

• Before and after any other panel operation

   The other panel buttons operate only in the off-line state. Press the ⟨ ON LINE ⟩ button to go off-line. After performing the panel operation(s), press the ⟨ ON LINE ⟩ button again to go back on-line.

• To pause during printing

   If you press the ⟨ ON LINE ⟩ button during printing, the printer stops printing and goes off-line, allowing you to check the printout or change a control panel setting. Printing resumes when you press the ⟨ ON LINE ⟩ button again to go back on-line.

• To cut fanfold forms at the end of printing

   When using fanfold forms, you can hold the ⟨ ON LINE ⟩ button down for one second. In addition to going off-line, the printer also feeds the paper forward approximately two inches. This allows you to cut it off just below the last line printed.
   When you press the ⟨ ON LINE ⟩ button again to go back on-line, the paper feeds backward stopping where you left off.

   NOTE:This function is valid only when the buffer is empty.

PAPER FEED button

If you press this button while off-line, the paper will feed forward. If you hold the button down, the printer will perform consecutive line feeds.

If you also press the ⊂ ON LINE ⊃ button while you are line-feeding, the paper will feed automatically to the top of the next page. This is explained later.

If you press this button while on-line, this will alternately flash the QUIET indicator on and off. When in Quiet mode with the QUIET indicator lit, the printer will print slightly slower, but at a reduced noise level.

SET/EJECT/PARK button

NOTE: This button has no effect if the bottom feed mode is selected.

Pressing this button causes the printer to begin paper loading if the paper has not loaded while in the off-line state.

If the paper has been loaded, this button results in different functions depending on the position of the release lever.

If the release lever is forward for fanfold forms, pressing this button parks the forms.

If the release lever is back for single sheets, pressing this button ejects the paper.

PITCH button

This button allows you to select the printing pitch. Remember that the printer must be off-line for you to do this. Successive presses of this button will illuminate (and select) the following options in order (Note that semi-condesed pitch is not available in the IBM mode):

Pitch	Indicator(s)
Pica (10 CPI)	10 CPI
Elite (12 CPI)	12 CPI
Semi-condensed (15 CPI)	15 CPI
Condensed pica (17 CPI)	10 CPI, COND
Condensed elite (20 CPI)	12 CPI, COND
Proportional	PROP
Condensed proportional	PROP, COND

FONT button

This button selects the font to be printed. Draft font is selected at power-up unless the default settings are changed. To change to HS Draft (High-Speed Draft) or one of the LQ (Letter Quality) fonts, set the printer off-line, then press the (FONT) button repeatedly until the indicators beside the desired selection illuminate. The selections cycle in the following order:

Font	Indicator(s)
Draft	HS-DRAFT, ROMAN
Roman	ROMAN
Sanserif	ROMAN, COURIER
Courier	COURIER
Prestige	COURIER, SCRIPT
Script	SCRIPT
Option	OPTION
High-Speed Draft	HS-DRAFT

The Option Font selection will be skipped unless a font cartridge is installed.

POWER-UP FUNCTIONS

In addition to their normal functions, all the control panel buttons have special functions that operate if you hold them down while switching power on.
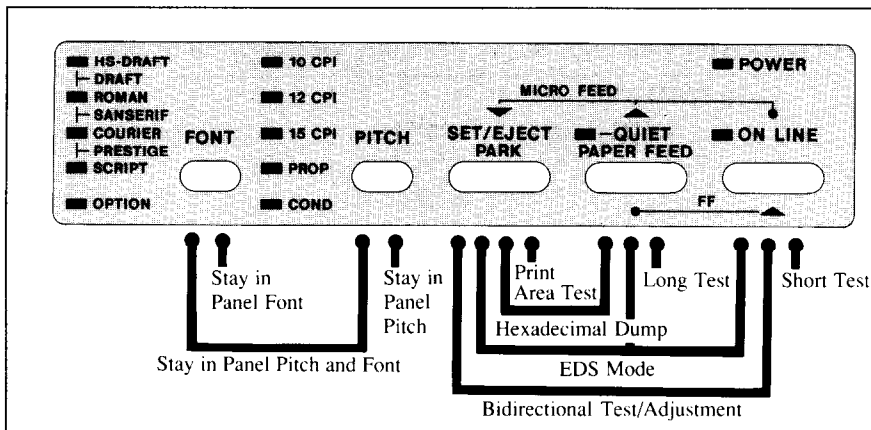
Figure 2-2. Power-up functions of control panel

Short test mode

If the printer is turned on while the ⟨ ON LINE ⟩ button is pressed, the printer will enter the short self-test mode. The printer will print the version number of the printer's ROM, followed by seven lines of the character set.

Each line will be offset by one character from the one before it. The final result will be something like Figure 2-3. (If the color ribbon is used with color printer, each line prints in a different color.)

Figure 2-3. Short self-test

Since the self-test occupies the full width of the carriage, it is recommended that the printer is loaded with the widest paper possible to avoid damage to the print head and/or platen.

Long test mode

If the printer is turned on while the (PAPER FEED) button is pressed, the printer will enter the long self-test mode. The printer will print the version number of the printer's ROM and the current EDS settings, followed by the whole character set printed in each font and pitch available.

The test cycles endlessly, so you must turn the power off to stop it.

Figure 2-4. Long self-test

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Since the self-test occupies the full width of the carriage, it is recommended that the printer is loaded with the widest paper possible to avoid damage to the print head and/or platen. In addition, the total number of lines printed is considerable, more than can be accomodated on a single sheet, so fanfold paper is recommended for this test.

Print area test mode

By holding the (SET/EJECT PARK) button down during power-up, the printer will enter the print area test mode. This way, you can find out how many lines on your paper are available for printing. The printer will print the first line message, then print the last line message after feeding to the bottom of the page.

If you have loaded the fanfold paper, only the first line message is printed.

Stay in Panel Pitch

By holding the (PITCH) button down during power-up, the print pitch can only be selected from the control panel. This prevents software interference. You will hear an acknowledging beep as power comes on.

After the beep tone, you can set the printer off-line, select a print pitch, then return to on-line and start printing. The pitch you selected will not be reset or otherwise changed by any commands your software may issue.

Stay in Panel Font

By holding the (FONT) button during power-up, fonts can only be selected from the control panel. This prevents software interference. There will be an acknowledging beep as power comes on, after which you can set the printer off-line, select a font, then return to the on-line state and begin printing. The selected font will not be changed by any commands your software may issue.

Stay in Panel Pitch and Font

If you want to protect both the pitch and font settings from software changes, press both the (PITCH) and (FONT) buttons during power-up. There will be two acknowledging beep tones.

Pressing these buttons during power-up does not prevent you from making any number of changes later from the control panel.

Hexadecimal dump

This feature is useful for programmers who are debugging printing programs and want to see the actual codes the printer is receiving. (Some computers change the codes the programmer intended.)

In this mode, all data received will be printed in a hexadecimal dump format, rather than the control codes being acted on as command codes.

This mode is accessed with the following procedure:

1. While holding both the (PAPER FEED) and (SELECT PARK) buttons down, turn power ON. A beep tone will be heard.
2. Begin printing. In place of the usual printout you will get a formatted dump showing exactly what data the printer receives. Each line presents sixteen characters, their hexadecimal codes to the left and printable characters printed on the right.
3. At the end of the hexadecimal dump, set the printer off-line with the (ON LINE) button. This is necessary to print the last line.

The following BASIC program is a simple test you can run in hexadecimal mode:

```
10 LPRINT WIDTH "LPT1:",255
20 FOR I=0 TO 255
30 LPRINT CHR$(I);
40 NEXT I
50 LPRINT
60 END
```

If your system passes the codes directly to the printer without changing them, you will get a printout like Figure 2-5.

```
00 01 02 03 04 05 06 07    08 09 0A 0B 0C 0D 0E 0F    ................
10 11 12 13 14 15 16 17    18 19 1A 1B 1C 1D 1E 1F    ................
20 21 22 23 24 25 26 27    28 29 2A 2B 2C 2D 2E 2F     !"#$%&'()*+,-./
30 31 32 33 34 35 36 37    38 39 3A 3B 3C 3D 3E 3F    0123456789:;<=>?
40 41 42 43 44 45 46 47    48 49 4A 4B 4C 4D 4E 4F    @ABCDEFGHIJKLMNO
50 51 52 53 54 55 56 57    58 59 5A 5B 5C 5D 5E 5F    PQRSTUVWXYZ[\]^_
60 61 62 63 64 65 66 67    68 69 6A 6B 6C 6D 6E 6F    `abcdefghijklmno
70 71 72 73 74 75 76 77    78 79 7A 7B 7C 7D 7E 7F    pqrstuvwxyz{|}~.
80 81 82 83 84 85 86 87    88 89 8A 8B 8C 8D 8E 8F    ................
90 91 92 93 94 95 96 97    98 99 9A 9B 9C 9D 9E 9F    ................
A0 A1 A2 A3 A4 A5 A6 A7    A8 A9 AA AB AC AD AE AF    ................
B0 B1 B2 B3 B4 B5 B6 B7    B8 B9 BA BB BC BD BE BF    ................
C0 C1 C2 C3 C4 C5 C6 C7    C8 C9 CA CB CC CD CE CF    ................
D0 D1 D2 D3 D4 D5 D6 D7    D8 D9 DA DB DC DD DE DF    ................
E0 E1 E2 E3 E4 E5 E6 E7    E8 E9 EA EB EC ED EE EF    ................
F0 F1 F2 F3 F4 F5 F6 F7    F8 F9 FA FB FC FD FE FF    ................
0D 0A                                                 ..
```

Figure 2-5. Sample hexadecimal dump

Most BASICs, however, are not quite that straightforward. For example, the IBM-PC will give you a printout similar to Figure 2-6.

```
00 01 02 03 04 05 06 07    08 09 0A 0B 0C 0D 0A 0E    ...............
0F 10 11 12 13 14 15 16    17 18 19 1B 1C 1D 1E 1F    ...............
20 21 22 23 24 25 26 27    28 29 2A 2B 2C 2D 2E 2F    !"#$%&'()*+,-./
30 31 32 33 34 35 36 37    38 39 3A 3B 3C 3D 3E 3F    0123456789:;<=>?
40 41 42 43 44 45 46 47    48 49 4A 4B 4C 4D 4E 4F    @ABCDEFGHIJKLMNO
50 51 52 53 54 55 56 57    58 59 5A 5B 5C 5D 5E 5F    PQRSTUVWXYZ[\]^_
60 61 62 63 64 65 66 67    68 69 6A 6B 6C 6D 6E 6F    `abcdefghijklmno
70 71 72 73 74 75 76 77    78 79 7A 7B 7C 7D 7E 7F    pqrstuvwxyz{|}~.
80 81 82 83 84 85 86 87    88 89 8A 8B 8C 8D 8E 8F    ...............
90 91 92 93 94 95 96 97    98 99 9A 9B 9C 9D 9E 9F    ...............
A0 A1 A2 A3 A4 A5 A6 A7    A8 A9 AA AB AC AD AE AF    ...............
B0 B1 B2 B3 B4 B5 B6 B7    B8 B9 BA BB BC BD BE BF    ...............
C0 C1 C2 C3 C4 C5 C6 C7    C8 C9 CA CB CC CD CE CF    ...............
D0 D1 D2 D3 D4 D5 D6 D7    D8 D9 DA DB DC DD DE DF    ...............
E0 E1 E2 E3 E4 E5 E6 E7    E8 E9 EA EB EC ED EE EF    ...............
F0 F1 F2 F3 F4 F5 F6 F7    F8 F9 FA FB FC FD FE FF    ...............
0D 0A                                                 ..
```

Figure 2-6. Sample hexadecimal dump with IBM-PC

When the IBM-PC BASIC interpreter sends hex code 0D (carriage return) it adds an extra hex 0A (line feed). Hex code 1A (end-of-file) also gets special treatment: the interpreter does not send it at all. This can cause problems with graphics or download character data. However, you can solve this problem by changing line 30 in the preceding program and adding the coding shown below.

Coding for IBM-PC with monochrome display:

```
30 GOSUB 100
100 X=INP(&H3BD) :IF X<128 THEN 100
110 OUT &H3BC,I :OUT &H3BE,5 :OUT &H3BE,4
120 RETURN
```

Coding for IBM-PC with color adapter:

```
30 GOSUB 100
100 X=INP(&H379) :IF X<128 THEN 100
110 OUT &H378,I :OUT &H37A,5 :OUT &H37A,4
120 RETURN
```

SWITCH COMBINATION FUNCTIONS

Several additional functions can be achieved by pressing the control panel buttons in combinations.
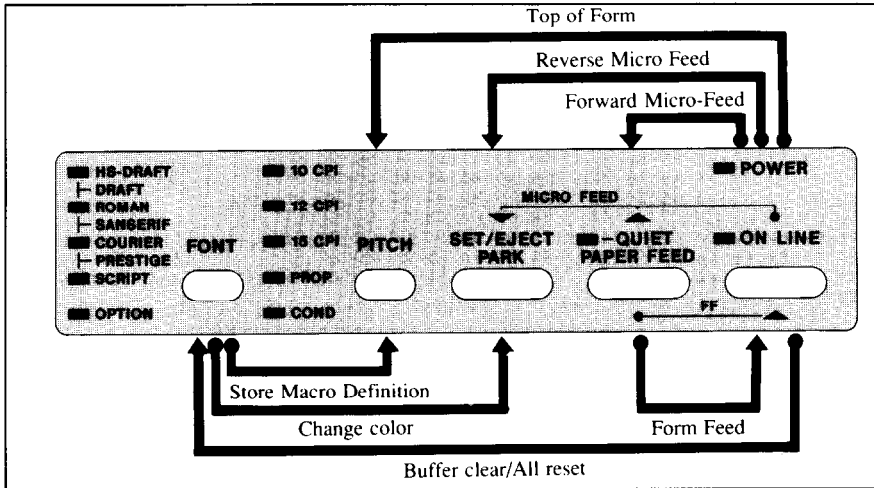
Figure 2-7. Switch combination functions of control panel

Form feed

If you are using single sheets, this operation ejects the current page. If you are using fanfold forms, it feeds to the top of the next page.

1. Press the (ON LINE) button to set the printer off-line.
2. Press the (PAPER FEED) button and hold it down. The printer will start performing successive line feeds.
3. While holding the (PAPER FEED) button down, press the (ON LINE) button, then release both buttons at the same time. The printer will smoothly eject the current page.

Top of form

When you power on the printer, the top-of-form position is automatically set to the current position. If this is not where you want the top of the page to be, you can change the top-of-form position as follows:

1. Press the (ON LINE) button to set the printer off-line.
2. Move the paper to the desired top-of-form position by pressing the (PAPER FEED) button, or by performing a forward or reverse micro-feed.

3. Press and hold the (ON LINE) button.
4. While holding the (ON LINE)button down, press the (PITCH) button, then release both buttons at the same time. The printer will beep to indicate that the top-of-form position has been set.

Forward micro-feed

For fine alignment, you can feed the paper forward in very small increments as follows:

1. Press the (ON LINE) button to set the printer off-line.
2. Press the (ON LINE) button again and hold it down.
3. While holding the (ON LINE) button down, press the (PAPER FEED) button. The paper will start advancing in a series of small steps. When you want to stop, release both buttons.

Reverse micro-feed

You can also feed the paper in small increments in reverse, to return to a higher position on the same page.

NOTE: With fanfold forms, do not try to return to a previous page. The perforation may catch inside the printer and cause a jam.

1. Press the (ON LINE) button to set the printer off-line.
2. Press the (ON LINE) button again and hold it down.
3. While holding the (ON LINE) button down, press the (SET/EJECT PARK) button. The paper will start moving backwards in a series of small steps. When you want to stop, release both buttons.

Changing the auto loading value

Normally, the printer automatically loads the paper one line from the top edge.
If you want to change this value, follow this procedure:

1. Load the paper using the (SET/EJECT PARK) button.
2. Change the print position using the micro feed function.
   The line on the card holder helps you to align the baseline of characters to be printed.
3. After you get the desired position, press the (ON LINE) button to save the value.

This value will remain unless you power off the printer. If you want to retain this value even after you turn off the power, store it using the Macro Definition function, which is described below.

Note that you can only change this value immediately after loading paper. If you feed paper, you cannot change the auto loading value.

Clearing the buffer/All reset

The printer stores received data in a large memory buffer. This creates a problem when you want to abandon a printing job and restart: the printer may be holding more data in its buffer than it has actually printed, and this unprinted data must be cleared out before restarting. Turning power off is one way to clear the buffer, but there is another way:

1. Halt the printing program on the computer. If printing stops immediately, the buffer is clear and the rest of this procedure is unnecessary. If printing does not stop, continue as follows:
2. Press the ⟨ ON LINE ⟩ button to set the printer off-line. Printing will now stop, but there may be data remaining in the buffer.
3. Press and hold the ⟨ ON LINE ⟩ button.
4. While pressing the ⟨ ON LINE ⟩ button down, press and hold the ⟨FONT⟩ button. Continue holding these two buttons down. In one second you will hear a beep tone signaling that the buffer has been cleared.
    If you hold these buttons more two seconds, you will hear three beep tones signaling that the printer has been initialized to the power-on default settings.
5. Release these buttons, make any necessary control panel settings, then set the printer back on-line.

It is essential to halt the printing program on the computer before you go off-line. Otherwise, when you go back on-line the computer will start sending data again and the printer will continue printing, with missing data where the buffer was cleared.

NOTE: If you are using the SPC-8K, Serial-Parallel Converter, reset the converter by pressing the red Clear button on it before you reset the printer.

Selecting the print color

Normally, the color printer prints with black even if the color ribbon is installed.

Without the aid of software, you can change the printing color as follows:

1. Press the ⊂ ON LINE ⊃ button to set the printer off-line.
2. Press the ⊂FONT⊃ button and hold it down.
3. While holding the ⊂FONT⊃ button, press the ⊂ SET/EJECT PARK ⊃ button.
   Each time you press the ⊂ SET/EJECT PARK ⊃ button, one of the indicators of FONT or PITCH will blink to show the current color as shown below.

Color	Indicator	Color	Indicator
Black	HS-DRAFT	Yellow	10 CPI
Magenta	ROMAN	Orange	12 CPI
Cyan	COURIER	Green	15 CPI
Violet	SCRIPT		

4. Release both buttons after you set the desired printing color.
   If you want to save the selected color for later use, store it using the Macro Definition.

NOTE: This function is valid only when the color ribbon is installed into the color printer.

Store Macro Definition

You can store the current settings to the printer for later use with the following procedure:

1. Press the ⊂ ON LINE ⊃ button to set the printer off-line.
2. Press the ⊂FONT⊃ button and hold it down.
3. While holding the ⊂FONT⊃ button down, press the ⊂PITCH⊃ button and hold them down until you hear two beep tones.
4. Release both buttons at the same time after the two beep tones to store the current setting.
   If you release these buttons after three beep tones, the macro is cleared.

NOTE: You can store the following settings with this procedure.
   • Current Font and Pitch
   • Current auto-loading amount for cut sheet
   • Current auto-loading amount for continuous paper
   • Current auto-loading amount in ASF mode

• Current print color (color printer only)

Data to be stored are controlled in Standard mode and IBM mode separately. For example, the data stored in the Standard mode are not effective in the IBM mode, and vice versa.

Chapter 3

DEFAULT SETTINGS

Most printers use a bank of DIP (Dual In-line Package) switches inside the printer to achieve various functions. However, this printer can change the power-up default settings by using the Electronic DIP Switch (EDS) mode.

This chapter explains how to use the EDS mode.

HOW TO SET THE EDS MODE

The EDS mode has 25 kinds of functions you can set as the power-on default.

To enter the EDS mode, turn the printer on while simultaneously holding the (SET/EJECT PARK) , (PAPER FEED) and (ON LINE) buttons.

In EDS mode, the indicators and the buttons on the control panel are used as shown below in Figure 3-1.

- Use the (FONT) button to select the Bank Number. One of the FONT indicators will illuminate to show the selected Bank Number.

- Use the (PITCH) button to select the Switch Number. One of the PITCH indicators will illuminate to show the selected Switch Number.

- The QUIET indicator shows the current setting.
  If you want to set it ON, press the (SET/EJECT PARK) button.

- Press the (PAPER FEED) button to print out the current settings.

- Press the (ON LINE) button to save the new settings and to exit the EDS mode.
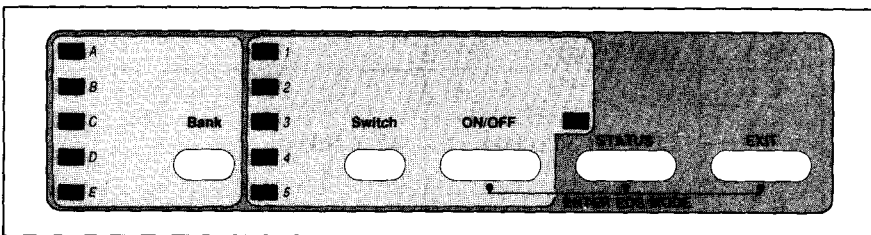
Figure 3-1. Button and indicator functions in the EDS mode

FUNCTIONS OF THE EDS SETTINGS

The printer is factory-set with all EDS switches in the ON position. These are the standard settings. By changing the settings, you can alter various printer functions to match your requirements. The following questions will help you choose the proper settings.

Number	Function	ON	OFF
A-1	Emulation	STANDARD	IBM
A-2	RAM Usage	Input Buffer	Download Buffer
A-3	Auto LF with CR	Disabled	Enabled
A-4	Auto Sheet Feeder	Not fitted	Fitted
A-5	Graphics Direction	Bi-directional	Uni-directional
B-1	Multi-part	Disabled	Enabled
B-2	Paper-out	Enabled	Disabled
B-3	Tear-off	Disabled	Enabled
B-4	(Reserved)	Leave ON	
B-5	Printable Area	Type A	Type B
C-1	Print Mode	(See below)	
C-2			
C-3	Page Length	(See below)	
C-4			
C-5	(Not Used)		
D-1	Character Table		
	(Standard mode)	Graphics	Italics
	(IBM mode)	IBM #2	IBM #1
D-2	IBM Code page or		
D-3	International	(See below)	
D-4	Character Set		
D-5	(Not Used)		
E-1			
E-2	LQ Font Selection	(See below)	
E-3			
E-4			
E-5	(Not Used)		

Switch A-1: Do you want to use the printer in Standard mode or IBM mode?

Select the mode compatible with your computer and software. In Standard mode the printer operates like the Epson LQ-860. In IBM mode it operates like the IBM Proprinter X24E. The ON position selects Standard mode. The OFF position selects IBM mode.

Switch A-2: Does your software download characters to the printer?

In order to download characters this switch must be in the OFF position. The printer then uses its RAM memory for storing character patterns and provides only a one-line print buffer. If you leave this switch ON, the printer uses its RAM memory as an input buffer, allowing the computer to send data faster than the printer prints.

NOTE: When you want to download characters with IBM mode by the monochrome version printer, you must install the optional RAM cartridge (RC-32Z). Otherwise, you cannot download even if this switch is set OFF.

Switch A-3: Do you want an automatic line feed?

If you leave this switch in the ON position, a separate line-feed code is required from your computer to obtain a line feed.

If you move this switch to the OFF position, the printer performs both a carriage return and line feed each time it receives a carriage-return code.

Most computer systems send a line feed code, or both a carriage return and line feed, at the end of each line, so this switch should be left ON.

If you get double line spacing when you expect single spacing, or if lines overprint each other, try changing the setting of this switch.

Switch A-4: Are you going to use the automatic sheet feeder (ASF)?

In order to use the automatic sheet feeder SF-10DQ, move this switch to the OFF position. Otherwise leave it ON.

Switch A-5: Are you going to print dot graphics uni-directionally?

When printing in dot graphics mode, the printer may either print bidirectionally (in alternate directions) for speed or in one direction only (unidirectional for increased accuracy). For practically all purposes, however, bidirectional printing is sufficiently accurate. In order to print uni-directionally, move this switch to the OFF position.

Switch B-1: Are you going to print on multi-part paper?

You can use up to 3-ply paper when this switch is ON. If you want to print on 4-ply or 5-ply paper, set this switch to the OFF position.

Switch B-2: Do you want the printer to stop printing at the end of the paper, or to keep printing?

When this switch is OFF the printer ignores the paper-out detector and prints down to (and beyond) the bottom edge. Otherwise leave it ON.

Switch B-3: Do you want to advance paper automatically at the end of printing?

You can select the Tear Off function with this switch OFF.

When using fanfold paper, the Tear Off function allows you to tear off one sheet of paper without fully advancing the following sheet.

Switch B-4: This switch is used for technical purpose only. Leave this switch ON.

Switch B-5: Which type of printing area do you want to use for single sheets?

This printer can use two types of printing area format for single sheets.

By putting the switch ON ("Type A"), the top of the first line of printing will start 1/6 inch from the top of the paper, and the printed area will end 1/6 inch from the bottom of the paper.

By putting the switch OFF ("Type B"), the first line of printing will start at one inch from the top of the paper, and the printed area will end 6 mm from the bottom of the printer.

Switches C-1 and C-2: Which print mode do you want to set?

These switches select the default print pitch and the fonts as shown below.

Print Mode	C-1	C-2
10CPI DRAFT	ON	ON
10CPI HS DRAFT	ON	OFF
17CPI DRAFT	OFF	ON
10CPI LQ	OFF	OFF

NOTE: If you change these switches after you have stored the macro, these settings will override the macro setting.

Switches C-3 and C-4: What is the page length of your paper?

Leave these switches ON if you will be using 11-inch forms. You will need to change the switches if you will be using a different page length as shown below:

Page Length	C-3	C-4
11 inches	ON	ON
A4 sized paper	ON	OFF
8 inches	OFF	ON
12 inches	OFF	OFF

Switch D-1: The action of this switch depends on the mode chosen with switch A-1.

If you selected Standard mode, do you want italic or graphic characters?

Move this switch OFF to print italics in the Standard character set. If you leave this switch in the ON position, in place of italics you will get the graphic characters, international characters, and mathematical symbols of IBM character set #2. See Chapter 9, character codes 128 to 254.

If you selected IBM mode, do you want IBM character set #1 or #2?

ON selects character set #2, which is for computers with an 8-bit interface (the most common kind). OFF selects character set #1, for computers with a 7-bit interface.

Switches D-2 to D-4: Do you want an international character set or IBM code page?

International character sets differ in their assignment of 14 character codes in the Standard Italic character set. See the character tables at the back of this manual. With these switches you can select one of eight character sets as follows:

Country	D-2	D-3	D-4	Country	D-2	D-3	D-4
U.S.A.	ON	ON	ON	Denmark I	ON	ON	OFF
France	OFF	ON	ON	Sweden	OFF	ON	OFF
Germany	ON	OFF	ON	Italy	ON	OFF	OFF
England	OFF	OFF	ON	Spain I	OFF	OFF	OFF

Except in the Standard Italic character set, these switches select the default character code page as shown below:

IBM Code Page	D-2	D-3	D-4	IBM Code Page	D-2	D-3	D-4
#437 U.S.A.	ON	ON	ON	#863 Canadian French	ON	ON	OFF
#850 Multi-lingual	OFF	ON	ON	#865 Nordic	OFF	ON	OFF
#860 Portuguese	ON	OFF	ON	(Reserved)	ON	OFF	OFF
#861 Icelandic	OFF	OFF	ON	(Reserved)	OFF	OFF	OFF

Switches E-1 to E-4: Which font do you want to print as the default Letter Quality?

These switches allows you to choose the default font selected when LQ mode is selected, as shown below.

Font Name	E-1	E-2	E-3	E-4	Font Name	E-1	E-2	E-3	E-4
Roman	ON	ON	ON	ON	Orator 2*	ON	ON	ON	OFF
Sanserif	OFF	ON	ON	ON	TW-Light*	OFF	ON	ON	OFF
Courier	ON	OFF	ON	ON	Letter-Gothic*	ON	OFF	ON	OFF
Prestige	OFF	OFF	ON	ON	Blippo*	OFF	OFF	ON	OFF
Script	ON	ON	OFF	ON	H-Gothic*	ON	ON	OFF	OFF
OCR-B*	OFF	ON	OFF	ON	Orane*	OFF	ON	OFF	OFF
OCR-A*	ON	OFF	OFF	ON	Cinema*	ON	OFF	OFF	OFF
Orator*	OFF	OFF	OFF	ON	Code 39*	OFF	OFF	OFF	OFF

Optional fonts (marked with an asterisk) can be selected only when the corresponding font cartridge is installed in the printer.

If the corresponding font cartridge is not installed, then Roman is selected.

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BIDIRECTIONAL TEST/ADJUSTMENT MODE

This mode is used to adjust the alignment of the print head on successive bidirectional passes. After a period of some months, your printer may work itself out of alignment on left and right printing passes. This will be most evident in graphics printing. This mode will probably be used very rarely.

1. Turn the printer off and then turn it on again while holding down the (SF EJECT PARK) and (ON LINE) buttons. The printer will then print something like the following:

```
*** DOT ADJUSTMENT SETTING ***

LQ          0 :   /////////////////////////////////////////////
```

2. The printer will feed the paper forwards and backwards during this operation, allowing you to view the paper for optimum alignment.
3. To adjust the printing, use the (SET EJECT PARK) and (PAPER FEED) buttons. The (SET EJECT PARK) button will move the second pass to the left. The (PAPER FEED) button will move the second pass to the right.

```
            *** DOT ADJUSTMENT SETTING ***

            LQ          0 :   /////////////////////////////////////////////
( SET EJECT PARK )►LQ       -1 :   //////////////////////////////////////////////
( PAPER FEED )►LQ           0 :   /////////////////////////////////////////////
```

4. When the two passes are aligned with each other to form one continuous line, the bidirectional alignment test is completed.
5. To change the mode for which the bidirectional adjustment is performed, press the (ON LINE) button. This will cycle between "LQ", "DRAFT" and "DRAFT COND".
   Repeat the process for all print modes.

```
            ***, DOT ADJUSTMENT SETTING ***

            LQ          0 :   /////////////////////////////////////////////
( SET EJECT PARK )►LQ       -1 :   //////////////////////////////////////////////
( PAPER FEED )►LQ           0 :   /////////////////////////////////////////////
( ON LINE )►DRAFT           0 :   /////////////////////////////////////////////
( PAPER FEED )►DRAFT       +1 :   $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
( SET EJECT PARK )►DRAFT    0 :   /////////////////////////////////////////////
```

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6. To save the corrected values and to exit from this mode, press the (PITCH) button.

```
                  *** DOT ADJUSTMENT SETTING ***
                 LQ            0 :   /////////////////////////////////////////
  (  SEL/EJECT  )  LQ         -1 :   //////////////////////////////////////////
  (PAPER FEED)    LQ           0 :   /////////////////////////////////////////
  (  ON LINE  )   DRAFT        0 :   /////////////////////////////////////////
  (PAPER FEED)    DRAFT       +1 :   ////////////////////////////////////////////
  (  SEL/EJECT  )  DRAFT        0 :   /////////////////////////////////////////
  (  ON LINE  )   DRAFT COND   0 :   ///////////////////////////////////////////////////
      (PITCH)      *** END ***
```

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Chapter 4
PRINTER CONTROL COMMANDS

The printer has two emulation modes: Standard mode and IBM mode. In standard mode, the printer emulates the functions of the Epson LQ-860. In IBM mode, the printer emulates the IBM Proprinter X24E. Additional command codes are included as a superset of these emulations.

The emulation is changed by means of EDS switch A-1. When ON, the printer will be in standard mode, and when OFF, the printer will be in IBM mode (see Chapter 3). It is not possible to change the emulation mode by means of software control.

This chapter describes the printer's control commands. Some commands are common to both the standard and IBM modes. In the descriptions of the commands, all commands will be categorized by function. The name of each command is followed by a table like the one below:

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "x" "1"	27 120 49	1B 78 31
	<ESC> "x" <1>	27 120 1	1B 78 01

Mode: Indicates the mode in which the command is recognized.
                     Std.   Standard mode (EDS switch A-1 on)
                     IBM IBM mode (EDS switch A-1 off)
                     Both Both standard and IBM modes

ASCII: Indicates the ASCII coding of the command. Control characters are enclosed in pointed brackets: For example, <1> means character code 1.

Decimal: Gives the command in decimal character codes.

Hexadecimal: Gives the command in hexadecimal character codes.

Parameters for which values must be supplied are indicated by italic letters such as *n*.

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FONT CONTROL COMMANDS

Select draft quality characters

Mode	ASCII	Decimal	Hexadecimal
Both	"(" "(" "F" ")" ")" "9"	40 40 70 41 41 57	28 28 46 29 29 39
Std.	<ESC> "x" "0"	27 120 48	1B 78 30
	<ESC> "x" <0>	27 120 0	1B 78 00

Changes from letter quality to draft quality. Ignored if the (FONT) button was pressed during power-up.

Select draft pica characters

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "I" <0>	27 73 0	1B 49 00

Changes to draft quality characters with pica pitch (10 cpi). Ignored if the (FONT) or (PITCH) button was pressed during power-up.

Select draft elite characters

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "I" <8>	27 73 8	1B 49 08

Changes to draft quality characters with elite pitch (12 cpi). Ignored if the (FONT) or (PITCH) button was pressed during power-up.

Select draft condensed characters

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "I" <DLE>	27 73 16	1B 49 10

Changes to draft quality characters with condensed pitch (17 cpi). Ignored if the (FONT) or (PITCH) button was pressed during power-up.

Select LQ characters

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "x" "1"	27 120 49	1B 78 31
	<ESC> "x" <1>	27 120 1	1B 78 01

Changes from draft quality to letter quality. The initial LQ font is Roman unless a different font has been selected by a preceding command. Ignored if the (FONT) button was pressed during power-up.

Select LQ pica characters

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "I" <2>	27 73 2	1B 49 02

Changes to letter quality characters with pica pitch (10 cpi). Ignored if the (FONT) or (PITCH) button was pressed during power-up.

Select LQ elite characters

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "I" <LF>	27 73 10	1B 49 0A

Changes to letter quality characters with elite pitch (12 cpi). Ignored if the (FONT) or (PITCH) button was pressed during power-up.

Select LQ condensed characters

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "I" <DC2>	27 73 18	1B 49 12

Changes to letter quality characters with condensed pitch (17 cpi). Ignored if the (FONT) or (PITCH) button was pressed during power-up.

Select LQ proportional characters

Mode	ASCII	Decimal	Hexadecimal
IBM	\<ESC> "I" \<3>	27 73 3	1B 49 03

Changes to letter quality characters with proportional pitch. Ignored if the (FONT) or (PITCH) button was pressed during power-up.

Select LQ font

Mode	ASCII	Decimal	Hexadecimal
Both	\<ESC> "k" *n*	27 107 *n*	1B 6B *n*
Std.	\<FS> "C" *n*	28 67 *n*	1C 43 *n*

Selects an LQ font according to the value of *n*. In draft mode, this command remains dormant and takes effect later when LQ is selected. Ignored if the (FONT) button was pressed during power-up or the corresponding font is not installed.

n	Font		*n*	Font	
0	Roman		8	Orator 2	(Option)
1	Sanserif		9	TW-Light	(Option)
2	Courier		10	Letter Gothic	(Option)
3	Prestige		11	Blippo	(Option)
4	Script		12	H-Gothic	(Option)
5	OCR-B	(Option)	13	Orane	(Option)
6	OCR-A	(Option)	14	Cinema	(Option)
7	Orator	(Option)	15	Code 39	(Option)

Select font

Mode	ASCII	Decimal	Hexadecimal
Both	"(" "(" "F" ")" ")" *n*	40 40 70 41 41 *n*	28 28 46 29 29 *n*

Changes a font according to the value of *n*. Ignored if the (FONT) button was pressed during power-up.

n	Font		*n*	Font
0	Roman		3	Prestige
1	Sanserif		4	Script
2	Courier		9	Draft

Select italic characters

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "4"	27 52	1B 34

Causes subsequent characters to be printed in italics.

Select upright characters

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "5"	27 53	1B 35

Stops italic printing and causes subsequent characters to be printed upright.

Emphasized printing

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "E"	27 69	1B 45

Causes subsequent characters to be emphasized by adding extra thickness to vertical strokes.

Cancel emphasized printing

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "F"	27 70	1B 46

Cancels emphasized printing.

Double-strike printing

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "G"	27 71	1B 47

Causes subsequent characters to be printed in double-strike mode with a slight vertical paper motion in between, causing a thickening of horizontal strokes.
For bold print, use of double-strike is recommended in LQ mode, and combined use of emphasized and double-strike is recommended in draft mode.

Cancel double-strike printing

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "H"	27 72	1B 48

Cancels double-strike printing.

Start underlining

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "–" "1"	27 45 49	1B 2D 31
	<ESC> "–" <1>	27 45 1	1B 2D 01

Causes subsequent characters to be underlined. IBM block graphics characters and spaces skipped by horizontal tabulation are not underlined.

Stop underlining

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "–" "0"	27 45 48	1B 2D 30
	<ESC> "–" <0>	27 45 0	1B 2D 00

Stops underlining.

Start overlining

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> " _ " "1"	27 95 49	1B 5F 31
	<ESC> " _ " <1>	27 95 1	1B 5F 01

Causes subsequent characters to be overlined. Spaces skipped by horizontal tabulation are not overlined.

Stop overlining

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> " _ " "0"	27 95 48	1B 5F 30
	<ESC> " _ " <0>	27 95 0	1B 5F 00

Stops overlining.

Select score

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "(" "–" <3> <0> <1> *n1* *n2*	27 40 45 3 0 1 *n1* *n2*	1B 28 2D 03 00 01 *n1* *n2*

Start score according to the values of *n1* and *n2*, as shown below.

n1	Function
1	Underlining
2	Strike-through
3	Overlining

n2	Function
0	Cancel score
1	Single continuous line
2	Double continuous line
5	Single broken line
6	Double broken line

Select ornament character

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "q" *n*	27 113 *n*	1B 71 *n*

Selects an ornament character according to the value of *n*, as shown below.

n	Character
0	Normal
1	Outline
2	Shadow
3	Shadow and outline

Superscript

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "S" "0"	27 83 48	1B 53 30
	<ESC> "S" <0>	27 83 0	1B 53 00

Causes subsequent characters to be printed as superscripts. Does not change the character pitch.

Subscript

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "S" "1"	27 83 49	1B 53 31
	<ESC> "S" <1>	27 83 1	1B 53 01

Causes subsequent characters to be printed as subscripts. Does not change the character pitch.

Cancel superscript or subscript

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "T"	27 84	1B 54

Stops printing superscripts or subscripts and returns to normal printing.

CHARACTER SET COMMANDS

Select standard character set

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "t" "0"	27 116 48	1B 74 30
	<ESC> "t" <0>	27 116 0	1B 74 00
Std.	<FS> "I" "0"	28 73 48	1C 49 30
	<FS> "I" <0>	28 73 0	1C 49 00

Selects the standard character set. This is the power-up default in Standard mode if EDS switch D-1 is OFF.

Select IBM character set

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "t" "1"	27 116 49	1B 74 31
	<ESC> "t" <1>	27 116 1	1B 74 01
Std.	<FS> "I" "1"	28 73 49	1C 49 31
	<FS> "I" <1>	28 73 1	1C 49 01

Selects an IBM character set. This is the power-up default in IBM mode.

Select character set #1

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "7"	27 55	1B 37

Selects character set #1.

Select character set #2

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "6"	27 54	1B 36

Selects character set #2.

Select international character set

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "R" n	27 82 n	1B 52 n

Selects an international character set in the Standard character set according to the value of n.

n	Character set	n	Character set
0	U.S.A	8	Japan
1	France	9	Norway
2	Germany	10	Denmark II
3	England	11	Spain II
4	Denmark I	12	Latin America
5	Sweden	13	Korea
6	Italy	14	Irish
7	Spain I	64	Legal

The first eight of these character sets (from U.S.A. to Spain I) can be selected as power-up defaults by EDS switches D-2 to D-4.

Select IBM code page

Mode	ASCII					Decimal					Hexadecimal				
Both	<ESC>	"["	"T"	<4>	<0>	27	91	84	4	0	1B	5B	54	04	00
	<0>	<0>	*n1*	*n2*		0	0	*n1*	*n2*		00	00	*n1*	*n2*	

Changes the code page of the current IBM character set according
to the values of *n1* and *n2*.

n1	*n2*	Code page
1	181	#437 U.S.A.
3	82	#850 Multi-lingual
3	92	#860 Portuguese
3	93	#861 Icelandic
3	95	#863 Canadian French
3	97	#865 Nordic

These code pages can be selected as power-up defaults by EDS
switches D-2 to D-4.

Enable printing of all character codes

Mode	ASCII			Decimal			Hexadecimal		
IBM	<ESC>	"\"	*n1* *n2*	27	92	*n1* *n2*	1B	5C	*n1* *n2*

Enables printing of all characters in the IBM character set, including
those assigned to character codes which are normally considered
control codes. This command remains in effect for the next *n1* + *n2*
× 256 characters, where *n1* and *n2* are numbers between 0 and 255.
During this interval no control functions are executed. If a code with
no assigned character is received, the printer prints a space.

Enable printing of all character codes on next character

Mode	ASCII		Decimal		Hexadecimal	
IBM	<ESC>	" ^ "	27	94	1B	5E

This command operates like <ESC> "\" except that it remains in
effect for only one character.

Select slash zero

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> " ~ " "1"	27 126 49	1B 7E 31
	<ESC> " ~ " <1>	27 126 1	1B 7E 01

Causes subsequent zero characters to be overprinted with a slash (0).

Select normal zero

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> " ~ " "0"	27 126 48	1B 7E 30
	<ESC> " ~ " <0>	27 126 0	1B 7E 00

Causes subsequent zero characters to be printed normally (0), without a slash.

CHARACTER SIZE AND PITCH COMMANDS

Pica pitch

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "P"	27 80	1B 50
IBM	<DC2>	18	12

In Standard mode, changes from either elite or semi-condensed to pica pitch (10 cpi) or from condensed elite to condensed pica (17 cpi). In IBM mode, changes from either elite or condensed to pica (10 cpi). Ignored if the (PITCH) button was pressed during power-up.

Elite pitch

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "M"	27 77	1B 4D
IBM	<ESC> "·"	27 58	1B 3A

Changes from either pica or semi-condensed to elite pitch (12 cpi) or from condensed pica to condensed elite (20 cpi). Ignored if the (PITCH) button was pressed during power-up.

Semi-condensed pitch

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "g"	27 103	1B 67

Changes from either pica or elite to semi-condensed pitch (15 cpi). Ignored if the (PITCH) button was pressed during power-up.

Condensed printing

Mode	ASCII	Decimal	Hexadecimal
Both	<SI>	15	0F
	<ESC> <SI>	27 15	1B 0F

Changes from pica to condensed pica (17 cpi) or from elite to condensed elite (20 cpi). Ignored if the (PITCH) button was pressed during power-up.

Cancel condensed printing

Mode	ASCII	Decimal	Hexadecimal
Both	<DC2>	18	12

In Standard mode, changes from condensed pica to normal pica or from condensed elite to normal elite. In IBM mode, always changes to normal pica. Ignored if the (PITCH) button was pressed during power-up.

Expanded printing

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "W" "1"	27 87 49	1B 57 31
	<ESC> "W" <1>	27 87 1	1B 57 01

Causes subsequent characters to be expanded to double width.

Cancel expanded printing

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "W" "0"	27 87 48	1B 57 30
	<ESC> "W" <0>	27 87 0	1B 57 00

Stops expanded printing and returns to normal width.

Expanded printing for one line

Mode	ASCII	Decimal	Hexadecimal
Both	<SO>	14	0E
	<ESC> <SO>	27 14	1B 0E

Causes subsequent characters in the current line to be expanded to double width. Characters return to normal width after the next line feed (<LF>). The <DC4>, <VT>, <FF>, and <ESC> "W" 0 commands also cancel expanded printing.

Cancel one-line expanded printing

Mode	ASCII	Decimal	Hexadecimal
Both	<DC4>	20	14

Stops one-line expanded printing set with <SO> or <ESC> <SO>. Does not cancel <ESC> "W" 1.

Select character width

Mode	ASCII	Decimal	Hexadecimal
Std.	<FS> "E" n	28 69 n	1C 45 n

Select a character width according to the value of n as shown below.

n Character width
0   Normal-wide
1   Double-wide
2   Triple-wide

Select proportional spacing

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "p" "1"	27 112 49	1B 70 31
	<ESC> "p" <1>	27 112 1	1B 70 01
IBM	<ESC> "P" <1>	27 80 1	1B 50 01

Causes subsequent characters to be proportionally spaced. Ignored if the (PITCH) button was pressed during power-up.

Select fixed spacing

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "p" "0"	27 112 48	1B 70 30
	<ESC> "p" <0>	27 112 0	1B 70 00
IBM	<ESC> "P" <0>	27 80 0	1B 50 00

Causes subsequent characters to be printed with fixed character spacing. Ignored if the (PITCH) button was pressed during power-up.

Select master print mode

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "!" n	27 33 n	1B 21 n

Selects a combined print mode according to the value of n. The value of n is the sum of the values given below for the desired characteristics.

Examples: $n = 1$ gives elite; $n = 9$ $(1 + 8)$ gives emphasized elite; $n = 137$ $(1 + 8 + 128)$ gives underlined emphasized elite.

Function	n value
Underline	128
Italic	64
Expanded	32
Double strike	16
Emphasized	8
Condensed [*]	4
Proportional [*]	2
Elite [*]	1

[*] Ignored if the (PITCH) button was pressed during power-up.

Increase character spacing

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> <SP> n	27 32 n	1B 20 n

Increases the space between characters by n dots, where n is a number from 0 to 127. Used in microjustification.

Select double or quadruple size

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "h" *n*	27 104 *n*	1B 68 *n*

Selects the size of subsequent characters as shown below. Extra-high characters align along the cap-line of normal characters, with the base line temporarily moving down. Line spacing is temporarily doubled when $n = 1$ and quadrupled when $n = 2$.

n	Effect
0	Normal size
1	Double-high, double-wide
2	Quadruple-high, quadruple-wide

Select character size

Mode	ASCII	Decimal	Hexadecimal
Both	"(" "(" "S" ")" ")" *n*	40 40 83 41 41 *n*	28 28 53 29 29 *n*

Selects a combination of character height and width according to the value of *n*, as below. Does not move the base line.

n	Character width	Character height
0	Single width	Single height
1	Double width	Single height
2	Single width	Double height
3	Double width	Double height

Print double-height characters

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "w" "1"	27 119 49	1B 77 31
	<ESC> "w" <1>	27 119 1	1B 77 01
	<FS> "V" "1"	28 86 49	1C 56 31
	<FS> "V" <1>	28 86 1	1C 56 01

Prints subsequent characters at double height without moving the base line, and without changing the line spacing.

Return to normal height

Mode	ASCII	Decimal	Hexadecimal
Std.	\<ESC\> "w" "0"	27 119 48	1B 77 30
	\<ESC\> "w" \<0\>	27 119 0	1B 77 00
	\<FS\> "V" "0"	28 86 48	1C 56 30
	\<FS\> "V" \<0\>	28 86 0	1C 56 00

Terminates double-height printing and prints subsequent characters at normal height.

Select character height, width, and line spacing

Mode	ASCII	Decimal	Hexadecimal
IBM	\<ESC\> "[" "@" \<4\> \<0\> \<0\> \<0\> *n* *m*	27 91 64 4 0 0 0 *n* *m*	1B 5B 40 04 00 00 00 *n* *m*

Selects a combination of character height, width, and line spacing according to the value of *n* and *m*, as below. Does not move the base line.

n	Line spacing	Character height
0	Unchanged	Unchanged
1	Unchanged	Single height
2	Unchanged	Double height
16	Single	Unchanged
17	Single	Single height
18	Single	Double height
32	Double	Unchanged
33	Double	Single height
34	Double	Double height

m	Character width
1	Single width (same as \<ESC\> "W" 0)
2	Double width (same as \<ESC\> "W" 1)

VERTICAL POSITION COMMANDS

Set line spacing to 1/8 inch

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "0"	27 48	1B 30

Sets the distance the paper advances or reverses in subsequent line feeds to 1/8 inch.

Set line spacing to 7/60 or 7/72 inch

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "1"	27 49	1B 31

Sets the distance the paper advances or reverses in subsequent line feeds to 7/60 inch (standard mode) or 7/72 inch (IBM mode).

Set line spacing to 1/6 inch

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "2"	27 50	1B 32

Sets the distance the paper advances or reverses in subsequent line feeds to 1/6 inch.

Set line spacing to n/360 inch

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "+" *n*	27 43 *n*	1B 2B *n*
	<FS> "3" *n*	28 51 *n*	1C 33 *n*

Sets the distance the paper advances or reverses in subsequent line feeds to *n*/360 inch, where *n* is between 0 and 255.

Set base unit for line spacing

Mode	ASCII	Decimal	Hexadecimal
IBM	\<ESC> "[" "\\" \<4> \<0> \<0> \<0> \<0> *n*	27 91 92 4 0 0 0 0 *n*	1B 5B 5C 04 00 00 00 00 *n*

Sets the base unit for the line spacing commands, \<ESC> "3" and \<ESC> "J". If the value of *n* is 180, the base unit is set to 1/180". If the value of *n* is 216, the base unit is set to 1/216". If otherwise specified, this command is ignored. This command becomes effective only after \<ESC> "3" or \<ESC> "J" is received, The default base unit is set to 1/216".

Set line spacing to *n*/180 inch or *n*/216 inch

Mode	ASCII	Decimal	Hexadecimal
Both	\<ESC> "3" *n*	27 51 *n*	1B 33 *n*

Sets the distance the paper advances or reverses in subsequent line feeds to *n*/180 inch or *n*/216 inch, where *n* is between 0 and 255. If *n*= 0, in Standard mode the line-feed distance is set to 0, but in IBM mode this command is ignored.

Set line spacing to *n*/60 inch or *n*/72 inch

Mode	ASCII	Decimal	Hexadecimal
Both	\<ESC> "A" *n*	27 65 *n*	1B 41 *n*

In Standard mode, sets the distance the paper advances or reverses in subsequent line feeds to *n*/60 inch, where *n* is between 0 and 255. If *n* =0, the line spacing is set to 0.

In IBM mode, this command defines the distance the paper advances or reverses in subsequent line feeds to *n*/72 inch, where *n* is between 1 and 85. The new line spacing does not take effect until the next \<ESC> "2" command.

Execute <ESC> "A"

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "2"	27 50	1B 32

Sets the line spacing to the value defined by the last preceding <ESC> "A" command. Sets the line spacing to 1/6 inch if there is no preceding <ESC> "A" command.

Line feed

Mode	ASCII	Decimal	Hexadecimal
Both	<LF>	10	0A

Prints the current line and feeds the paper to the next line. See the preceding commands for the line spacing.

Reverse line feed

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> <LF>	27 10	1B 0A
IBM	<ESC> "]"	27 93	1B 5D

Prints the current line and feeds the paper in the reverse direction to the preceding line. See the preceding commands for the line spacing. Ignored when friction feed is used.

Select forward feed mode

Mode	ASCII	Decimal	Hexadecimal
Std.	<FS> "F"	28 70	1C 46

Cancels the reverse feed mode and selects forward feed mode. This is the default setting at power-on.

Select reverse feed mode

Mode	ASCII	Decimal	Hexadecimal
Std.	<FS> "R"	28 82	1C 52

Selects reverse feed mode. Reverses the direction of all vertical movements. Ignored when friction feed or bottom feed is used.

Perform one *n*/180-inch or *n*/216-inch line feed

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "J" *n*	27 74 *n*	1B 4A *n*

Feeds the paper once by *n*/180 inches or *n*/216 inches, where *n* is between 1 and 255. Does not move the print position right or left in the standard mode. Does not change the line-spacing setting.

Perform one *n*/180-inch reverse line feed

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "j" *n*	27 106 *n*	1B 6A *n*

Feeds the paper once by *n*/180 inches in the reverse direction, where *n* is between 1 and 255. Does not move the print position right or left. Does not change the line-spacing setting.

Feed paper *n* lines

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "f" "1" *n*	27 102 49 *n*	1B 66 31 *n*
	<ESC> "f" <1> *n*	27 102 1 *n*	1B 66 01 *n*

Feeds the paper *n* lines from the current line, where *n* is between 0 and 127.

Set top of page at current position

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "4"	27 52	1B 34

Sets the current position as the top-of-page position. Note that this can also be done from the control panel.

Set page length to *n* lines

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "C" *n*	27 67 *n*	1B 43 *n*

Sets the page length to *n* lines in the current line spacing, where *n* is between 1 and 127 in Standard mode or between 1 and 64 in IBM mode. Changing the line spacing later does not alter the physical page length. The current line becomes the top of the page.

Set page length to *n* inches

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "C" <0> *n*	27 67 0 *n*	1B 43 00 *n*

Sets the page length to *n* inches, where *n* is between 1 and 32 in Standard mode or between 1 and 64 in IBM mode. The current line becomes the top of the page.

Set bottom margin

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "N" *n*	27 78 *n*	1B 4E *n*

Sets the bottom margin to *n* lines, where *n* is between 1 and 127 in Standard mode or between 1 and 255 in IBM mode. The bottom margin is reset when you change the page length.

Cancel bottom margin

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "O"	27 79	1B 4F

Cancels the bottom margin.

Form feed

Mode	ASCII	Decimal	Hexadecimal
Both	<FF>	12	0C

Feeds the paper to the top of the next page according to the current page length, and moves the print position to the left margin. When the automatic sheet feeder (ASF) is selected (EDS switch A-4 is OFF), this command ejects the current page.

Return to top of current page

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> <FF>	27 12	1B 0C

Feeds the paper backward to the top of the current page. Ignored when friction feed is used.

Disable paper-out detector

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "8"	27 56	1B 38

Causes the printer to disregard the signal sent by the paper-out detector, enabling printing to the bottom of the paper. Overrides the setting of EDS switch B-2.

Enable paper-out detector

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "9"	27 57	1B 39

Causes the printer to stop printing before the end of the paper. Overrides the setting of EDS switch B-2.

Set vertical tab stops

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "B" $n1$ $n2$ ... <0>	27 66 $n1$ $n2$ ... 0	1B 42 $n1$ $n2$ ... 00

Cancels all current vertical tab stops and sets new vertical tab stops at lines $n1$, $n2$, etc., where $n1$, $n2$, etc. are numbers between 1 and 255. A maximum of 16 vertical tab stops can be set. The tab stops must be specified in ascending order; any violation of ascending order terminates the tab stop list. Standard termination is by the <0> control code. The vertical tab stops are set in terms of the current line spacing and do not move if the line spacing is changed later.

Set vertical tab stops every *n* lines

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "e" "1" *n*	27 101 49 *n*	1B 65 31 *n*
	<ESC> "e" <1> *n*	27 101 1 *n*	1B 65 01 *n*

Cancels all current vertical tab stops and sets new tab stops every *n* lines, where *n* is between 2 and 127.

Set vertical tab stops in channel

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "b" *n0* *n1* *n2* ... <0>	27 98 *n0* *n1* *n2* ... 0	1B 62 *n0* *n1* *n2* ... 00

Cancels all current vertical tab stops in channel *n0*, (where *n0* is between 0 and 7) and sets new vertical tab stops in this channel. (A channel is a set of vertical tab stops selected by the <ESC> "/" command.) See <ESC> "B" for parameters *n1*, *n2*, ... <0>.

Select vertical tab channel

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "/" *n0*	27 47 *n0*	1B 2F *n0*

Selects a set of vertical tab stops designated by a channel number (*n0*) from 0 to 7. The tab stops in each channel are set by <ESC> "b".

Vertical tab

Mode	ASCII	Decimal	Hexadecimal
Both	<VT>	11	0B

Feeds the paper to the next vertical tab stop and moves the print position to the left margin. Performs a line feed if no vertical tabs are set, as at power-up. Feeds to the top of the next page if vertical tabs are set but the current line is at or below the last vertical tab stop.

HORIZONTAL POSITION COMMANDS

Set left margin

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "l" n	27 108 n	1B 6C n

Sets the left margin at column *n* (where *n* is between 0 and 255) in the current character pitch (pica pitch if proportional spacing is selected). The left margin does not move if the character pitch is changed later. The left margin must be at least two columns to the left of the right margin and within the limits below:

Pica	$0 \leq n \leq 76$
Elite	$0 \leq n \leq 91$
Semi-condensed	$0 \leq n \leq 114$
Condensed pica	$0 \leq n \leq 130$
Condensed elite	$0 \leq n \leq 152$
Expanded pica	$0 \leq n \leq 38$
Expanded elite	$0 \leq n \leq 45$
Expanded semi-condensed	$0 \leq n \leq 57$
Expanded condensed pica	$0 \leq n \leq 64$
Expanded condensed elite	$0 \leq n \leq 76$

Set right margin

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "Q" n	27 81 n	1B 51 n

Sets the right margin at column *n* in the current character pitch (pica pitch if proportional spacing is currently selected). Column *n* becomes the last character position in the line. The right margin does not move if the character pitch is changed later. The right margin must be within the limits below:

Pica	$4 \leq n \leq 80$
Elite	$5 \leq n \leq 96$
Semi-condensed	$6 \leq n \leq 120$
Condensed pica	$7 \leq n \leq 137$
Condensed elite	$8 \leq n \leq 160$
Expanded pica	$2 \leq n \leq 40$
Expanded elite	$3 \leq n \leq 48$
Expanded semi-condensed	$3 \leq n \leq 60$
Expanded condensed pica	$4 \leq n \leq 68$
Expanded condensed elite	$4 \leq n \leq 80$

Set left and right margins

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "X" n1 n2	27 88 n1 n2	1B 58 n1 n2

Sets the left margin at column n1 and the right margin at column n2. See the preceding commands for margin restrictions and other notes.

Carriage return

Mode	ASCII	Decimal	Hexadecimal
Both	<CR>	13	0D

Prints the current line and returns the next print position to the left margin. If EDS switch A-3 is OFF, also performs a line feed.

Set automatic line feed

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "5" <1>	27 53 1	1B 35 01

Causes the printer to perform both a carriage return and line feed each time it receives a <CR> code. This command takes priority over EDS switch A-3.

Cancel automatic line feed

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "5" <0>	27 53 0	1B 35 00

Causes the printer to perform only a carriage return when it receives a <CR> code. This command takes priority over EDS switch A-3.

Backspace

Mode	ASCII	Decimal	Hexadecimal
Both	<BS>	8	08

Moves the print position one column to the left. Ignored if the print position is at the left margin. This command can be used to overstrike or combine characters.

Left justify

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "a" "0"	27 97 48	1B 61 30
	<ESC> "a" <0>	27 97 0	1B 61 00

Aligns subsequent text with the left margin, leaving the right margin ragged.

Center text

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "a" "1"	27 97 49	1B 61 31
	<ESC> "a" <1>	27 97 1	1B 61 01

Centers subsequent text between the left and right margins.

Right justify

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "a" "2"	27 97 50	1B 61 32
	<ESC> "a" <2>	27 97 2	1B 61 02

Aligns subsequent text with the right margin, leaving the left margin ragged.

Full justify

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "a" "3"	27 97 51	1B 61 33
	<ESC> "a" <3>	27 97 3	1B 61 03

Aligns subsequent text between the left and right margins.

Set horizontal tab stops

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "D" *n1* *n2* ... <0>	27 68 *n1* *n2* ... 0	1B 44 *n1* *n2* ... 00

Cancels all current horizontal tab stops and sets new tab stops at columns *n1*, *n2*, etc. in the current character pitch (pica pitch if proportional spacing is currently selected), where *n1*, *n2*, etc. are numbers between 1 and 255. The maximum number of horizontal tab stops allowed is 32 in Standard mode and 64 in IBM mode. The tab stops must be specified in ascending order; any violation of ascending order terminates the tab stop list. Standard termination is by the <0> control code. To clear all tab stops, specify <ESC> "D" <0>.

Set horizontal tab stops every *n* columns

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "e" "0" *n*	27 101 48 *n*	1B 65 30 *n*
	<ESC> "e" <0> *n*	27 101 0 *n*	1B 65 00 *n*

Cancels all current horizontal tab stops and sets new tab stops every *n* columns, where *n* is between 1 and 127.

Reset all tab stops

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "R"	27 82	1B 52

Resets the horizontal tab stops to their power-up values in which a tab stop is set every 8 column starting at column 9. Also clears all vertical tab stops.

Horizontal tab

Mode	ASCII	Decimal	Hexadecimal
Both	<HT>	9	09

Moves the print position to the next horizontal tab stop. Ignored if there is no next horizontal tab stop in the current line. Note that when underlining is selected, spaces skipped by horizontal tabulation are not underlined.

Relative horizontal tab

Mode	ASCII	Decimal	Hexadecimal
Std.	\<ESC\> "\\" *n1* *n2*	27 92 *n1* *n2*	1B 5C *n1* *n2*

Moves the print position right or left a specified distance (maximum 8 inches). Ignored if the resulting position is beyond the right or left margin. The formulas for the distance and direction are as follows:
If *n2* is between 0 and 63, the print head moves right by (*n1* + *n2* × 256) dots.
If you want to move the print head to the left, *n1* and *n2* are obtained by subtracting the value from 65536, and dividing the result into high and low bytes.

Relative horizontal tab in inches

Mode	ASCII	Decimal	Hexadecimal
IBM	\<ESC\> "d" *n1* *n2*	27 100 *n1* *n2*	1B 64 *n1* *n2*

Sets the next print position to (*n1* +*n2* × 256)/120 inches from the current position.
Ignored if this position is beyond the right margin. The maximum position is 8 inches.

Absolute horizontal tab in inches

Mode	ASCII	Decimal	Hexadecimal
Std.	\<ESC\> "$" *n1* *n2*	27 36 *n1* *n2*	1B 24 *n1* *n2*

Sets the next print position to (*n1* + *n2* × 256)/60 inches from the left margin on the current line. Ignored if this position is beyond the right margin. The maximum position is 8 inches.

Absolute horizontal tab in columns

Mode	ASCII	Decimal	Hexadecimal
Std.	\<ESC\> "f" "0" *n*	27 102 48 *n*	1B 66 30 *n*
	\<ESC\> "f" \<0\> *n*	27 102 0 *n*	1B 66 00 *n*

Moves the next print position to column *n* from the left margin, where *n* is between 0 and 127.

GRAPHICS COMMANDS

Print normal-density 8-bit graphics

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "K" *n1* *n2* *m1* *m2* ...	27 75 *n1* *n2* *m1* *m2* ...	1B 4B *n1* *n2* *m1* *m2* ...

Prints bit-image graphics at 60 dots per inch horizontally. The graphic image is 8 dots high and $n1 + n2 \times 256$ dots wide. Maximum width is 8 inches (480 dots). $m1, m2, ...$ are the dot data, each a 1-byte value from 0 to 255 representing 8 vertical dots, with the most significant bit at the top and the least significant bit at the bottom. The number of data bytes must be $n1 + n2 \times 256$. Dots beyond the right margin are ignored. At the end of bit-image printing the printer returns automatically to character mode.

Print double-density 8-bit graphics

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "L" *n1* *n2* *m1* *m2* ...	27 76 *n1* *n2* *m1* *m2* ...	1B 4C *n1* *n2* *m1* *m2* ...

Prints bit-image graphics at 120 dots per inch horizontally (maximum 960 dots wide). See <ESC> "K" for other information.

Print double-density, double-speed 8-bit graphics

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "Y" *n1* *n2* *m1* *m2* ...	27 89 *n1* *n2* *m1* *m2* ...	1B 59 *n1* *n2* *m1* *m2* ...

Prints bit-image graphics at 120 dots per inch horizontally (maximum 960 dots wide), skipping every second dot in the horizontal direction. See <ESC> "K" for other information.

Print quadruple-density 8-bit graphics

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "Z" *n1* *n2* *m1* *m2* ...	27 90 *n1* *n2* *m1* *m2* ...	1B 5A *n1* *n2* *m1* *m2* ...

Prints bit-image graphics at 240 dots per inch horizontally (maximum 1920 dots wide), skipping every second dot in the horizontal direction. See <ESC> "K" for other information.

Print hex-density 24-bit graphics

Mode	ASCII	Decimal	Hexadecimal
Std.	<FS> "Z" *n1* *n2* *m1* *m2* *m3* ...	28 90 *n1* *n2* *m1* *m2* *m3* ...	1C 5A *n1* *n2* *m1* *m2* *m3* ...

Prints 24-bit dot graphics at 360 dots per inch horizontally. The graphics image is 24 dots high and $n1 + n2 \times 256$ dots wide. Maximum width is 8 inches (2880 dots). In the data $m1$, $m2$, $m3$ ... each three bytes represent 24 vertical dots. In the leftmost position, the most significant bit of $m1$ is the top dot; the least significant bit of $m1$ is the eighth dot from the top; the most significant bit of $m2$ is the ninth dot; the least significant bit of $m2$ is the sixteenth dot from the top; the most significant bit of $m3$ is the seventeenth dot from the top; the least significant bit of $m3$ is the bottom dot. The rest of data is similar. The number of data bytes must be $3 \times (n1 + n2 \times 256)$. Dots beyond the right margin are ignored. At the end of dot graphics printing, the printer returns automatically to character mode.

Select graphics mode

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "*" *n0* *n1* *n2* *m1* *m2* ...	27 42 *n0* *n1* *n2* *m1* *m2* ...	1B 2A *n0* *n1* *n2* *m1* *m2* ...

Selects one of eleven graphics modes depending on the value of $n0$ and prints bit-image graphics in this mode. See <ESC> "K" (for 8-bit graphics) or <FS> "Z" (for 24-bit graphics) for information on $n1, n2, m1, m2, ...$

$n0$	Graphics mode	
0	8-bit Normal-density	(60 dots per inch)
1	8-bit Double-density	(120 dots per inch)
2	8-bit Double-density, double-speed	(120 dots per inch)
3	8-bit Quadruple-density	(240 dots per inch)
4	8-bit CRT graphics, mode I	(80 dots per inch)
6	8-bit CRT graphics, mode II	(90 dots per inch)
32	24-bit Normal-density	(60 dots per inch)
33	24-bit Double-density	(120 dots per inch)
38	24-bit CRT graphics	(90 dots per inch)
39	24-bit Triple-density	(180 dots per inch)
40	24-bit Hex-density	(360 dots per inch)

Select graphics mode

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "[" "g" *n1* *n2* *m0* *m1* *m2* ...	27 91 103 *n1* *n2* *m0* *m1* *m2* ...	1B 5B 67 *n1* *n2* *m0* *m1* *m2* ...

Selects one of eight graphics modes depending on the value of *m0* and prints dot graphics in this mode. The graphics image is ($n1 + n2 \times 256$) – 1 dots wide. See <ESC> "K" (for 8-bit graphics) or <FS> "Z" (for 24-bit graphics) for information on *m1*, *m2*, ...

m0   Graphics mode

0	8-bit Normal-density	(60 dots per inch)
1	8-bit Double-density	(120 dots per inch)
2	8-bit Double-density, double-speed	(120 dots per inch)
3	8-bit Quadruple-density	(240 dots per inch)
8	24-bit Normal-density	(60 dots per inch)
9	24-bit Double-density	(120 dots per inch)
11	24-bit Triple-density	(180 dots per inch)
12	24-bit Hex-density	(360 dots per inch)

Convert graphics density

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "?" *n* *m*	27 63 *n* *m*	1B 3F *n* *m*

Converts graphics defined by subsequent <ESC> "K", <ESC> "L", <ESC> "Y" or <ESC> "Z" commands to a density mode defined by <ESC> "*". *n* is "K", "L", "Y" or "Z", indicating the mode to be converted. *m* is a code from <0> to <4> or <6> indicating one of the modes of <ESC> "*".

DOWNLOAD CHARACTER COMMANDS

Define download characters

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "&" <0> *n1* *n2* *m0* *m1* *m2* *d1* *d2* ... *dx*	27 38 0 *n1* *n2* *m0* *m1* *m2* *d1* *d2* ... *dx*	1B 26 00 *n1* *n2* *m0* *m1* *m2* *d1* *d2* ... *dx*

Defines one or more new characters and stores them in RAM for later use. EDS switch A-2 must be OFF; otherwise RAM is used as an input buffer, not downloading characters, and this command is ignored.

n1 is the character code of the first character defined and *n2* is the character code of the last character defined. *n1* must be equal to or less than *n2*.

The data for each character start with three bytes specifying proportional spacing attributes: the first byte, *m0*, specifies the left of the character; the second byte, *m1*, specifies the character width; the third byte, *m2*, specifies the right of the character. These values must not exceed the following maximum limits:

Character mode	*m1*	*m0* + *m1* + *m2*
Draft	9	12
LQ pica	31	36
LQ elite	27	30
LQ semi-condensed	19	24
LQ proportional	37	42
Draft super/subscript	7	12
LQ super/subscript	19	36
LQ prop. super/subscript	37	42

Next comes the dot data. Normal character height is 24 dots, so there must be $3 \times m1$ bytes of dot data. If the printer is in super/subscript mode, however, the character height is 16 dots, so there must be $2 \times m1$ bytes of dot data.

Each data byte indicates eight vertical dots, with the most significant bit being the top dot, and the least significant bit being the bottom dot.

For further details, please refer to chapter 5.

Define download characters

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "=" *nl* *n2* "#" *n3* *n4* <0> *n5* *ml* *m2* ... *m9* *dl* *d2* ... *dx*	27 61 *nl* *n2* 35 *n3* *n4* 0 *n5* *ml* *m2* ... *m9* *dl* *d2* ... *dx*	1B 3D *nl* *nl* 23 *n3* *n4* 00 *n5* *ml* *m2* ... *m9* *dl* *d2* ... *dx*

Defines new characters and stores them in RAM for later use. EDS switch A-2 must be OFF and the optional RAM cartridge, RC-32Z, must be installed; otherwise RAM is used as an input buffer, not downloading characters, and this command is ignored.

Downloading characters in IBM mode requires 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.

$(nl + n2 \times 256)$ give the number of bytes to be downloaded.
n3 and *n4* indicate the low order and high order addresses in which data is to be stored. *n3* should be 15 and *n4* should be 128 for this printer.
n5 determines the character mode to be downloaded, as shown below:

n5	Character mode	Character width
0	Draft	9
1	LQ pica	35
2	LQ proportional	17 ~ 41
3	LQ elite	29

ml through *m9* indicate Index Table data.
ml and *m2* indicate the adress where Dot Pattern is stored. *ml* is the high-order byte. *m3* indicates the number of columns in the character memory, and *m4* indicates the number of columns in the character.
m5 through *m9* are compression mask bits. 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.
It is necessary to define all of Index Table data before the Dot Pattern data to download many characters.

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d1, *d2*, ... *dx* is the Dot Pattern data being downloaded.
Each data byte indicates eight vertical dots, with the most significant bit being the top dot, and the least significant bit being the bottom dot.

Copy character set from ROM into RAM

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> ":" <0> *n* <0>	27 58 0 *n* 0	1B 3A 00 *n* 00

Copies the selected character set with *n*, as shown below, to the corresponding download character RAM area, overwriting any download data already present. Ignored when EDS switch A-2 is ON.

n	Font		*n*	Font	
0	Roman		8	Orator 2	(Option)
1	Sanserif		9	TW-Light	(Option)
2	Courier		10	Letter Gothic	(Option)
3	Prestige		11	Blippo	(Option)
4	Script		12	H-Gothic	(Option)
5	OCR-B	(Option)	13	Orane	(Option)
6	OCR-A	(Option)	14	Cinema	(Option)
7	Orator	(Option)	15	Code 39	(Option)

Select download character set

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "%" "1"	27 37 49	1B 25 31
	<ESC> "%" <1>	27 37 1	1B 25 01

Selects the download character set. Ignored when EDS switch A-2 is ON.

Shift download character area

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "t" "2"	27 116 50	1B 74 32
	<ESC> "t" <2>	27 116 2	1B 74 02
	<FS> "I" "2"	28 73 50	1C 49 32
	<FS> "I" <2>	28 73 2	1C 49 02

Shifts the download character area defined between 0 to 127 to the area between 128 to 255.

Select draft pica download character set

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "I" <4>	27 73 4	1B 49 04

Selects the download character set, draft quality, and pica pitch (10cpi). Ignored if the (FONT) button was pressed during power-up or if EDS switch A-2 is ON.

Select draft elite download character set

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "I" <FF>	27 73 12	1B 49 0C

Selects the download character set, draft quality, and elite pitch (12 cpi). Ignored if the (FONT) button was pressed during power-up or if EDS switch A-2 is ON.

Select draft condensed download characters

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "I" <DC4>	27 73 20	1B 49 14

Selects the download character set, draft quality, and condensed pitch (17 cpi). Ignored if the (FONT) button was pressed during power-up or if EDS switch A-2 is ON.

Select LQ pica download characters

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "I" <6>	27 73 6	1B 49 06

Selects the LQ download character set with pica pitch (10 cpi). Ignored if the (FONT) button was pressed during power-up or if EDS switch A-2 is ON.

Select LQ elite download characters

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "I" <SO>	27 73 14	1B 49 0E

Selects the LQ download character set with elite pitch (12 cpi).
Ignored if the (FONT) button was pressed during power-up or if EDS
switch A-2 is ON.

Select LQ condensed download characters

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "I" <SYN>	27 73 22	1B 49 16

Selects the LQ download character set with condensed pitch (17
cpi). Ignored if the (FONT) button was pressed during power-up or
if EDS switch A-2 is ON.

Select LQ proportional download characters

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "I" <7>	27 73 7	1B 49 07

Selects the LQ download character set with proportional pitch.
Ignored if the (FONT) button was pressed during power-up or if EDS
switch A-2 is ON.

Select ROM character set

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "%" "0"	27 37 48	1B 25 30
	<ESC> "%" <0>	27 37 0	1B 25 00

Stops using the download character set and returns to the built-in
ROM character set. Ignored when EDS switch A-2 is ON.

COLOR SELECTION COMMANDS

The commands in this section are valid only with the color printer.

Select print color

Mode	ASCII	Decimal	Hexadecimal
Both	"(" "(" "C" ")" ")" *n*	40 40 67 41 41 *n*	28 28 43 29 29 *n*
	<ESC> "r" *n*	27 114 *n*	1B 72 *n*

Selects the printing color according to the value of *n* as shown below. Ignored if the color ribbon is not installed.

n	Color	*n*	Color
0	Black	4	Yellow
1	Magenta	5	Orange
2	Cyan	6	Green
3	Violet		

OTHER PRINTER CONTROL COMMANDS

Set MSB to 1

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> ">"	27 62	1B 3E

Sets the most significant bit of each subsequent byte received to 1, allowing users with a 7-bit interface to access characters with ASCII codes greater than 127.

Set MSB to 0

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "="	27 61	1B 3D

Sets the most significant bit of each subsequent byte received to 0.

Accept MSB as is

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "#"	27 35	1B 23

Cancels the preceding commands and accepts the most significant bit as it is sent to the printer.

Delete last character sent

Mode	ASCII	Decimal	Hexadecimal
Std.	<DEL>	127	7F

Deletes the last character received. Ignored if the last character received has already been printed, or if the last character received was all or part of a command.

Cancel last line

Mode	ASCII	Decimal	Hexadecimal
Both	<CAN>	24	18

Deletes the last line currently present in the print buffer.

Set printer off-line

Mode	ASCII	Decimal	Hexadecimal
Std.	<DC3>	19	13
IBM	<ESC> "Q" "$"	27 81 36	1B 51 24

Sets the printer off-line. The printer disregards all subsequent characters and commands except <DC1>, which returns it to the on-line state. The printer's ON LINE indicator does not go off.

Set printer on-line

Mode	ASCII	Decimal	Hexadecimal
Both	<DC1>	17	11

Returns the printer to the on-line state, allowing it to receive and process all subsequent characters and commands. This command is ignored if the printer was set off-line by pressing the (ON LINE) button on the control panel.

Stop printing

Mode	ASCII	Decimal	Hexadecimal
IBM	<ESC> "j"	27 106	1B 6A

Prints the entire contents of the input buffer, then sets the printer off-line. The (ON LINE) indicator on the control panel goes off.

Bell

Mode	ASCII	Decimal	Hexadecimal
Both	<BEL>	7	07

Sounds a brief beep tone from the printer's beeper.

Bidirectional printing

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "U" "0"	27 85 48	1B 55 30
	<ESC> "U" <0>	27 85 0	1B 55 00

Causes subsequent printing to be done in the normal bidirectional mode, which is faster than unidirectional printing.

Unidirectional printing

Mode	ASCII	Decimal	Hexadecimal
Both	<ESC> "U" "1"	27 85 49	1B 55 31
	<ESC> "U" <1>	27 85 1	1B 55 01

Causes subsequent printing to be done unidirectionally, ensuring maximum vertical alignment precision. Ignored when EDS switch A-5 is set ON.

One-line unidirectional printing

Mode	ASCII	Decimal	Hexadecimal
Std.	<ESC> "<"	27 60	1B 3C

Immediately returns the print head to the left margin, then prints the remainder of the line from left to right. Normal bidirectional printing resumes on the next line. Ignored when EDS switch A-5 is ON.

Manual feed

Mode	ASCII					Decimal					Hexadecimal				
Both	\<ESC\>	\<EM\>	\<0\>			27	25	0			1B	19	00		
	"("	"("	"0"	")"	")"	40	40	48	41	41	28	28	30	29	29

Selects manual sheet feeding even when the optional automatic sheet feeder is mounted. Ignored if EDS switch A-4 is ON (ASF inactive).

Auto feed

Mode	ASCII					Decimal					Hexadecimal				
Both	\<ESC\>	\<EM\>	\<4\>			27	25	4			1B	19	04		
	"("	"("	"4"	")"	")"	40	40	52	41	41	28	28	34	29	29

Selects the automatic sheet feeder. Ignored if EDS switch A-4 is ON (ASF inactive).

Eject paper from ASF

Mode	ASCII					Decimal					Hexadecimal				
Both	\<ESC\>	\<EM\>	"R"			27	25	82			1B	19	52		
	"("	"("	"R"	")"	")"	40	40	82	41	41	28	28	52	29	29

Ejects the current page. Ignored if EDS switch A-4 is ON (ASF inactive).

Set print start position on ASF

Mode	ASCII						Decimal				Hexadecimal				
Both	\<ESC\>	\<EM\>	"T"	n			27 25 84	n			1B 19 54	n			
	"("	"("	"T"	")"	")"	n	40 40 84 41 41	n			28 28 54 29 29	n			

Skips $n/6$ inches at the top of the page, where n is equal to or greater than 1. Ignored if EDS switch A-4 is ON (ASF inactive).

Reset printer

Mode	ASCII	Decimal	Hexadecimal
Both	\<ESC\> "@"	27 64	1B 40
Std.	\<FS\> "@"	28 64	1C 40

Reinitializes the printer. Clears the print buffer and returns settings to their power-up values. Does not clear the input buffer or change ASF selections.