FUJITSU DL3600
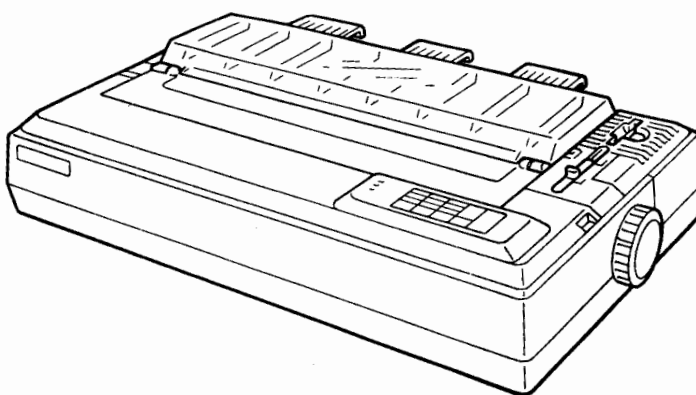
DOT MATRIX PRINTER

USER'S MANUAL

AND

PROGRAMMER'S MANUAL

Federal Communications Commission
Radio Frequency Interference Statement
for United States Users

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measurments:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio / TV technician for help.

FCC WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

(This equipment has been tested as 3375A of the model number.)

NOTES
1. The use of a non-shielded interface cable with the referenced device is prohibited. The length of the parallel interface cable must be 3 meters (10 feet) or less. The length of the serial interface cable must be 15 meters (50 feet) or less.
2. The length of the power cord must be 3 meters (10 feet) or less.

Notice for Canadian Users

This digital apparatus does not exceed the class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numériqué n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Notice for German Users

Dieses Gerät entspricht als Einzelgerät den Funkenstörungsanforderungen der Postverfügung Nr. 1046/1984 bzw. der Grenzklasse B nach VDE 0871/6.78. Das Kabel muß abgeschirmt und unter 3 Meter lang sein.

TRADEMARK ACKNOWLEDGMENTS

ABOUT THIS MANUAL

Thank you for buying this printer. You can expect years of reliable
service with very little maintenance. This manual explains how to use
your printer to full advantage. The manual has two parts:

- The first part, the *User's Manual*, explains how to set up, use,
  and maintain the Fujitsu DL3600 dot matrix printer and its
  options. This manual is written for both new and experi-
  enced users of printers.

- The second part, the *Programmer's Manual*, provides detailed
  information on the Fujitsu DPL24C PLUS command set. This
  manual is written for programmers or other users who want
  to learn more about the DPL24C PLUS command set.

Each manual has several appendices, a glossary, and an index.
Appendix A of the User's Manual lists additional publications avail-
able for the printer. To obtain additional publications or information,
please contact your dealer or authorized Fujitsu representative. Fujitsu
subsidiaries are listed at the end of the manual.

USER'S MANUAL

This manual explains how to install, set up, and use your printer and its options. It also explains how to keep the printer in top working condition and what to do should something go wrong. Detailed procedures are provided for first-time users. Experienced users may be able to skip some of the details, using the table of contents and chapter introductions to locate needed information.

ORGANIZATION

The user's manual is organized as follows:

The **Quick Reference** section summarizes everyday printer operations. After you become familiar with the printer, use this section as a memory aid.

Chapter 1, Introduction, introduces the printer, listing key features as well as options to enhance the printer's capabilities.

Chapter 2, Setting Up, gives step-by-step procedures for setting up the printer for immediate use. It also familiarizes you with the names of the printer's basic parts. If this is your first dot matrix printer, you should read this chapter from start to finish.

Chapter 3, Loading and Using Paper, explains how to load and use paper with your printer.

Chapter 4, Printing, covers basic printing operations. Everyday use of the printer's control panel, including paper loading and selecting print features, is detailed. After you know how the printer works, use the **Quick Reference** section at the beginning of the manual to refresh your memory.

Chapter 5, Using Setup Mode, describes how to change the printer's optional settings such as print features, hardware options, and top-of-form. Most settings only affect print features such as the typestyle and page format. However, a few settings must be selected correctly for compatibility with your system hardware and software. Refer to this chapter as indicated in Chapter 2 or as required.

Chapter 6, Maintenance, explains basic maintenance procedures for this printer.

Chapter 7, Problem Solving, covers problem solving techniques. Before contacting your dealer for help, check the list of problems and solutions provided in this chapter.

Chapter 8, Installing Options, describes the options available for the printer and how to install them.

At the end of this manual, there are several appendices, a glossary, and an index. Appendix A lists order numbers for the printer's supplies, options, and publications. The other appendices provide additional technical information.

CONVENTIONS

Bold and *italics* are used in this manual to call your attention to special information. This information includes warnings, cautions, and notes.

WARNINGS
A WARNING indicates that personal injury may result if you do not follow a procedure correctly.

CAUTIONS
A CAUTION indicates that damage to the printer may result if you do not follow a procedure correctly.

NOTES
A NOTE provides "how-to" tips or suggestions to help you perform a procedure correctly. NOTEs are particularly useful for first-time users.

For Experienced Users:
If you are familiar with this printer or with dot matrix printers in general, this information will help you use the manual effectively.

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QUICK REFERENCE

This Quick Reference section is written for experienced users — those who are familiar with how the printer works, but who may need to refresh their memories occasionally. *Only the printer's normal (non-setup) mode is covered.* For details on setup mode, see Chapter 5.

The printer operating modes are as follows:
- Normal Mode (no item indicators flashing)
  This mode can be used to perform everyday printer operations. The printer must be turned on and be online.
- Normal Mode (item indicators flashing)
  This mode can be used to select print features. The printer must be turned on and be offline, and you must press the MODE button.
- Setup Mode
  This mode can be used to select the printer's default settings. The printer must be turned on and you must press the MODE button.

Special mode item indicators
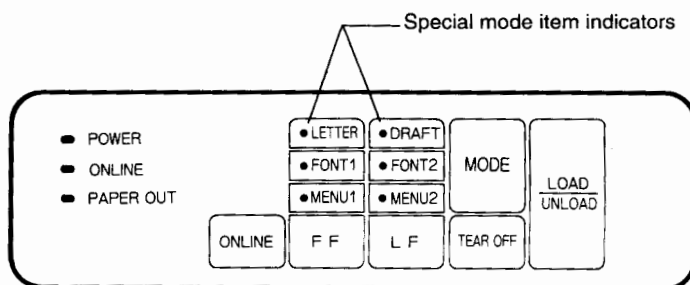
Printer Operations (Normal Mode)

√ : Operation can be performed when the printer is in this state.
— : Operation cannot be performed when the printer is in this state.
N/A : Does not apply.
FL : Flashing

Operation	Online	Offline Item Ind. OFF	FL	What You Do
Clear print buffer	√	√	√	Turn printer off.
Eject single sheets	√	√	—	Press FF.
Enter normal mode	N/A	N/A	N/A	Turn printer on.
Exit normal mode	√	√	√	Turn printer off (you cannot exit to setup mode).
Form feed (forward)	√	√	—	Press FF.
Line feed (forward)	√	√	—	Press LF.
Load paper	√	√	—	Press LOAD/UNLOAD.
Place printer offline	√	—	—	Press ONLINE.
Place printer online	—	√	√	Press ONLINE.
Reset power-on defaults	√	√	√	Turn printer off, then on.
Select LETTER or DRAFT	—	—	√	With a top item indicator flashing, press FF or LF.
Select FONT 1 or FONT 2	—	—	√	With a middle item indicator flashing, press FF or LF.
Select MENU 1 or MENU 2	—	—	√	With a bottom item indicator flashing, press FF or LF.
Start/stop/resume printing	√	—	—	Start: Send print command. Stop/resume: Press ONLINE.
Self-test printing	√	√	√	Start: Turn printer off. Press FF while turning printer on. Pause/resume: Press MODE or LF. Exit: Press ONLINE.
Tear off forms	√	√	—	Press TEAR OFF. Tear off forms, press any button to retract forms.
Unload paper to park position (forms only)	√	√	—	Press LOAD/UNLOAD.

INTRODUCTION

Congratulations on purchasing this printer. It is an ideal solution for those who require versatility as well as maximum compatibility with today's software packages and personal computers. Using a 24-wire print head, the printer provides crisp printing for business, office, and home environments. Your printer is also easy to install and use.
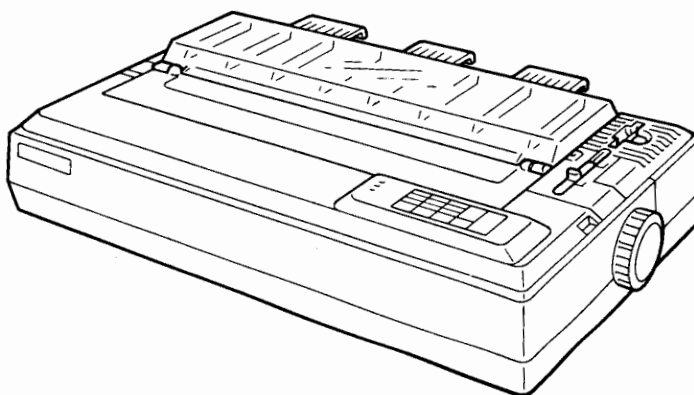
Dot matrix printer

Key printer features and useful options are listed in the next two sections.

FEATURES

- **Software compatibility**. Fujitsu DPL24C PLUS, IBM Proprinter XL24, Epson LQ-2500, and Epson LQ-2550 emulations are resident. Additional emulations are available on plug-in emulation cards.

- **Easy connection with most computers**. Choose either a Centronics parallel interface or an optional RS-232C serial interface for your printer.
- **Character sets.** IBM PC character sets 1 and 2, IBM PS/2 character sets (code pages 437, 850, 860, 863, and 865), ISO 8859-1/ECMA 94, and international character sets are available.
- **Multiple font options.** Eight resident fonts: Courier 10, Pica 10, Prestige Elite 12, Boldface PS, Correspondence, Compressed font, Draft, and High-speed Draft. Optional fonts are available on plug-in font cards. Up to 31.75K bytes are available for downloading fonts.
- **High-speed printing**. At 10 cpi, print speed ranges from 90 cps for letter quality printing to 300 cps for high-speed draft quality printing.
- **Large print buffer**. 24K maximum. Allows you to send files to the printer and return to work in your application.
- **136-column print line**. Allows printing in landscape mode using legal or standard computer forms.
- **Superior paper handling**. Paper parking of continuous forms makes it easy to switch between continuous forms and single sheets. For automatic feeding of single sheets, an optional cut sheet feeder is available.
- **Color model**. Provides seven-color printing if supported by your software.
- **Maintenance-free**. Periodic cleaning and changing the ribbon cartridge are all that's required.

OPTIONS

Options available for your printer are listed below. For detailed information on options, see Chapter 8.

- Cut sheet feeder (to complement your feeder, a double bin adapter is also available)
- Font cards
- Emulation cards
- Serial interface board
- Color kit

SETTING UP

2

Your new printer is easy to install and set up. This chapter tells you how to set up the printer and get started printing right away. If this is your first dot matrix printer, you should read the entire chapter from start to finish, following all of the steps. In this chapter you will learn how to:

- Position, unpack, and assemble the printer
- Identify the printer's major components
- Connect the power and interface cables
- Test the printer before connecting your computer
- Select an emulation and print using your software

If you have a problem setting up the printer, review the problems and solutions listed in Chapter 7. If the problem persists, contact your dealer.

SELECTING A GOOD LOCATION

This printer is suitable for most business, office, and home environments. To obtain peak performance from the printer, select a location that meets the following guidelines.

√ Place the printer on a sturdy, level surface.

√ Place the printer near a well-grounded AC power outlet.

√ To ensure easy access to the front and rear of the printer, leave several inches of space around the printer. Do not block the air vents on the sides and rear of the printer.

√ Do not place the printer in direct sunlight or near heaters.

√ Be sure the room is well-ventilated and free of excessive dust.

√ Do not expose the printer to extremes of temperature and humidity.

√ Use the power cord supplied with the printer. Do not use an extension cord.

√ Do not plug the printer into a power outlet that is shared with heavy industrial equipment (such as motors) or appliances (such as copiers or coffee makers). Such equipment often emits electrical noise or causes power degradation.

UNPACKING

Unpack your printer as follows:

1. Open the carton and remove the printer and its components. Be sure you have all of the items shown below.

Printer

Ribbon cartridge

User's manual

Power cord

Platen knob

Cut sheet stand

Paper guide extenders
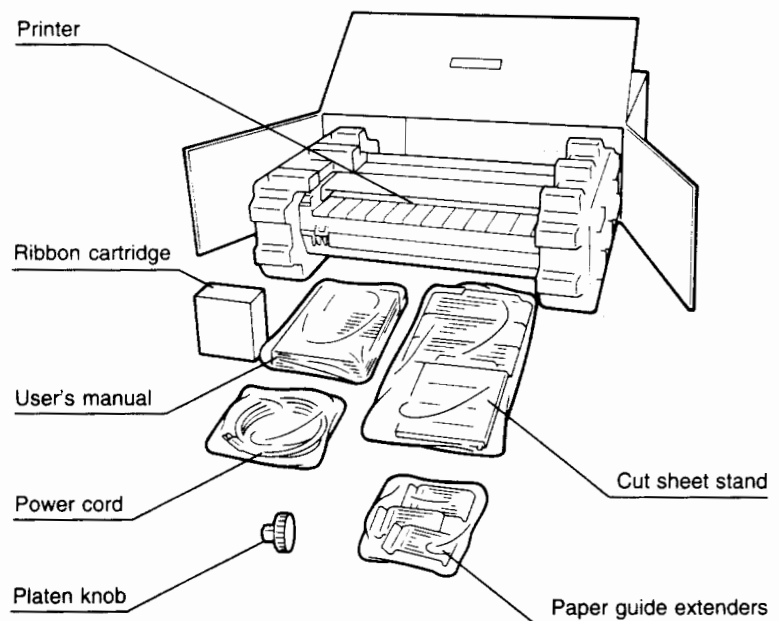
Checking items received

2. Carefully examine each item for damage. Report any damage to your dealer or shipping agent.

Setting Up

3. Place the printer where you plan to use it.

4. Open the covers and remove the cardboard shipping restraint that holds the print head carriage in place. Remove the cushion from the back of the printer.

Shipping restraint

Support material
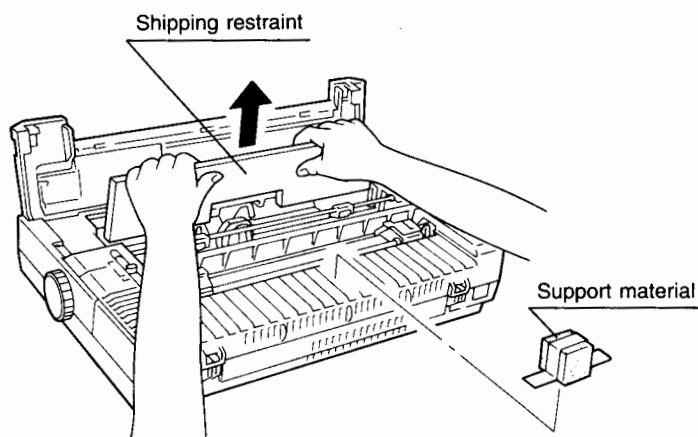
Removing the shipping restraint

5. Store the original shipping carton and packaging materials. The original packaging is ideal for moving or shipping your printer to another location.

NOTE

You must supply the interface cable. It is not shipped with the printer.

Checking Options and Supplies

The following options and supplies are shipped in separate packages:

- Cut sheet feeder
- Double bin adapter
- Font cards

- Emulation cards
- Ribbon cartridges
- Color kit

If you ordered any of these items, make sure that you received them. To install options, see Chapter 8.

Once you're sure you have everything, you're ready to assemble the printer.

ASSEMBLING THE PRINTER

In this section you will install the platen knob, cut sheet stand, and ribbon cartridge.

Installing the Platen Knob

Referring to the following figure, fit the groove on the platen knob over the same-sized groove on the right side of the printer.
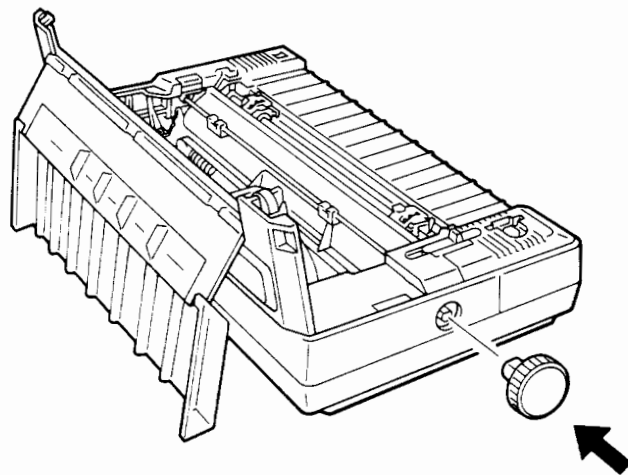
Installing the platen knob

Installing the Paper Guide Extenders

The paper guide extenders ensure a smooth output path to prevent paper jams when using multi-part forms. There are three extenders. Install the paper guide extenders if you plan to use paper-stapled, multi-part forms. To install the paper guide extenders:

1. Turn the paper guide panel over. Each paper guide has two clips on the top edge. Hook the slots on the extender over the clips on the paper guide and slide it up (towards the top of the paper guide). Then slide the extender left to lock it in place.

2. Now move the extender up to snap the lower edge of the extender under the "W" shaped clip on the paper guide.
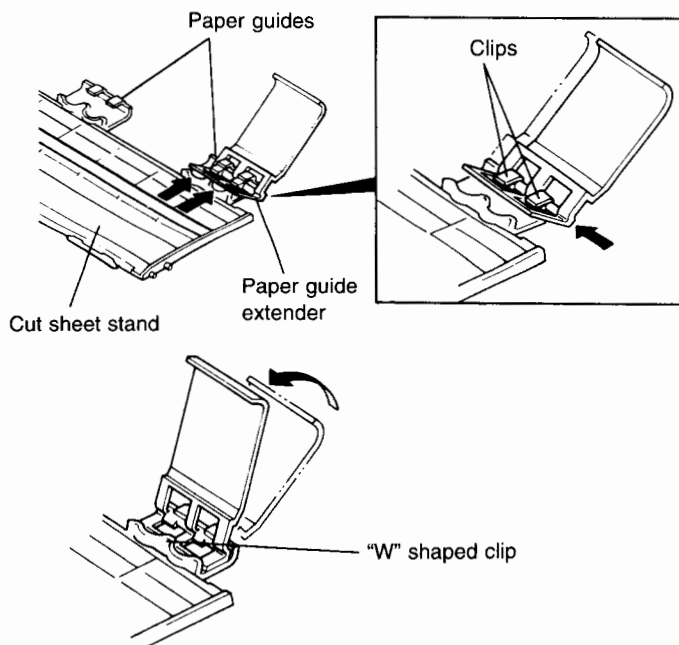
Installing the paper guide extenders

See page 3-22 for loading multi-part forms with the paper guide extenders installed.

Instaling the Cut Sheet Stand

The cut sheet stand allows smooth feeding of both single sheets and continuous forms. To install the cut sheet stand:

1. Open the top cover. Referring to the following figure, locate the two grooved notches on top of the printer and behind the top cover. Note that each notch has a front groove and a rear groove.
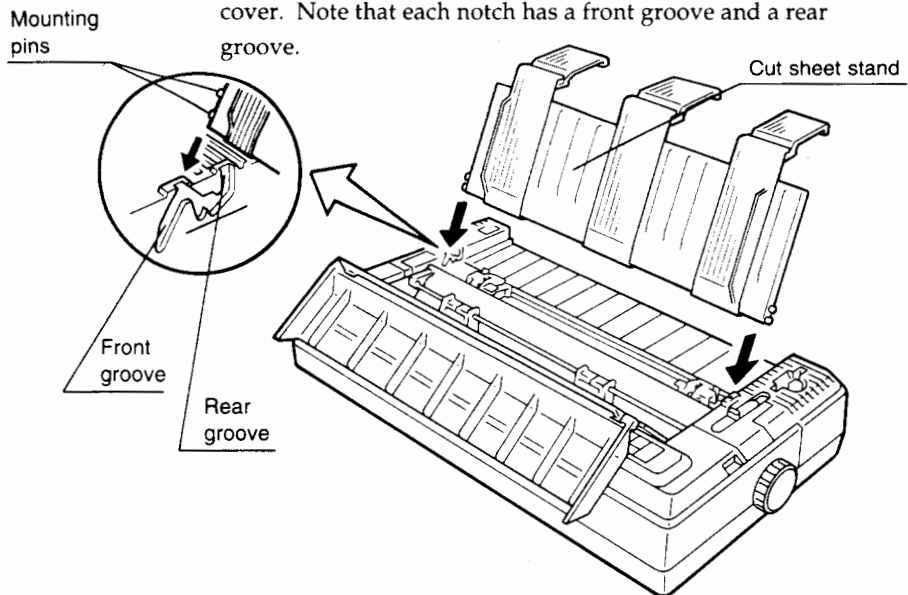
Installing the cut sheet stand

2. Locate the two mounting pins on each side of the cut sheet stand.

3. Tilt the cut sheet stand at an angle over the top of the printer. Slide the cut sheet stand's mounting pins into the long, front grooves of the notches. This is the cut sheet stand's *up* position, used for printing on single sheets.

To rotate the cut sheet stand *down*, grasp it by the sides and lift up until the two upper mounting pins fall into the rear grooves of the notches. This is the *down* position used for printing on most continuous forms paper.

Installing the Ribbon Cartridge

A color printer can use either color or black ribbon cartridges. A monochrome printer *requires* a black ribbon cartridge. To install the ribbon cartridge:

1. Open the top and front covers of the printer. For easy access to the print head carriage, slide it to the position where a bail roller does not obstruct the nose of the print head.

2. Inside the left side of the printer, locate the paper thickness lever, shown in the following figure. The paper thickness lever has five positions: ①, ②, ③, ④, and ⑤. Move the paper thickness lever to position ⑤.

Paper thickness lever
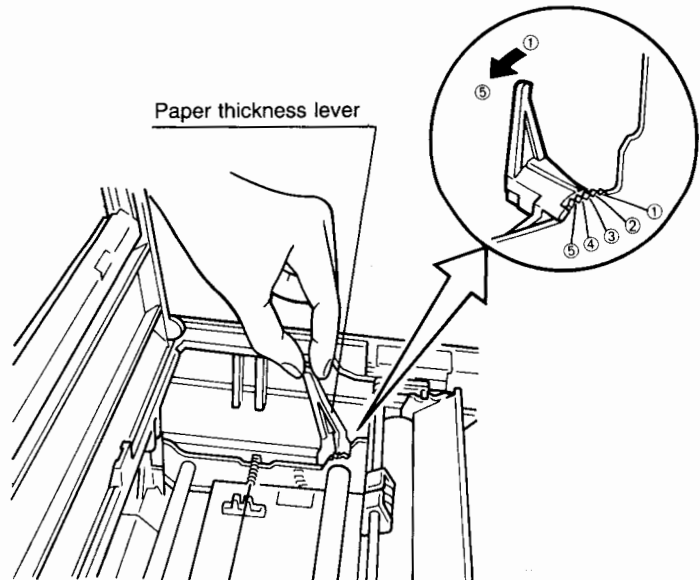
Preparing to install the ribbon

3. Remove the ribbon cartridge from its package. Remove the stopper releasing the ribbon feed knob (see the following figure). Turn the ribbon feed knob CLOCKWISE to be sure it feeds properly.

Ribbon

Ribbon feed knob

Turn clockwise to tighten

Stopper

(Black)

Ribbon

Ribbon feed knob

Stopper

(Color)
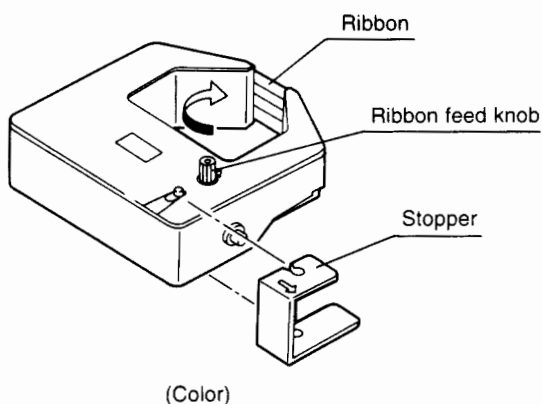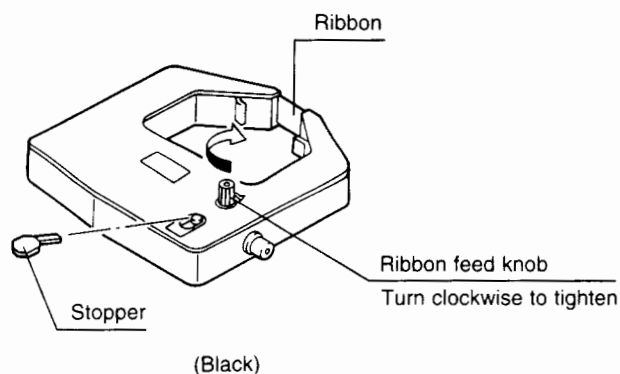
Preparing the ribbon cartridge

4. Locate the mounting pin on either side of the ribbon cartridge. Referring to the following figure, place the mounting pins onto ribbon release levers on the ribbon support studs inside the printer. Rotate the cartridge so the ribbon falls between the nose of the print head and the plastic print guide.

Ribbon cartridge

Ribbon release lever
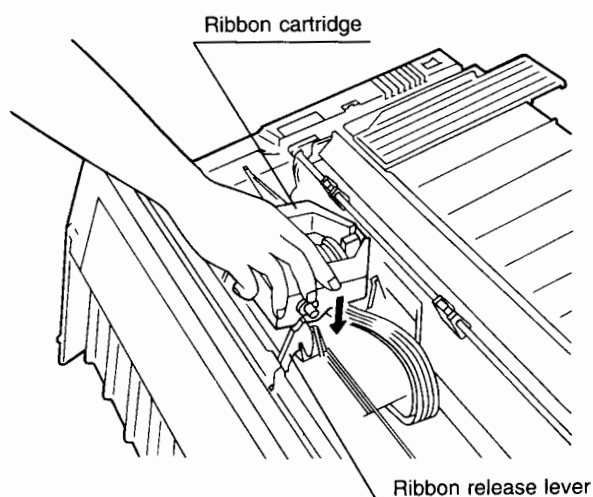
Installing the ribbon cartridge

5. Press down the cartridge along the slopes of the ribbon release levers until the mounting pins snap into the notches on the ribbon support studs. Gently pull on the cartridge to verify that the pins are securely installed in the notches and the ribbon is smoothly moved across the feed path.

6. Turn the ribbon feed knob CLOCKWISE to tighten the ribbon.

7. Move the paper thickness lever (inside the left side of the printer) to position ①. This is the correct setting for most single sheet printing.

8. Close the front and top covers of the printer.

GETTING ACQUAINTED WITH YOUR PRINTER

Now that your printer is assembled, take a moment to become familiar with its major components.

Looking at the printer from the front and right side, you can see the components shown in the figure below.

Paper guide extenders

Paper guides

Paper thickness lever

Platen

Power switch

Cut sheet stand

Paper bail roller

Forms tractor

Card slot

Card cover

Paper select lever

Top cover

Platen knob

Front cover
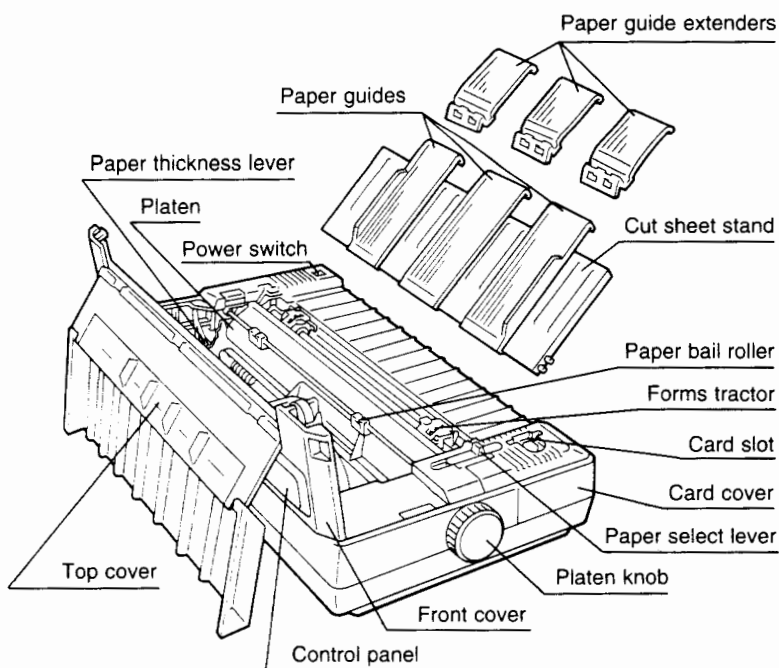
Control panel

Front and side view of printer

The printer's control panel contains the buttons and indicators used to load and feed paper (see Chapter 3) and select print features (see Chaper 4). The control panel also allows you to change the printer's optional settings (see Chapter 5).

Looking at the printer from the rear, you can see the following components:

Interface connector   Paper guide extenders

Nameplate   AC power connector
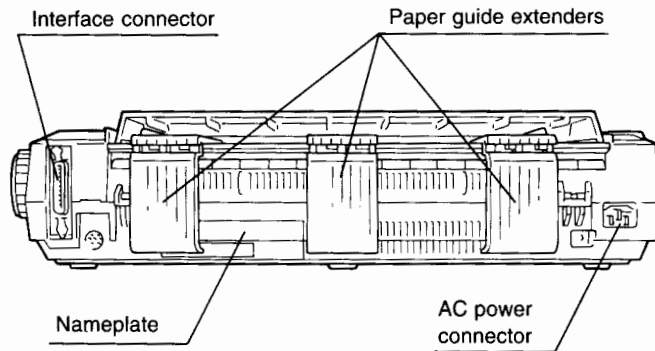
Rear view of printer

CONNECTING THE POWER CORD

Before you plug in the printer:

√ Be sure the printer power is switched off. The "0" on the rear of the power switch should be visible.

√ Be sure your power outlet is properly grounded.

√ Be sure you have the power cord shipped with the printer. This cord is designed to minimize radio frequency interference.

To plug in the power cord:

1. Plug one end of the power cord into the power connector at the left back of the printer.

2. Plug the other end of the power cord into your power outlet.
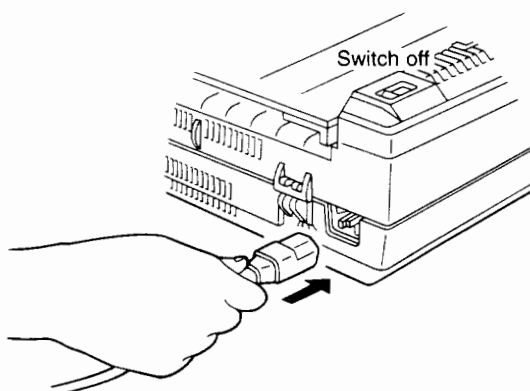
Connecting the power cord

3. Make sure the power cord is securely connected.

4. To turn on the power, press down the rear of the power switch. The "1" on the front of the switch will be visible. Within a few seconds, the POWER indicator on the printer's control panel turns green, the print head moves to its home position, and the ONLINE indicator turns green.

NOTE
If the printer beeps and the PAPER OUT indicator turns red, it indicates that the paper select lever is set to the rear (continuous forms) position but no forms paper is loaded. When you move the paper select lever to the forward (single sheet) position, as described in the next section, PAPER OUT will turn off.

TESTING THE PRINTER (OFFLINE)

At this point you can load a piece of paper and run the printer's self-test. By running the self-test, you can check the printer's performance and print quality before you connect it to your computer.

Loading Paper for the Self-Test

To print the self-test, use paper greater than 215.9 mm (8-1/2 inches) in width to avoid printing on the platen. Standard letter or A4 size paper can be used by inserting the paper *lengthwise*.

Before you load a sheet of paper, make sure that the printer is turned on. Then do the following:

1. Make sure the paper thickness lever (inside the left side of the printer) is set to position ① (nearest the platen). Make sure that the paper select lever (on the top right side of the printer) is pushed forward, as shown in the following figure.
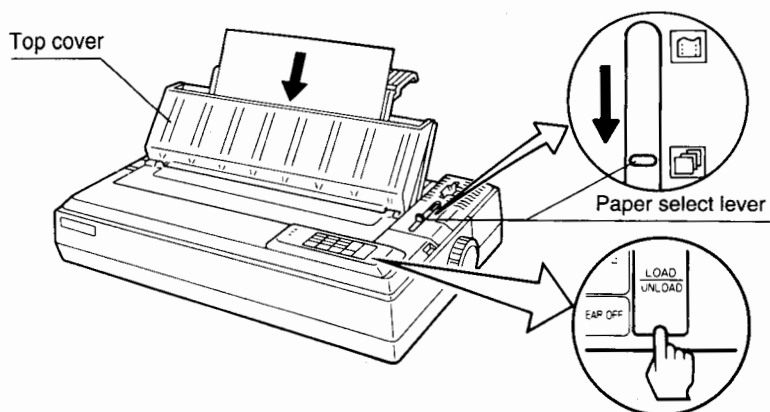
Loading a sheet of paper

2. Raise the cut sheet stand. Move the left paper guide so that the paper can cover from column 1 to column 80 on the scale. Insert a piece of paper into the cut sheet stand. If using paper of letter or A4 size, insert the paper *lengthwise* to avoid printing on the platen.

CAUTION
Printing on the platen will damage the platen and print head.

Adjust the right paper guide so that the paper lies flat on the cut sheet stand.

3. Press the LOAD/UNLOAD button. The paper will be loaded to the top-of-form position.

Top-of-form is the base used by the printer to calculate the top margin of the page. The possible top-of-form settings are 25.4 mm (1 inch), which is the factory setting, or 4.2 mm (1/6 inch). The total top margin of your page is the sum of the following settings: top-of-form, the top margin specified in your software, and the top margin specified in the printer's setup mode. See Chapter 5 for information on changing the top-of-form or top margin settings.

Printing the Self-Test

The printer has a built-in self-test program. The self-test prints the firmware version, the names of the printer's resident emulations, and all of the characters available in the emulations. The self-test prints 80 characters per line. If you are using a color printer and ribbon, printing is in seven colors.

Be sure a piece of paper is loaded. Then follow these steps to print a self-test page.

1. Turn off the printer.

2. While pressing the FF button, turn the printer back on. Continue pressing FF until the printer beeps. Self-test printing will start.
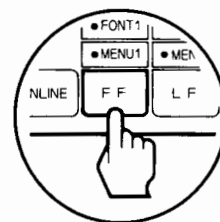
Starting the self-test

3. Allow printing to continue for about 15 seconds. To stop printing, press the LF or MODE button. To remove the test page, manually turn the platen knob clockwise.

NOTE
Do not try to use the FF (form feed) button to eject the paper. In self-test mode, FF cannot be used to feed paper forward.

4. Look at the self-test page. It should look similar to the sample on the following page.

Check that printing is uniform, without light, dark, or smudged areas. If the print quality is good, go to step 5. Otherwise, try to correct the problem using these steps:

• Make sure that the ribbon is installed correctly.

• Make sure that the paper thickness lever is set to position ①.

• Insert a new sheet of paper into the cut sheet stand. Turn the platen knob to manually advance the paper until the top edge has moved past the paper bail rollers.

• Press LF or MODE to restart printing. If the print quality remains poor, turn off the printer and contact your dealer for assistance.

```
=== Self test printing ===

BUTTON        ACTION
<ONLINE>      Exit to normal mode
< F  F >      Return to <<FUNCTION>> menu
< L  F >      Pause/resume printing
< MODE >      Pause/resume printing

1.  Software specification

    D05B-2903-D101,D201 (02B)

2.  Emulations

    DPL24C+ --- FUJITSU DPL24C PLUS              Ver. 1.03
    IBMXL24 --- IBM Proprinter XL24              Ver. 1.04
    LQ2500  --- EPSON LQ2500                     Ver. 1.04
    LQ2550  --- EPSON LQ2550                     Ver. 1.03

3.  Repeat printing
```

Sample self-test page

5. To exit the self-test mode, press ONLINE. The printer will
   return online.

NOTE

The printer is able to print a special "demo pattern" illustrating some of the printer's capabilities. To print the demo pattern, which is shown in the figure below, perform the following steps:

- Load a sheet of letter or A4 size paper. Turn off the printer.

- While pressing the LF button, turn the printer back on. The printer will start printing the demo pattern.

- To stop the demo, press ONLINE. To restart the demo, press ONLINE again.

- To exit demo mode, turn off the printer.

```
==== PRINTER FUNCTION SPECIFICATION ====

Printing technology:     24 wire dot matrix, Logic seeking
Resolution:              Letter quality  - 360 X 180 dots/inch
                         Draft  quality  - 120 X 180 dots/inch
                         High speed draft - 90 X 180 dots/inch
Color (Option):          7 colors  Black,Magenta,Cyan,
                         Violet,Yellow,Orange, and Green
Standard command set:    Fujitsu DPL24C PLUS Version 1.04
Resident emulations:     Epson LQ2500,LQ2550, IBM Proprinter XL24
Emulation cards (option): Fujitsu DPL24D/Diablo 630API, DEC LA50/75/120/210
Character sets:          Codepage 437,850,860,863,865,ISO8859-1
                         11 national sets,357 characters per font
Print functions:         See below.

Fonts - Courier 10, Pica 10, Prestige 12, Boldface PS
        Compression 17, Correspondence 10, Draft 12
        Font card No0, Font card No1, Font card No2, Font card No3
```

Bold printing Shadow printing *Italic printing* <u>Underline</u>
Condensed ˢᵘᵖᵉʳˢᶜʳⁱᵖᵗ ₛᵤᵦₛ꜀ᵣᵢₚₜ

D o u b l e   w i d t h Double height **Double W & H**

(The following functions are for the DPL24C PLUS only)

Underline <u>TYPE 1</u> <u>**TYPE 2**</u> <u>**TYPE 3**</u> <u>**TYPE 4**</u> <u>**TYPE 5**</u> <u>**TYPE 6**</u> O̅v̅e̅r̅l̅i̅n̅e̅

Bar code print: Codabar,EAN8,EAN13,Code 3 of 9,Industrial 2 of 5
                 Interleaved 2 of 5,Matrix 2 of 5,UPC type A

EAN8 example:

```
   ║║║ ║ ║║ ║║║║ ║ ║║║
   1234 5670
```

Multiwidth & height + Screened outline:

FOR TITLE

Demo pattern

**CONNECTING
THE PRINTER TO
YOUR COMPUTER**

Your printer has either a Centronics parallel interface or an RS-232C serial interface. The parallel interface is factory-installed. The serial interface is available as a separate option (see Chapter 8 for installation instructions). Cables for either type of interface are available from dealers, cable manufacturers, and other suppliers. For detailed interface specifications, see Appendix D.

Selecting a Parallel Interface Cable

If you are using a parallel interface, you must use a parallel interface cable that meets the following specifications:

√ At the printer end, use a shielded male Centronics connector such as an Amphenol DDK 57FE-30360 or its equivalent. To prevent RFI (radio frequency interference), the connector cover must be connected to the cable shield.

√ At the computer end, most computers (including IBM PCs) require a male DB-25P connector, but some computers require a Centronics connector. To determine the type of connector your computer uses, refer to your computer's user manual.

√ Be sure the length of the cable does not exceed 3 meters (10 feet).

Selecting a Serial Interface Cable

If you are using a serial interface, you must use a serial interface cable that meets the following specifications:

√ At the printer end, use a 25-pin male connector such as a Cannon DB-25P or its equivalent.

√ To determine the type of connector your computer requires, refer to your computer's user manual or ask your dealer.

√ The length of the cable can be up to 15 meters (50 feet). This cable length is required in many networking and shared-printer configurations.

Connecting the Interface Cable

To connect the interface cable:

1. Turn off both the printer and the computer.

2. Attach the interface cable to the connector at the right rear of the printer. See the following figure.
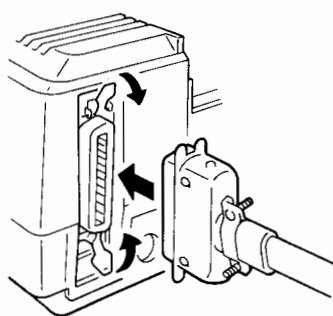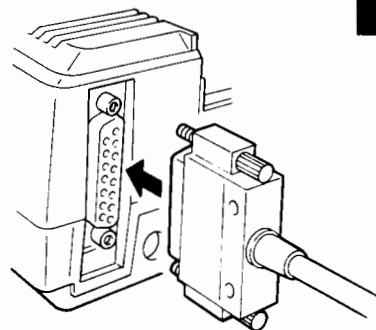
Parallel interface   Serial interface

Connecting the interface cable

3. To secure a parallel interface cable, flip the fastener clips on the printer into the notches on the cable connector. To secure a serial interface cable, tighten the screws in the cable connector.

4. Attach the other end of the interface cable to your computer. Gently pull on the cable to verify that the cable is secure.

SELECTING AN EMULATION   Before printing with your software, you must verify that the correct emulation is selected on your printer. This section explains what emulations are and how to select the emulation you require.

For Experienced Users:

The printer's preselected factory setting is the Fujitsu DPL24C PLUS emulation. If this is the emulation you require, you may skip this section.

An emulation is a set of commands used by your software to communicate with the printer. There are many different emulations available for printers. Each emulation has its own unique features and capabilities. This printer offers four *resident* emulations:

- Fujitsu DPL24C PLUS (for Fujitsu DL-series printers)
- IBM Proprinter XL24
- Epson LQ-2500
- Epson LQ-2550

Resident emulations are stored in the printer's permanent memory. Additional emulations are also available on removable emulation cards (see Chapter 8).

Here are some pointers to help you determine which emulation to select:

√ Determine which emulations your software supports. Refer to your software documentation. Because most software programs support this printer, we recommend you try running a program first with the factory default emulation as is (DPL24C PLUS emulation is factory default.).

√ If you are using more than one software package, determine which emulation is supported by the software you use most frequently. That's the emulation you should select on the printer.

√ If more than one emulation is supported by your software, select the DPL24C PLUS emulation if possible. This is the emulation with the greatest capabilities.

√ If you want to use an emulation not supported by your software, contact your software manufacturer or printer supplier and ask whether support is available. For example, you may be able to obtain a printer driver not shipped with the original software package.

To select an emulation, follow these steps.

1. Turn on the printer and load a sheet of paper.

To change a single printer setting such as the emulation, you can use single sheet paper. To change several printer settings as described in Chapter 5, however, you must load continuous forms paper. See Chapter 3 for paper loading instructions.

2. Enter setup mode.

Turn the printer off. While pressing the MODE button, turn the printer back on. Continue pressing MODE until the printer beeps.

If you don't hear a beep and the printer goes online, you are not in setup mode. Turn off the power and try again. Make sure you press MODE until the printer beeps.

When the printer enters offline setup mode, it prints the following information.

```
*****    OFFLINE  SETUP  MODE    *****
        - The red cursor indicates the option to be selected.
        - The selected option is underlined.
        - "SAVE&END" function must be selected to exit setup mode.
        - Following list shows how buttons function in setup mode:

BUTTON | ACTION on <<FUNCTION>> menu | ACTION on <ITEM> menu
-------+----------------------------+-------------------------------------
ONLINE |Reprint <<FUNCTION>> menu    |Select option & return to <<FUNCTION>> menu
 F  F  |Select function              |Select option & print next item
 L  F  |Select function              |Select option & print previous item
 MODE  |Move cursor to next function |Move cursor to next option




                                    _____ <<FUNCTION>> menu
               <<FUNCTION>>
Functions ──► SAVE&END PANEL  MENU1  MENU2  HARDWRE LIST  DEFAULT SELF-TST HEX-DUMP V-ALMNT TOF-ADJ
               ◄_____ Red cursor on print guide
```

Initial printout in setup mode

Make sure that the <<FUNCTION>> menu (shown in the previous figure) is printed at the bottom of the page.

3. Select the MENU1 function.

Look for the red cursor on the plastic print guide. Initially, it should be positioned below SAVE&END at the beginning of the <<FUNCTION>> menu. Repeatedly press MODE to position the red cursor beneath MENU1, as shown below:


```
<<FUNCTION>>
 SAVE&END  PANEL  MENU1  MENU2    HARDWRE   LIST     DEFAULT  SELF-TST  HEX-DUMP  V-ALMNT  TOP-ADJ

                              Press MODE to position the red cursor.
```
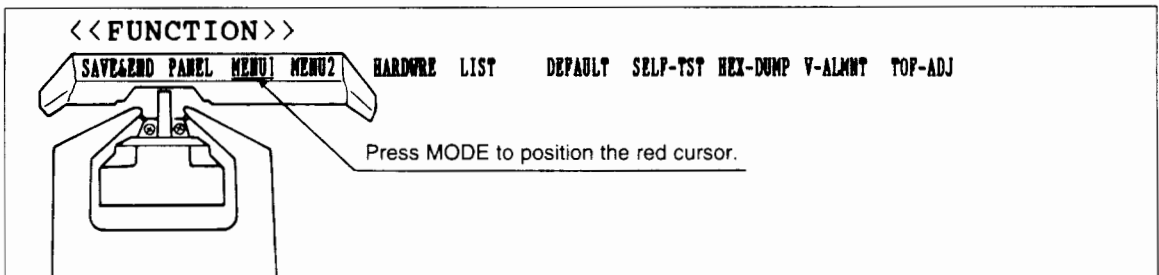
Press FF to select MENU1 and print the <EMULATE> options:

```
<EMULATE>        DPL24C+  IBMXL24  LQ2500   LQ2550
```
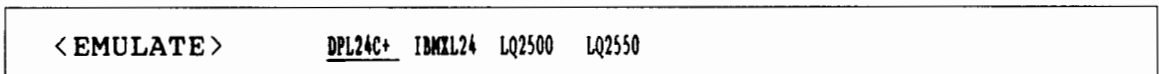
The currently selected emulation is indicated by a short underline. In the figure above, the Fujitsu DPL24C PLUS emulation is selected.

4. Select an emulation.

Repeatedly press MODE to position the cursor beneath the emulation you require. Press FF to select the emulation and print the next MENU1 item.

5. Exit MENU1.

Press ONLINE to exit the MENU1 function and reprint the <<FUNCTION>> menu.

LOADING AND USING PAPER

3

This chapter explains how your printer uses paper. Topics are covered in this order:

- Selecting paper
- Overview of paper operations
- Adjusting for paper thickness
- Using single sheets
- Using continuous forms
- Feeding paper
- Switching paper types

Tips for handling paper are given at the end of this chapter. If you are using multi-part forms, check this section.

SELECTING PAPER

The printer can handle either single sheets of paper or continuous forms. Single sheets, sometimes called cut sheets, include individual sheets of paper and non-continuous multi-part forms. Continuous forms include paper and multi-part forms fed into the printer using the rear forms tractors.

For best results, be sure that your paper meets the specifications listed below. See Appendix B for detailed specifications. If the specifications of your paper are unclear, try testing the paper or consult your dealer.

Length	Single sheets: 76 to 364 mm (3 to 14.3 inches) Continuous forms: 102 to 558 mm (4 to 22 inches)
Width	Single sheets: 102 to 420 mm (4 to 16.5 inches) Continuous forms: 102 to 406 mm (4 to 16 inches)
Thickness	0.33 mm (0.013 inch) maximum total thickness
Copies	1 to 5 copies, including the original. For carbon-interleaved paper, the carbon counts as a copy.
Binding	Single sheets: top edge gluing only Continuous forms: point gluing recommended paper stapling allowed

**OVERVIEW OF
PAPER OPERATIONS**

The following levers and buttons are used to handle paper in
your printer:

- Paper select lever, which is located on the top right corner of the
  printer
- Paper thickness lever, which is located inside the front cover on
  the left side of the printer
- FF, LF, TEAR OFF, and LOAD/UNLOAD buttons on the
  control panel

The figure below shows the location of each lever and button.
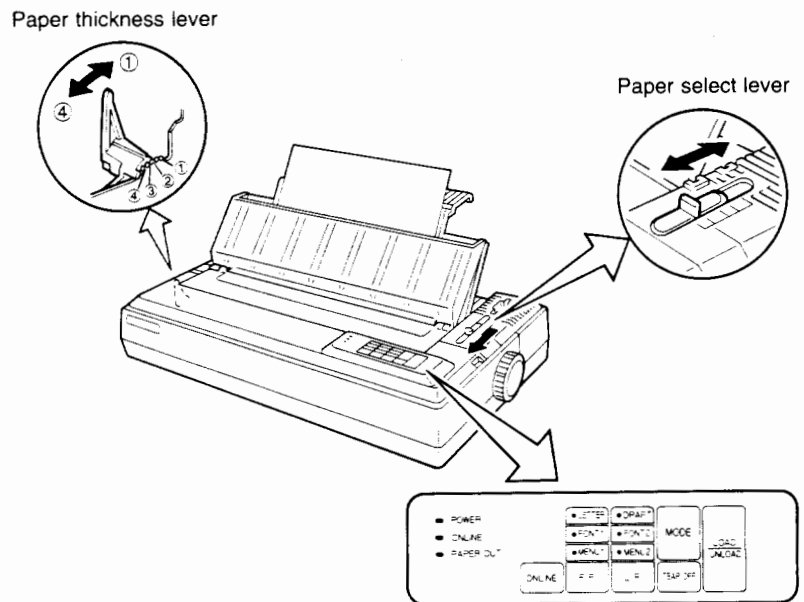
Printer levers and buttons

Table 3.1 summarizes how the levers and buttons are used to handle
paper. More detailed information, is provided in subsequent sections
of this chapter.

NOTE
To load and advance paper, the special mode item indicators must not be flashing. To turn the MODE indicators off, repeatedly press the MODE button until none of the indicators are flashing.

Table 3.1 Levers and Buttons Used to Handle Paper

Lever/Button	Purpose	What You Do
FF	Form feed	Press FF to execute a form feed. Continuous forms are fed forward by one page. Single sheets are ejected.
LF	Line feed	Press LF to feed paper forward by one line.
TEAR OFF	Advance forms for tear-off	Press TEAR OFF to advance forms to the tear-off edge. Tear off the forms, then press any button to retract the forms.
LOAD/ UNLOAD	Load/unload paper	Press LOAD/UNLOAD to load paper, or to unload (retract) continuous forms to the park position.
Paper select lever	Select the paper path	Move the paper select lever forward for single sheets (cut sheet stand or feeder). Move the paper select lever back for continuous forms.
Paper thickness lever	Adjust for paper thickness or number of copies	Move the paper thickness lever to position ①, ②, ③, ④, or ⑤. For copies, select the notch number position that is equal to the number of copies.

Using Paper

ADJUSTING FOR PAPER THICKNESS

The printer can handle paper of different thicknesses. This includes multi-part forms with up to five parts (original plus four copies). For detailed paper thickness specifications, see Appendix B.

The paper thickness lever, which is located inside the front cover on the left side of the printer, allows you to adjust for different paper thicknesses. Be sure to adjust the paper thickness lever whenever you change the number of copies being printed.

To adjust the paper thickness lever:

1. Open the top and front covers of the printer.

   CAUTION
   The print head may be hot if you've been printing recently.

2. Locate the paper thickness lever, which is shown in the figure below.
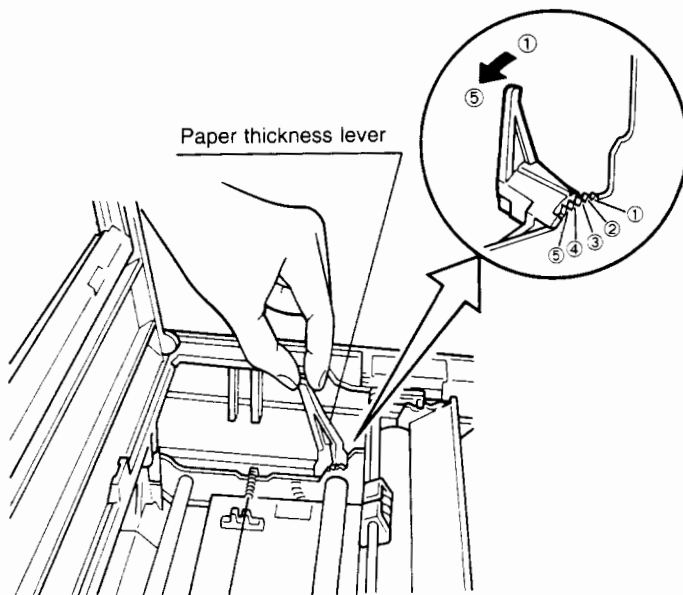
Adjusting the paper thickness lever

3. The paper thickness lever has five positions: ①, ②, ③, ④, and ⑤. Use the following table to determine the appropriate setting for your paper. If necessary, move the paper thickness lever to a lower or higher position in accordance with paper quality.

Table 3.2 Paper Thickness Lever Settings

Number of Copies (Including Original)*	Position
1 copy	1
2 copies	1 or 2
3 copies	3
4 copies	4
5 copies	5
Ribbon replacement	5

* For carbon-interleaved paper, the carbon counts as one copy.

USING SINGLE SHEETS

This section explains how to load paper in the cut sheet stand or cut sheet feeder. The cut sheet stand allows paper to be loaded manually one sheet at a time. An optional cut sheet feeder allows paper to be automatically loaded from a stack.

Loading a Single Sheet of Paper

To load a sheet of paper into the cut sheet stand:

1. Make sure the printer is turned on. Check that continuous forms are retracted to the park position (see **Unloading Continuous Forms** later in this chapter for details).

2. If necessary, re-adjust the paper thickness lever (see **Adjusting for Paper Thickness** earlier in this chapter).

3. Move the paper select lever (on the top right side of the printer) forward.

4. Open the top cover and raise the cut sheet stand to the *up* position. Position the left paper guide.

NOTE
To help align the paper guide, use the bail unit ruler on the platen, which shows 10 columns per inch.

When the left paper guide is positioned at n columns from column 0 on the ruler, you will obtain a left margin of n columns, plus the left margins specified using your software and the printer's setup mode.
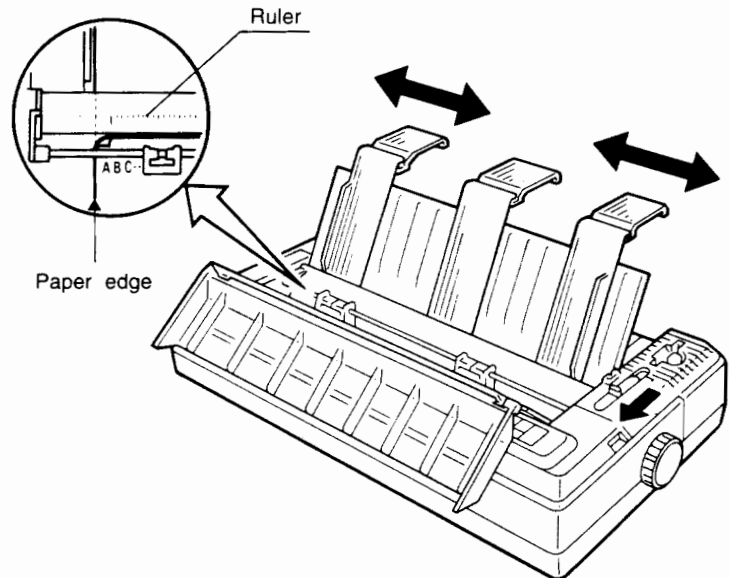
Preparing to load a sheet of paper

5. Insert a sheet of paper into the cut sheet stand. Be sure that the bottom edge of the paper snugly engages with the platen. Adjust the right paper guide.

6. If any of the special mode item indicators are flashing, repeatedly press MODE to stop the indicators from flashing. Then press the LOAD/UNLOAD button. The paper then advances to the top-of-form position. Top-of-form is the first line on which printing can start. To adjust the position of the paper slightly, manually turn the platen knob.
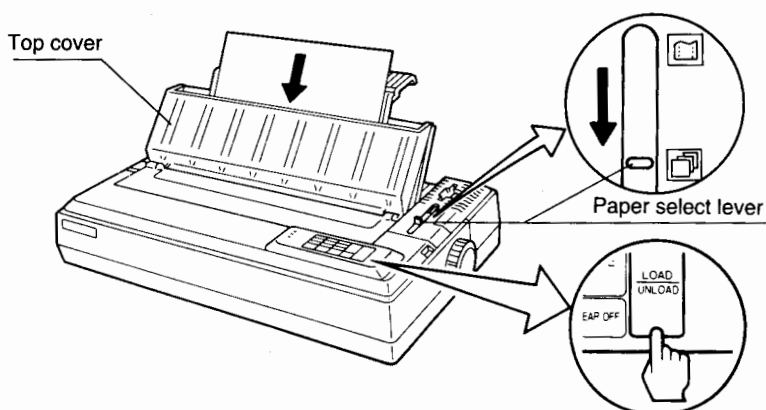
Loading a sheet of paper

7. Place the printer online by pressing the ONLINE button. Print a sample page and check the margins of the page. If necessary, adjust the following:

- Horizontal alignment of the paper. Re-adjust the paper guides if required.
- Top-of-form setting (see Chapter 5)
- Margin settings. Use your software or the printer's setup mode mode (see Chapter 5).

Loading Paper in the Cut Sheet Feeder

A cut sheet feeder allows you to automatically print on single sheets of paper without inserting the sheets one by one. This can save you a lot of time when printing long files using single sheets. See Chapter 8 for more information on cut sheet feeders.

When the feeder is mounted, you must enter the printer's setup mode and specify either SINGLE or DOUBLE as the feeder type. Otherwise, the feeder will not work. To enter setup mode and specify the feeder type, see **Changing Hardware Options** in Chapter 5.

To load paper in the cut sheet feeder:

1. Make sure that the printer is turned on. Check that continuous forms are retracted to the park position (see **Unloading Continuous Forms** later in this chapter for details).

2. If necessary, re-adjust the paper thickness lever (see **Adjusting for Paper Thickness** earlier in this chapter).

3. Move the paper select lever (on the top right side of the printer) forward.

4. Referring to the figure below, prepare the cut sheet feeder as follows:
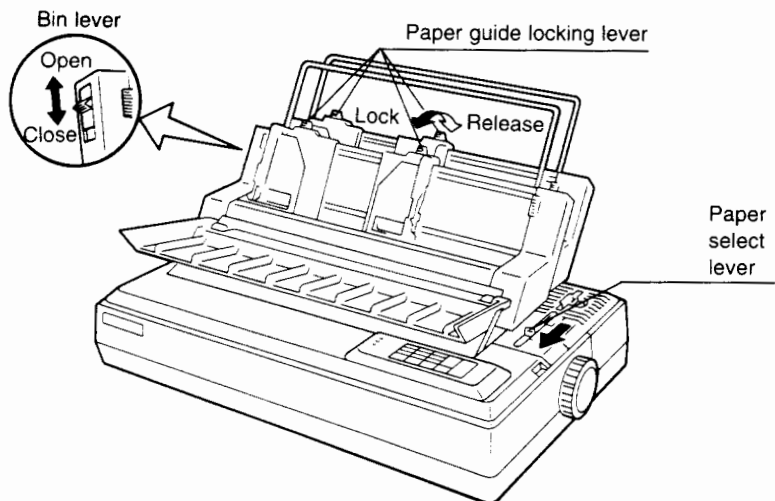
Preparing the cut sheet feeder

- To open the paper bin, push the bin lever up to "OPEN." The bin lever is located on the left side of the feeder.

- Push back both of the paper guide locking levers of the feeder.

- Position the left paper guide. Pull the left locking lever forward to secure the left paper guide.

NOTES

- **To help align the left paper guide, use the inch-based ruler located behind the paper guides. The ruler is subdivided into 10 columns per inch. Setting the left paper guide 12.7 mm (1/2 inch) from the left provides a left margin of 6.3 mm (1/4 inch), plus the left margin specified using your software or the printer's setup mode.**

- **The vertical mark near the base of the left paper guide, shown in the figure below, indicates the location of the printer's paper-out sensor (the groove on the left side of the platen). Do not position the left paper guide to the right of this vertical mark, or your paper will not load properly.**
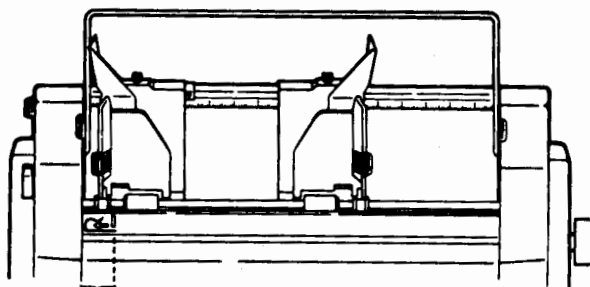
Make sure that the left edge of your paper falls within this area.

- Slide the right paper guide to the approximate width of your paper.

5. Manually fan the stack of paper and place it in the paper bin. See the following figure.

NOTE

A short vertical mark inside each paper guide indicates the maximum capacity of the bin. Be sure that your paper stack does not exceed these vertical marks.
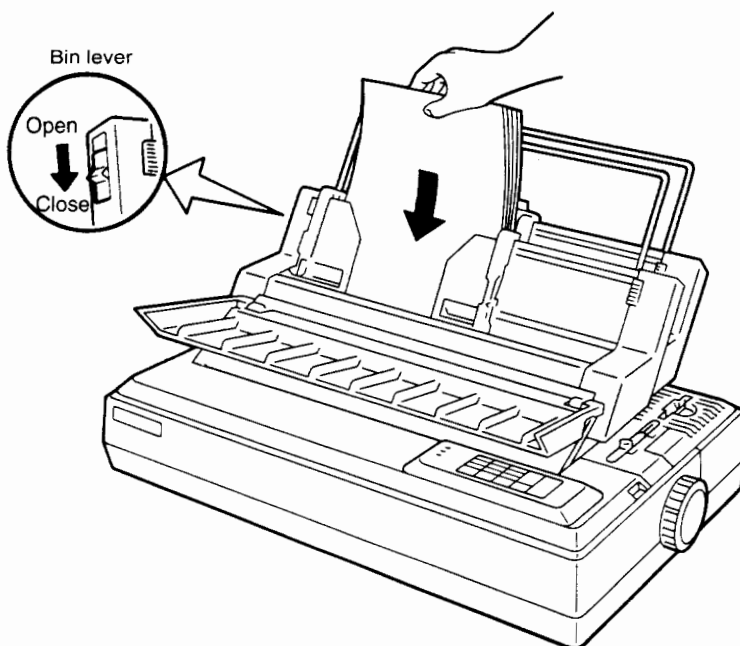
Loading the cut sheet feeder

6. Re-adjust the right paper guide, leaving a slight gap between the paper guide and the right edge of the paper. About 1.5 mm (1/16 inch) is sufficient. Pull the right locking lever forward.

7. Push the bin lever down to "CLOSED"

8. To load paper to the top-of-form position, use one of the following methods:

- Load the paper *manually* . If any of the special mode item indicators is flashing, repeatedly press MODE to stop the indicators from flashing. Press the LOAD/UNLOAD button. The paper then advances to the top-of-form position. To adjust the position of the paper slightly, manually turn the platen knob.

- Load the paper *using software*. Place the printer online. Load paper according to the instructions in your software documentation. Most software packages automatically load paper for printing.

9. Place the printer online by pressing the ONLINE button. Print a sample page and check the margins of the page. If necessary, adjust the following:

- Horizontal alignment of the paper stack. Re-adjust the paper guides if required.
- Top-of-form setting (see Chapter 5)
- Margin settings. Use your software or the printer's setup mode (see Chapter 5).

Ejecting Single Sheets

If you print using software, each sheet is automatically ejected when the end of the printed page is reached. To manually eject sheets of paper, use one of the following methods:

- Execute a forward form feed. (With the special mode item indicators not flashing, press FF.)
- Turn the platen knob clockwise.

USING CONTINUOUS FORMS

Continuous forms paper, fanfolded at the horizontal perforations, is fed into the printer using the rear forms tractors. Forms paper is ideal for printing rough drafts and long files.

Positioning the Paper Stack

Place the stack of forms paper directly below the rear of the printer. After the paper is installed in the printer, the paper path will look like this:

Single-part and side-glued
multi-part forms

Paper-stapled
multi-part forms
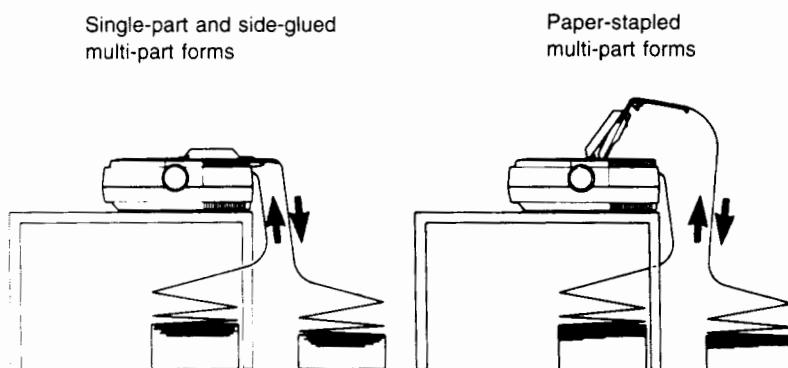
Placement of continuous forms

NOTE
If another placement of continuous forms is required, see page 3-24.

Loading Continuous Forms

If you have a cut sheet feeder installed, you must remove it to load continuous forms paper. To load forms paper:

1. Make sure that the printer is turned on. Remove any single sheet paper from the printer.

2. If necessary, re-adjust the paper thickness lever (see **Adjusting for Paper Thickness** earlier in this chapter).

3. Move the paper select lever (shown below) to the rear position.

4. Open the top cover and remove the cut sheet stand, if installed.

Using Paper

Cut sheet stand

Paper select lever
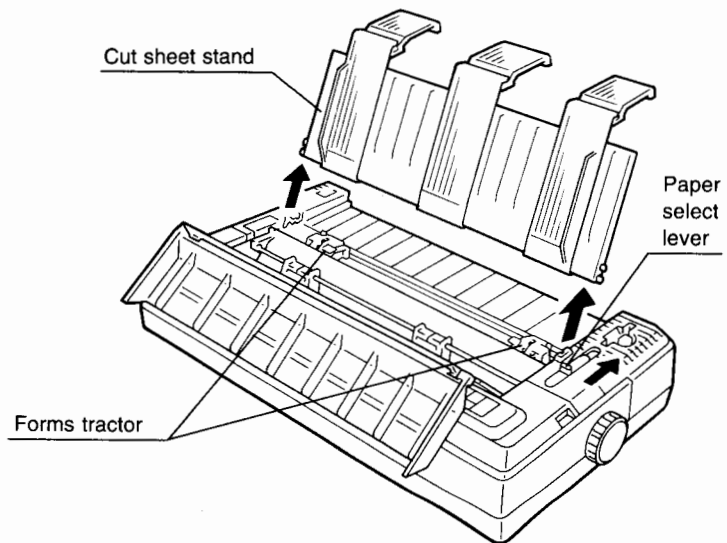
Forms tractor

Preparing to load forms paper

5. Release the tractor locking levers by pushing them toward the rear of the printer. See the following figure.

6. Position the right tractor (as seen from the rear of the printer). Pull the right locking lever toward the front of the printer to secure the tractor.

NOTE
On the bail unit, there is an inch-based ruler with 10-columns per inch. When no left margin is specified using your software or the printer's setup mode, positioning the right tractor's inner edge at column 0 of the ruler makes a left margin of about 1/2 inch (for paper with a standard vertical perforation.)
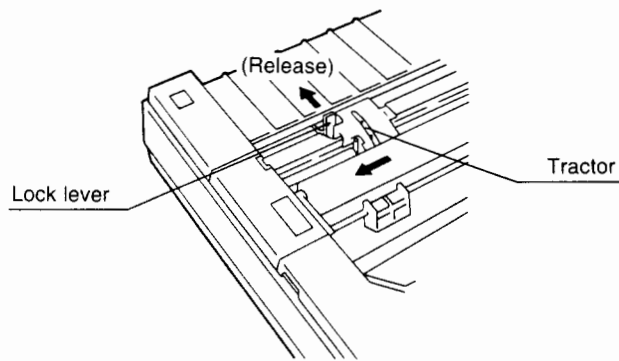
Positioning the tractors

7. Open the tractor paper holders and fit the form's feed holes onto the left and right tractor pins. Adjust the left tractor (as seen from the rear of the printer) to the width of the form. Close the paper holders.
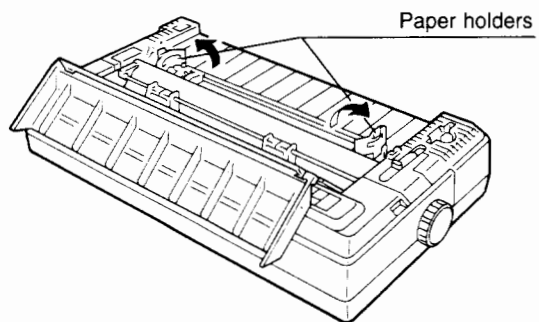
Opening the paper holders
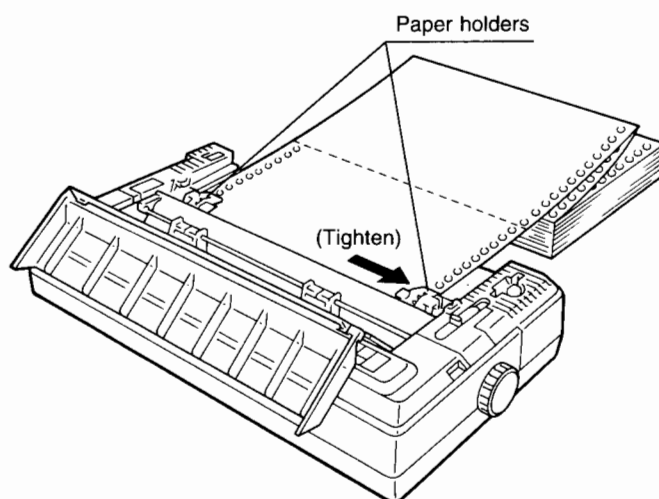
Installing forms paper

8. Pull the left tractor (as seen from the rear) to stretch the paper taut. Pull the left locking lever to the front to secure the tractor in place.

9. Return the cut sheet stand. Raise it to the up position for paper-stapled multi-part forms. For other forms paper, lower the cut sheet stand to the down position. Close the top cover.

10. If any of the MODE indicators are lit, repeatedly press MODE to turn the indicators off. Press the LOAD/UNLOAD button. The paper then advances to the top-of-form position. Top-of-form is the first line on which printing can start.

11. Place the printer online by pressing the ONLINE button. Print a sample page and check the margins of the printed page. If necessary, adjust the following:

   • Horizontal alignment of the paper. Move the forms tractors as required.
   • Top-of-form setting (see Chapter 5)
   • Margin settings. Use your software or the printer's setup mode (see Chapter 5).

Unloading Continuous Forms

To unload continuous forms:

1. Make sure that the paper select lever is set to the rear position.

2. Make sure that the special mode item indicators are not flashing. Press the LOAD/UNLOAD button. The continuous forms are then unloaded (retracted) to the park position. If forms cannot be retracted in one operation, continue to press LOAD/UNLOAD until the paper is parked.

   NOTE
   The printer can retract forms a maximum of 55.8 cm (22 inches) per operation.

3. To remove the forms, remove the cut sheet stand, raise the tractor paper holders, and lift out the paper. It is not necessary to remove the forms when using cut sheet paper.

Tearing Off Forms

Your printer has a special "tear-off edge" that allows you to remove printed pages without wasting paper. The tear-off edge is located on the top cover. (This feature is available even if you have a cut sheet feeder installed. The tear-off edge is also located on the front cover of the cut sheet feeder.)

To tear off continuous forms using the tear-off edge:

1. Make sure that the special mode item indicators are not flashing. Press the TEAR OFF button. The paper then advances to the tear-off edge.

   NOTE
   If the bottom perforation of your paper is not positioned at the tear-off edge, it may indicate that the length of your paper is not correctly specified in your software or the printer's setup mode. Check that the paper length is correctly speci-fied. For information on specifying page length using setup mode, see Chapter 5.

2. Open the top portion of the top cover and tear the paper off at the perforation.
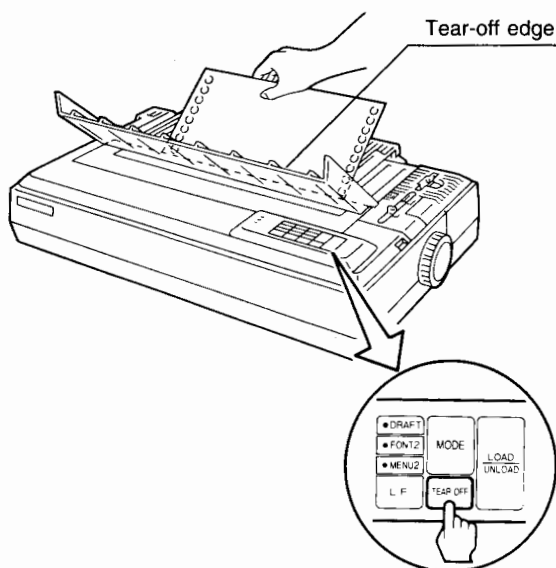
Tearing off continuous forms

3. Press any button to retract the forms back to the top-of-form position. Close the top cover.

FEEDING PAPER

You can use the FF and LF buttons on the printer's control panel to move paper forward. The FF (from feed) button moves the paper one page at a time. The LF (line feed) button moves the paper forward one line at a time.

The printer does not allow you to execute "reverse" form or line feeds from the control panel. To move paper backwards, manually rotate the platen knob.

To advance paper by a page or a line:

1. If the printer is offline, check that the special mode item indicators are not flashing. If any of the indicators are flashing, repeatedly press the MODE button until the indicators do not flash.

2. Press FF to advance the paper by one page. Press LF to advance the paper by one line.

NOTE
If the PAPER OUT indicator is lit, pressing LOAD/UNLOAD loads paper to the top-of-form position. Pressing FF advances the paper by a page.

SWITCHING PAPER TYPES

If you have more than one type of printing job, it is often convenient to switch between using continuous forms and single sheets. This section explains how to switch back and forth between paper types. It is not necessary to remove the continuous forms paper from the printer.

Switching to Single Sheets

To switch from continuous forms to single sheets:

1. Tear off your printed pages.

2. Retract the forms paper to the park position (press LOAD/ UNLOAD). The PAPER OUT indicator turns red.

   CAUTION
   Failure to retract the forms paper causes paper jams.

3. Move the paper select lever to the forward (single sheet) position.

4. Raise the cut sheet stand or mount the cut sheet feeder. See **Loading Single Sheets** earlier in this chapter for details. If you are using the cut sheet stand, be sure to press the LOAD/ UNLOAD button to advance the paper to top-of-form.

You are now ready to print using single sheets.

Switching to Continuous Forms

To switch from single sheets to continuous forms:

1. If a sheet of paper is loaded, turn the platen knob or press the FF button to remove it.

   CAUTION
   Failure to remove the paper causes paper jams.

2. Move the paper select lever to the rear (continuous forms) position.

3. Press the LOAD/UNLOAD button. The continuous forms paper then advances to top-of-form.

You are now ready to print using continuous forms paper.

TIPS ON HANDLING PAPER

General Tips

- Use high-quality paper. Do not use paper that is wrinkled or curled at the edges.
- Do not use paper with staples or metal parts.
- Do not use paper with projection in the surface level.
- Store paper in a clean, dry environment.
- To manually load paper, turn the platen knob. Then, press the ONLINE button so that the print head moves to the home position where paper cannot be caught by the bail rollers.
- When you use narrow paper on which the bail rollers cannot fully press the paper, slide the rollers inward from the standard position where each groove clicks the roller. See the following figure.

Using Paper
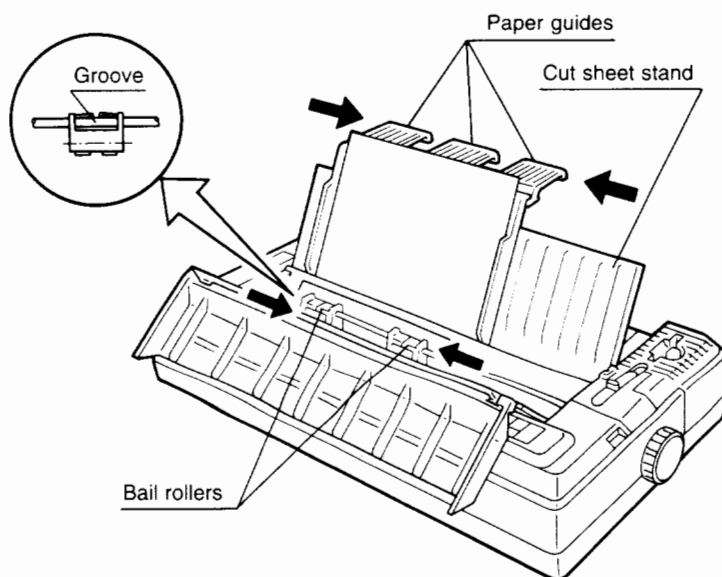
Positioning bail rollers for narrow paper

Continuous Forms

- Do not print using more than five parts (the original plus four copies). For carbon-interleaved forms, be sure to count the carbon as a copy.
- Avoid using carbon-interleaved single sheets. Printing tends to become misaligned on the bottom sheet.
- Avoid using lightly paper-stapled forms. Paper jamming may occur. Paper-stapled forms do not have staples in them. Instead, they are multi-part forms that have crimped edges to hold them together (most multi-part forms are glued).
- Check paper placement and alignment each time you use the printer. For long print jobs, especially those with heavy duty printing using continuous forms, check the paper stacks periodically. Be sure that the outgoing stack is folding properly. See the figure on the following page.
- To ensure smoother feeding of paper-stapled multi-part forms, raise the cut sheet stand as a support behind the forms. See the figure on the following page. See also page 3-22 and 3-24.

<Single-part>

<Paper-stapled multi-part>
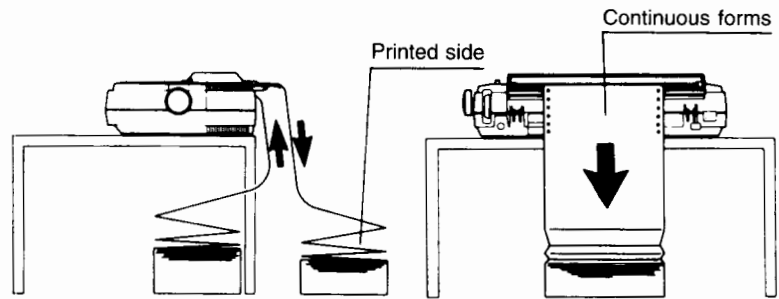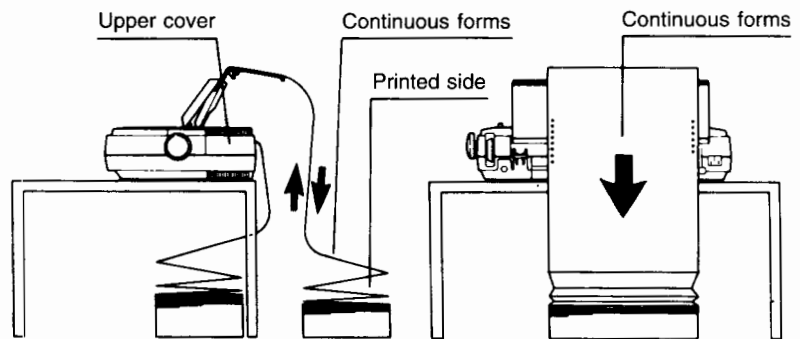
Paper placement for continuous forms

- If you are using one-part lighter weight continuous forms, or multi-part forms in high temperature, position the bail rollers at the left and right sides of the paper so that each roller rests half on the paper and half on the platen. This evens the paper tension and helps prevent less durable forms from tearing during printing. This should also be done if you plan on printing continuously. See the figure on the following page.

Half-catch
position
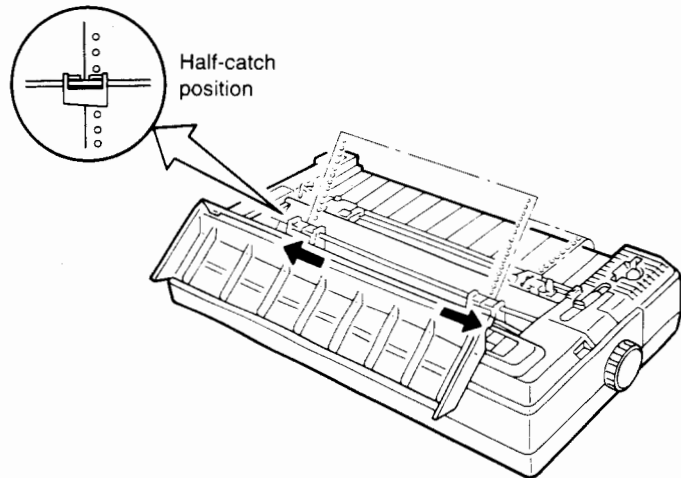
**Bail roller position for thin paper or
multi-part forms at high temperature**

- For paper-stapled continuous forms or other multi-part forms
  that have difficulty feeding through the printer, follow the steps
  below.

1. Make sure that the paper is loaded properly and that the
   paper thickness setting is correct.

2. Add the paper guide extenders. See page 2-5, Installing the
   Paper Guide Extenders, for more information.

3. Load the paper-stapled multi-part forms. See page 3-12,
   Loading Continuous Forms, for more information.

4. Place the cut sheet stand in the up position, and move the
   paper guides to the center with the extenders lowered.

   Caution
   *Do not autoload the forms with the cut sheet stand in the up
   position. Otherwise, a paper jam can occur.*

Paper guide   Paper guide extender
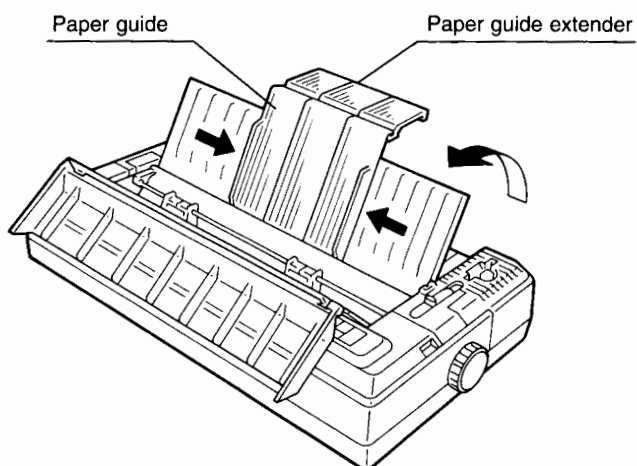
**Positioning the paper guides after loading forms
to further smooth paper feeding**

5. Make sure that the paper is positioned so that it feeds in a
   straight line without interference. See the figure on page 3-21.

<Single-part>
<Paper-stapled multi-part>
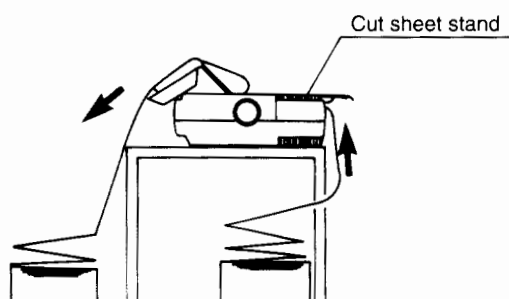
Cut sheet stand

Optional placement of continuous forms

- When printed paper must be stacked below the front of printer, place the cut sheet stand in the down position and open the top cover as shown above.

6. Exit setup mode, saving the emulation.

To exit setup mode and save the new emulation, make sure that the red cursor is positioned beneath SAVE&END and then press FF. The printer selects SAVE&END and then returns online.

To change other printer settings using setup mode, see Chapter 5.

PRINTING A SAMPLE PAGE (ONLINE)

Once you have used the printer's self-test to verify that the printer hardware functions correctly, you can try printing using one of your software packages. This will tell you whether the printer is correctly connected to your computer.

If you are using a parallel interface, the printer usually prints the correct characters. You may need to adjust the page layout or various print features using your software or the printer's setup mode. However, if you are using a serial interface, it is possible that the printer will not work at all, or that it will print a lot of "?" characters. This means that the serial settings on the printer do not match those on your computer or in your software. Before changing these settings, use the following procedure to try printing using the printer's preselected factory settings.

To test communication between the printer and computer, follow these steps.

1. Load a piece of paper.

2. Check that the printer is online. The ONLINE indicator should be green. If it isn't, press the ONLINE button.

3. Try to print using your word processor, a programming language, or other software.

4. If the page layout or other print features are wrong, use your software's printer selection menus or the the printer's setup mode, described in Chapter 5, to make the changes you require.

If the printer does not print or prints the wrong characters, perform the following steps:

- Make sure that the interface cable is properly connected.

- Make sure that the printer emulation selected in your software is the same as the emulation selected on the printer.

- If you are using a serial interface, make sure that the printer's serial interface setting are the same as those on the computer. The printer's preselected factory settings are 8 data bits, no parity, 1 stop bit, 9600 baud, and XON/XOFF protocol.

You can change the serial settings on either the printer or your computer. To change the printer's settings, see Chapter 5. To change the computer's settings, use the selection menus provided by your software or the commands provided by your computer's operating system. An example using the MS-DOS operating system is given below. If the printer still does not work, consult your dealer or someone experienced in serial interface communications.

Using MS-DOS to Specify Serial Interface Settings

For an IBM PC or compatible, the following MS-DOS MODE commands can be used to set the computer's serial settings to match the printer's factory settings:

```
MODE COM1:9600,N,8,1,P
MODE LPT1:=COM1
```

To activate these settings whenever you turn the computer on, include the MODE commands in your AUTOEXEC.BAT file. Make sure that the MODE.COM file is included in your root directory.

You are now finished setting up and testing the printer. To familiarize yourself with everyday printer operations such as loading paper, selecting print features, and printing, see Chapters 3 and 4.

PRINTING

4

This chapter describes everyday print operations. To load paper for printing, see Chapter 3. Then use the procedures in this chapter to:

- Select print features
- Start, stop, or resume printing
- Remove printed pages
- Clear the print buffer

SELECTING PRINT FEATURES

The print features you select determine how your printed pages will look. Print features include the following:

- Print quality
- Fonts
- Pitch (characters per horizontal inch)
- Page length and width
- Line spacing (lines per vertical inch)
- Color

To select print features, you can use either commercial software or the printer's control panel. Which method you use depends upon the capabilities of your software. If your software has most of the features you require, you may rarely — if ever — use the control panel to select print features. *In fact, your software often overrides the printer's settings.*

If your software has limited options, you can use the printer's control panel to select print features. The control panel often allows you to select features your software lacks. For example, you can select font cards or downloaded fonts not supported by your software.

Using Commercial Software

Many of today's commercial software packages offer a wide variety of print features, including features not offered by the printer. For example, software often provides a wider range of font sizes than the printer. It also allows you to specify multiple fonts on a page and multi-color printing. To determine which features your software supports and how to select them, refer to your software documentation.

Using the Control Panel

Using the MODE, FF, and LF buttons, you can select from the following sets of options listed on the printer's control panel:

- LETTER or DRAFT
- FONT1 or FONT2
- MENU1 or MENU2
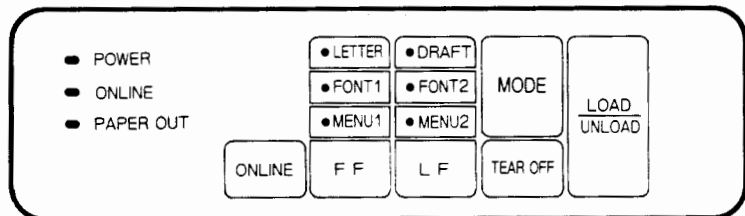
MENU1 and MENU2 represent two different sets of print features that include emulation, print quality, font, pitch, and line spacing. FONT1 and FONT2 represent two different font/pitch combinations. Use the printer's setup mode to assign print features to MENU1 and MENU2, or to assign a font and pitch to FONT1 and FONT2. LETTER and DRAFT represent two different print qualities. You can also assign regular draft or high-speed draft print quality to DRAFT on the control panel.

If you haven't already assigned values to MENU1, MENU2, FONT1, FONT2, and DRAFT, go to Chapter 5 now. This chapter explains how you can use the setup mode to assign values to these options.

When you first turn the printer on, MENU1 is active. This means that all of the print features assigned to MENU1 are also active. You can also easily switch to MENU2 before printing. In addition, you can select different print qualities (LETTER or DRAFT) and font/pitch settings (FONT1 or FONT2) than those already assigned to MENU1 and MENU2.

To select these print features (MENU1/MENU2, LETTER/DRAFT, and FONT1/FONT2), use the MODE button to make certain that the item indicators flash. Then press the FF or LF buttons to select a feature. See the following for details.

NOTE
For easy reference, you should keep a list of your current MENU1, MENU2, FONT1, and FONT2 settings near the printer. To print a list of current settings, see Printing a List of Selected Options in Chapter 5. You may also want to use the space provided in Table 4.1 to record your settings.

Selecting MENU1 or MENU2

When you first turn the printer on, MENU1 is active. To switch to MENU2, or to switch back to MENU1 again, follow these steps.

1. Press ONLINE to place the printer offline.

2. Repeatedly press MODE until MENU1 and MENU2 are lit or blinking. The lighted indicator means that the option is selected, and the flashing indicator means that the option is not selected.
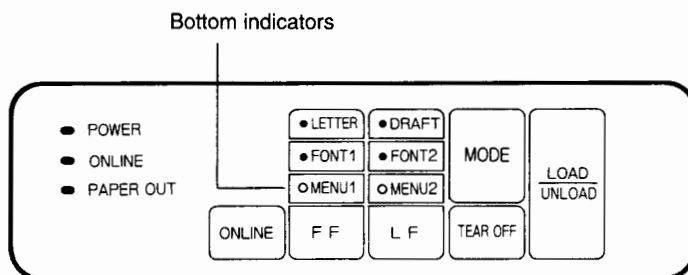
Table 4.1 MENU1, MENU2, FONT1, and FONT2 Settings

Possible Settings	Default Settings For easy reference, check (√) or mark your default settings in the space below.				
Print Feature	MENU1	MENU2	FONT1	FONT2	DRAFT
Emulation Fujitsu DPL24C PLUS IBM Proprinter XL24 Epson LQ-2500 Epson LQ-2550 Emulation card					
Print quality Letter Report Draft High-speed draft					
Font Courier 10 Prestige Elite 12 Compressed font Boldface Pica 10 Correspondence font Font name in font card Download font 0 Download font 1					
Pitch 2.5, 3, 5, 6, 10, 12, 15, 17, 18, or 20 cpi Proportional spacing					
Other features:					

3. To select MENU1, press FF. To select MENU2, press LF.

4. To change the print quality or font/pitch setting, see the next two sections. Otherwise, press ONLINE to return online. You can now print using the selected menu.

Changing the print quality

Before printing, you can use the control panel to select either LETTER or DRAFT print quality. You do not need to do this if you just selected a menu (MENU1 or MENU2) with the appropriate print quality. To change the print quality:

1. Be sure that the printer is offline. Be sure that the menu you want — either MENU1 or MENU2 — is selected. See the previous section.

2. Repeatedly press MODE until LETTER and DRAFT are lit or flashing. The lighted indicator means that the option is selected, and the flashing indicator means that the option is not selected.

Top indicators
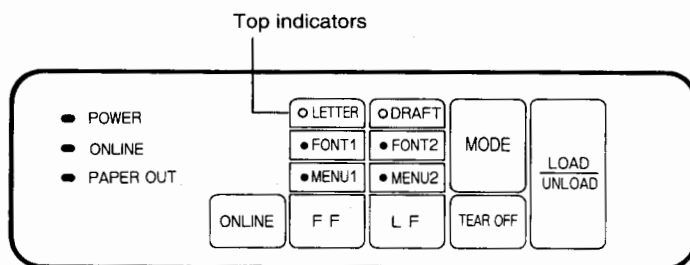
3. To select LETTER, press FF. To select DRAFT, press LF.

4. To change the font/pitch setting, see the next section. Otherwise, press ONLINE to return online for printing. You can now print using the selected menu and print quality.

NOTE
The new print quality remains active until you change it, turn the printer off, or select MENU1 or MENU2 again.

Changing the font/pitch

Before printing, you can use the control panel to select the font/pitch you assigned to either FONT1 or FONT2 in setup mode. You do not need to do this if you just selected a menu (either MENU1 or MENU2) with the appropriate font/pitch. To change the font/pitch:

1. Be sure that the printer is offline. Be sure that the menu you want — either MENU1 or MENU2 — is selected.

2. Repeatedly press MODE until FONT1 and FONT2 are lit or flashing. The lighted indicator means that the option is selected, and the flashing indicator means that the option is not selected.

Middle indicators
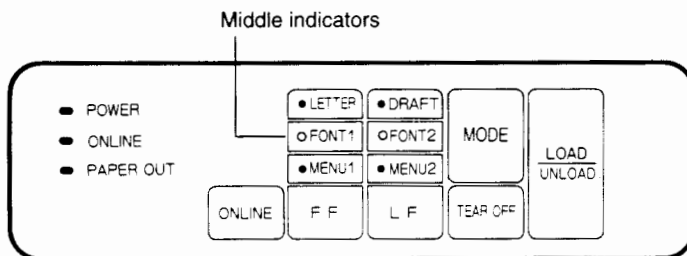
3. To select FONT1, press FF. To select FONT2, press LF.

4. To change the print quality, see the previous section. Otherwise, press ONLINE to return online for printing. You can now print using the selected menu and font/pitch setting.

NOTE
The new font/pitch setting remains active until you change it, turn the printer off, or select MENU1 or MENU2 again.

When the printer is turned on, or if the MENU1 or MENU2 setting is changed after the font/pitch setting, both FONT1 and FONT2 become unselected.

PRINTING

Start Printing

Before you start to print, be sure that the paper is loaded. Also verify that the paper thickness lever is set to the appropriate position (②, ③, or ④).

To start printing, use the commands provided by your software or computer.

Stop Printing

To stop printing immediately, press the ONLINE button to place the printer offline. You can also use your software to stop printing, but there will be a slight delay before printing stops. Any data sent to the print buffer, but not yet printed, is stored until you resume printing. Data in the print buffer is lost when you turn the printer off.

To resume printing, press ONLINE again. To cancel printing, use the cancel commands provided by your software or computer. To clear the print buffer, turn the printer off. Any data sent to the print buffer before you canceled will be lost.

Resuming from Paper-Out

The printer can "sense" when paper runs out. Depending upon how PPR-OUT (paper-out) is set in setup mode, the printer either:

- Stops printing and turns on the red PAPER OUT indicator, or
- Continues printing until no more data remains in the printer

See Chapter 5 for details on setting PPR-OUT. The factory default is to stop printing when continuous forms paper runs out, and to continue printing when the cut sheet stand is empty.

CAUTION
When using the cut sheet stand, be careful not to run out of paper while printing. Printing on the platen damages the printer.

If the cut sheet feeder runs out of paper, the printer always stops printing, regardless of the PPR-OUT setting.

To resume printing when paper runs out:

1. Install paper on the forms tractors or in the cut sheet feeder bin. See Chapter 3 for details.

2. To load the first sheet of paper, press LOAD/UNLOAD. The PAPER OUT indicator will turn off.
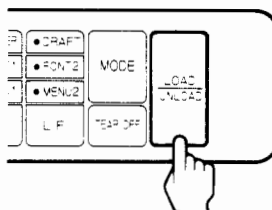
3. Press the ONLINE button to place the printer online and resume printing.

NOTE
For continuous forms, the page where printing stopped and the page where printing resumes will probably be incorrectly printed. Wait for the entire job to finish printing. Then reprint these pages.

REMOVING PRINTED PAGES

This section describes the best methods for removing single sheets or continuous forms paper after printing.

Removing Single Sheets

When you print using software, the printer automatically ejects each sheet of paper when the end of the printed page is reached. To eject sheets manually, use one of the following methods:

- Execute a form feed (press FF with the special mode item indicators not flashing)
- Turn the platen knob clockwise

Removing Continuous Forms

To avoid wasting paper, use the printer's tear-off edge to remove continuous forms paper. Press the TEAR OFF button to advance the perforation to the tear-off edge (the special mode item indicators must not be flashing). Tear the paper off, then press any button to retract the paper back to the top-of-form position. See Chapter 3 for more detailed instructions.

CLEARING THE PRINT BUFFER

Turning the printer off clears all data from the print buffer. This is useful when you cancel a print operation and you do not want to continue printing the data already sent to the printer. When you turn the printer on again, its power-on defaults become active.

5

USING SETUP MODE

Your printer has two modes: normal mode and setup mode. *Normal mode* is used for everyday printer operations and is explained in Chapters 3 and 4.

Setup mode serves two purposes. It allows you to:

- Select the printer's optional settings
- Help diagnose printer problems

These setup mode services can be done offline using the printer control panel or remotely using a setup program in your computer system or software. This chapter explains how to use the offline setup mode. For remote setup mode, which is valid in DPL24C PLUS emulation only, see the programmer's manual in the second part of this manual.

Optional settings on the printer include the emulation, fonts, pitch, page length and width, serial interface options, and the top-of-form setting. When you save your settings in the printer's permanent memory, they become the new default settings (called "defaults" for short). The defaults are active whenever you turn on the printer. For example, if you save DPL24C PLUS as the default emulation, DPL24C PLUS is active when you turn on the printer.

The printer's diagnostic functions are SELF-TST, HEX-DUMP, and V-ALMNT. These functions are helpful for printer troubleshooting, which is described in Chapter 7. HEX-DUMP is also used by programmers to print hex dumps.

Setup Mode

HOW TO USE THIS CHAPTER

The sections in this chapter are presented in a logical sequence. *If you are a first-time user*, read the following sections *first*:

- Entering Setup Mode
- Overview of Setup Mode

These sections will familiarize you with how setup mode works. Once you understand the basics, use the following sections to select printer options that are compatible with your computer system's hardware and software setup:

- Printing a List of Selected Options
- Deciding Which Options to Change
- Changing Panel Options
- Changing MENU1 and MENU2 Options
- Changing Hardware Options
- Changing Top-of-Form
- Exiting and Saving

To restore the printer's default settings (factory defaults or power-on defaults), see **Resetting Defaults**.

For information on using the SELF-TST, HEX-DUMP, and V-ALMNT functions, see **Using the Diagnostic Functions.**

For Experienced Users:

Once you are familiar with setup mode, you may want to use the flowchart at the end of this chapter for quick reference. This flowchart lists all of the printer's setup functions, items, and options.

ENTERING SETUP MODE

Before entering setup mode, load continuous forms paper into the printer (see Chapter 3 for paper loading instructions). Several sheets of paper may be required to make all of your setup selections.

To enter setup mode, follow these steps.

1. Make sure that continuous forms paper is loaded and that the paper select lever is set to the rear position.

2. Turn the printer off.

NOTE
To enter setup mode, you must first turn the printer off.

3. While pressing the MODE button, turn the printer back on. Continue pressing MODE until the printer beeps.
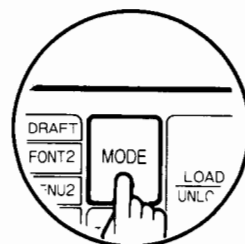
Entering setup mode

If you do not hear a beep and the printer goes online, you are not in setup mode. Turn off the power and try again. Make sure that you press MODE until the printer beeps.

4. The printer enters offline setup mode and prints the following information.

```
*****     OFFLINE  SETUP  MODE     *****

      - The red cursor indicates the option to be selected.
      - The selected option is underlined.
      - "SAVE&END" function must be selected to exit setup mode.
      - Following list shows how buttons function in setup mode:

BUTTON | ACTION on <<FUNCTION>> menu |  ACTION on <ITEM> menu
-------+-----------------------------+-------------------------------------
ONLINE |Reprint <<FUNCTION>> menu    |Select option & return to <<FUNCTION>> menu
 F  F  |Select function              |Select option & print next item
 L  F  |Select function              |Select option & print previous item
 MODE  |Move cursor to next function |Move cursor to next option



                            ——— <<FUNCTION>> menu

              <<FUNCTION>>
Functions ——▶ SAVE&END PANEL    MENU1   MENU2   HARDWRE LIST   DEFAULT SELF-TST HEX-DUMP V-ALMNT TOF-ADJ

              └————— Red cursor on print guide
```

Help menu

Initial printout in setup mode

The initial printout contains a header, a help menu, and a <<FUNCTION>> menu. The header tells you that the printer is offline and in setup mode. The help menu provides a quick summary of how to use setup mode. Finally, the <<FUNCTION>> menu lists all of the functions available to you in setup mode. Note that the red cursor on the plastic print guide is initially positioned below the SAVE&END function.

You can remove the top cover for easy operation of the control panel and easy confirmation of printouts during setup operation. To remove the top cover, slightly open the top cover. Next, lift and release the left hinge of the cover as shown in the following figure. Then, pull out the right hinge to remove the top cover.
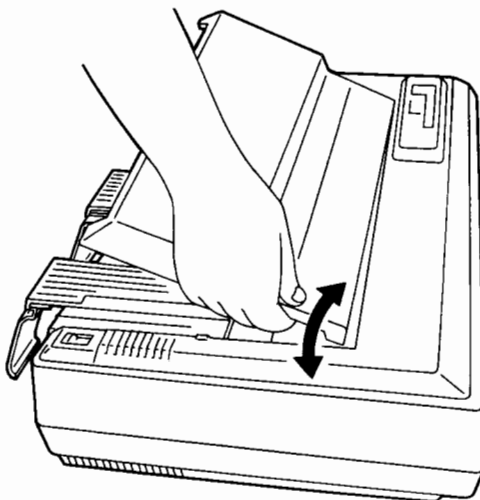
Removing the top cover

OVERVIEW OF SETUP MODE   When you enter setup mode, as described in the previous section, the <<FUNCTION>> menu is always printed as shown below.

```
<<FUNCTION>>
    SAVE&END PANEL    MENU1    MENU2    HARDWRE  LIST    DEFAULT  SELF-TST HEX-DUMP V-ALMNT  TOF-ADJ
```

The purpose of each function is briefly described in the table below.

Table 5.1 Setup Functions

Function	Purpose
SAVE&END	Exit setup mode and save any changes made while in setup mode.
PANEL	Assign a font and pitch to FONT1 and FONT2 on the printer's control panel. You may also assign regular or high-speed draft print quality to DRAFT on the control panel.
MENU1 and MENU2	Assign print features to MENU1 and MENU2 on the printer's control panel.
HARDWRE	Change the printer's hardware options.
LIST	Print a list of all currently selected options.
DEFAULT	Reset factory defaults in MENU1 and MENU2.
SELF-TST	Run the self-test.
HEX-DUMP	Print hex dumps.
V-ALMNT	Check and correct vertical print alignment.
TOF-ADJ	Set top-of-form.

To select a function from the <<FUNCTION>> menu:

1. Repeatedly press MODE to position the red cursor on the plastic print guide beneath the function you require.

2. Press FF to underline (select) the function. If the function has items and options, the printer prints the first item and its options. The PANEL, MENU1, MENU2, HARDWRE, and TOF-ADJ functions contain items that have selectable options. The other functions do not have items or options.

   For example, the first three MENU1 items and their options are shown below. Items are enclosed in brackets < >.

<EMULATE>	<u>DPL24C+</u>	IBMXL24	LQ2500	LQ2550			
<FONT >	<u>COUR 10</u>	PRSTG12	COMPRSD	BOLDFCE	PICA 10	CORRESP	DOWNLD0	DOWNLD1
<QUALITY>	<u>LETTER</u>	REPORT	DRAFT	HI-DRFT			

To select an option from the <item> menu:

1. Repeatedly press MODE to position the red cursor on the plastic print guide beneath the option you require.

2. Press FF to underline (select) the option. The printer prints the next item and its options.

3. After selecting all options you require, press ONLINE to reprint the <<FUNCTION>> menu.

   For each item, the option with a short underline beneath it is the current default option (the option currently saved in the printer's permanent memory). In the previous example, the default options are Fujitsu DPL24C PLUS emulation, Courier 10 font, and letter print quality.

The chart on the opposite page summarizes how to use the printer's buttons to select options such as the emulation, font, and print quality. It also summarizes how to use the buttons with functions that do not have items or selectable options.

Setup Mode Example

To become familiar with setup mode, try the following example. This example shows how to change the font and pitch in MENU2 to Prestige Elite 12 and 12 cpi.

1. Load continuous forms paper.

2. Enter setup mode.

While pressing MODE, turn the printer on. Continue pressing MODE until the printer beeps.

3. Select the MENU2 function.

Wait for the printer to stop printing and press MODE three times to position the red cursor on the print guide beneath MENU2. Press FF to select the MENU2 function and print the <EMULATE> item and its options.

4. Select the current emulation.

Since you do not want to change the emulation, press FF to select the current emulation and print the <FONT> item and its options.

5. Change the font to Prestige Elite 12.

Press MODE once to position the cursor beneath PRSTG12. Press FF to select PRSTG12 and print the next item, <QUALITY>, and its options.

```
┌─────────────────────────────────────────┐
│ Enter setup mode: MODE+power on │
└─────────────────────────────────────────┘
```

Reprint <<FUNCTION>> menu

```
┌─────────────────────────────────────────┐
│ Printer prints <<FUNCTION>> menu │
└─────────────────────────────────────────┘

┌─────────────────────────────────────────┐
│ Select function: Press MODE to │
│ position cursor. Press FF. │
└─────────────────────────────────────────┘
```

Functions

```
┌─────────────────────┐
│ Printer │        SAVE&END
│ saves │
│ changes │
│ and exits │
│ setup │
│ mode │        ▓▓▓▓▓▓▓▓▓▓▓▓▓▓     Select options: Press
└─────────────────────┘        PAPER MENU...         MODE to position cursor.
                                                      Press FF or LF.

                                                      Press ONLINE

                               LIST, DEFAULT

┌─────────────────┐
│ Press ONLINE │               SELF-TST, HEX-DUMP    Press MODE or LF to
└─────────────────┘                                  pause/resume.

                                                      Press FF

                               V-ALMNT                See Using Diagnostic
                                                      Functions later in this chapter
                                                      for details.
```

▓▓▓▓ : Functions with items and options.

Summary of Setup Mode

6. Select the current print quality.

Since you do not want to change the print quality, press FF to select the current print quality and print the next item, <PITCH>.

7. Change the pitch to 12 cpi and exit the MENU2 function.

Press MODE once to position the cursor beneath 12 CPI. Since you do not want to make any other changes in MENU2, press ONLINE to select 12 CPI and exit MENU2. The <<FUNCTION>> menu is then reprinted. If necessary, you can see the results of your settings by selecting SELF-TST to print test pages.

8. Exit setup mode, saving the new font and pitch.

Check that the cursor is beneath SAVE&END. Press FF to select SAVE&END. The printer saves Prestige Elite 12 and 12 cpi as the new power-on defaults in MENU2. It then exits setup mode and returns online. These settings remain in effect until you change them.

Points to Remember

- Load continuous forms paper *before entering setup mode*. In setup mode, the FF, LF, and MODE buttons cannot be used to load or feed paper. To load paper in setup mode, you must use the platen knob.

- Whenever you enter setup mode, short help menus are printed at the top of the page. Help menus are also printed when you select the SELF-TST, HEX-DUMP, or V-ALMNT functions. You can use the help menus for quick reference while using setup mode.

- When printing the items and options for each function, you can only print one item at a time. However, you can move either forward or backwards in the item list. To move forward (print the next item), press FF. To move backwards (print the previous item), press LF.

- While in the <<FUNCTION>> menu or when you are selecting a function that contains items and selectable options, you can press ONLINE to reprint the <<FUNCTION>> menu.

- A short underline beneath the first two letters of an option indicates that it is the current default setting. For example, 12 CPI indicates that 12 characters per inch is the default pitch. To change the default, you must select and save a new pitch setting.

- While in setup mode, you can always use the LIST function to print out a list of the currently selected options (see the next section for details).

- To exit setup mode and permanently save your changes, you must select either the SAVE&END function or the SELF-TST function (if convenient, the HEX-DUMP and V-ALMNT functions are also available). For details, see the section **Exiting and Saving** later in this chapter. To exit setup mode without saving your changes, turn the printer off. Your previous power-on defaults are active when you turn the printer on again.

Setup Mode

**PRINTING A LIST OF
SELECTED OPTIONS**

The LIST function prints a list of all the printer's currently selected options. This function is useful for checking the printer's settings when you first enter setup mode or just before you exit. To print a list of options, load continuous forms paper. Then follow these steps.

1. Enter setup mode.

While pressing MODE, turn the printer on. Wait for the printer to stop printing and check that the <<FUNCTION>> menu is printed as shown below.

<<FUNCTION>>
SAVE&END PANEL   MENU1   MENU2   HARDWRE LIST   DEFAULT SELF-TST HEX-DUMP V-ALMNT TOP-ADJ

2. Select the LIST function.

Repeatedly press MODE to position the red cursor beneath LIST. Next, press FF. The printer selects LIST and starts to print a list of all currently selected options.   The preselected factory settings, also called factory defaults, are shown on the opposite page.

When the printer finishes printing the list of options, it reprints the <<FUNCTION>> menu.

NOTE
To remove the printout, turn the platen knob until the paper can be torn off at the perforation. In setup mode, you cannot use the printer's tear-off feature (TEAR OFF button).

3. Do one of the following:

- **Select another function.**
- **Exit setup mode, saving any changes you made.**

For details about other functions, see the other sections in this chapter. To exit setup mode and save your changes, make sure that the red cursor is positioned beneath SAVE&END and then press FF.

```
*** Setup parameters ***

<< Menu 1 settings >>              << Menu 2 settings >>
-------------------------          -------------------------
Func.   |Item    |Option            Func.   |Item    |Option
-------------------------          -------------------------
MENU  1 |EMULATE|DPL24C+           MENU  2 |EMULATE|DPL24C+
MENU  1 |FONT   |COUR 10           MENU  2 |FONT   |COUR 10
MENU  1 |QUALITY|LETTER            MENU  2 |QUALITY|LETTER
MENU  1 |PITCH  |10 CPI            MENU  2 |PITCH  |10 CPI
MENU  1 |LINE SP|6 LPI             MENU  2 |LINE SP|6 LPI
MENU  1 |CHAR-W |NORMAL            MENU  2 |CHAR-W |NORMAL
MENU  1 |CHAR-H |NORMAL            MENU  2 |CHAR-H |NORMAL
MENU  1 |ATTRIB |NONE              MENU  2 |ATTRIB |NONE
MENU  1 |PAGE LG|11.0 IN           MENU  2 |PAGE LG|11.0 IN
MENU  1 |COLOR  |AUTOSEL(*1)       MENU  2 |COLOR  |AUTOSEL(*1)
MENU  1 |LFT-END| 1 COLM           MENU  2 |LFT-END| 1 COLM
MENU  1 |TOP-MRG| 1 LINE           MENU  2 |TOP-MRG| 1 LINE
MENU  1 |LANGUGE|PAGE437           MENU  2 |LANGUGE|PAGE437
MENU  1 |CHR-SET|SET 2             MENU  2 |CHR-SET|SET 2
MENU  1 |PRF-SKP|NO-SKIP           MENU  2 |PRF-SKP|NO-SKIP
MENU  1 |WIDTH  |13.6 IN           MENU  2 |WIDTH  |13.6 IN
MENU  1 |ZEROFNT|NO-SLSH           MENU  2 |ZEROFNT|NO-SLSH
MENU  1 |DC3-CDE|ENABLE            MENU  2 |DC3-CDE|ENABLE
MENU  1 |CR-CODE|CR ONLY           MENU  2 |CR-CODE|CR ONLY
MENU  1 |LF-CODE|LF & CR           MENU  2 |LF-CODE|LF & CR
MENU  1 |RGHTEND|WRAP              MENU  2 |RGHTEND|WRAP
MENU  1 |==END==|                  MENU  2 |==END==|
-------------------------          -------------------------


<< Panel settings >>               << Hardware settings >>
-------------------------          -------------------------
Func.   |Item    |Option            Func.   |Item    |Option
-------------------------          -------------------------
PANEL   |DRAFT  |DRAFT             HARDWRE|PPR-OUT|CNTONLY
PANEL   |FONT1  |COUR 10           HARDWRE|PRT-DIR| BI-DIR
PANEL   |F1PITCH|10 CPI            HARDWRE|BUZZER |ON
PANEL   |FONT2  |PRSTG12           HARDWRE|WORD-LG|8 BIT
PANEL   |F2PITCH|12 CPI            HARDWRE|BUFFER |SINGLE
PANEL   |==END==|                  HARDWRE|FEEDER |REAR
-------------------------          HARDWRE|FORMAT |8NONE 1  ⎫
                                   HARDWRE|BAUD-RT| 9600    ⎪
                                   HARDWRE|PROTOCL|XON/XOF  ⎬ (*2)
<< Top of form settings >>         HARDWRE|DSR    |IGNORE   ⎪
-------------------------          HARDWRE|DUPLEX |FULL     ⎪
Func.   |Item    |Option            HARDWRE|==END==|        ⎭
-------------------------          -------------------------
TOF-ADJ|ORIGIN | 1 INCH
TOF-ADJ|FINEADJ| 0
TOF-ADJ|==END==|
-------------------------
```

*1 Listed for color models
*2 Listed for models with a serial interface

Printout of factory defaults using LIST

**DECIDING WHICH
OPTIONS TO CHANGE**

On the previous page, a printout of the printer's factory default settings is shown. In this printout, options are listed by functional group:

- Panel settings (PANEL function)
- Menu 1 settings (MENU1 function)
- Menu 2 settings (MENU2 function)
- Hardware settings (HARDWRE function)
- Top-of-form settings (TOF-ADJ function)

Most selectable options only alter print features such as the typestyle, page format, and color selection. However, some options must be selected correctly for the printer to work properly with your system hardware and software. Table 5.2 lists function items that have required options. These required options must be selected correctly for system and printer accessory compatibility.

Table 5.2 Required Options

Function	Item	Required Options
PANEL	None	None. See **Changing Panel Options** later in this chapter.
MENU1	EMULATE	*The emulation selected on the printer must be the same as the emulation selected in your system software.* If you selected an emulation when you set up the printer (Chapter 2), you do not need to change the EMULATE option unless you want to switch to a different emulation. The emulation assigned to MENU1 is the default when you turn the printer on. See the section **Changing MENU1 and MENU2 Options** later in this chapter.

Table 5.2 Required Options (Cont.)

Function	Item	Required Options
MENU2	None	Options for the MENU2 function should only be changed if you plan to select MENU2 from the printer's control panel. In this case, *the emulation selected for MENU2 must be the same as the emulation selected in your system software.* See the section **Changing MENU1 and MENU2 Options** later in this chapter.
HARDWRE	FEEDER	Change the FEEDER option if you install a cut sheet feeder. If the single or double bin option is not correctly specified, the feeder will not work.
	FORMAT BAUD-RT PROTOCL DSR DUPLEX	*If you have a serial interface, the serial interface options selected on the printer must be the same as the settings you selected using your system software or your computer's operating system.* If the settings are not the same, the printer will not print, or it will print incorrect characters. See the section **Changing Hardware Options** later in this chapter.
TOF-ADJ	None	If you are not using software to specify the top margin of the page, use the printer's default top-of-form setting (1 inch (25.4 mm) from the top of the page). If you are using software to specify the top margin of the page, change the default setting to 1/6 inch (4.2 mm). See the section **Changing Top-of-Form** later in this chapter.

CHANGING PANEL OPTIONS

The PANEL function changes the font and pitch assigned to FONT1 and FONT2 on the printer's control panel. In normal (non-setup) mode, you can use the control panel to easily switch back and forth between the fonts for printing (see Chapter 4 for details). The PANEL function also assigns either regular draft or high-speed draft print quality to DRAFT on the printer's control panel.

The PANEL items and options are listed in Table 5.3. Items are listed in the order in which they are printed. All settings are optional. The procedure for changing the panel options follows Table 5.3.

Table 5.3 PANEL Items and Options

NOTE: Underlined options are the factory defaults.

PANEL Items	Options	Description
<DRAFT>	<u>DRAFT</u>	Regular draft print quality. Prints 3 times as fast as letter print quality.
	HI-DRFT	High-speed draft print quality. Prints 3.3 times as fast as letter print quality.
<FONT1>		For each font below, the recommended pitch settings are given in parentheses. When you change the font, be sure to also change the pitch, if required.
	<u>COUR 10</u>	Courier 10 (10cpi)
	PRSTG12	Prestige Elite 12 (12cpi)
	COMPRSD	Compressed font (15, 17, and 18cpi)
	BOLDFCE	Boldface (Proportional)
	PICA 10	Pica 10 (10cpi)
	CORRESP	Correspondence (10cpi)
	XXXXXXX	Font names in a font card
	DOWNLD#	Font 0 or font 1 in the printer's download RAM

Table 5.3 PANEL Items and Options (Cont.)

NOTE: Underlined options are the factory defaults.

PANEL Items	Options	Description
<F1PITCH>	## CPI PROP SP	2.5, 3, 5, 6, <u>10</u>, 12, 15, 17, 18, or 20 cpi (characters per horizontal inch) Proportional spacing
<FONT2>	Same options as <FONT1>; <u>PRSTG12</u>	The factory default for FONT2 is Prestige Elite 12.
<F2PITCH>	Same options as <F1PITCH>; <u>12 CPI</u>	The factory default for F2PITCH is 12 cpi.
<==END==>	—	Indicates the end of the PANEL items. Press FF to print the first item. Press LF to print the previous item, <F2PITCH>. Press ONLINE to reprint the <<FUNCTION>> menu.

√ Procedure

To change the panel options, make sure continuous forms paper is loaded. Then take the following steps.

1. Enter setup mode.

While pressing MODE, turn the printer on. Wait for the printer to stop printing and check that the <<FUNCTION>> menu is printed as shown below.

```
<<FUNCTION>>
   SAVE&END  PANEL    MENU1    MENU2    HARDWRE  LIST    DEFAULT  SELF-TST HEX-DUMP V-ALMNT  TOP-ADJ
```

2. Select the PANEL function.

Repeatedly press MODE to position the red cursor beneath PANEL. Press FF to select PANEL and print the first item and its options. The <DRAFT> options are then printed as shown below.

‹ DRAFT ›	<u>DRAFT</u> HI-DRFT

3. Assign a print quality to DRAFT.

Repeatedly press MODE to position the cursor beneath the print quality you want. Press FF to select the quality and print the <FONT1> options. The <FONT1> options are shown below.

‹ FONT 1 ›	<u>COUR 10</u> PRSTG12 COMPRSD BOLDPCE PICA 10 CORRESP DOWNLDO DOWNLD1

4. Assign a font to FONT1.

Repeatedly press MODE to position the cursor beneath the font you want. Press FF to select the font and print the <F1PITCH> options. The <F1PITCH> options are shown below.

5. Assign a pitch to FONT1.

Repeatedly press MODE to position the cursor beneath the pitch you want. Press FF to select the pitch and print the <FONT2> options. The <FONT2> options are shown below.

‹ FONT 2 ›	COUR 10 <u>PRSTG12</u> COMPRSD BOLDPCE PICA 10 CORRESP DOWNLDO DOWNLD1

6. Assign a font and pitch to FONT2.

Use the same method as in steps 4 and 5.

7. Exit PANEL.

Press ONLINE to exit the PANEL function and reprint the
<<FUNCTION>> menu.

8. Do one of the following:

- **Select another function.**
- **Exit setup mode, saving your changes.**

NOTE
**Both FONT1 and FONT2 settings become inactive (FONT1
and FONT2 indicators are not lit) when the printer is turned
on. The MENU1 and MENU2 selections can be changed after
you change the FONT1 and FONT2 selections using the FF
and LF buttons with the MODE indicators on.**

For details about other functions, see the other sections in this
chapter. To exit setup mode and save your changes, make sure
that the red cursor is positioned beneath SAVE&END, and then
press FF.

**CHANGING MENU1
AND MENU2 OPTIONS**

The MENU1 and MENU2 functions allow you to change the print
options assigned to MENU1 and MENU2 on the printer's control
panel. In normal (non-setup) mode, you can easily switch back and
forth between the menus for printing. See Chapter 4 for details.

The MENU1 and MENU2 items and options are listed in Table 5.4.
Both functions offer the same items and options. The items in Table
5.4 are listed in the order in which they are printed. For emulations,
some items are not defined and some options differ with emulations.
For emulation cards, refer to the user's guides shipped with the cards.

You must select the same emulation on the printer as in your system
software. If the emulations are not the same, the printer will not work
correctly with your system software. If you plan to use two different
emulations on a regular basis, assign the most frequently used
emulation to MENU1. Assign the other emulation to MENU2. All of
the other settings available for MENU1 and MENU2 are optional.

To determine which features your software supports, refer to your software documentation. If you have a color printer, the default for <COLOR> is AUTOSEL, which allows you to specify color using your software.

The procedure for changing the MENU1 and MENU2 options follows Table 5.4.

Table 5.4 MENU1 and MENU2 Items and Options

NOTES:
- Underlined options are the factory defaults.
- Footnotes show items and options that differ for the IBM XL24 and Epson LQ-2500/LQ-2550 emulations. See the end of this table for footnote meanings.

MENU1 and MENU2 Items	Options	Description
<EMULATE>		Select the same emulation as the one selected in your system software.
		See the section **Selecting an Emulation** in Chapter 2 for pointers on selecting an emulation.
	DPL24C+	Fujitsu DL-series printers (DPL24C PLUS command set)
	IBMXL24	IBM Proprinter XL24 printers
	LQ2500	Epson LQ-2500 printers
	LQ2550	Epson LQ-2550 printers
	XXXXXXX	Name of the printer emulation available on the currently installed emulation card
		NOTE: When you select a new emulation, all MENU1 or MENU2 options are reset to the factory defaults for that emulation.

Table 5.4 MENU1 and MENU2 Items and Options (Cont.)

NOTES:
- Underlined options are the factory defaults.
- Footnotes show items and options that differ for the IBM XL24 and Epson LQ-2500/LQ-2550 emulations. See the end of this table for footnote meanings.

MENU1 and MENU2 Items	Options	Description
<FONT>		For each font below, the recommended pitch settings are given in parentheses. When you change the font, be sure to also change the pitch, if required.
	<u>COUR 10</u> PRSTG12 COMPRSD BOLDFCE PICA 10 CORRESP	Courier 10 (10cpi) Prestige Elite 12 (12cpi) Compressed font (15, 17, and 18cpi) Boldface (Proportional) Pica 10 (10cpi) Correspondence(10cpi)
	XXXXXXX DOWNLD#	Font names in a font card Font 0 or font 1 in the printer's download RAM See Appendix A in the programmer's manual for font examples.
<QUALITY>		Select the print quality that meets your needs most of the time.
	<u>LETTER</u>	Letter print quality. Provides the highest resolution and the slowest print speed. Invalid for the compressed font.
	REPORT	Report print quality. Provides lower resolution than letter quality at twice the speed.

Table 5.4 MENU1 and MENU2 Items and Options (Cont.)

NOTES:
• Underlined options are the factory defaults.
• Footnotes show items and options that differ for the IBM XL24 and Epson
  LQ-2500/LQ-2550 emulations. See the end of this table for footnote meanings.

MENU1 and MENU2 Items	Options	Description
	DRAFT	Regular draft print quality. Provides lower resolution than report quality at three times letter speed.
	HI-DRFT	High-speed draft print quality. Provides lower resolution than draft quality at 3.3 times letter speed.
<PITCH>	## CPI	2.5, 3, 5, 6, <u>10</u>, 12, 15, 17, 18, or 20 cpi (characters per horizontal inch)
	PROP SP	Proportional spacing
<LINE SP>	## LPI	1, 2, 3, 4, 5, <u>6</u>, 7, or 8 lpi (lines per vertical inch) **6 lpi 3 lpi (double spacing)** ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD ABCD

Table 5.4 MENU1 and MENU2 Items and Options (Cont.)

NOTES:
- Underlined options are the factory defaults.
- Footnotes show items and options that differ for the IBM XL24 and Epson LQ-2500/LQ-2550 emulations. See the end of this table for footnote meanings.

MENU1 and MENU2 Items	Options	Description
<CHAR-W>		If necessary, also change the pitch when 2 TIMES or 4 TIMES is selected.
	NORMAL	Standard character width **ABCD**
	2 TIMES	Double character width **ABCD**
	4 TIMES (*1)	Quadruple character width **ABCD**
<CHAR-H>		If necessary, also change the line spacing when 2 TIMES or 4 TIMES is selected.
	NORMAL	Standard character height **ABCD abcd**
	2 TIMES	Double character height **ABCD abcd**
	4 TIMES (*1)	Quadruple character height **ABCD abcd**

Table 5.4 MENU1 and MENU2 Items and Options (Cont.)

NOTES:
- Underlined options are the factory defaults.
- Footnotes show items and options that differ for the IBM XL24 and Epson LQ-2500/LQ-2550 emulations. See the end of this table for footnote meanings.

MENU1 and MENU2 Items	Options	Description
<ATTRIB>		Selects an attribute to add emphasis to your documents. Only one attribute may be selected at a time.
	<u>NONE</u>	**Standard characters (no attributes)**
	ITALICS	*Italic printing*
	CONDNSD (*1)	Condensed printing
	SHADOW	**Double printing with a slight horizontal offset**
	BOLD	**Double printing at the same position**
<PAGE LG>		Specifies the length of the page in inches.
	## IN	*For DPL24C PLUS and IBM XL24 emulations:* 3.0, 3.5, 4.0, 5.0, 5.5, 6.0, 7.0, 8.0, 8.5, <u>11.0</u> (letter size), 11.6 (A4 size), 12.0, 14.0, or 18.0 inches *For Epson LQ-2500/LQ-2550 emulation:* 4.0, 4.5, 5.0, ..., <u>11.0</u>, 11.5, ...,22.0 inches

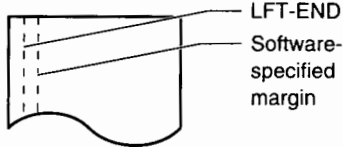### Table 5.4 MENU1 and MENU2 Items and Options (Cont.)

NOTES:
- Underlined options are the factory defaults.
- Footnotes show items and options that differ for the IBM XL24 and Epson LQ-2500/LQ-2550 emulations. See the end of this table for footnote meanings.

MENU1 and MENU2 Items	Options	Description
<COLOR>		*Available only for color printers. This item does not print if you have a monochrome printer.*
	AUTOSEL	Automatic color selection. Specifies color using your software. Seven colors can be specified: black, yellow, red, blue, violet, orange, and green.
	BLACK YELLOW MAGENTA CYAN	Black Yellow Red Blue
<LFT-END>		Specifies the starting column of the left margin. When the pitch is 12 cpi (also the default pitch for proportional spacing), 12 columns equal one inch. The left margin equals the number of columns specified by LFT-END, plus your software's left margin, if specified, when the left end of the paper is set to column 0.
	## COLM	Column 1, 2, 3, ..., 41

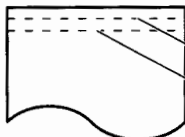## Table 5.4 MENU1 and MENU2 Items and Options (Cont.)

NOTES:
- Underlined options are the factory defaults.
- Footnotes show items and options that differ for the IBM XL24 and Epson LQ-2500/LQ-2550 emulations. See the end of this table for footnote meanings.

MENU1 and MENU2 Items	Options	Description
<TOP-MRG>		Specifies the top margin of the page in lines. To set <TOP-MRG> to 1 inch when line spacing equals 6 lpi, select 7 lines. *The total size of your top margin equals the sum of these three settings:* top-of-form, <TOP-MRG> setting, and the software-specified top margin. If you are using software to specify a top margin, you should use the default (1 line) for <TOP-MRG>.
	## LINE	1, 2, 3,4, 5, 6, 7, 8, 9, or 10 lines Top-of-form Top margin setting
<LANGUGE>		Selects a language. Appendix A in the programmer's manual shows the character sets for each language.
	USA	American English (This is the same as code page 437.)
	UK	British English
	GERMAN	German
	FRENCH	French

Table 5.4 MENU1 and MENU2 Items and Options (Cont.)

NOTES:
- Underlined options are the factory defaults.
- Footnotes show items and options that differ for the IBM XL24 and Epson LQ-2500/LQ-2550 emulations. See the end of this table for footnote meanings.

MENU1 and MENU2 Items	Options	Description
	ITALIAN	Italian
	SPANISH	Spanish
	SWEDISH	Swedish
	FINNISH	Finnish
	DANISH1	Danish I
	DANISH2	Danish II
	NORWEGN	Norwegian
	PAGE###	Code page 437, 850, 860, 863, or 865 (Code page 437 is the same as American English.)
	ISO8859	ISO-8859-1
	ECMA94	ECMA-94
	(*4)	
	SPANSH1	Spanish I
	SPANSH2	Spanish II
	JAPAN	Japanese
	LATIN A	Latin American
<CHR-SET>	SET 1	IBM character set 1
	SET 2	IBM character set 2
		If a font card or download (soft) font is used, the character set for that font overrides the <CHR-SET> setting.
	(*4)	
	ITALIC	Italic characters available
	GRAPHIC	Graphics characters (ruled lines) available

Setup Mode

Table 5.4 MENU1 and MENU2 Items and Options (Cont.)

NOTES:
- Underlined options are the factory defaults.
- Footnotes show items and options that differ for the IBM XL24 and Epson LQ-2500/LQ-2550 emulations. See the end of this table for footnote meanings.

MENU1 and MENU2 Items	Options	Description
<AGM> (*2)	OFF	Specifies that Alternate Graphics Mode (AGM) is set off. The base of line spacing is 1/72 or 1/216 of an inch.
	ON	Specifies that Alternate Graphics Mode (AGM) is set on. The base of line spacing is 1/60 or 1/180 of an inch.
<PRF-SKP>		For continuous forms, specifies whether an inch is skipped over the perforation. If you are not using software to specify a bottom margin, select SKIP when using thicker multi-part forms.
	SKIP	One inch is skipped over the perforation.
	NO-SKIP	The perforation is not skipped. Printing continues in the bottom margin of the page.
<WIDTH>	13.6 IN	13.6-inch page width
	11.0 IN	11-inch page width
	8.0 IN	8-inch page width
<ZEROFNT> (*3)		Specifies whether to print the number zero with a slash. This is useful for distinguising the capital letter "O" from the number "0". Invalid for some soft fonts and font cards.
	NO-SLSH	0
	SLASH	0

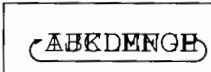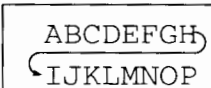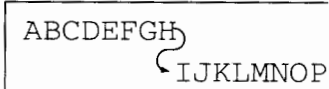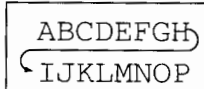### Table 5.4 MENU1 and MENU2 Items and Options (Cont.)

NOTES:
• Underlined options are the factory defaults.
• Footnotes show items and options that differ for the IBM XL24 and Epson LQ-2500/LQ-2550 emulations. See the end of this table for footnote meanings.
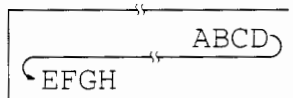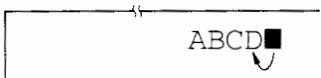
MENU1 and MENU2 Items	Options	Description
<DC3-CDE>	ENABLE	Enables the DC1 and DC3 codes. Any data received between DC3 and the next DC1 is ignored.
	DISABLE	Disables the DC1 and DC3 codes. These codes are then ignored.
<CR-CODE>	CR ONLY	No line feed is added to a carriage return.
	CR & LF	A line feed is added to each carriage return.
<LF-CODE> (*3)	LF ONLY	No carriage return is added to a line feed.
	LF & CR	A carriage return is added to each line feed.

Table 5.4 MENU1 and MENU2 Items and Options (Cont.)

NOTES:
- Underlined options are the factory defaults.
- Footnotes show items and options that differ for the IBM XL24 and Epson LQ-2500/LQ-2550 emulations. See the end of this table for footnote meanings.

MENU1 and MENU2 Items	Options	Description
<RGHTEND>	<u>WRAP</u>	End-of-line wrap. Causes a carriage return plus a line feed. ABCD⌐ └EFGH
	OVR-PRT	Characters are overprinted at the end of a line. ABCD■
<==END==>		Indicates the end of the MENU1 items. Press FF to print the first item, <EMULATE>. Press LF to print the previous item, <RGHTEND>. Press ONLINE to reprint the <<FUNCTION>> menu.

*1 Unavailable for the IBM XL24 emulation

*2 Available *only* for the IBM XL24 emulation

*3 Unavailable for the Epson LQ-2500/LQ-2550 emulations

*4 Available *only* for the Epson LQ-2500/LQ-2550 emulations

√ **Procedure**

To change the options assigned to MENU1 or MENU2, make sure that continuous forms paper is loaded. Then take the following steps.

1. Enter setup mode.

While pressing MODE, turn the printer on. Wait for the printer to stop printing. The <<FUNCTION>> menu should have printed as shown below.

```
<<FUNCTION>>
    SAVE&END PANEL    MENU1    MENU2    HARDWRE   LIST    DEFAULT   SELF-TST  HEX-DUMP  V-ALMNT   TOF-ADJ
```

2. Select the MENU1 or MENU2 function.

Repeatedly press MODE to position the red cursor beneath either the MENU1 or MENU2 function. Press FF to select the function and print the <EMULATE> options as shown below.

```
<EMULATE>        DPL24C+  IBMXL24   LQ2500    LQ2550
```

3. Select an emulation.

Repeatedly press MODE to position the cursor beneath the emulation you require. Then do one of the following:

- Press FF to select the emulation and print the next MENU1 or MENU2 item. As shown in Table 5.4, this is the <FONT> item.

Setup Mode

- Press LF to select the emulation and print <==END==>. Press LF again to print the last MENU1 or MENU2 item. As shown in Table 5.4, this is the <RGHTEND> item. Using LF is convenient when the options you need to change are near the end of the list of items.

NOTE
Whenever you select a new emulation, all MENU1 or MENU2 options are reset to the factory defaults for that emulation.

4. Change the other MENU1 or MENU2 options if required.

Press MODE to move the cursor to the option you want to select. Press FF to select the option and print the next item listed in Table 5.4. Press LF to select the option and print the previous item.

5. Exit MENU1 or MENU2.

Press ONLINE to exit the selected function and reprint the <<FUNCTION>> menu.

6. Do one of the following:

- **Select another function.**
- **Exit setup mode, saving your changes.**

For details about other functions, see the other sections in this chapter. To exit setup mode and save your changes, make sure that the red cursor is positioned beneath SAVE&END, and then press FF.

Resetting MENU1 and MENU2

To reset the factory defaults for both MENU1 and MENU2, select the DEFAULT function. For a detailed procedure, see the section **Resetting Defaults** later in this chapter. The printer's panel, hardware, and top-of-form options are not reset.

CHANGING HARDWARE OPTIONS

The HARDWRE function defines the printer's hardware conditions. The following options must be set properly for the printer to function correctly with your system hardware:

- Serial interface options (for serial interface only)
- Type of cut sheet feeder, if installed

The HARDWRE items and options are listed in Table 5.5. Items are listed in the order in which they are printed. The procedure for changing the hardware options follows Table 5.5.

Table 5.5 HARDWRE Items and Options

NOTE: Underlined options are the factory defaults.

HARDWRE Items	Options	Description
<PPR-OUT>		Specifies how the printer responds when you run out of paper.
	CNTONLY	The printer detects paper-out only for continuous forms. Printing stops and the PAPER OUT indicator turns red.
	DETECT	The printer detects paper-out for both continuous forms and single sheets. Printing stops and the PAPER OUT indicator turns red.

Table 5.5 HARDWRE Items and Options (Cont.)

NOTE: Underlined options are the factory defaults.

HARDWRE Items	Options	Description
	IGNORE	The printer ignores paper-out for both continuous forms and single sheets. Printing continues until no more data remains. No PAPER OUT warning appears. **NOTE: For cut sheet feeders, printing stops and the PAPER OUT indicator turns red, regardless of the PPR-OUT setting.**
<PRT-DIR>	<u>BI-DIR</u> UNI-DIR	Bidirectional printing. Unidirectional printing is useful for precision printing, such as vertical lines in tables. Printing is slower than bidirectional printing.
<BUZZER>		Turns the printer's status buzzer on or off.
	<u>ON</u>	Buzzer on. This is the recommended setting. The printer beeps to indicate paper-out, installation or removal of a font card, and various other conditions.
	OFF	Buzzer off.

Table 5.5 HARDWRE Items and Options (Cont.)

NOTE: Underlined options are the factory defaults.

HARDWRE Items	Options	Description
<WORD-LG>		To determine the required word length, refer to your computer documentation. Select 8-BIT when you print bit image graphics.
	8 BIT	8-bit word length. Used by most computers.
	7 BIT	7-bit word length.
<BUFFER>		**Download**
		Print buffer **buffer**
	256BYTE	256 bytes 31.75K bytes
	2KBYTE	2K bytes 30K bytes
	8KBYTE	8K bytes 24K bytes
	24KBYTE	24K bytes 8K bytes
		NOTE: For IBMXL24 emulation, the print buffer is fixed to 256 bytes regardless of the setting of this item. For LQ2500/LQ2550 emulation with 24KBYTE selected, a download error occurs.
<FEEDER>		Tells the printer whether a cut sheet feeder is installed.
	REAR	No cut sheet feeder is installed.
	SINGLE	A single bin cut sheet feeder is installed.
	DOUBLE	A double bin cut sheet feeder is installed.

Serial Interface Items. The following items are printed only when your printer has a serial interface. Be sure that the options selected on the printer are the same as the options selected using your computer's operating system or your software. Refer to the documentation provided with your computer and your software.

Setup Mode

Table 5.5 HARDWRE Items and Options (Cont.)

NOTE: Underlined options are the factory defaults.

HARDWRE Items	Options	Description		
<FORMAT>		No. of data bits	Parity bit	No. of stop bits
	8NONE 1	8	None	1
	8NONE 2	8	None	2
	8EVEN 1	8	Even	1
	8 ODD 1	8	Odd	1
	7EVEN 1	7	Even	1
	7 ODD 1	7	Odd	1
	7MARK 1	7	Mark	1
	7SPACE1	7	Space	1
	7EVEN 2	7	Even	2
	7 ODD 2	7	Odd	2
		The data format includes a start bit. The mark parity bit is always logical 1. The space parity bit is always logical 0.		
<BAUD-RT>	150 300 600 1200 4800 9600 19200	The baud rate is in bps (bits per second). Select the same baud rate as your computer or modem.		

Table 5.5 HARDWRE Items and Options (Cont.)

NOTE: Underlined options are the factory defaults.

HARDWRE Items	Options	Description
<PROTOCL>		Indicates data transmission protocol.
	XON/XOF	The DC1 and DC3 codes are used.
	DTR	The Data Terminal Ready signal is used.
	REV-CHL	The Reverse Channel signal is used.
	ETX/ACK	The ETX and ACK codes are used.
<DSR>	IGNORE	DSR is ignored by the printer.
	DETECT	DSR is detected by the printer.
<DUPLEX>	FULL	Simultaneous data transmission occurs in opposite directions.
	HALF	Data transmission occurs in either direction, but not simulta-neously.
<==END==>	—	Indicates the end of the HARDWRE item list. Press FF to print the first item, which is <PPR-OUT>. Press LF to print the previous item. Press ONLINE to reprint the <<FUNCTION>> menu.

Setup Mode

√ Procedure

To change the printer's hardware options, make sure that continuous forms paper is loaded. Then take the following steps.

1. Enter setup mode.

While pressing MODE, turn the printer on. Wait for the printer to stop printing and check that the <<FUNCTION>> menu is printed as shown below.

```
<<FUNCTION>>
    SAVE&END PANEL    MENU1    MENU2    HARDWRE LIST    DEFAULT  SELF-TST HEX-DUMP V-ALMNT  TOP-ADJ
```

2. Select the HARDWRE function.

Repeatedly press MODE to position the red cursor beneath HARDWRE. Press FF to select HARDWRE and print the first item and its options as shown below.

```
<PPR-OUT>        CNTONLY DETECT    IGNORE
```

3. Select an option for the selected item.

Press MODE to move the cursor to the option you require. Press FF to select the option and print the next item.

NOTE
To print the previous item, press LF.

4. Repeat step 3 until all required options are changed.

5. Exit the HARDWRE function.

Press ONLINE to exit the HARDWRE function and reprint the
<<FUNCTION>> menu.

6. Do one of the following:

- **Select another function.**
- **Exit setup mode, saving your changes.**

For details about other functions, see the other sections in this
chapter. To exit setup mode and save your changes, make sure
that the red cursor is positioned beneath SAVE&END, and then
press FF.

CHANGING TOP-OF-FORM

The top edge of your paper is the *physical* top of the page. The *logical*
top of the page, as "understood" by the printer when loading paper, is
called its top-of-form setting. The TOF-ADJ function tells the printer
where it should establish top-of-form. Printing starts at the position
obtained by adding the following:

- The top-of-form setting
- The top margin specified by your software
- The printer's TOP-MRG (top margin) setting

The printer's top-of-form setting can be either 1/6 of an inch (4.2 mm)
or 1 inch (25.4 mm). You can also fine-adjust the top-of-form setting.
The factory default is 1 inch.

The TOF-ADJ items and options are listed in Table 5.6. Items are listed
in the order in which they are printed. The procedure for changing
top-of-form follows Table 5.6.

Table 5.6 TOF-ADJ Items and Options

NOTE: Underlined options are the factory defaults.

TOF-ADJ Items	Options	Description
<ORIGIN>	1/6INCH	Sets top-of-form to 1/6 of an inch from the top of the physical page. This setting is recommended when your top margin is software-specified.
	1 INCH	Sets top-of-form to 1 inch from the top of the physical page. This setting is recommended if your top margin is not software-specified.
<FINEADJ>		Fine-adjusts the top-of-form setting in increments of 1/60 of an inch (.42 mm).
	-7/60IN,..., -1/60IN 0	Decreases top-of-form slightly.
	+1/60IN,..., +8/60IN	Increases top-of-form slightly.
<==END==>	—	Indicates the end of the TOF-ADJ item list. Press FF to print the first item, which is <ORIGIN>. Press LF to print the last item, which is <FINEADJ>. Press ONLINE to reprint the <<FUNCTION>> menu.

√ Procedure

To change the top-of-form setting, make sure that continuous forms paper is loaded. Then take the following steps.

1. Enter setup mode.

While pressing MODE, turn the printer on. Wait for the printer to stop printing and check that the <<FUNCTION>> menu is printed as shown below.

```
<<FUNCTION>>
   SAVE&END PANEL    MENU1    MENU2    HARDWRE  LIST     DEFAULT  SELF-TST HEX-DUMP V-ALMNT  TOF-ADJ
```

2. Select the TOF-ADJ function.

Repeatedly press MODE to position the red cursor beneath TOF-ADJ. Press FF to select TOF-ADJ and print the <ORIGIN> options as shown below.

```
<ORIGIN >        1/6INCH   1 INCH
```

3. Select 1/6 inch or 1 inch.

Press MODE to move the cursor to either 1/6 inch (4.2 mm) or 1 inch (25.4 mm). Press FF to select the option. The <FINEADJ> item is then printed. If you know that you need to fine-adjust top-of-form, you may do so now. Otherwise, go to step 4.

4. Exit the TOF-ADJ function.

Press ONLINE to exit the TOF-ADJ function and reprint the <<FUNCTION>> menu.

5. Exit setup mode, saving the top-of-form setting.

Make sure that the red cursor is positioned beneath SAVE&END, and then press FF.

6. Check the top-of-form setting.

Load a sheet of paper and print a sample page using your software. If necessary, re-enter setup mode and fine-adjust top-of-form by changing the <FINEADJ> option.

EXITING AND SAVING

There are two different methods to exit setup mode and save any changes you made. Briefly, these methods are:

- To exit setup mode immediately, select the SAVE&END function.
- To print the self-test before exiting setup mode, select the SELF-TST function. Then exit setup mode by pressing ONLINE.

With either method, any settings you changed while in setup mode are saved as the printer's new power-on defaults. The new defaults remain active until you change them again.

NOTE
The only way to exit setup mode without saving your changes is to turn off the printer. When you turn the printer back on, its previous default settings become active.

√ Procedure

To exit setup mode and save your changes using SELF-TST, see the section **Printing the Self-Test** later in this chapter. To exit setup mode and save your changes using SAVE&END, follow these steps.

1. Print the <<FUNCTION>> menu.

The <<FUNCTION>> menu should be the last printed line on the page. If the <<FUNCTION>> menu is not printed, press ONLINE to print it. (If you are using the SELF-TST or HEX-DUMP functions, press FF instead of ONLINE to print the <<FUNCTION>> menu.) The <<FUNCTION>> menu is shown below.

```
<<FUNCTION>>
   SAVE&END PANEL    MENU1    MENU2    HARDWRE  LIST     DEFAULT  SELF-TST HEX-DUMP V-ALMNT  TOP-ADJ
```

2. Select the SAVE&END function.

Check that the red cursor is positioned beneath SAVE&END. Press FF to select SAVE&END. The printer exits setup mode and returns online (the ONLINE indicator turns green). Any changes you made while in setup mode are saved.

RESETTING DEFAULTS

This section describes how to reset the printer's power-on defaults, all of the factory defaults, or the factory defaults for MENU1 and MENU2 only.

Resetting Power-On Defaults

Power-on defaults are those settings saved in the printer's permanent memory. The defaults are active whenever you turn the printer on. The easiest way to reset the power-on defaults is to turn the printer off and on. This is useful if you have made changes in setup mode that you do not want to save.

Resetting Factory Defaults

Factory defaults are those settings preselected at the factory. For a list of the printer's factory defaults, see the section **Printing a List of Selected Options** earlier in this chapter. To reset the factory defaults for all functions, follow these steps.

1. **Turn off the printer.**

2. **While pressing both the MODE and LF buttons, turn on the printer. Continue to press MODE and LF until the printer beeps.**

The factory defaults are now reset.

Resetting Factory Defaults in MENU1 and MENU2

Factory defaults for MENU1 and MENU2 are listed in Table 5.4. To reset the factory defaults in MENU1 and MENU2 only, use the following procedure. The printer's panel, hardware, and top-of-form options are not reset.

1. **Enter setup mode.**

While pressing MODE, turn the printer on. Wait for the printer to stop printing and check that the <<FUNCTION>> menu is printed as shown below.

```
<<FUNCTION>>
   SAVE&END PANEL   MENU1   MENU2   HARDWRE  LIST    DEFAULT  SELF-TST HEX-DUMP V-ALMNT  TOP-ADJ
```

4. Exit the SELF-TST function.

To exit the SELF-TST function, do one of the following:

- To exit SELF-TST and remain in setup mode, press FF. The <<FUNCTION>> menu is then reprinted.

- To exit SELF-TST and return online, press ONLINE. The printer permanently saves any changes you made while in setup mode and returns you online so that you are ready to print.

An alternate way to start self-test printing is to turn off the printer, and then press the FF button while turning the printer back on. As described in Chapter 2, this method is convenient when you first set up the printer.

Printing Hex Dumps

The HEX-DUMP function prints data and commands in hexadecimal characters and abbreviated control codes. The character set used for printing is IBM character set 2, which is shown in Appendix A of the programmer's manual. This is useful for checking whether your computer is sending the correct commands to the printer and whether the printer is executing the commands correctly. It is also useful for debugging software programs.

√ Procedure

To print hex dumps, make sure that continuous forms paper is loaded into the printer. Then follow these steps.

1. Enter setup mode.

While pressing MODE, turn the printer on. Wait for the printer to stop printing and check that the <<FUNCTION>> menu is printed as shown below.

```
<<FUNCTION>>
   SAVE&END PANEL   MENU1   MENU2   HARDWRE  LIST   DEFAULT  SELF-TST HEX-DUMP V-ALMNT  TOF-ADJ
```

2. Select the HEX-DUMP function.

Repeatedly press MODE to position the red cursor beneath HEX-DUMP. Then, press FF to select the HEX-DUMP function. The printer goes *online* and prints a header and a short help menu.

3. Print the hex dump.

To start hex dump printing, send your file or program to the printer. The printer goes online and prints the hex dump. A sample hex dump is shown in the following figure.

2. Select the DEFAULT function.

Repeatedly press MODE to position the red cursor beneath
DEFAULT. Press FF to select DEFAULT and reprint the
<<FUNCTION>> menu. The default values in MENU1 and
MENU2 are now reset.

3. Do one of the following:

- **Select new options for MENU1 or MENU2.**
- **Exit setup mode, saving the factory defaults.**

See the section **Changing MENU1 and MENU2 Options**. To
exit setup mode and save the new defaults, make sure that the
red cursor is positioned beneath SAVE&END, and then press
FF.

USING THE DIAGNOSTIC FUNCTIONS

This section describes how to use the following printer diagnostic
functions:

- SELF-TST
- HEX-DUMP
- V-ALMNT

These functions are helpful for checking print quality and diagnosing
printer problems. HEX-DUMP is also useful to programmers.

Printing the Self-Test

The SELF-TST function prints test pages to check how the printer
operates independent of your computer. The self-test does not check
the interface between the computer and the printer.

The self-test prints the printer's firmware version, its resident emula-
tions, and all of the characters available in the currently selected
character set. For color printers with a color ribbon, printing occurs in
seven colors. If the DPL24C PLUS emulation is selected for MENU1,

the self-test is printed using the settings currently assigned to MENU1. For example, if Prestige Elite 12 and italics are selected, the self-test prints using Prestige Elite 12 and italics. This is a convenient way to see how printing from MENU1 will look.

√ Procedure

This procedure assumes you are in setup mode. To print the self-test, make sure that continuous forms paper is loaded into the printer. Then follow these steps.

1. Print the <<FUNCTION>> menu.

The <<FUNCTION>> menu should be the last printed line on the page. If the <<FUNCTION>> menu is not printed, press ONLINE to print it. (If you are using the HEX-DUMP function, press FF instead of ONLINE to print the <<FUNCTION>> menu.) The <<FUNCTION>> menu is shown below.

```
<<FUNCTION>>
  SAVE&END PANEL    MENU1    MENU2    HARDWRE  LIST     DEFAULT  SELF-TST HEX-DUMP V-ALMNT  TOP-ADJ
```

2. Select the SELF-TST function.

Repeatedly press MODE to position the red cursor beneath SELF-TST, and then Press FF. The printer selects SELF-TST and starts printing. A short help menu is printed at the top of the page, followed by the self-test. Note that the printer *does not go online* during self-test printing.

3. Examine the self-test page.

To pause self-test printing, press MODE or LF. A sample self-test page is shown in Chapter 2. To resume self-test printing, press MODE or LF again.

Press LF or MODE to pause hex dump printing. To resume hex dump printing, press LF or MODE again.

```
                   <<FUNCTION>>
                     SAVE&END PANEL    MENU1    MENU2    HARDWRE  LIST    DEFAULT  SELF-TST  HEX-DUMP V-ALMNT  TOF-ADJ


    *** Hex dump printing ***

     BUTTON            ACTION
     <ONLINE>          Exit to normal mode
     < F   F >         Return to <<FUNCTION>> menu
     < L   F >         Pause/resume printing
     < MODE >          Pause/resume printing

    0  1  2  3  4  5  6  7  8  9  A  B  C  D  E  F     0123456789ABCDEF
    48 65 78 20 64 75 6D 70 20 70 72 69 6E 74 69 6E    Hex dump printin
    67 0D 0A 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D    g◻◻!"#$%&'()*+,-
    2E 2F 30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D    ./0123456789:;<=
    3E 3F 40 41 42 43 44 45 46 47 48 49 4A 4B 4C 4D    >?@ABCDEFGHIJKLM
    4E 4F 50 51 52 53 54 55 56 57 58 59 5A 5B 5C 5D    NOPQRSTUVWXYZ[\]
    5E 5F 60 61 62 63 64 65 66 67 68 69 6A 6B 6C 6D    ^_`abcdefghijklm
    6E 6F 70 0D 0A 71 72 73 74 75 76 77 78 79 7A 7B    nop◻◻qrstuvwxyz{
    7C 7D 7E 0D 0A                                     |}~◻◻
```

Sample hex dump

NOTE
When hex dump printing stops, the printer remains online in setup mode (the ONLINE indicator is green). To print another hex dump, send another file to the printer.

4. Exit the HEX-DUMP function.

To exit the HEX-DUMP function, do one of the following:

- To exit HEX-DUMP and remain in setup mode, press FF. The <<FUNCTION>> menu is then reprinted. For details about other functions, see the other sections in this chapter.

- To exit HEX-DUMP and return to online normal mode, press ONLINE. If you press ONLINE while the hex dump is printing, printing continues but the printer switches from hexadecimal format to standard characters.

An alternate way to print hex dumps is as follows:

- Turn off the printer.

- While simultaneously pressing the FF and LF buttons, turn the printer back on. Continue pressing FF and LF until the printer beeps.

- Send your file or program to the printer. Hex dump printing then starts.

Checking Vertical Print Alignment

The V-ALMNT function corrects the vertical character displacement that sometimes occurs with bi-directional printing. Characters printed from left to right become misaligned with the characters printed from right to left. An example of vertical displacement follows:

```
This example shows how printing looks
when characters are vertically
misaligned. Note that the left
margin is not straight.
```

If you notice misaligned printing, use the following procedure to check and correct the vertical print alignment.

√ Procedure

Make sure that continuous forms paper is loaded into the printer. If possible, use forms 355.6 mm (14 inches) wide to avoid printing on the platen. However, you can also use forms of letter or A4 size even for this 136-column printer by setting the WIDTH option in MENU1 to 8 inches. See the section **Changing MENU1 and MENU2 Options** for details. Follow these steps to check and correct vertical print alignment.

1. Enter setup mode.

While pressing MODE, turn the printer on. Wait for the printer to stop printing and check that the <<FUNCTION>> menu is printed as shown below.

```
<<FUNCTION>>
    SAVE&END PANEL     MENU1     MENU2     HARDWRE  LIST     DEFAULT  SELF-TST HEX-DUMP V-ALMNT  TOP-ADJ
```

2. Select the V-ALMNT function.

Repeatedly press MODE to position the red cursor beneath V-ALMNT. Then, press FF to select the V-ALMNT function. The printer starts printing rows of parallel bars using letter quality speed.

3. Adjust the vertical print alignment at letter quality speed.

Look at the parallel bars. If the bars are aligned (not jagged), go to step 4. If the bars are offset to the left (see the following figure), repeatedly press MODE until the bars are aligned. If the bars are offset to the right (see the following figure), repeatedly press LF until the bars are aligned.
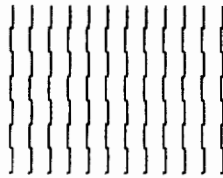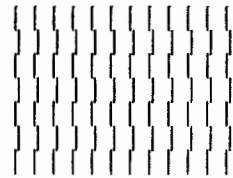
Bars offset to left   Bars offset to right

4. Adjust the vertical print alignment at correspondence speed.

Press FF to switch from letter speed to correspondence speed.

Look at the parallel bars. If the bars are aligned (not jagged), go
to step 5. If the bars are offset to the left, repeatedly press
MODE until the bars are aligned. If the bars are offset to the
right, repeatedly press LF until the bars are aligned.

5. Adjust the vertical print alignment at draft speed.

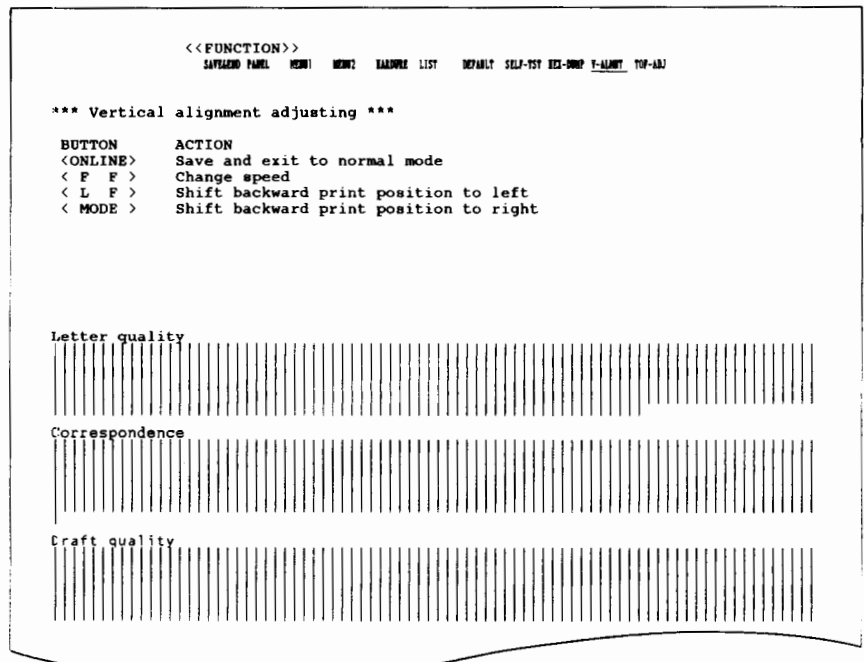Press FF to switch from correspondence speed to draft speed.

Look at the parallel bars. If the bars are aligned (not jagged), go
to step 6. If the bars are offset to the left, repeatedly press
MODE until the bars are aligned. If the bars are offset to the
right, repeatedly press LF until the bars are aligned.

6. Exit the V-ALMNT function.

Press ONLINE to exit the V-ALMNT function and save the new
vertical alignment settings. The printer exits setup mode and
returns online.

NOTE
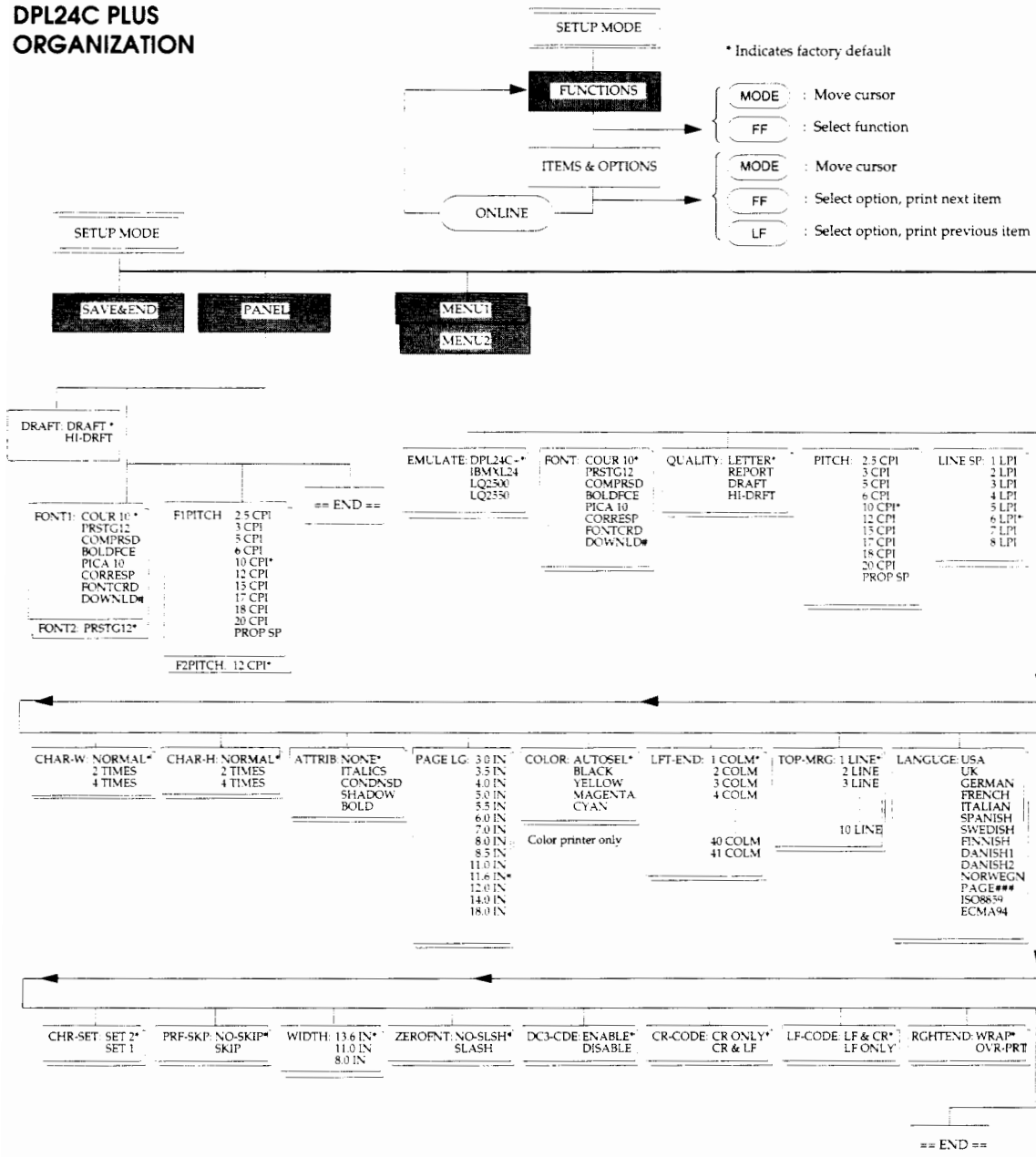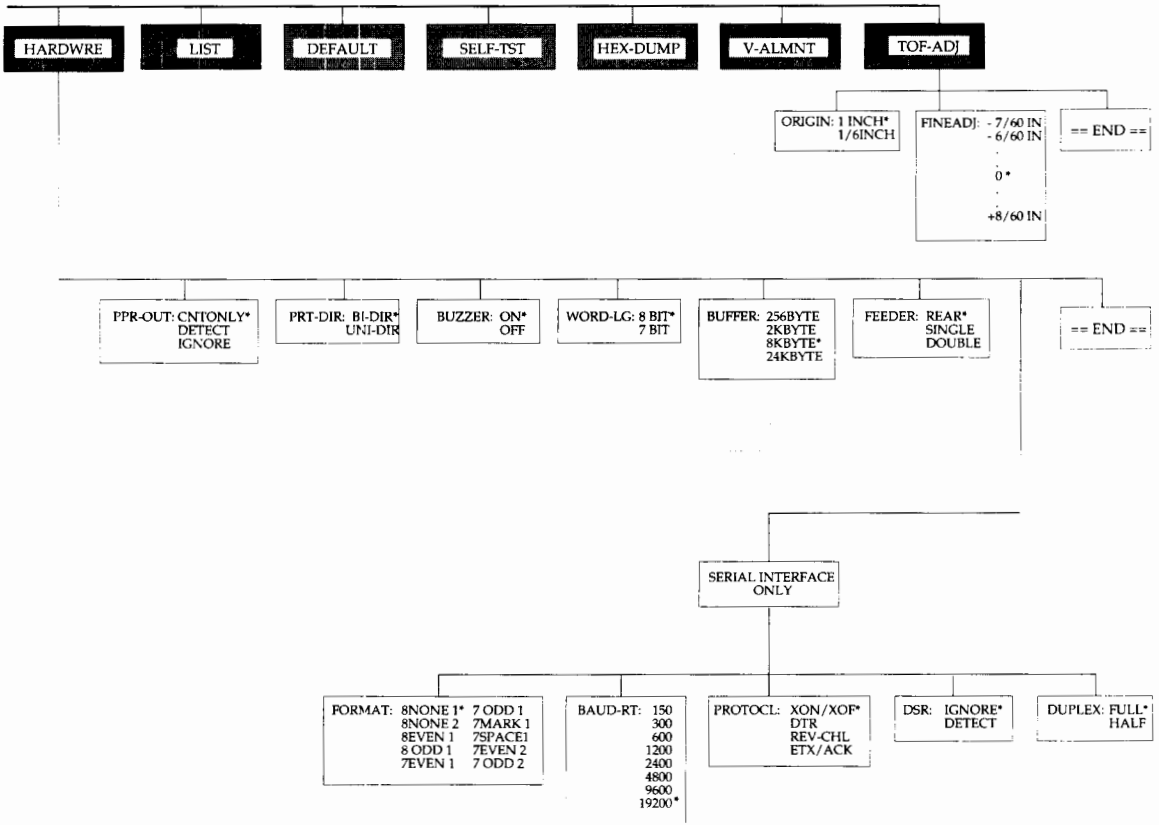**To exit the V-ALMNT function, you must exit setup mode.**

```
        <<FUNCTION>>
        SAVE&END PANEL  MENU1  MENU2  HARDWRE LIST  DEFAULT SELF-TST HEX-DUMP V-ALMNT TOF-ADJ


*** Vertical alignment adjusting ***

BUTTON      ACTION
<ONLINE>    Save and exit to normal mode
< F  F >    Change speed
< L  F >    Shift backward print position to left
< MODE >    Shift backward print position to right




Letter quality
|||||||||||||   |   |   |   |   |   |   |||||||||||||||

Correspondence
|||||||||||   |   |   |   |   |   |   ||||||||||||||||

Craft quality
|||||||||||   |   |   |   |   |   |   |||||||||||||||
```

Correct vertical print alignment

SETUP MODE REFERENCE

The flowchart in this section shows how setup mode is organized for Fujitsu DPL24C PLUS emulation. Following the flowchart, differences are listed for the IBM Proprinter XL24 and Epson LQ-2500/LQ-2550 emulations.

DPL24C PLUS
ORGANIZATION

SETUP MODE

* Indicates factory default

FUNCTIONS

| MODE | : Move cursor |
| FF | : Select function |

ITEMS & OPTIONS

| MODE | : Move cursor |

ONLINE

| FF | : Select option, print next item |
| LF | : Select option, print previous item |

SETUP MODE

SAVE&END   PANEL   MENU1
                     MENU2

```
DRAFT: DRAFT *
       HI-DRFT
```

EMULATE: DPL24C-*	FONT: COUR 10*	QUALITY: LETTER*	PITCH: 2.5 CPI	LINE SP: 1 LPI
IBMXL24	PRSTG12	REPORT	3 CPI	2 LPI
LQ2500	COMPRSD	DRAFT	5 CPI	3 LPI
LQ2550	BOLDFCE	HI-DRFT	6 CPI	4 LPI
	PICA 10		10 CPI*	5 LPI
== END ==	CORRESP		12 CPI	6 LPI*
	FONTCRD		15 CPI	7 LPI
	DOWNLD♦		17 CPI	8 LPI
			18 CPI	
			20 CPI	
			PROP SP	

```
FONT1: COUR 10 *     F1PITCH: 2.5 CPI
       PRSTG12               3 CPI
       COMPRSD               5 CPI
       BOLDFCE               6 CPI
       PICA 10               10 CPI*
       CORRESP               12 CPI
       FONTCRD               15 CPI
       DOWNLD♦               17 CPI
                             18 CPI
FONT2: PRSTG12*              20 CPI
                             PROP SP

       F2PITCH: 12 CPI*
```

CHAR-W: NORMAL*	CHAR-H: NORMAL*	ATTRIB: NONE*	PAGE LG: 3.0 IN	COLOR: AUTOSEL*	LFT-END: 1 COLM*	TOP-MRG: 1 LINE*	LANGUGE: USA
2 TIMES	2 TIMES	ITALICS	3.5 IN	BLACK	2 COLM	2 LINE	UK
4 TIMES	4 TIMES	CONDNSD	4.0 IN	YELLOW	3 COLM	3 LINE	GERMAN
		SHADOW	5.0 IN	MAGENTA	4 COLM		FRENCH
		BOLD	5.5 IN	CYAN			ITALIAN
			6.0 IN				SPANISH
			7.0 IN	Color printer only		10 LINE	SWEDISH
			8.0 IN		40 COLM		FINNISH
			8.5 IN		41 COLM		DANISH1
			11.0 IN				DANISH2
			11.6 IN*				NORWEGN
			12.0 IN				PAGE###
			14.0 IN				ISO8859
			18.0 IN				ECMA94

CHR-SET: SET 2*	PRF-SKP: NO-SKIP*	WIDTH: 13.6 IN*	ZEROFNT: NO-SLSH*	DC3-CDE: ENABLE*	CR-CODE: CR ONLY*	LF-CODE: LF & CR*	RGHTEND: WRAP*
SET 1	SKIP	11.0 IN	SLASH	DISABLE	CR & LF	LF ONLY	OVR-PRT
		8.0 IN					

== END ==

Setup Mode

| HARDWRE | LIST | DEFAULT | SELF-TST | HEX-DUMP | V-ALMNT | TOF-ADJ |

| ORIGIN: 1 INCH* | FINEADJ: - 7/60 IN | == END == |
| 1/6INCH | - 6/60 IN |
| 0 * |
| +8/60 IN |

PPR-OUT: CNTONLY*	PRT-DIR: BI-DIR*	BUZZER: ON*	WORD-LG: 8 BIT*	BUFFER: 256BYTE	FEEDER: REAR*	== END ==
DETECT	UNI-DIR	OFF	7 BIT	2KBYTE	SINGLE
IGNORE				8KBYTE*	DOUBLE
				24KBYTE	

SERIAL INTERFACE
ONLY

FORMAT: 8NONE 1* 7 ODD 1	BAUD-RT: 150	PROTOCL: XON/XOF*	DSR: IGNORE*	DUPLEX: FULL*
8NONE 2 7MARK 1	300	DTR	DETECT	HALF
8EVEN 1 7SPACE1	600	REV-CHL		
8 ODD 1 7EVEN 2	1200	ETX/ACK		
7EVEN 1 7 ODD 2	2400			
	4800			
	9600			
	19200*			

Differences for IBM Proprinter XL24 Emulation

In the IBM Proprinter XL24 emulation, MENU1 and MENU2 differ from the DPL24C PLUS emulation in the following ways:

- The following options are different:

CHAR-W: NORMAL * 2 TIMES	CHAR-H: NORMAL * 2 TIMES	ATTRIB: NONE* ITALIC SHADOW BOLD

- The AGM item is provided:

CHR-SET: SET 2 * SET 1	AGM: OFF * ON	PRF-SKIP: NO-SKIP * SKIP

Differences for Epson LQ-2500/LQ-2550 Emulation

In the Epson LQ-2500/LQ-2550 emulations, MENU1 and MENU2 differ from the DPL24C PLUS emulation in the following ways:

- The ZEROFNT and LF-CODE items are not defined.

- The following options are different:

PAGE LG: 4.0 IN 4.5 IN 5.0 IN 5.5 IN . . . 11.0 IN. 11.5 IN . . 22.0 IN	LANGUGE: USA FRENCH GERMAN UK DANISH 1 SWEDISH ITALIAN SPANISH 1 JAPAN NORWEGN DANISH 2 SPANISH 2 LATIN A PAGE # ISO 8859 ECMA94	CHR-SET: ITALIC * GRAPHIC

- The LINE SP follows the CHAR-H.

MAINTENANCE

Your printer requires very little care. Occasional cleaning and replacement of the ribbon cartridge are all that is required.

Lubrication of the printer is not usually necessary. If the print head carriage does not move smoothly back and forth, clean the printer using the procedures in this chapter. If the problem continues, contact your dealer to determine whether lubrication might be needed.

CLEANING

The front and top covers of the printer help protect it from dust and dirt. However, paper produces small particles that accumulate inside the printer. This section explains how to clean and vacuum the printer and how to clean the platen and paper bail rollers.

Cleaning and Vacuuming the Printer

WARNING
To avoid any possibility of injury, turn off the power to both the printer and the computer, and unplug the printer before cleaning.

Use the following procedure to clean and vacuum the printer as required.

1. Remove any paper that is loaded in the printer. Be sure that the printer power cord is unplugged and that the power is off.

2. Using a soft vacuum brush, vacuum the exterior of the printer. Be sure to vacuum the air vents at the sides and rear of the printer. Also vacuum the cut sheet stand or feeder.

3. Use a soft, damp cloth to wipe the exterior of the printer, including the front and top covers. A mild detergent may be used.

CAUTION

Do not use solvents or abrasive cleaning materials that may damage the printer.

4. Open the front and top covers of the printer and remove the ribbon cartridge. Using a soft vacuum brush, gently vacuum the platen, print head carriage, and surrounding areas. You can easily move the print head left and right with the power off. Be careful not to press too hard on the print head cable extending from the print head carriage (see the following figure).

Printer interior
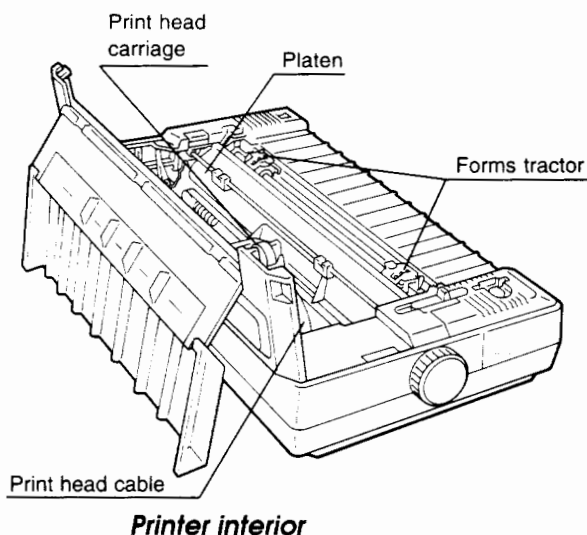
5. Re-install the ribbon cartridge. Close the front and top covers.

6. Raise the cut sheet stand. Vacuum the rear forms tractors and surrounding areas.

Cleaning the Platen and Paper Bail Rollers

To remove excess ink from the platen and paper bail rollers, clean them about once a month. Obtain the platen cleaner recommended by your supplier and follow these steps.

1. Apply a small amount of platen cleaner to a soft cloth. Avoid getting platen cleaner inside the printer.

CAUTION
Do not use alcohol to clean the platen. Alcohol may cause the rubber to harden.

2. Place the cloth against the platen and manually rotate the platen knob.

3. To dry the platen, place a dry cloth against it while rotating the platen knob.

4. Gently wipe the paper bail rollers using the cloth containing the platen cleaner. Dry the rollers with a dry cloth.

REPLACING THE RIBBON CARTRIDGE

A color printer can use either a color or black ribbon cartridge. A monochrome printer *requires* a black ribbon cartridge. Appendix A lists order numbers for ribbon cartridges.

To replace the ribbon cartridge:

1. Turn off the printer.

2. Open the top and front covers of the printer. For easy access to the print head carriage, slide it about three quarters of the way to the right side of the platen.

CAUTION
The print head may be hot if you have been printing recently.

Maintenance

3. Move the paper thickness lever to position ⑤, as shown in the figure below.

Paper thickness lever
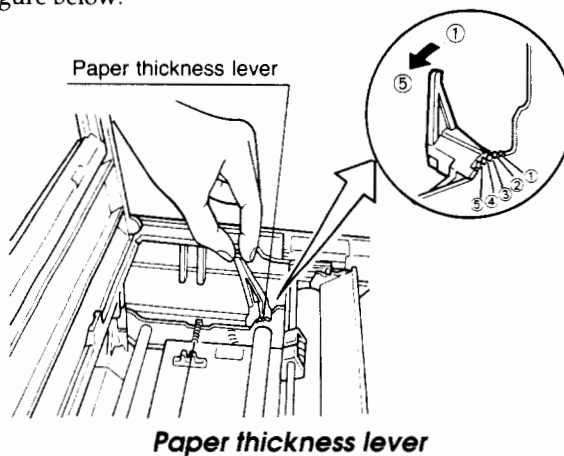
4. To remove the ribbon cartridge, pull one of the cartridge release levers on either side of the cartridge. As you pull the lever toward you, gently lift the cartridge out of the printer.

Removing the ribbon cartridge
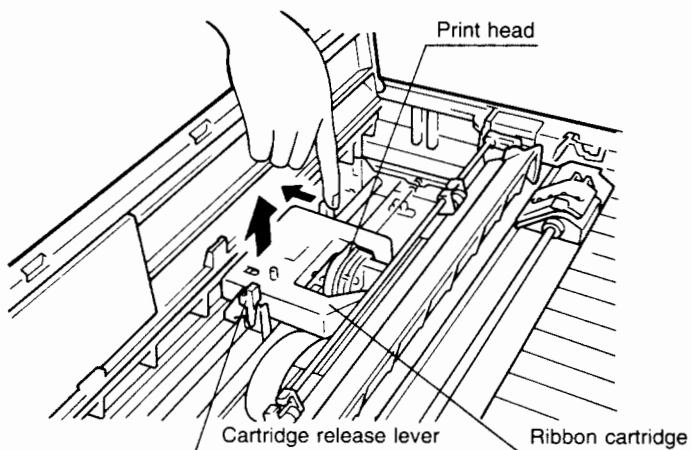
5. Remove the new ribbon cartridge from its package. Remove the stopper releasing the ribbon feed knob (see the following figure). The shape of the stopper differs with ribbon suppliers. Turn the ribbon feed knob CLOCKWISE to be sure that it feeds properly.

Ribbon

Ribbon feed knob
Turn clockwise to tighten

Stopper

(Black)

Ribbon

Ribbon feed knob

Stopper

(Color)
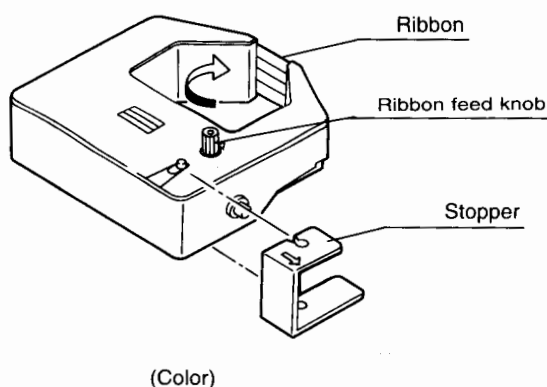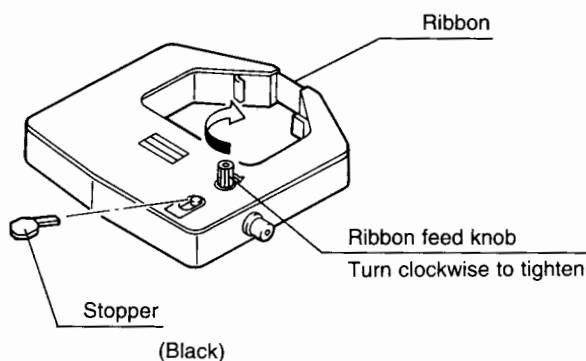
Preparing the new ribbon cartridge

6. Referring to the following figure, place the two mounting pins (on the sides of the ribbon cartridge) onto the ribbon release levers on the ribbon support studs inside the printer. Rotate the cartridge so that the ribbon falls between the nose of the print head and the plastic print guide.
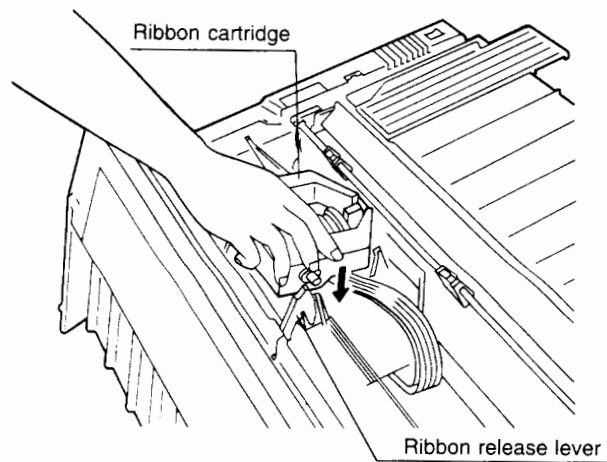
Installing the new ribbon cartridge

7. Press down the cartridge along the slopes of the ribbon release levers until the mounting pins snap into the notches on the ribbon support studs. Gently pull on the cartridge to verify that the pins are securely installed in the notches and that the ribbon is smoothly placed across the feed path.

8. Turn the ribbon feed knob CLOCKWISE to tighten the ribbon.

9. Move the paper thickness lever (which is located inside the left side of the printer) back to its original position. For single sheet printing, the correct position is position ①. Table 3.1 in Chapter 3 gives other paper thickness lever settings.

10. Close the top and front covers of the printer.

7

PROBLEM SOLVING

Your printer is extremely reliable, but occasional problems may occur. You can solve many of these problems yourself, using this chapter. For problems you cannot resolve, contact your dealer for assistance. This chapter is organized as follows:

- Problems and solutions
- Diagnostic functions
- Getting help

PROBLEMS AND SOLUTIONS

The tables in this section list common printer problems and their solutions. The following types of problems are listed:

- Printing problems
- Paper handling problems
- Operational problems

Printing Problems

Poor print quality or other printing problems are often caused by incorrect printer setup or incorrect software settings. A gradual decrease in print quality usually indicates a worn ribbon. Table 7.1 lists common printing problems and their solutions.

Table 7.1 Printing Problems and Solutions

Problems	Solutions
Printing is too light or too dark.	Make sure that the ribbon cartridge is properly installed and that the ribbon feeds smoothly. Make sure that the paper thickness lever is set for the thickness of your paper. See Table 3.1 in Chapter 3. The ribbon may be worn. Replace the ribbon.
Stains or smudges appear on the page.	Make sure that the paper thickness lever is set for the thickness of your paper. See Table 3.1 in Chapter 3. The ribbon may be worn. Replace the ribbon. Check to see whether the tip of the print head is dirty. Clean it with a soft cloth.
The page is blank.	Make sure that the ribbon cartridge is properly installed.
Printing is erratic or the wrong characters are printed. Many "?" characters are printed.	Make sure that the interface cable is securely connected to both the printer and computer. Make sure that the printer emulation selected in your software is the same as the emulation selected on the printer. See the section **Selecting an Emulation** in Chapter 2. If you are using an RS-232C serial interface, make sure that the serial settings required by your software or computer are the same as the settings on the printer. See the section **Changing Hardware Options** in Chapter 5.

Table 7.1 Printing Problems and Solutions (Cont.)

Problems	Solutions
Printing is vertically misaligned (jagged).	Use the printer's V-ALMNT function to check the vertical print alignment. If necessary, adjust the print alignment. See the section **Using the Diagnostic Functions** in Chapter 5.
The top margin is wrong.	The top margin is the sum of the top-of-form setting, the software-specified top margin, and the printer's TOP-MRG setting. Check the following: • Make sure that the top-of-form setting is correct. The possible default settings are 25.4 mm (1 inch) and 4.2 mm (1/6 of an inch). See the section **Changing Top-of-Form** in Chapter 5. • Check the software-specified top margin. Refer to your software documentation. • Check the printer's TOP-MRG setting. See the section **Changing MENU1 and MENU2 Options** in Chapter 5.
Lines are double spaced instead of single spaced	Check the line spacing setting in your software. Change the CR-CODE setting in the printer's setup mode to CR ONLY. See the section **Changing MENU1 and MENU2 Options** in Chapter 5.
The printer keeps printing on the same line.	Change the CR-CODE setting in the printer's setup mode to CR & LF. See the section **Changing MENU1 and MENU2 Options** in Chapter 5.
The next print line starts where the previous line ended instead of at the left margin.	Change the LF-CODE setting in the printer's setup mode to LF & CR. See the section **Changing MENU1 and MENU2 Options** in Chapter 5.

Problem
Solving

Paper Handling Problems

Table 7.2 lists common paper handling problems and their solutions. See Chapter 3 for detailed procedures on loading and using paper.

Table 7.2 Paper Handling Problems and Solutions

Problems	Solutions
Paper cannot be loaded.	Make sure that the paper select lever is set correctly. Move the lever backward for continuous forms and forward for single sheets.
	Make sure that your paper covers the paper-out sensor (about 100 mm from the left edge of the platen).
	If you are using a cut sheet feeder, make sure that the bin lever (on the left side of the feeder) is set down to the "CLOSED" position.
	If you are using a cut sheet feeder, make sure that FEEDER was set correctly in setup mode. Specify SINGLE for a single bin feeder or DOUBLE for a double bin feeder. See the section **Changing Hardware Options** in Chapter 5.
Paper jams while loading.	Turn off the printer and remove the jammed paper. Remove any obstructions from the paper path.
	Make sure that the paper thickness lever is set for the thickness of your paper. See Table 3.1 in Chapter 3.
	If using a cut sheet feeder, make sure that the bin lever (on the left side of the feeder) is set down to the "CLOSED" position.
	Make sure that the paper is not folded, creased, or torn. Re-install the paper.

Table 7.2 Paper Handling Problems and Solutions (Cont.)

Problems	Solutions
Paper jams while printing.	Turn off the printer and remove the jammed paper. Remove any obstructions from the paper path.

Make sure that the paper thickness lever is set for the thickness of your paper. See Table 3.1 in Chapter 3.

For continuous forms, make sure that the ingoing and outgoing paper stacks are correctly placed. Paper should feed in a straight line.

For paper-stapled multi-part continuous forms, make sure that the cut sheet stand is set in the up position and that the paper guides are centered with the extenders lowered.

For one-part lighter-weight continuous forms or multi-part continuous forms used in high temperature, make sure that the bail rollers rest half on the paper and half on the platen.

If you are using a cut sheet feeder, make sure that the bin lever (on the left side of the feeder) is set down to the "CLOSED" position.

Re-install the paper. |
| Paper slips off the forms tractors. Or, the perforated holes of the paper are broken during printing. | Make sure that the forms tractors are positioned for the width of your paper and that the perforated holes of the paper fit directly over the tractor sprockets. |

Problem Solving

Operational Problems

Table 7.3 lists common operational problems and their solutions. If you cannot resolve a problem, contact your dealer.

Table 7.3 Operational Problems and Solutions

Problems	Solutions
The power does not turn on.	Make sure that the "1" on the printer's power switch is toggled up. Make sure that the power cord is securely connected to both the printer and the outlet. Make sure that the power outlet is functional. Turn the power off. Wait 30 seconds and turn the printer on again. If the printer still has no power, contact your dealer.
The printer is on, but it will not print.	Make sure that the printer is online. Make sure that the interface cable is securely connected to both the printer and the computer. Check to see whether the red PAPER OUT indicator is lit. If so, load paper. Run the printer's self-test (see Chapter 5). If the self-test executes normally, the problem is caused by the interface, the computer, incorrect printer settings, or incorrect software settings. Make sure that the printer emulation selected in your software is the same as the emulation selected on the printer. See the section **Selecting an Emulation** in Chapter 2.

Table 7.3 Operational Problems and Solutions (Cont.)

Problems	Solutions
The printer is on, but it will not print (continued).	If you are using an RS-232C serial interface, make sure that the serial settings required by your software or computer are the same as the settings on the printer. See the section **Chaning Hardware Options** in Chapter 5.
The printer beeps four times and the red PAPER OUT indicator keeps blinking.	The printer hardware, a font card, or an emulation card is defective. If a font or emulation card is installed, remove the card and use a soft brush to clean the gold contacts. Re-insert the card, and turn the printer on. If the problem continues, contact your dealer.
The cut sheet feeder does not operate.	Make sure that the cut sheet feeder is firmly mounted on the printer. Make sure that FEEDER was set correctly in setup mode. Specify SINGLE for a single bin feeder or DOUBLE for a double bin feeder. See the section **Changing Hardware Options** in Chapter 5.

Problem
Solving

DIAGNOSTIC FUNCTIONS

The printer's diagnostic functions are SELF-TST, HEX-DUMP, and V-ALMNT.

- SELF-TST tells you whether the printer hardware is functioning correctly. If the printer hardware is functional, any problems you are having are probably caused by incorrect printer settings, incorrect software settings, the interface, or the computer.

- HEX-DUMP allows you to determine whether the computer is sending the correct commands to the printer, and whether the printer is executing the commands correctly. This function is useful to programmers or others who understand how to interpret hex dumps.

- V-ALMNT allows you to check and, if necessary, correct the printer's vertical print alignment.

For details on using these functions, all of which are available in the printer's setup mode, see Chapter 5.

GETTING HELP

If you are not able to correct a problem using this chapter, contact your dealer for assistance. Be prepared to provide the following information:

- Your printer's model number, serial number, and date of manufacture. Look for this information on the nameplate at the rear of the printer.
- Description of the problem
- Type of interface you are using
- Names of your software packages
- List of the printer's default settings. To print the default settings, see Chapter 5.

8

INSTALLING OPTIONS

By installing options, you can expand the capabilities of your printer. Options available for the printer include:

- Single bin cut sheet feeder
- Double bin adapter for cut sheet feeder
- Font cards
- Emulation cards
- Serial interface board
- Color kit

All options can be purchased from your dealer and installed by you. This chapter describes how to install each option. See Appendix A for order numbers.

INSTALLING A CUT SHEET FEEDER

A cut sheet feeder allows you to automatically print on single sheets without inserting the sheets one by one. A double bin adapter is also available.

Options
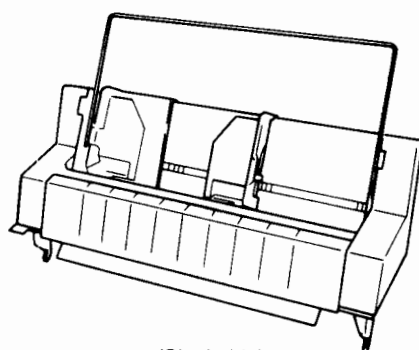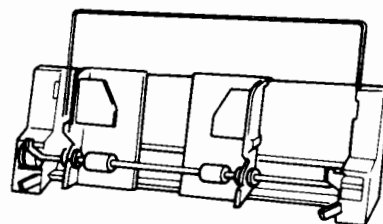
(Single bin)   (Double bin adaptor)

Single bin cut sheet feeder and double bin adapter

To mount a cut sheet feeder on your printer, refer to the manual shipped with the feeder. After the feeder is mounted, you must enter the printer's setup mode and specify either SINGLE or DOUBLE as the feeder type. Otherwise, the feeder will not work. To enter setup mode and specify the feeder type, see the section **Changing Hardware Options** in Chapter 5.

For details on using your cut sheet feeder, see Chapter 3.

INSTALLING/REMOVING FONT CARDS

In addition to the printer's eight resident fonts, you can use other fonts by installing font cards. Only one font card can be used at a time. You cannot use a font card when using an emulation card.

Font cards that are currently available include:

*   Dutch 801™·ˈ Script', Old English, Humanist 521™·ˈ
*   Swiss 721™·ˈ, Script', Old English, Humanist 521™·ˈ
*   Deluxe Courier', Light Italic 12, Orator 10
*   Deluxe Prestige', Light Italic 12, Letter Gothic 12
*   OCR-A, OCR-B, Scientific 12/18

      ·ˈLicensed from Bitstream Inc., Cambridge, Massachusetts

For the latest information on font cards, contact your dealer. Appendix B in the programmer's manual provides examples showing how each font looks.
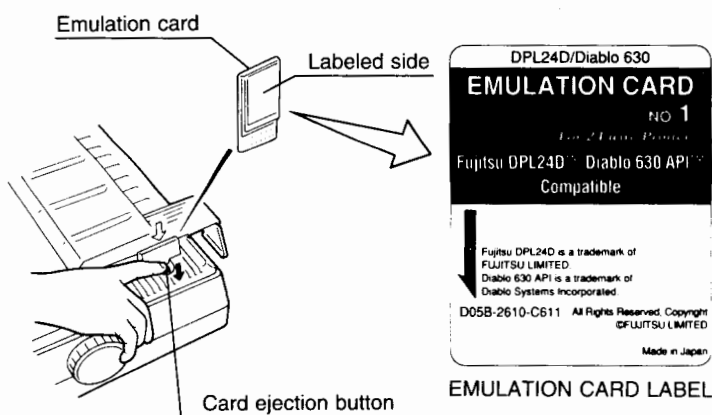
Installing a Font Card

When handling font cards, take the following precautions:

*   Always store font cards in their electrostatic-proof cases. Static electricity and magnets can alter the information stored on font cards.
*   Do not touch the font card's gold connectors. Dirt, dust, oil, or perspiration may damage the card.

To install a font card, turn on the printer and follow these steps.

1. Remove the font card from its case, being careful not to touch the gold connectors. Check that the label "For 24-wire Printers" appears on the card.

CAUTION
Do not use a font card designed for any other printer type.

2. Face the font card so that the "FONT CARD" label faces *out*, toward the eject button and so that the arrow points towards the printer. Insert the font card into the card slot on the rear right top of the printer.

3. Press down firmly on the center of the card until the card clicks into place.

If the card is correctly inserted, the printer beeps twice. (The printer does not beep if you de-activated BUZZER in setup mode.)
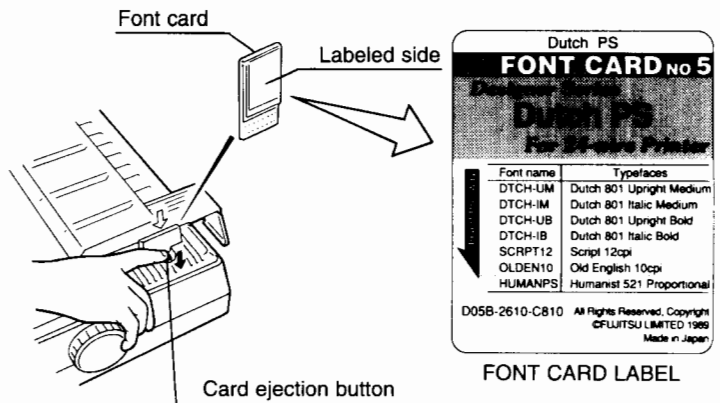
Inserting the font card

To select fonts on font cards, you can use either your software or the printer's control panel. To select fonts using software, refer to your software documentation. To select fonts using the control panel, you must first enter the printer's setup mode. Then, assign the font options you require to MENU1, MENU2, FONT1, and FONT2 on the printer's control panel (see Chapter 5 for details). After you save your font options and exit setup mode, you can select fonts from the control panel as described in Chapter 4.

Removing a Font Card

To remove a font card, press the eject button and pull the card out of the card slot. If the printer is on, it beeps twice when the card is removed. (The printer does not beep if you de-activated BUZZER in setup mode.)

Return the font card to its electrostatic-proof case. Be careful not to drop or bend the card.

INSTALLING/REMOVING EMULATION CARDS

In addition to the printer's four resident emulations, you can use other emulations by installing emulation cards. Only one emulation card can be used at a time. You cannot use an emulation card when using a font card.

When installing or removing emulation cards, always turn off the printer.

Emulation cards currently available include:

- Fujitsu DPL24D (for Diablo 630 compatibility)
- DEC LA50/75/120/210

Installing an Emulation Card

When handling emulation cards, take the following precautions:

• Always store emulation cards in their electrostatic-proof cases. Static electricity and magnets can alter the information stored on emulation cards.
• Do not touch the emulation card's gold connectors. Dirt, dust, oil, or perspiration may damage the card.

To install an emulation card, follow these steps.

1. Turn off the printer.

2. Remove the emulation card from its case, being careful not to touch the gold connectors.

3. Face the emulation card so that the label faces *out*, toward the eject button. Insert the emulation card into the card slot on the top right, near the back of the printer.

Emulation card
Labeled side

DPL24D/Diablo 630
EMULATION CARD
NO 1
Fujitsu DPL24D   Diablo 630 API
Compatible

Fujitsu DPL24D is a trademark of FUJITSU LIMITED.
Diablo 630 API is a trademark of Diablo Systems Incorporated.
D05B-2610-C611   All Rights Reserved. Copyright
©FUJITSU LIMITED

Made in Japan

EMULATION CARD LABEL

Card ejection button

Options

Inserting the emulation card

4. Enter setup mode and select the emulation in MENU1 and/or MENU2. See Chapter 5 for details.

5. If the emulation does not appear in the setup menu, the card was probably not inserted correctly. Remove the card and try inserting it again.

Removing an Emulation Card

To remove an emulation card, turn off the printer. Press the eject button and pull the emulation card out of the card slot.

Return the emulation card to its electrostatic-proof case. Be careful not to drop or bend the card.

CHANGING THE INTERFACE BOARD

Your printer can communicate with a computer through either a Centronics parallel interface or an RS-232C serial interface. Most likely, you selected one of these already installed when you purchased your printer. If necessary, these interface boards can be purchased separately and changed by following these steps.

1. Turn off and unplug the printer. If an interface cable is connected to the printer, disconnect it.

2. Set the paper select lever for single sheets (forward) and remove a font or emulation card if one is installed.

3. To remove the card cover, insert a flat screwdriver (or a coin) into the notch on the rear of the cover and push down to unlock the cover. The cover can then be pulled back for removal.
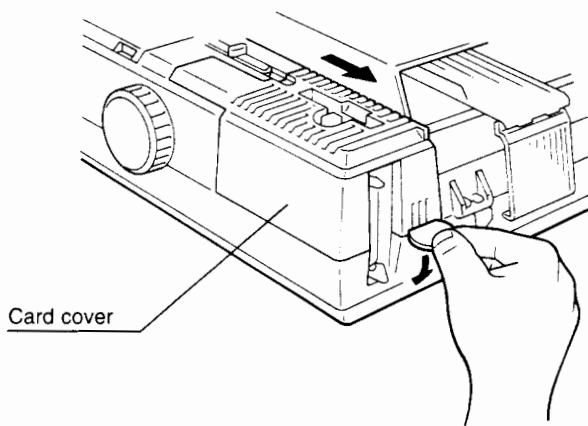
Card cover

Removing the card cover

4. To remove the currently installed interface board, remove the two screws and pull the board up and away from the printer.

5. Remove the new interface board from its package. Hold the interface board by the metal end, being careful not to touch the card surface. Slide the board down into the slot from which the previous interface board was removed. The board can only be inserted one way. Push the board all the way into the printer.

6. Re-install the two screws removed in step 4.
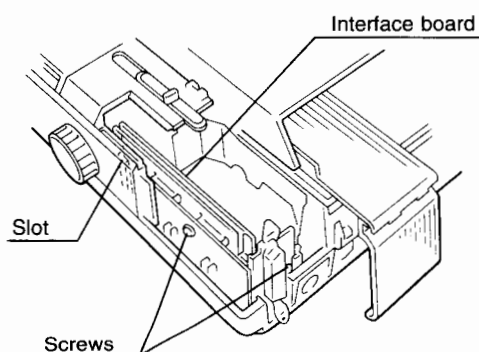
Installing the interface board

7. Replace the card cover by sliding it forward into position and then snapping it into place.

8. Plug in the printer and turn on the power. To connect the new interface, follow the procedures in Chapter 2, starting with the section **Connecting the Printer to Your Computer**.

9. Be sure to initialize the defaults in the controller by turning the power switch on while holding down both the MODE and LF buttons until the printer beeps.

INSTALLING A COLOR KIT

A monochrome printer can be easily reconfigured as a color printer by installing a color kit and color ribbon cartridge.

To install a color kit, follow these steps.

1. Turn the printer power off and open the top and front covers.

2. Remove the ribbon cartridge, loosen the two screws (do not remove them) on the carriage frame, and slide the carriage to the far right side.

   CAUTION
   The print head may be hot if you have been printing recently.

3. Slide the flat cable from the color kit through the space between the print head and the carriage frame. The cable loops under the carriage frame on the right side and then goes under the frame, towards the left.

4. Insert the mounting brackets of the color kit between the carriage frame and the two screw heads. Tighten the screws while pushing the kit toward the frame.
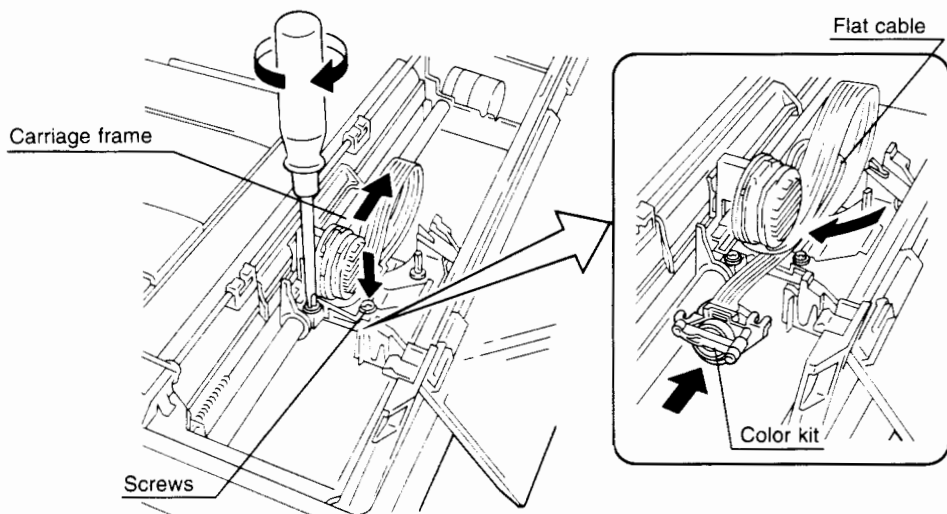
Installing the color kit

5. Slide the clear plastic connector cover to the right and remove it.

6. Pull the end of the shift motor connector to open the contacts. Insert the end of the flat cable into the connector. Push the connector back in to close the contacts.

Connector cover

Print head

Flat cable

Shift motor connector

Shift motor connector

Print head connectors

(Connector open)

(Connector closed)
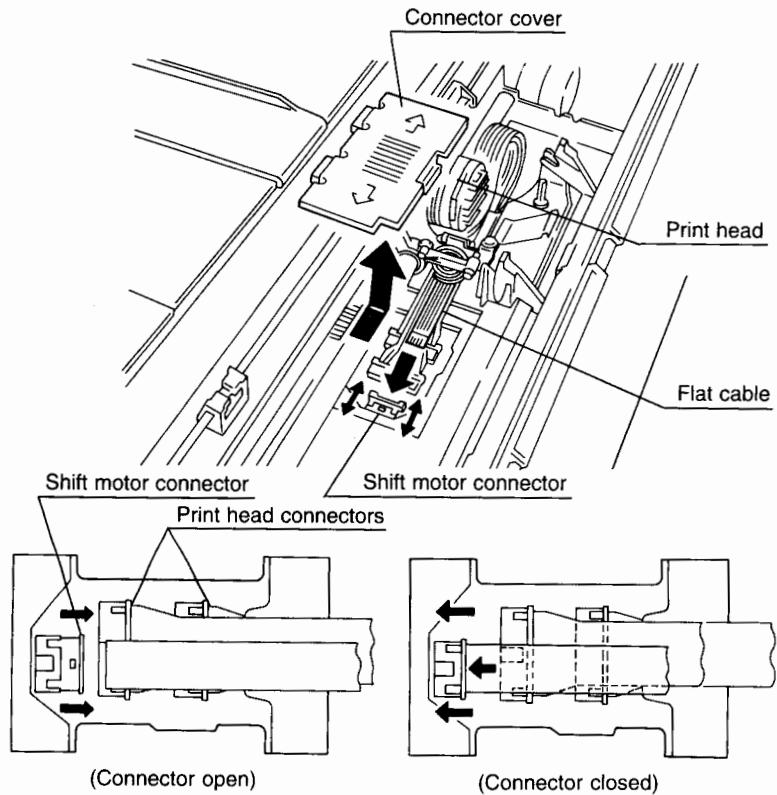
Connecting the color kit flat cable

Options

Color Printing

To print in color, select a color in one of the two ways shown below:

With the control panel:

1. While pressing the MODE button, turn the printer on to place the printer in setup mode.

2. Select the appropriate option for the COLOR item of the MENU1 or MENU2 function.

You can switch between these colors by pressing the FF and LF buttons while the appropriate MODE indicators (MENU1 and MENU2) are lit. You can only select one color at a time.

Through software control:

You can print in seven colors (including black) using the color selection command from your application package. If your application package does not support color selection, you can send the color selection command. See Appendix C or the second part of this manual for color selection commands. Note that some printer emulations have no color selection command. For details, refer to the corresponding programmer's manual.

SUPPLIES, OPTIONS, AND PUBLICATIONS

A
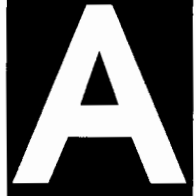
This appendix lists the supplies, options, and programmer's manuals available for the printer. Contact your dealer for information on ordering any of these items.

SUPPLIES

Supplies	Order Numbers
Ribbon cartridges	
Black ribbon	D30L-9001-0601
Color ribbon	D30L-9001-0402

OPTIONS

Options	Order Numbers	Description
Cut sheet feeder	ASF300-FJ3401	Single bin feeder
	ASF300-FJ3411	Double bin adapter mounted on single bin feeder
Font cards	D05B-2610-C810	Dutch 801 PS, Script 12, Old English 10, Humanist 521 PS
	D05B-2610-C811	Swiss 721 PS, Script 12, Old English 10, Humanist 521 PS
	D05B-2610-C812	Courier 10/12/15/17, Light Italic 12, Orator 10
	D05B-2610-C813	Prestige 10/12/15/17, Light Italic 12, Letter Gothic 12
	D05B-2610-C814	OCR-A, OCR-B, Scientific 12/18

Supplies

**OPTIONS
(CONTINUED)**

Options	Order Numbers	Description
Emulation cards	D05B-2610-C611	Fujitsu DPL24D (Diablo 630) emulation
	D05B-2610-C612	DEC LA50/75/120/210 emulation
Color kit	D86B-1156-D351	Color ribbon included
Interface board	D05B-2903-B101	Centronics parallel interface board
	D05B-2903-B201	RS-232C serial interface board

	Order Numbers	Description
Fujitsu Creative Faces™	D05B-9011-C100	Font-scaling software utility for Microsoft® Windows™; giving text smooth, well formed characters, virtually free of jagged edges.

PUBLICATIONS

Publications	Order Numbers
Programmer's Manual (IBM XL24 Emulation)	B-69519
Programmer's Manual (Epson LQ-2500/LQ-2550 Emulation)	B-69520
Programmer's Manual (Fujitsu DPL24D Emulation); compatible with Diablo 630 API	B-69593
Programmer's Manual (DEC LA50/75/120/210 Emulation)	B-69637

PRINTER AND PAPER SPECIFICATIONS

B

This appendix lists physical, functional, and performance specifications for the printer. It also gives detailed specifications for paper.

PHYSICAL SPECIFICATIONS		
Dimensions		
	Height	120 mm (4.7 inches)
	Width	580 mm (22.8 inches)
	Depth	345 mm (13.6 inches)
Weight		12.0 kg (26.5 lbs)
AC power requirements		100 to 120 VAC ±10%, 50/60 Hz +2%/-4%
		220 to 240 VAC ±10%, 50/60 Hz +2%/-4%
Power consumption		
	USA	145 VA for printing characters H in LQ mode
		250 VA maximum
	EUROPE	155 VA for printing characters H in LQ mode
		265 VA maximum
Interface		Centronics parallel or RS-232C serial
Data buffer size		256, 2K, 8K, or 24K bytes
Download buffer		Maximum 31.75K bytes
		(32K bytes minus data buffer size)
Operating environment		5 to 38°C (41 to 100°F)
		30% to 80% RH (no condensation)
		Wet bulb temperature, less than 29°C (84°F)
Storage environment		-15 to 60°C (-4 to 140°F)
		10% to 95% RH (no condensation)

Specifications

**FUNCTIONAL
SPECIFICATIONS**

Print method   Impact dot matrix with a 0.2 mm, 24-wire head

Print direction   Bi-directional, uni-directional, or logic seeking

Character cell   Horizontal x vertical
   Letter (10 cpi)   36 x 24 dots
   Letter (12 cpi)   30 x 24 dots
   Report   18 x 24 dots
   Draft   12 x 24 dots
   High-speed draft   9 x 24 dots

Paper handling   Standard friction-feed platen (single sheet)
                            Standard rear push tractors (continuous forms)
                            Optional cut sheet feeder (see Chapter 8)

Paper type   1- to 5-part side-glued or paper-stapled fan-
                            folded continuous forms with sprocket holes
                            1- to 5-part top-glued single sheets

Paper size
   Width   101-420 mm (4-16.5 inches)
   Length   76-364 mm (3-14.3 inches)

Paper thickness   Up to 0.33 mm (0.013 of an inch)

Page length   Depends upon emulation. The default is 11
                            inches for all emulations.
                            DPL24C PLUS and IBM XL24: 3, 3.5, 4, 5, 5.5, 6,
                            7, 8, 8.5, 11, 11.6, 12, 14, or 18 inches
                            Epson LQ-2500/LQ-2550: 4, 4.5, 5, 5.5, ..., 11,
                            11.5, 12, ..., 22 inches
                            Programmable in one line or inch increments in
                            all emulations

Number of copies   Up to 5, including the original

Command sets (emulations)
   Resident   Fujitsu DPL24C PLUS
                            IBM Proprinter XL24
                            Epson LQ-2500/LQ-2550
   Emulation cards   Fujitsu DPL24D (Diablo 630 API)
                            DEC LA50/75/120/210

Character sets	IBM PC character sets 1 and 2	
	IBM PS/2 character sets (code pages 437, 850, 860, 863, and 865)	
	ISO 8859-1/ECMA 94	
	International character sets	
	Fujitsu character set (357 characters)	

Standard fonts

Resident — Letter quality fonts: Courier 10, Prestige Elite 12, Boldface PS, and Pica 10. Correspondence, Draft, High-speed Draft, and Compressed also available.

Optional — Available on font cards. See Appendix A.

Download — Available from independent vendors

Character pitch — 2.5, 3, 5, 6, 10, 12, 15, 17.1, 18, or 20 cpi, or proportional spacing. Programmable in 1/360 of an inch or various increments for image graphics.

Characters per line
136 cpl at 10 cpi
163 cpl at 12 cpi
204 cpl at 15 cpi
232 cpl at 17.1 cpi
244 cpl at 18 cpi
272 cpl at 20 cpi

Line spacing — 1, 2, 3, 4, 5, 6, 7, or 8 lines per inch. Programmable in 1/360 of an inch or various increments for image graphics.

PERFORMANCE SPECIFICATIONS

Print speed	**10 cpi**	**12 cpi**
Letter	90 cps	108 cps
Report	180 cps	216 cps
Draft	270 cps	324 cps
High-speed draft	300 cps	360 cps
	cpi:	characters per inch
	cps:	characters per second

Line feed speed — 100 ms per line at 6 lines per inch

Form feed speed — 4 inches per second

Specifications

Ribbon life

Color	Up to 0.3 million characters per color
Black	Up to 2.5 million characters

Certification

Safety

Applied Regulation	Applied Area
UL478-05 (for 100 to 120 VAC)	United States
CSA C22.2×220 (for 100 to 120 VAC)	Canada
TUV EN60 950 (for 220 to 240 VAC)	German

RFI Regulation

Applied Regulation	Applied Area
Class B of FCC Part 15B (for 100 to 120 VAC, Certification)	United States

PAPER SPECIFICATIONS

Print Area

This section illustrates the recommended print area for single sheets and continuous forms.

Print area for single sheets

102-420 mm (4-16.5 inches)

102 mm
(4 inches)
to
558 mm
(22 inches)

Print area

25.4 mm
(1 inch)

May be decreased
to 4.23 mm (1/6 of
an inch;) however,
line spacing
may be uneven.

25.4 mm
(1 inch)

25.4 mm
(1 inch)

No reverse line
feed permitted

Print area

Approx 69 mm
(2.7 inches)

Paper end

Approx 36 mm
(1.4 inches)

6.35-32 mm
(0.25-1.3 inches)

6.35 mm or more
(0.25 of an inch or more)

Print area may be off the paper
depending on paper setting or
width.

.... Perforation

////// Uneven line spacing area

Print area for continuous forms

Paper Thickness

Paper thickness is indicated by the weight of the paper in either grams per square meter (g/m^2) or in pounds per bond (lbs/bond). The following table illustrates the allowable paper thickness for one-part paper or for each sheet of multi-part paper. The total thickness must not exceed 0.33 mm (0.013 of an inch).

For carbonless or carbon-backed paper, the weight may vary depending upon the paper manufacturer. When using paper of borderline thickness, you should test the paper.

Specifications

Type of Paper	Part	Thickness	
		Continuous forms	**Single sheets**
One-part	Single	52-81 g/m² (45-70 kg or 14-22 lb)	
Carbonless 2P	Top Bottom	52 g/m² (45 kg or 14 lb) 52-81 g/m² (45-70 kg or 14-22 lb)	40-52 g/m² (34-45 kg or 11-14 lb) 64-81 g/m² (55-70 kg or 17-22 lb)
3P	Top Middle Bottom	40 g/m² (34 kg or 11 lb) 40 g/m² (34 kg or 11 lb) 40-64 g/m² (34-55 kg or 11-17 lb)	
4P	Top Middle Middle Bottom	40 g/m² (34 kg or 11 lb) 40 g/m² (34 kg or 11 lb) 40 g/m² (34 kg or 11 lb) 40-64 g/m² (34-55 kg or 11-17 lb)	
5P	Top Middle Middle Middle Bottom	40 g/m² (34 kg or 11 lb) 40 g/m² (34 kg or 11 lb) 40 g/m² (34 kg or 11 lb) 40 g/m² (34 kg or 11 lb) 40-64 g/m² (34-55 kg or 11-17 lb)	
Carbon-backed 2P	Top Bottom	52 g/m² (45 kg or 14 lb) 52-81 g/m² (45-70 kg or 14-22 lb)	40-52 g/m² (34-45 kg or 11-14 lb) 64-81 g/m² (55-70 kg or 17-22 lb)
3P	Top Middle Bottom	40 g/m² (34 kg or 11 lb) 40 g/m² (34 kg or 11 lb) 40-64 g/m² (34-55 kg or 11-17 lb)	
4P	Top Middle Middle Bottom	40 g/m² (34 kg or 11 lb) 40 g/m² (34 kg or 11 lb) 40 g/m² (34 kg or 11 lb) 40-64 g/m² (34-55 kg or 11-17 lb)	
5P	Top Middle Middle Middle Bottom	40 g/m² (34 kg or 11 lb) 40 g/m² (34 kg or 11 lb) 40 g/m² (34 kg or 11 lb) 40 g/m² (34 kg or 11 lb) 40-64 g/m² (34-55 kg or 11-17 lb)	

Type of Paper	Part	Thickness	
		Continuous forms	Single sheets
Carbon-interleaved 2P	Top Carbon Bottom	40 g/m² (34 kg or 11 lb) Counted as one sheet 40-64 g/m² (34-55 kg or 11-17 lb)	*Avoid using carbon-interleaved single sheets.*
3P	Top Carbon Middle Carbon Bottom	40 g/m² (34 kg or 11 lb) Counted as one sheet 40 g/m² (34 kg or 11 lb) Counted as one sheet 40-64 g/m² (34-55 kg or 11-17 lb)	

kg: Kilogram weight of 1000 sheets of 788 x 1091 mm paper (1.16 g/m²)

lb: Pound weight of 500 sheets of 17 x 22 inch paper (3.76 g/m²)

COMMAND SETS

This printer has four resident comand sets. The native command set, Fujitsu DPL24C PLUS for DL-series printers, is detailed in the second part of this manual.

This appendix lists the commands and their parameters in the remaining three resident command sets: IBM Proprinter XL24, Epson LQ-2500, and Epson LQ-2550. Separate programmer's manuals for these emulations are also available. See Appendix A for order numbers.

Select the same emulation that is selected in your software. If your software supports two or more emulations including DPL24C PLUS, select DPL24C PLUS for better printer performance.

For general information on printer commands, see the programmer's manual, which is the second part of this manual.

Command Sets

IBM PROPRINTER XL24 EMULATION

This section lists the printer comands for the IBM Proprinter XL24 emulation. Asterisks in the "Function" column indicate extended commands not supported by the original printer. See the *Programmer's Manual (IBM XL24 Emulation)* for detailed information on using these commands.

Function	Command
Print Mode Control	
Double-strike (bold) printing on	ESC G
Double-strike (bold) printing off	ESC H
Emphasized (shadow) printing on	ESC E
Emphasized (shadow) printing off	ESC F
One-line double width characters on	SO or ESC SO
One-line double width characters off	DC4
Double width characters on/off	ESC W (n)
(on: $n = 1$, off: $n = 0$)	
Double height/double width characters	ESC [@ (n_1) (n_2)
$n_1 = 4$, $n_2 = 0$, $m_1 = 0$, $m_2 = 0$	(m_1) ... (m_4)
m_3 controls character height and line spacing:	

m_3	Height	Spacing
0	Unchanged	Unchanged
1	Normal	Unchanged
2	Double	Unchanged
16	Unchanged	Single
17	Normal	Single
18	Double	Single
32	Unchanged	Double
33	Normal	Double
34	Double	Double

m_4 controls character width:

m_4	Width
0	Unchanged
1	Normal
2	Double

Function	Command
Condensed characters on	SI or ESC SI
Condensed and elite characters off	DC2
Subscript or superscript printing on (subscript: $n = 1$, superscript: $n = 0$)	ESC S (n)
Subscript and superscript printing off	ESC T
Underline on/off (on: $n = 1$, off: $n = 0$)	ESC- (n)
Overline on/off (on: $n = 1$, off: $n = 0$)	ESC _ (n)
Horizontal Control	
Space	SP
Backspace	BS
Carriage return	CR
Elite characters on	ESC :
Proportionally spaced characters on/off (on: $n = 1$, off: $n = 0$)	ESC P (n)
Vertical Control	
Line feed	LF
Form feed	FF
Advance paper n/216 inch ($0 \leq n \leq 255$)	ESC J (n)
Advance paper n/180 inch (in AG mode) ($0 \leq n \leq 255$)	ESC J (n)
Set line spacing to 1/8 lines	ESC 0
Set line spacing to 7/72 inch	ESC 1
Set line spacing to n/216 inch ($0 \leq n \leq 255$)	ESC 3 (n)
Set line spacing to n/180 inch (in AG mode) ($0 \leq n \leq 255$)	ESC 3 (n)
Preset line spacing to n/72 inch ($0 \leq n \leq 255$)	ESC A (n)
Preset line spacing to n/60 inch (in AG mode) ($0 \leq n \leq 255$)	ESC A (n)
Set line spacing to the preset value The preset line spacing command is ESC A (n).	ESC 2

Command Sets

Function	Command
Change graphics line spacing base to 1/216 or 1/180 inch (for ESC J and ESC 3) $m_1 = 4, m_2 = 0$ t_1 = any value, t_2 = any value, $t_3 = 0$ $t_4 = 180$ òr 216	ESC [\ (m_1) (m_2) (t_1) ... (t_4)
Tabulation	
Horizontal tab execution	HT
Set horizontal tabs The values of n_1 to n_k in this command are the ASCII values of the print columns (at the current character width) where you want to set tabs. $(1 \le n \le 255)$ $(1 \le k \le 28)$	ESC D (n_1) ... (n_k) NUL
Clear all horizontal tabs	ESC D NUL
Move print position right by n/120 inch $(0 \le n_1, n_2 \le 255)$ $(n = n_1 + n_2 \times 256)$	ESC d $(n_1)(n_2)$
Vertical tab execution	VT
Set vertical tabs The values of n_1 to n_k in this command are the ASCII values of the lines (at the current line spacing) where you want to set tabs. $(1 \le n \le 255)$ $(1 \le k \le 64)$	ESC B (n_1)... (n_k) NUL
Clear all vertical tabs	ESC B NUL
Reset tabs to default values	ESC R
Page Formatting	
Set left margin at column n and right margin at column m $(0 \le n, m \le 255)$	ESC X (n) (m)
Set perforation skip by n lines $(0 \le n \le 255)$	ESC N (n)
Perforation skip off	ESC O
Set page length to n lines $(1 \le n \le 255)$	ESC C (n)
Set page length to n inches $(1 \le n \le 22)$	ESC C NUL (n)
Set top-of-form	ESC 4

Function	Command
Color Selection*	
Select printing color*	ESC r (n)
n = 0: Black	
1: Magenta (red)	
2: Cyan (blue)	
3: Violet	
4: Yellow	
5: Orange	
6: Green	
Character Set Control	
Select character set 1	ESC 7
Select character set 2	ESC 6
Print $n_1 + n_2 \times 256$ characters from all-character set	ESC \ $(n_1)(n_2)$
(*chars.*: characters to be printed)	(*chars.*)
Print a character from all-character set	ESC ^ (*char.*)
(*char.*: a character to be printed)	
Clear input buffer	CAN
Select printer	DC1
Deselect printer (ignore input)	ESC Q #
Downloading	
Select resident or download font	ESC I (n)
n = 0: Resident Draft	
2: Resident Courier	
4: Download Draft	
6: Download Courier	
Create download font	ESC = $(n_1)(n_2)$
	ID $(m_1)(m_2)$ (*data*)

Command
Sets

Function	Command
Bit Image Graphics	
Single density graphics	ESC K $(n_1)(n_2)$ (*data*)
Double density graphics	ESC L $(n_1)(n_2)$ (*data*)
High speed double density graphics	ESC Y $(n_1)(n_2)$ (*data*)
Quadruple density graphics	ESC Z $(n_1)(n_2)$ (*data*)
High-resolution graphics	ESC [g $(n_1)(n_2)$ (*m*) (*data*)
Select graphics mode (in AG mode only)	ESC * (*m*) $(c_1)(c_2)$ (*data*)
Cut Sheet Feeder Control*	
Feed a sheet from bin 1*	ESC EM 1
Feed a sheet from bin 2*	ESC EM 2
Feed a sheet from bin 3*	ESC EM E
Eject a page from the printer*	ESC EM R
Select bin 1 for following pages*	//1//
Select bin 2 for following pages*	//2//
Select bin 3 for following pages*	//E//
Eject sheet at end of current page*	//R//
Change bins at next page*	//C//
Printer Option Control*	
HCPP control*	//F//
HCPP control*	//T//
Miscellaneous	
Sound the bell	BEL
Uni-directional printing on/off (on: $n = 1$, off: $n = 0$)	ESC U (*n*)
Add a carriage return to all line feeds (on: $n = 1$, off: $n = 0$)	ESC 5 (*n*)
Printer offline	ESC j
Enter online mode*	ESC e ONLINE (*data*)

EPSON LQ-2500/
LQ-2550 EMULATIONS

This section lists the printer comands for the Epson LQ-2500 and LQ-2550 emulations. Asterisks in the "Function" column indicate extended commands not supported by the original printer. See the *Programmer's Manual (Epson LQ2500/2550 Emulation)* for detailed information on using these commands.

Function	Command
Print Mode Control	
Double-strike (bold) printing on	ESC G
Double-strike (bold) printing off	ESC H
Emphasized (shadow) printing on	ESC E
Emphasized (shadow) printing off	ESC F
Italic printing on	ESC 4
Italic printing off	ESC 5
Select character style*	ESC q (n)
$n =$ 0: Normal	
1: Outlined	
2: Shaded	
3: Outlined and shadowed	
One-line double width characters on	SO or ESC SO
One-line double width characters off	DC4
Double width characters on/off	ESC W (n)
(on: $n = 1$, off: $n = 0$)	
Double height characters on/off	ESC w (n)
(on: $n = 1$, off: $n = 0$)	
Condensed characters on	SI or ESC SI
Condensed characters off	DC2
Subscript or superscript printing on	ESC S (n)
(subscript: $n = 1$, superscript: $n = 0$)	
Subscript and superscript printing off	ESC T
Underline on/off	ESC - (n)
(on: $n = 1$, off: $n = 0$)	

Command
Sets

Function	Command

Select printing style
  This command combines
  various printing styles. The value
  of n is the sum of the values of the
  styles you want to combine.
  $n = 0$: Pica pitch
       1: Elite pitch
       2: Proportional spacing
       4: Condensed
       8: Shadow
    16: Bold
    32: Double width
    64: Italics
  128: Underline
	ESC ! (n)

Horizontal Control	
Space	SP
Backspace	BS
Carriage return	CR
Set elite pitch	ESC M
Set pica pitch	ESC P
Set 15 CPI	ESC g
Proportionally spaced characters on/off (on: $n = 1$, off: $n = 0$)	ESC p (n)

Set inter-character space to n/120 inch
  (for draft) or n/180 inch (for letter)
  $(0 \le n \le 127)$
	ESC SP (n)

Vertical Control	
Line feed	LF
Form feed	FF
Advance paper n/180 inch $(0 \le n \le 255)$	ESC J (n)
Reverse paper n/180 inch $(0 \le n \le 255)$*	ESC j (n)
Set line spacing to 1/8 inch	ESC 0
Set line spacing to n/180 inch $(0 \le n \le 255)$	ESC 3 (n)
Set line spacing to n/60 inch $(0 \le n \le 127)$	ESC A (n)
Set line spacing to 1/6 inch	ESC 2
Set line spacing to n/360 inch $(0 \le n \le 255)$*	ESC + (n)

Function	Command
Tabulation	
Horizontal tab execution	HT
Set horizontal tabs	ESC D
The values of n_1–n_k in this command are the ASCII values of the print columns (at the current character width) where you want to set tabs. $(1 \leq n \leq 255)$ $(1 \leq k \leq 32)$	(n_1) ... (n_k) NUL
Move print position n/60 inch right from left margin (n = n_1 + n_2 x 256)	ESC \$ (n_1) (n_2)
Move print position n/120 inch (for draft) or n/180 inch (for letter) left or right from the current position (n = n_1 + n_2 x 256)	ESC \ (n_1) (n_2)
Vertical tab execution	VT
Set vertical tabs	ESC B (n_1) ...
The values of n_1 to n_k in this command are the ASCII values of the lines (at the current line spacing) where you want to set tabs. $(1 \leq n \leq 255)$ $(1 \leq k \leq 16)$	(n_k) NUL
Select vertical tabs by channel	ESC b (c)
The values of n_1 to n_k in this command are the ASCII values of the lines (at the current line spacing) where you want to set tabs. $(0 \leq c \leq 7)$ $(1 \leq n \leq 255)$ $(1 \leq k \leq 16)$	(n_1)...(n_k) NUL
Select vertical tab channel $(0 \leq c \leq 7)$	ESC / (c)
Page Formatting	
Set right margin to column n $(1 \leq n \leq 255)$	ESC Q (n)
Set left margin to column n + 1 $(1 \leq n \leq 255)$	ESC ℓ (n)
Set perforation skip by n lines $(1 \leq n \leq 127)$	ESC N (n)

Command
Sets

Function	Command
Perforation skip off	ESC O
Set page length to n lines $(1 \leq n \leq 127)$	ESC C (n)
Set page length to n inches $(1 \leq n \leq 22)$	ESC C NUL (n)
Color Selection	
Select printing color	ESC r (n)
$n = 0$: Black	
1: Magenta (red)	
2: Cyan (blue)	
3: Violet	
4: Yellow	
5: Orange	
6: Green	
Character Set Control	
Select character set 2	ESC 7
Select character set 1	ESC 6
Select character set table	ESC t (n)
$n = 0$: Italics character set	
1: Graphics character set	
2: Download character set (LQ-2550 only)	
Select international character set	ESC R (n)
$n = 0$: USA	
1: France	
2: Germany	
3: United Kingdom	
4: Denmark 1	
5: Sweden	
6: Italy	
7: Spanish 1	
8: Japan	
9: Norway	
10: Denmark 2	
11: Spanish 2	
12: Latin America	

Function	Command
Clear input buffer	CAN
Select printer	DC1
Deselect printer (ignore input)	DC3
Delete a character	DEL
Force most significant bit to 1	ESC >
Force most significant bit to 0	ESC =
Cancel control over most significant bit	ESC #
Word Processing	
Line justification on	ESC a (n)
$\quad n$ = 0: Left justify	
$\qquad$ 1: Center	
$\qquad$ 2: Right justify	
$\qquad$ 3: Full justify	
Font Selection and Downloading	
Select font	ESC % (n)
Select letter or draft quality	ESC x (n)
$\quad n$ = 0: Draft	
$\qquad$ 1: Letter	
Select type style	ESC k (n)
$\quad n$ =0: Dutch 801 (*)	
$\qquad$ 1: Swiss 721 (*)	
$\qquad$ 2: Courier (default)	
$\qquad$ 3: Prestige	
$\qquad$ 4: Script (*)	
$\qquad$ 5: OCR-B (*)	
$\qquad$ 6: OCR-A (*)	
$\qquad$ (*) with a font card	
Copy resident font to download area*	ESC : (n_1) (n_2) (n_3)
Create download font*	ESC & NUL (n_1) (n_2) (d_0) (d_1) (d_2) (data)

Command Sets

Function	Command
Bit Image Graphics	
Graphics type m graphics	ESC * (m) (n_1) (n_2) (data)
Bit image mode definition	ESC ? (s) (n)
Single density graphics	ESC K (n_1) (n_2) (data)
Double density graphics	ESC L (n_1) (n_2) (data)
High-speed double density graphics	ESC Y (n_1) (n_2) (data)
Quadruple density graphics	ESC Z (n_1) (n_2) (data)
Cut Sheet Feeder Control	
Feed a sheet from bin 1	ESC EM 1
Feed a sheet from bin 2	ESC EM 2
Feed a sheet from bin 3*	ESC EM E
ASF mode on	ESC EM 4
ASF mode off	ESC EM 0
Eject a page from the printer	ESC EM R
Select bin 1 for following pages*	//1//
Select bin 2 for following pages*	//2//
Select bin 3 for following pages*	//E//
Eject sheet at end of current page*	//R//
Change bins at next page*	//C//
Printer Option Control*	
HCPP control*	//F//
HCPP control*	//T//
Miscellaneous	
Sound the bell	BEL
Move print head to home position	ESC <
Uni-directional printing on/off (on: $n = 1$, off: $n = 0$)	ESC U (n)
Initialize printer	ESC @
Half speed printing on/off (on: $n = 1$, off: $n = 0$)	ESC s (n)
Enter online setup mode*	ESC e ONLINE (data)

D

INTERFACE INFORMATION

This printer can communicate with a computer through either a Centronics parallel interface or an RS-232C serial interface. The printer cannot be equipped with both interfaces at the same time. If necessary, you can remove the interface currently used and install the other interface (see Chapter 8 for details).

This appendix provides information you may need if you are wiring your own interface cables or programming for computer-to-printer communications. Most users do not need to refer to this appendix. If you are simply trying to connect your printer to your computer, check the instructions in Chapter 2.

PARALLEL INTERFACE

The Centronics interface is the industry-standard parallel interface. The cable connector at the printer side should be a shielded Amphenol DDK 57FE-30360 or its equivalent.

The connector pin assignments are shown in the following table. In this table:

- "Input" indicates a signal input to the printer from the computer.

- "Output" indicates a signal output from the printer.

- The return lines specified in the second column represent twisted pairs, with one side connected to signal ground.

- The standard signal levels are 0.0 to +0.4 V for low, and +2.4 to +5.0 V for high.

Interface

Pin No.	Return Pin No.	Signal Name	Direction	Description
1	19	Data Strobe	Input	Strobe pulse for reading data. The printer reads data when this signal is low. The pulse width must be 1 μs or more at the receiving terminal.
2-9	20-27	Data 1 to 8	Input	Data 8 (pin 9) is the most significant bit, but it is not used in 7-bit ASCII communications. All signals that indicate data is logical 1 should go high at least 1 μs before the falling edge of the Data Strobe signal and must stay high for at least 1 μs after the rising edge.
10	28	Acknowledge	Output	Pulse signal indicating the printer has received data and is ready to accept the next data. This signal is also issued when the printer is switched from offline to online.
11	29	Busy	Output	Output data cannot be received when this signal is high. This signal goes high during data entry, when the printer is offline, when the buffer is full, or when an error occurs.
12	30	Paper Empty	Output	This signal goes high when the printer is out of paper.
13	-	Select	Output	This signal indicates the selected (online) state when high and the deselected (offline) state when low.

Pin No.	Return Pin No.	Signal Name	Direc-tion	Description
14	-	$\overline{\text{Auto Feed XT}}$	Input	Not used
15	-	-	-	No connection
16	-	Signal Ground	-	Logic ground level (0 V)
17	-	Frame Ground	-	Printer chassis ground line FG and SG are connected.
18	-	-	-	No connection
19-30	-	Signal Ground	-	Twisted pair return lines
31	-	$\overline{\text{Input Prime}}$	Input	If this signal is low for more than 50 µs, the printer is reset to the initial condition and is placed online.
32	-	$\overline{\text{Fault}}$	Output	This signal goes low when the printer is offline, paper is out, or when there is a printer error.
33	-	Signal Ground	-	Logic ground level (0 V)
34	-	-	-	No connection
35	-	+5 VR	Output	Pulled up to +5 V through a 3.3 kΩ resistor.
36	-	$\overline{\text{SLCT-IN}}$	Input	Not used

Interface

Data Transmission Timing

The Centronics interface of this printer guarantees the received data when the Data and $\overline{\text{Data Strobe}}$ signals from the computer have the following timing with respect to the Busy and Acknowledge signals from the printer.
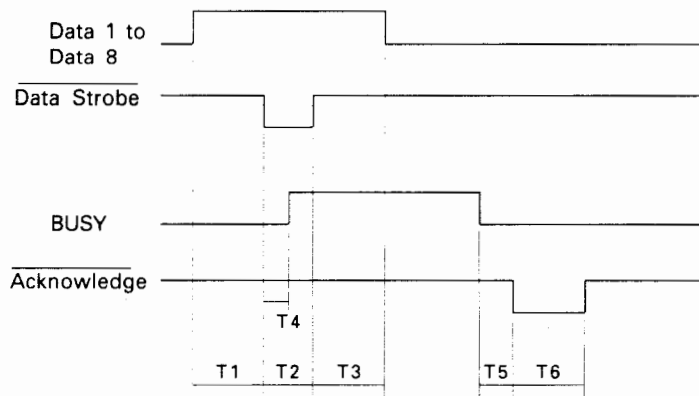
$$T1, T2, T3 > 1\ \mu s$$
$$T4 < 1\ \mu s$$
$$0\ \mu s < T5 < 3\ \mu s$$
$$2\ \mu s < T6 < 6\ \mu s$$

SERIAL INTERFACE

RS-232C is the standard interface for data terminal equipment. The cable connector at the printer side should be a D-subminiature Cannon or Cinch DB-25P male connector or equivalent conforming to EIA standards.

The following table shows the pin assignments that are commonly used by most computers. In this table:

- "Input" indicates a signal input to the printer from the computer.

- "Output" indicates a signal output from the printer.

- The signal level for mark (logical 1) is -3 V or lower; for space (logical 0), it is +3 V or higher.

Pin No.	Signal Name	Direc- tion	Description
1	FG	–	Frame Ground
2	TD	Output	Transmitted Data. This pin carries information from the printer to the computer.
3	RD	Input	Received Data. This pin carries information from the computer to the printer.
4	RTS	Output	Request To Send. Spaces are sent when the printer is ready to transmit data.
5	CTS	Input	Clear To Send. Spaces are sent when the computer is ready to receive data.
6	DSR	Input	Data Set Ready. Spaces are sent when the computer has been powered on and is ready.
7	SG	–	Signal Ground (common return)
8	CD	Input	Data Carrier Detect. Spaces are sent when the computer lets the printer receive data.
11	RC	Output	Reverse Channel. This is used in the RC protocol only. Spaces are sent when the printer is ready to send or receive data.
20	DTR	Output	Data Terminal Ready. Spaces are sent when the printer has been powered on and is ready.

Interface

Serial Options

The serial options listed below must be set the same way on both the computer and the printer. Using the printer's control panel, the computer's operating system, or your software, you can change the options specified as "selectable."

Transmission mode:	Asynchronous, full duplex, or half duplex (selectable)
Speeds:	150, 300, 600, 1200, 2400, 4800, 9600, or 19200 baud (selectable)
Data bits:	7 or 8 bits (selectable)
Parity bit:	Odd, even, mark, space, or none (selectable)
Start bit:	1 bit
Stop bit:	1 or 2 bits (selectable)
Protocol:	XON/XOFF (DC1/DC3), DTR (Data Terminal Ready), RC (Reverse Channel), or ETX/ACK (selectable)
Buffer size:	256, 2K, 8K, or 24K bytes (selectable)

Cable Wiring

This printer allows two types of serial communication control: DSR enabled and DSR disabled. The type you use is determined by your computer's requirements and affects the way the interface cable is wired. To select between DSR enabled and DSR disabled control, use the printer's HARDWRE (hardware) function (see Chapter 5).

DSR disabled control offers simpler cabling and communication than DSR enabled control. It can be used for interfacing with an IBM PC or most other personal computers. With DSR disabled control, input control signals DSR is always considered high, regardless of their actual states. Therefore, a wire connection for these pins is not required. CTS and CD must be high or open wiring. The following figure shows the wiring required for connection to an IBM PC.

```
              Host                    Printer

TD    (Pin 2)  ──────────────①──────── TD
RD    (Pin 3)  ◄─────────          ──► RD
DSR   (Pin 6)  ◄───────┐     # ──────► DSR
DTR   (Pin 20) ──────►②      ─────────DTR (RC)
RTS   (Pin 4)  ────►#        # ──────► RTS
CTS   (Pin 5)  ◄──────┘      # ──────► CTS
CD    (Pin 8)  ◄───────      # ──────► CD
SG    (Pin 7)  ──────────────────────── SG
```
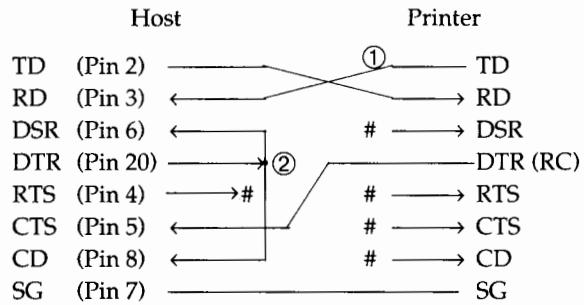
\# indicates an open wire.
Wire ① is unnecessary for the DTR (or RC) protocol.
Some computers may not require wire ②.

DSR enabled control enables communication with an RS-232C interface. The CTS and DSR input control signals are enabled; CD is ignored. DSR must be high when the printer receives data. If the printer has data to be transmitted to the computer, the printer transmits the data immediately when both DSR and CTS are high.

For connection to a DCE (data communications equipment) device using DSR enabled control, use a straight-through cable. For connection to a DTE (data terminal equipment) device, use a null-modem cable as shown below.

```
           Host (DTE)              Printer (DTE)

TD    (Pin 2)  ────────     ──────── TD
RD    (Pin 3)  ◄───────  ╳  ──────► RD
DSR   (Pin 6)  ◄───────  ╳  ──────► DSR
DTR   (Pin 20) ────────     ──────── DTR
RTS   (Pin 4)  ────────┐    ┌◄────── RTS
CTS   (Pin 5)  ◄───────┤    ├──────► CTS
CD    (Pin 8)  ◄───────┘    └──────► CD
SG    (Pin 7)  ──────────────────── SG
```
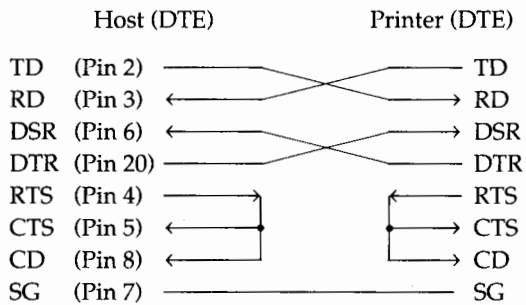
Serial Protocols

A protocol is a set of instructions that control the way data is transmitted between devices such as a computer and printer. The protocol ensures that the computer does not send information to the printer faster than it can be processed. By telling the computer when it can receive data, the protocol prevents the printer's buffer from overflowing.

Interface

This printer offers a choice of four different protocols for connection to a variety of computers: XON/XOFF, DTR, RC, and ETX/ACK. The following table describes each protocol. If your computer's documentation does not recommend a particular protocol, try DTR.

Protocol	Description
XON/XOFF (DC1/DC3)	When the printer is ready to receive data, it sends the XON (DC1) code (hex 11). When fewer than 255 bytes of space remain in the buffer (or when the printer is switched offline), the printer sends the XOFF (DC3) code (hex 13). (When the input buffer is configured for 256 bytes, the buffer limit is reduced from 255 bytes to 63 bytes.) The computer must stop transmitting data within 255 (63) characters of receiving the XOFF, or information may be lost. If paper runs out, the printer sends a NAK code (hex 15).
DTR	This is a hardware protocol; that is, the DTR signal on interface cable pin 20 is used to control the flow of data rather than sending a character code. When the printer is ready to receive data, pin 20 is high. When fewer than 255 (63) bytes of space remain in the buffer (or when the printer is switched offline), pin 20 goes low. The computer must stop transmitting data within 255 (63) characters of DTR going low, or information may be lost.
RC	This protocol is the same as the DTR protocol, except that it uses the Reverse Channel signal (pin 11) instead of the Data Terminal Ready signal (pin 20).
ETX/ACK	This protocol is a little more complicated, but allows faster throughput under some conditions. The computer adds the ETX (End of Text) character (hex 03) at the end of each block of print data. The block, including the ETX character, is usually half the printer's input buffer, but it can be as large as the input buffer. When the printer gets the ETX character out of the buffer, it sends an ACK (Acknowledge) character (hex 06) to the computer (the ETX character is not printed). The computer must stop transmitting the next block of data until receiving the ACK character, or information may be lost. Data transmission continues until the printer finishes printing two blocks, so that high-throughput data communication is provided.

GLOSSARY OF TERMS

A4 size

A standard paper size used in Japan and other countries. Paper is 210 x 295 mm (8.25 x 11.6 inches).

Application software

Software programs that perform tasks such as word processing, database management, or accounting on a computer.

ASCII

An acronym for American Standard Code for Information Interchange. ASCII is a set of 256 codes (numbered 0 to 255) used to communicate information between a computer and another device such as a printer.

Baud rate

The speed, in bits per second, at which data is transmitted to a device such as a printer. Baud rates apply to serial data only. 1200 baud equals approximately 120 characters per second.

Bidirectional printing

Alternately printing lines from left to right and right to left. Bidirectional printing is faster than unidirectional printing because there are no carriage returns.

Bit

The smallest unit of information in computer memory. A bit is a single digit, either a 1 or a 0, in the binary numbering system. Eight bits equal one byte.

Buffer

A storage area for data in the printer or computer. The printer's buffer consists of a print buffer and a download buffer. The print buffer holds data to be printed. The download buffer holds downloaded data such as download (soft) fonts.

Byte

Eight bits. A byte represents a single character such as a number, letter, or control character.

Carriage return (CR)

The return of the print head carriage to the beginning of the next line.

Centronics interface

A type of parallel interface. See **Parallel interface.**

Glossary

Column	A vertical column on a printed page. This printer can print either 80-column, 110-column, or 136 column pages at 10-pitch (10 characters per inch).
Command set	A set of print and format commands used to control the printer. Each printer has its own resident command sets embedded in the printer firmware, and they are actuated by codes sent from the host computer. Some printers, including this one, can also use command sets available on emulation cards.
Condensed print	Print that uses "condensed" characters. Condensed characters have a decreased width. Using condensed print increases the number of characters per line.
Continuous forms	Connected fan-folded sheets of paper fed into the printer using forms tractors. The fan-folded sheets are separated by tearing them at their perforations.
Control panel	A panel containing the printer's indicators and buttons. The control panel is used to control printer operations such as loading paper, selecting print features, and changing setup options.
cpi	Characters per horizontal inch. Also referred to as pitch. For example, 12-pitch means 12 cpi.
cps	Characters per second.
Cut sheets	See **Single sheets**.
Cut sheet feeder	An option that replaces the cut sheet stand. It allows automatic loading from a stack of paper.
Defaults	Settings automatically selected by the printer when power is turned on. By entering setup mode, you can change the defaults to ensure compatibility with your system hardware and software.
Dot matrix	The grid used to print characters on a dot matrix printer. Each dot corresponds to a wire in the print head.

Downloading	Transferring soft fonts from the computer to the printer's memory. Downloading allows you to use fonts not resident in the computer.
dpi	Dots per inch.
Emulation	A command set that allows one printer to print like another printer. This printer has four resident emulations: Fujitsu DPL24C PLUS, IBM Proprinter XL24, Epson LQ-2500, and Epson LQ-2550. The printer can also use emulation cards.
Emulation card	A plug-in card that allows the printer to print the same as another brand of printer.
Font	A complete set of printable characters all having the same size and style. For example, Courier 10 and Prestige Elite 12 are commonly used fonts.
Font card	A plug-in card containing one or more fonts. Font cards provide fonts that are not resident in the printer.
Form feed (FF)	A signal to the printer to advance the paper forward one page. Form feeds can be executed either using software or the FF button on the printer's control panel.
Graphics printing	Controlling the print head wires (dots) individually to produce a picture or an image on the page.
Hexadecimal	A base-16 numbering system (also commonly referred to as hex numbers). Since a base-16 system requires 16 digits, numbers 0 through 9 and letters A through F are used. It is convenient to express binary numbers in hexadecimal because fewer digits are required.
Hex dump	A hexadecimal printout of control codes and data. Hex dumps are used to debug computer programs and to troubleshoot printer malfunctions. To print a hex dump using the printer, you can use the HEX-DUMP function in setup mode.
Interface	The connection that allows communication from one part of a system to another. For example, electrical signals are transferred between the computer and printer over an interface cable.

Glossary

International characters   Characters and symbols specific to a particular language.

Kb   Kilobyte. 1 Kb equals 1024 bytes.

Letter size   A standard paper size used in the U.S.A. and other countries. Paper is 8-1/2 x 11 inches (215.9 x 279.4 mm).

Line feed (LF)   A signal to the printer that advances the paper forward one line. Line feeds can be executed either using software or the LF button on the printer's control panel.

Line spacing   The vertical spacing between lines, measured in lines per inch.

lpi   Lines per inch. Used to measure line spacing.

Monospacing   Character spacing in which each printed character has the same width. Also called fixed pitch, monospacing is the opposite of proportional spacing. Typewriter or computer-printed text is typically monospaced.

Non-resident fonts   Fonts not present (resident) in the printer's permanent memory. This includes soft fonts and fonts on font cards.

Normal mode   One of the printer's two operating modes. In normal mode, the control panel can be used to perform everyday printer operations such as loading and unloading paper, feeding paper, and selecting print features. See also **Setup mode**.

Offline   When the printer is offline, it receives commands from the printer's control panel, instead of the computer. It indicates that the printer is not "online" with the computer.

Online   When the printer is online, it is ready to receive or is receiving commands from the computer. The printer must be online to print.

Parallel interface   A standard computer interface. Information is transferred between devices over separate wires, allowing all of the bits that make up the character to be transmitted simultaneously (in parallel).

Park position	The position in which continuous forms paper is retracted or "parked" on the rear forms tractors. When the forms paper is loaded, it moves forward from the park position onto the platen.
Permanent memory	Memory that retains information even if the power is turned off. The printer's permanent memory retains the default settings that are specified using the printer's setup mode.
Pitch	Characters per horizontal inch (cpi).
Platen	A hard rubber cylinder that moves paper forward during printing.
Proportional spacing	Character spacing in which wide characters occupy more space than narrow characters. For example, characters such as "W" or "M"occupy more space than characters such as "i" or "l." Many font card fonts and soft fonts are proportionally spaced. Sometimes abbreviated PS, proportional spacing is the opposite of monospacing.
Protocol	A set of instructions that control the way data is transmitted between devices such as a computer and printer.
Resident fonts	Fonts present (resident) in the printer's permanent memory. For this printer, the resident fonts are Courier 10, Prestige Elite 12, Pica 10, Boldface PS, Compressed font, Correspondence, Draft, and High-speed draft. Unlike soft fonts or fonts on font cards, resident fonts can always be accessed.
RS-232C interface	A type of serial interface. See **Serial interface.**
Self-test	A test to determine whether the printer is working correctly. Test pages are printed to show print quality and whether all characters print. The self-test only tests the printer. It does not test how the computer works with the printer.
Serial interface	A standard computer interface. Information is transferred between devices over a single wire (although other wires are used for control). With a serial interface, an interface cable greater than 3 meters (10 feet) can be used. This is often necessary in networking environments, where the printer may be shared.

Glossary

Setup mode

One of the printer's two operating modes. In setup mode, the control panel can be used to select the printer's default settings, such as print features, hardware options, and top-of-form. Setup mode also provides some diagnostic functions. See also **Normal mode**.

Shadow printing

Printing characters twice for emphasis. Characters printed the second time are shifted slightly to the right.

Single sheets

Sheets of paper, envelopes, and non-continuous multi-part forms fed into the printer using the cut sheet stand or optional cut sheet feeder. They are also sometimes called cut sheets.

Soft fonts

Fonts downloaded from a disk to the printer's memory. They are also referred to as download fonts. Unlike resident fonts, soft fonts are available only while in the printer's memory.

Software

Programs that control the computer and printer to perform specified tasks such as word processing, database management, and preparation of spreadsheets. Software is sometimes referred to as application software.

Top margin

The total space at the top of the printed page. The top margin is the sum of all of the following: the top-of-form setting, the software-specified top margin, and the printer's TOP-MRG setting.

Top-of-form (TOF)

The logical top of the physical page, as "understood" by the printer when loading paper. The default TOF settings for the printer are 1/6 of an inch (4.2 mm) or 1 inch (25.4 mm).

Tractor feed

A method for feeding continuous forms forward for printing. Holes on the sides of the forms fit over sprockets on two tractors inside the printer.

Unidirectional printing

Printing in one direction only, left to right. Printing is slower than with bidirectional printing, but the vertical alignment is more accurate. Unidirectional printing is useful when precise vertical alignment is required, as in ruled tables.

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